



Environmental Management Plan for Shwe Field Existing Development (Phase 1)

EMP Report

posco
INTERNATIONAL

POSCO International Corporation

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ENVIRONMENTAL MANAGEMENT PLAN for SHWE FIELD EXISTING DEVELOPMENT (PHASE 1)

Prepared by



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ACRONYMS AND ABBREVIATIONS

Name	Description
EIA	Environmental Impact Assessment
ERM	Environmental Resources Management
EMP	Environmental Management Plan
EQEG	Environmental Quality Emission Guidelines
GWP	Global Warming Potential
HVAC	Heating, Ventilation and Air conditioning
IMO	International Maritime Organization
km	Kilometres
km ²	Square kilometres
l	Litres
m	Metres
m ³	Cubic metres
MARPOL	International Convention for the Prevention of Pollution from Ships
MOB	MAIN OPERATIONS BASE FOR AVIATION including (Helicopter Hangar, Passenger briefing room, Fuel Facility Area, Helipads, Taxiway to Main Active RWY (RUNWAY))
MODI	Mobile Offshore Drilling Unit
MOGE	Myanma Oil and Gas Enterprise
MONREC	Ministry of Natural Resources and Environmental Conservation
MSDS	Material Safety Data Sheet
MTOW	MAXIMUM TAKE OFF WEIGHT
NFPA	National Fire Protection Association
PIC	POSCO INTERNATIONAL Corporation (Myanmar E&P)
RW	ROTARY WING @ HELICOPTER
R-143A	1,1,1,2-Tetrafluroethane
R-407C	Pentafluoroethane
SEP	Stakeholder Engagement Plan
SIA	Social Impact Assessment
SOPEP	Shipboard Oil Pollution Emergency Plan

1. EXECUTIVE SUMMARY

1.1 Introduction

This document outlines the Environmental Management Plan (EMP) for the existing Shwe Field Development located in Block A-1 and A-3, offshore Rakhine State, Myanmar (“the Project”). Although referred to in Myanmar legislation as an “EMP”; the scope also covers social impacts and mitigation measures as per the requirements of the EIA Procedure (2015). The Project covers the current development of the Shwe Field and Mya North Field offshore as well as the onshore gas terminal and pipelines associated with the offshore development.

POSCO INTERNATIONAL Corporation (Myanmar E&P) (PIC) is acting as Operator of the Shwe Project with 51% equity and joint venture partners are Myanmar Oil and Gas Enterprise (15%), ONGC Videsh (India) Ltd. (17%), GAIL (India) Ltd. (8.5%) and Korea Gas Corp. (8.5%).

Referring to Article 8 of the Environmental Impact Assessment (EIA) Procedure (29 December 2015), any Project already in existence prior to the issuance of the Environmental Conservation Rules, or the construction of such which has already commenced prior to the issuance of the Rules, shall be required to undertake, within the timeframe prescribed by the Environmental Conservation Department (ECD) of the Ministry of Natural Resources and Environmental Conservation (MONREC), an environmental compliance audit, including on-site assessment, to identify past and/or present concerns related to that Project’s Environmental Impacts, and to:

- Develop an Environmental Management Plan (EMP);
- Obtain an Environmental Compliance Certificate (ECC); and
- Take appropriate actions to mitigate Adverse Impacts in accordance with the Law, the Rules, and other applicable guidelines.

This EMP aims to provide an environmental and social management framework by outlining the compliance requirements, mitigation measures and monitoring programmes, to be undertaken throughout the Project activities.

To comply with the law requirement, PIC is thus required to compile an EMP and submit to MONREC/ECD for consideration and approval to obtain an ECC. PIC have commissioned **Environmental Resources Management (ERM)** to undertake the EMP Study and PIC have taken responsibility to update the existing EMP accordance with ECD’s comments.

1.2 Project Description

The Shwe Project began with exploration activities (seismic and exploratory drilling) which was conducted between 2003 and 2006. Phase 1 of the Shwe Development was completed in 2013. Natural gas has been continuously produced from these fields and supplied for Myanmar domestic demand and China demand since July 2013.

In Phase 2 development, it will cover the production of raw gas from the Shwe Subsea & Shwe Phyu fields PIC submitted an Environmental Impact Assessment (EIA) report for Phase 2 in 2017 and received approval in January 2019.

Phase 3 Development will include the installation and operation of a Low-Pressure Gas Compression Platform (SHK). A Central Drilling, Production and Processing Platform (SHP) was installed in 111 m of water depth in 2012. SHK will be approximately 100 m south-east of SHP and connected to the existing SHP Platform.

1.2.1 Offshore

The Shwe and Shwe Phyu fields are located within Block A-1 and the Mya field is located in Block A-3 (defined as the Project Area). The offshore parts of the Project cover the Shwe integrated drilling, production and processing Platform (SHP) and the Mya North subsea installation.

1.2.2 Midstream and Onshore

Onshore facilities are located to the south of Kyaukpyu at northwest Ramree Island. The setting of the onshore Project Area (50.6Ha/ 105.35 Ac) comprises typically of undeveloped rural area in Lakekhamaw Group of Kyaukphyu Township. The land permit was obtained for land use through Ministry of Home Affairs Notification No. (774/2016) dated on 17th March 2016. The Onshore Gas Terminal (OGT) receives gas production via export gas pipeline from Shwe Platform (SHP), located at the edge of the continental shelf approximately 106 km northwest of Ramree Island.

A schematic diagram of the main components for the Project is presented in *Figure 1.1*. **Phase 1 is shown in red.** The other infrastructure relates to the future phases and is therefore not covered by this EMP.

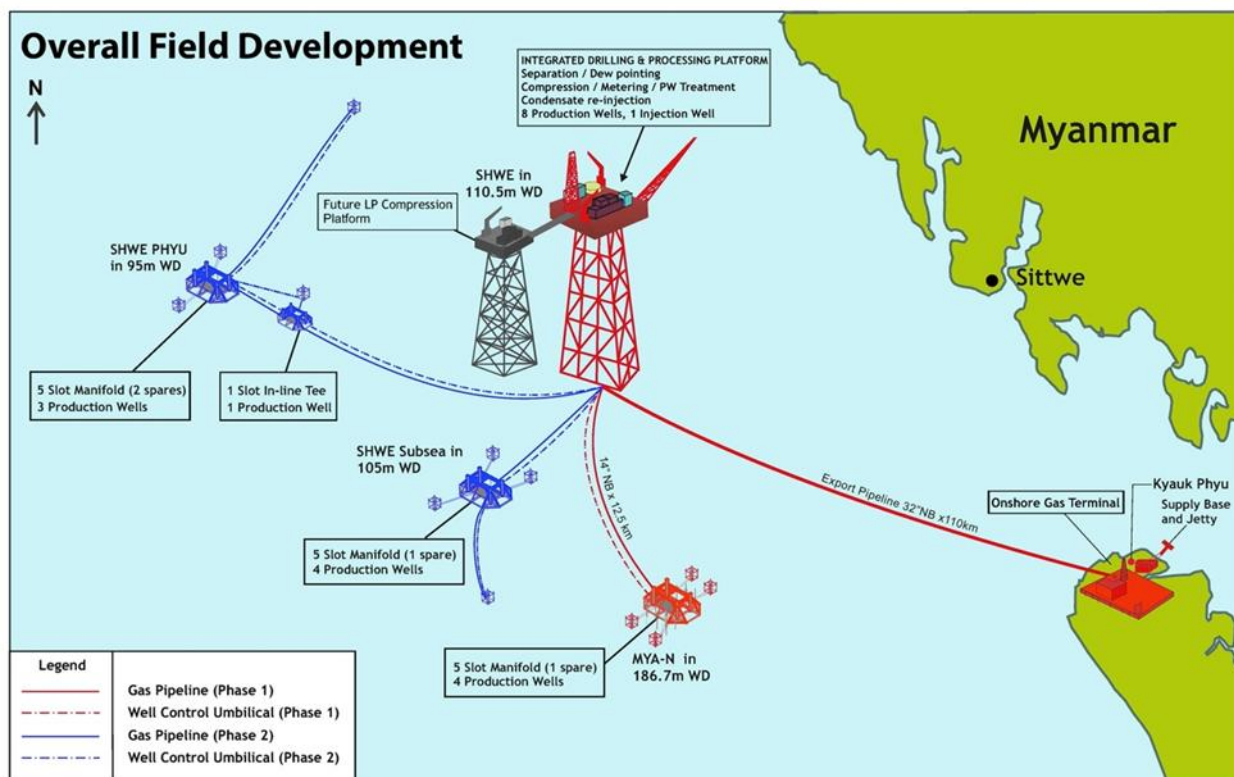


Figure 1-1 Schematic of Phase I Development (Source: PIC) Shown in red

1.2.3 Offshore Blocks near the Project

Block A-1 and A-3 are surrounded by other offshore oil and gas blocks: AD-7, A-4, AD-1 and A-2 (shown in *Figure 1-2*).

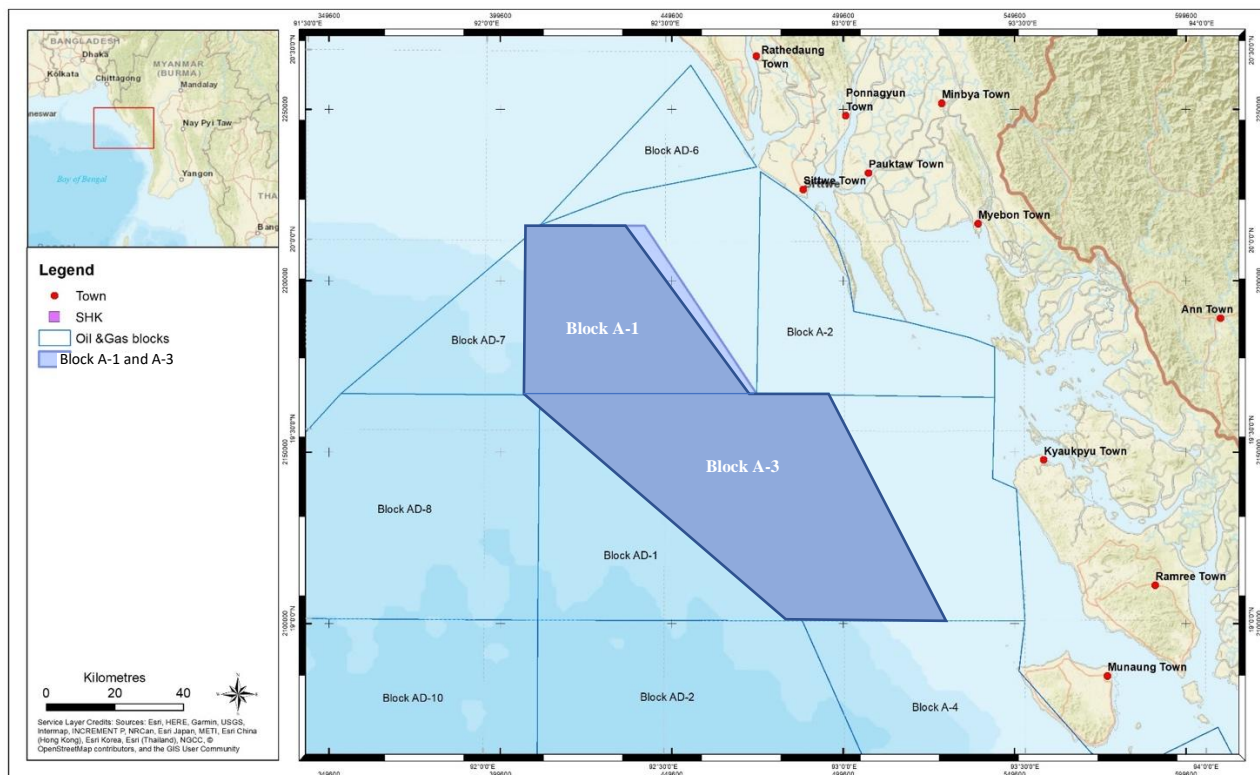


Figure 1-2 Oil and Gas Blocks around the project

It is understood that the offshore waters of Rakhine are expected to have a number of oil and gas exploration activities, and these activities may overlap with other oil and gas operations such as seismic surveys and drilling, in neighboring Blocks.

The assessment for cumulative impacts has considered to address possible impacts related to:

- Disturbance of marine fauna;
- Unplanned spills; and,
- Fishing activities.

1.3 Policy and Legal Requirements

PIC have a Corporate Code of Conduct and Ethics which includes the company's commitments to health, safety and environment. These standards also include PIC's responsibility to employment, local communities, host countries as well as one another.

A number of other laws exist in Myanmar which, either directly or indirectly, relate to environmental and social management, however these laws are general in nature and refer primarily to good practice recommendations. Primarily, the EMP is conducted in line with the Myanmar EIA Procedure (2015).

The Project will adopt MARPOL Convention (MARPOL: International Convention for the Prevention of Pollution from Ships 1973 and MARPOL Protocol of 1978) which is partially ratified by Myanmar.

The *Myanmar National Environmental Quality Emission Guidelines (NEQG) (2015)* provide the basis for regulation and control of noise and vibration, air emissions, and liquid discharges from various sources in order to prevent pollution for purposes of protection of human and ecosystem health. These guidelines will provide the basis for compliance determination when implementing mitigation and monitoring requirements for the EMP.

1.4 Project Developer's Contractual and Commitments for Proposed Project

Outline Laws, regulations and standards shall be followed for environmental quality, safety and health, protection of sensitive areas, protection of endangered species, siting, and land use control at the international, national, and local levels.

PIC will comply with the Environmental Conservation Law dated on March 30, 2012, Rules dated on June 5, 2014, and Procedures dated on December 29, 2015, National Environmental Quality (Emission) Guideline dated on April 22, 2015 and all necessary national and international standards PIC's commitments are illustrated in **Appendix A**.

PIC commits to the following and commitment letter are attached in **Appendix A**.

- A. The project's EMP is accurate and complete.
- B. EMP is written in alignment with Myanmar EIA procedure and related laws.
- C. The project will always follow the commitment of EMP and the environment mitigation plan.

1.5 Description of Surrounding Environment

Temperature: Based on meteorological records at the Shwe Field, the mean temperature is reported to be in the range of 24 - 27°C. Minimum temperature is between 19 - 24°C, while maximum is approximately 34°. The warmest months are April to October while the coolest months are December to February.

Wind Speed: Winds are generally light to moderate, with mean monthly wind speeds falling in the range of 3.2 m/s to 7.1 m/s. Strong winds (> 10 m/s) are most persistent during the southwest monsoon season in the months of June to August. Wind speed less than 2 m/s only occur less than 7 % of the time during the year.

Storms and Cyclones: Gale force winds (17.2 ms^{-1} or over) are mainly associated with local rain squalls and with severe tropical storms or cyclones. The central region off the coast receives the worst buffeting during the summer monsoon. The threat of cyclones with winds above 32.7 m s^{-1} affects different areas at different times of the year, affecting all areas though the major tracks do not pass over the Andaman Sea. They are most frequent from mid-May to early December.

Earthquakes: More recently, a M6.8 RS occurred with an epicentre west of Chauk, adjacent to Rakhine State (24 August 2016). Historical records of earthquakes are noted within the Study Area and the magnitudes of the earthquakes were ranked 5 or less (Union of Myanmar, 2009).

Tsunami: The recent 2004 tsunami generated by the Sumatra earthquake caused moderate damage to the Rakhine Coast and this area is comparatively more vulnerable to a potential tsunami.

Oceanography and Hydrology: Tides in the Study Area are semi-diurnal with a recorded tidal range of approximately 2 m at the Shwe Field, which is similar to coastal areas of the Study Area.

Type of Sediment: The seabed is characterized by soft mud with relatively low ecological value or significance.

Environmental Baseline Condition (Sampling result of 2019):

Sediment Quality

- The content of organic matter found to occur in seabed sediment was found to be considered typical of unpolluted offshore marine environments.

- Metal concentrations were considered to be indicative of naturally-occurring background metal concentrations with no metal at concentrations of environmental concern recorded.
- The total hydrocarbon concentration in all sediment samples was recorded < 1 mg/kg, and the oil and grease concentration in all samples was < 0.1 %.
- No concentrations above the detection limit were registered for all hydrocarbon fractions in any of the sediment samples collected. Overall, no evidence of hydrocarbon contamination was found in the collected marine sediment samples from the surrounds.

Seawater Quality

- Seawater temperature and salinity was largely similar among the sampling locations and vertical gradient in seawater temperature and salinity was observed, in which temperature decreased and salinity increased progressively from the surface to the bottom.
- Photosynthetic organisms consume CO₂, which in turn generates an increase in pH. High pH values are thus evidence of a high production by phytoplankton. Seawater pH was similar among sampling locations and in general pH levels were observed to decrease with depth. The higher pH in surface waters than at depth was indicative of the higher phytoplankton production in these well-lit surface waters.
- In comparison to National Environmental Quality (Emissions) Guidelines, TSS levels of ambient waters were well below discharge standards (50mg/L) for this parameter.
- DO concentrations at all depths were recorded <4 mg/l indicating relatively low oxygen levels at the time of sampling.
- Overall, the COD and BOD measurements indicated that low organic content with no evidence of organic pollution. In comparison to National Environmental Quality (Emissions) Guidelines, BOD and COD levels of ambient waters were well below discharge standards (30 mg/l and 125 mg/l respectively) for these parameters.
- In comparison to National Environmental Quality (Emissions) Guidelines, total nitrogen, total phosphorus and ammonia levels of ambient waters were well below discharge standards (10 mg/l, 2 mg/l and 10mg/l respectively) for these parameters, arsenic, copper, lead, zinc, chromium, cadmium and mercury levels of ambient waters were well below discharge standards.
- In comparison to NEQEG, oil and grease levels of ambient waters were well below discharge standards (10 mg/l equivalent to 10,000 ug/l) for this parameter.

Marine Biodiversity

- Given the deeper water depths at the proposed well sites (ranging approximately 700 to 1000 m), insufficient light reaches the seabed to allow the growth of primary producers such as seagrass, *macroalgae* or *zooxanthellate Scleractinia* (reef building) corals and these groups are absent from the seabed in the vicinity of well sites.
- Given the limited scope to impact plankton concentrations or abundance as well as high turnover rates, the plankton community in the Area of Influence is thus regarded as of low environmental sensitivity to the proposed Project activities.
- Due to the relatively remote offshore location of the project works, the biological nature of the works area is considered to be of relatively low ecological value compared to more productive nearshore areas. The deep waters are not expected to support communities of high ecological importance; however, it is noted that marine mammals, marine turtles and seabirds may occasionally pass through these waters.
- There are no sensitive habitats or protected areas within the operational area within the project area. Oyster Island is the closest Key Biodiversity Area (KBA) to the Project Area at 60 km. KBAs, which include important bird and biodiversity areas, are identified by the Bird Life International Partnership. This area has been identified due to the presence of two marine turtle species listed as species of

conservation concern on the IUCN Red List; green turtle and hawksbill turtle; which are listed as endangered and critically endangered respectively by the IUCN. The majority of fish species recorded in Myanmar waters are generally not considered of conservation concern. However, there are a number of marine mammals and turtle species in Myanmar waters and offshore Rakhine State that are globally and/or nationally protected species.

Social Environment:

- The majority of Rakhine fishermen are fishing in waters within 50 km confirmed by ESIA Study and given that the proposed Project is located 70 km from the Sittwe and 80 km from Kyauk Phyu, there is unlikely to be any significant overlap with local fishing activity.
- Given the location and nature of the project activities, the Project is not likely to have an impact on local villages or communities in Rakhine State.

1.6 Summary of Impacts and Mitigation Measures

The EIA Studies demonstrate that the operational, environmental and social setting is understood, with all potential environmental and social impacts assessed. Provided that the recommended mitigation measures (as specified in this EMP) are properly implemented, it is expected that the environmental and social impacts of the proposed Project will be managed by PIC in a professional and acceptable manner. As such, the EIA concludes that **no Major** impacts on the environment and people are anticipated from this Project and all residual risks for identified potential impacts have been properly mitigated to be as low as reasonably practicable (ALARP) ⁽¹⁾.

⁽¹⁾ As Low As Reasonably Practicable (ALARP) has been defined as an impact that is tolerable only if impact reduction is impracticable or if the effort involved in reducing the impact further would be grossly disproportionate to the benefit gained.

Table 1-1 Summary of Impacts, Mitigation Measures and Residual Impacts from Operational Phase

Environmental Issue	Activity/ Source of Impact	Mitigation Measures	Residual Impact Significance
Air quality	SHP, support vessels and air transportation	<ul style="list-style-type: none"> Ensure application of efficient equipment operations. 	Negligible
	Air Emissions from CPP	<ul style="list-style-type: none"> Maintain records of all maintenance and application of appropriate operation processes. 	Minor
Sea Water Quality	Discharge of Produced Water, Deck drains, bilge water discharges and sewage and greywater discharges	<ul style="list-style-type: none"> All produced water will be treated offshore and discharged into the sea. Discharges of oil to the sea in produced water will meet the Myanmar EQEG (discharge to sea maximum one day oil and grease should not exceed 42 mg/l; 30-day average should not exceed 29 mg/l). Adequate sampling points will be provided to check oil in water content. Chemical selection and use will be risk based so as to minimise the discharge of hazardous chemicals to sea. Platform utility system design standards and in-place operating philosophies to ensure discharged produced water achieves < 30 mg/l oil-in-water content (monthly average) Compliance with requirements of MARPOL, Annexes I and IV for larger vessels All vessels, barges and rigs operate in compliance with MARPOL Annexes I: oil-in-water content of discharges should not exceed 15 ppm. All sewage and greywater discharges comply with MARPOL 73/78. Oil-water separators for deck drains in drilling platform and vessels Oil-water separators for bilge water discharges Collect used oil and oil-contaminated waste into slop tank for recycling or disposal by best available practice. 	Minor

Environmental Issue	Activity/ Source of Impact	Mitigation Measures	Residual Impact Significance
Marine Organisms	Disturbance effects on marine life of sewage, bilge water and oil contaminants	<ul style="list-style-type: none"> • Same measures as for Seawater Quality • Use only well-maintained vessels • Service and inspect vessels regularly during operation • Shut-down machines and equipment that are in intermittent use (or throttle down to minimum) 	Negligible to Minor
Fisheries and Navigation	Offshore facilities are a potential navigational hazard	<ul style="list-style-type: none"> • Assign 500 m radius exclusion zone (safety zone) around the platform to be closely monitored and actively enforced • There would also be an Alert Area (5 nautical miles), where navigation is forbidden • The platform will be provided with a range of navigation warning devices including navigation light, area lighting, communications equipment and radar reflectors • Notices to mariners will be issued/posted to alert shipping to the infield presence of the installed facilities • All vessel operators related to the project will be required to comply with Myanmar Law, Port Authority regulations and PIC requirements with respect to vessel navigation practices • Vessel movements should be discussed with Port Authority as appropriate to ensure minimal disturbance to ongoing operations and reduce the risk or marine accidents • Jetty and vessels will be appropriately lit with good navigation warning devices, including navigation lights, area lighting, navigation/communications equipment and radar reflectors to provide sufficient warning to other vessels in the area 	Negligible

Environmental Issue	Activity/ Source of Impact	Mitigation Measures	Residual Impact Significance
Waste Management	Non-hazardous wastes	<ul style="list-style-type: none"> Enforce all contractors to comply with Company HSE waste management requirements and relevant laws and monitor contractors' operations for their compliances Minimize waste generation Implement appropriate waste segregation and storage and transport waste by boats to onshore facility for disposal by best available practice Arrange training about appropriate wastes management and storage Use waste manifest for all hazardous waste Establish guidelines for hazardous waste transportation Implementing Periodical ISO 14001 Audit for Environmental Management System 	Negligible
	Hazardous wastes		Negligible
	Storage of waste/ fuel etc. onsite		Negligible
	Operational discharges from operational vessels		Negligible to Minor
	Run-off and discharge of sewage and greywater		Negligible to Minor
	Spills & Leaks from offshore platform SHP		Negligible to minor
	Chemical Spills		Negligible
	Navigation management (notice to mariners)		Minor
Occupational Health and Safety	Physical Injury & Harassment	<ul style="list-style-type: none"> Management controls and occupational health and safety management system Operational controls including permitting system, management of changes, contractor management, monitoring, accident reporting and investigation, management plans, amendment, and protection, etc. Implementation according to health and safety implementation process and protection control measures such as safety procedures to use tools, safety operate, request working permit, PPE, etc. Implementation based on restoration/ response measures such as first aid, plans to hire necessary licensed medic, emergency plans, and response plans in case of emergency Implementation according to other measures such as health examination, information distribution, recommendation, training, and assigning health and safety/monitoring officers Implementing Periodical ISO 45001 Audit for Occupational Health and Safety Management System 	Minor
	Risk of injury to facilities and support vessel personnel		Negligible
	Risk of injury to facilities personnel		Negligible

Environmental Issue	Activity/ Source of Impact	Mitigation Measures	Residual Impact Significance
Social Values	Social Cohesion	<ul style="list-style-type: none"> The provision of a variety of leisure and recreation activities and facilities. The development and implementation of employee and contractor behaviour policies and training. Strict prohibition of the excessive use of alcohol and drugs by all project and contractor personnel. Employment of local people resident in the project impact area. Development and implementation of a community and cultural awareness training program for Project employees and contractors. Establishment of appropriate partnerships with non-government organisations to collaborate on social support services for local and new residents experiencing transitional hardship due to Project development. Support traditional industries through the preferential local procurement of goods and services available in Kyaukpyu (particularly fresh produce) through the development and implementation of a preferential local procurement strategy. 	Negligible
	Public Health		Minor (negative) Positive from improved facilities
	Economy, Industry and Employment		Moderate to Minor
	Education		Minor (negative) Positive from improved facilities
	Infrastructure		Minor (negative) Positive from improved facilities
	Human Rights		Moderate – Minor
	Resettlement and Compensation		Minor – Negligible

1.7 Management and Monitoring

PIC will submit an Environmental Monitoring Report to MONREC every **6 months**. The report will include the following information collated during the Project:

- Environment Record.
- Waste Record.

A summary of the monitoring and record keeping is provided in Table 1-2.

Table 1-2 Summary of the Monitoring and Record-keeping

Project Activity/ Environmental Aspect	Monitoring Measures	Reporting	Responsibility
Waste Generation	Quantities of solid waste disposed Quantities of Hazardous waste disposed Quantities of any fluids discharged and hydrocarbon content if measured	Environmental Discharge Report	PIC
Commercial Fishery Interaction	Recording of community grievances	Records of grievance in accordance with the community grievance mechanism	PIC
Training	Details of crew inductions	Induction record sheet	PIC
Incident reporting	Details of any environmental or social-incidents which cause negative impacts to environmental and social community	Incident report forms	PIC
Compliance Reporting	Compliance with EMP	Inspection check sheets Final Environmental Discharge Report	PIC
Accidental Releases and Leaks	Safety Record	Safety record included in Project Environmental Monitoring report	PIC
Air emissions	Calculation of GHG emissions from gas flared	Environmental Monitoring Report	PIC O&M

The Project will adopt MARPOL requirements and a SOPEP will be prepared and implemented. Should spills occur, they will be reported in the SOPEP Report.

1.8 Public Consultation and Information Disclosure

The EMP consultation meetings were held with various relevant stakeholders at the regional (Rakhine) level in Sittwe and township level in Kyaukpyu Township. The consultation helped the Project to gather information on potentially affected people, and on potential data gaps and stakeholder's concerns and suggestion, and how these can be closed out in the EMP.

The date, time, location, stakeholder and purpose of each meeting is provided in Table 1-3.

Table 1-3 EMP Stakeholder Engagement in October and November 2018

Date, Time and Location	Stakeholder	Purpose of Engagement
30 th October 2018 (Chief Minister Meeting Hall)	Rakhine State Government	<ul style="list-style-type: none"> • Present information on the Project • Get approval for township / village level meeting • Gathers concerns and suggestion from stakeholders
31 st October 2018 (Kyaukpyu GAD Meeting Hall)	Local government Department, village tract leaders, CSOs and other interested parties	<ul style="list-style-type: none"> • Present Project information to local government, village tract leaders and other interested parties • Gather concerns and suggestions from stakeholders
1 st November 2018 (Lakekamaw Village Tract)	Local community of Lakekamaw Village Tract	<ul style="list-style-type: none"> • Present Project information to local government and local community members • Undertake social-baseline data collection • Gather concerns and suggestions from stakeholders
1 st November 2018 (Gonechwein village Tract)	Local community of Gonechwein village Tract	<ul style="list-style-type: none"> • Present Project information to local government and local community members • Undertake social-baseline data collection • Gather concerns and suggestions from stakeholders

The EMP Report will also disclose on PIC's website (<https://www.poscointl.com/eng/esg/myanmarReport.do>) as well as the executive summary of the EMP Report in Myanmar and English. Hard copies will be provided upon request at PIC's office in Yangon as well as in Sittwe, Kyaukpyu GAD offices.

၁. အကျဉ်းချုပ် အစီရင်ခံစာ

၁.၁ နိဒါန်း

ယခု ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှု အစီအစဉ် (EMP) ပါ ဤစာတမ်းသည် မြန်မာနိုင်ငံ၊ ရခိုင်ပြည်နယ် ကမ်းလွန် လုပ်ကွက်အမှတ် A-1 နှင့် A-3 တို့၌ တည်ရှိသည့် ဆောင်ရွက်ဆဲ Shwe Field Development အတွက် ဖြစ်ပါသည်။ (“စီမံကိန်း”)။ မြန်မာနိုင်ငံ ဥပဒေအရ “EMP” အဖြစ် ရည်ညွှန်းသော်လည်း၊ ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်း ဆိုင်ရာ လုပ်ထုံးလုပ်နည်း (၂၀၁၅) ၏ နယ်ပယ်တိုင်းတာသတ်မှတ်ခြင်း သတ်မှတ်ချက်များအရ လူမှုဘဝ သက်ရောက်မှုများ နှင့် လျော့ချမှု အစီအမံများလည်း ပါဝင်ပါသည်။ စီမံကိန်း တွင် ကမ်းလွန် Shwe Field နှင့် Mya North Field တို့၏ လက်ရှိဆောင်ရွက်မှုတို့နှင့် ကုန်းတွင်း ဆောင်ရွက်မှုဖြစ်သော ချိတ်ဆက်နေသော ကုန်းတွင်းဓာတ်ငွေ့ဂိတ် နှင့် ပိုက်လိုင်းများလည်း ပါဝင်ပါသည်။

POSCO INTERNATIONAL Corporation (Myanmar E&P) (PIC) သည် ၅၁% ပါဝင်မှုဖြင့် Shwe Project ၏ လုပ်ငန်းဆောင်ရွက်သူ (operator) အဖြစ်ဆောင်ရွက်လျက်ရှိပြီး၊ အကျိုးတူလုပ်ငန်းတွင် မြန်မာ့ ရေနံနှင့်သဘာဝ ဓာတ်ငွေ့လုပ်ငန်း (၁၅%)၊ ONGC Videsh (အိန္ဒိယ) လီမိတက် (၁၇%)၊ GAIL (အိန္ဒိယ) လီမိတက် (၈.၅%) နှင့် Korea Gas Corp (၈.၅%) တို့မှ အသီးသီးပါဝင်လျက်ရှိပါသည်။

မည်သည့် စီမံကိန်းမဆို၊ သယံဇာတနှင့်သဘာဝပတ်ဝန်းကျင် ထိန်းသိမ်းရေး ဝန်ကြီးဌာန (MONREC) ၏ ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဦးစီးဌာန (ECD)မှ သတ်မှတ်သော အချိန်ကန့်သတ်ချက်အတွင်း စီမံကိန်း၏ ပတ်ဝန်းကျင်ထိခိုက်မှုများနှင့် စပ်လျဉ်း၍ ယခင် နှင့်/သို့မဟုတ် ယခု စိုးရိမ်မှုများကို ဖော်ထုတ် သတ်မှတ်ရန် လုပ်ငန်းခွင် ဆန်းစစ်ခြင်းအပါအဝင် ပတ်ဝန်းကျင် လိုက်နာဆောင်ရွက်မှု စစ်ဆေးခြင်းနှင့်

- ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှု အစီအစဉ် (EMP) တစ်ရပ် ရေးဆွဲရန်၊
- ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဆိုင်ရာ လိုက်နာဆောင်ရွက်မှု သက်သေခံလက်မှတ် (ECC) ရရှိရန် နှင့်
- ဥပဒေ၊ နည်းဥပဒေများ နှင့် အခြား သက်ဆိုင်ရာ ဥပဒေများနှင့်အညီ ဆိုးကျိုးသက်ရောက်မှု များကို လျော့ချရန် သင့်လျော်သည့် အရေးယူဆောင်ရွက်မှုများကို ပြုလုပ်ရန် လိုအပ်ပါသည်။

ဤ ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ် (EMP) သည် စီမံကိန်း လှုပ်ရှားမှုများတစ်လျှောက် ဆောင်ရွက်ရမည့် လိုက်နာမှု လိုအပ်ချက်များ၊ လျော့ပါးရေး အစီအမံများနှင့် စောင့်ကြည့်ရေး အစီအစဉ်များကို ဖော်ပြခြင်းဖြင့် သဘာဝပတ်ဝန်းကျင်နှင့် လူမှုရေး စီမံခန့်ခွဲမှု မူဘောင်တစ်ရပ်ကို ပံ့ပိုးပေးရန် ရည်ရွယ်ပါသည်။

ထို့ကြောင့်၊ ဥပဒေအရ သတ်မှတ်ချက်များနှင့်အညီဖြစ်စေရန်၊ PIC သည် ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဆိုင်ရာ လိုက်နာဆောင်ရွက်မှု သက်သေခံလက်မှတ် (ECC) ခွင့်ပြုချက်အတွက် ထည့်သွင်း စဉ်းစားရန် ပတ်ဝန်းကျင် စီမံခန့်ခွဲမှုအစီအစဉ် (EMP) ကို ဆောင်ရွက်ရန် လိုအပ်ပြီး၊ MONREC/ECD သို့ တင်ပြရန်လိုအပ်ပါသည်။ EMP လေ့လာချက်အား PIC ၏ တာဝန်ပေးချက်အရ Environmental Resources Management (ERM) မှ ဆောင်ရွက်ခဲ့ပြီး ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်အပေါ် ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဦးစီးဌာနမှ စိစစ်တွေ့ရှိချက်နှင့် သုံးသပ် အကြံပြုချက်များအား ပြန်လည်ပြင်ဆင်တင်ပြပါသည်။

၁.၂ စီမံကိန်းအကြောင်းအရာ ဖော်ပြချက်

ရွှေစီမံကိန်းသည် တူးဖော်ခြင်းလုပ်ငန်းများ (ဆိုက်စမစ်နှင့် တူးဖော်ခြင်း) အား ၂၀၀၃ ခုနှစ်မှ ၂၀၀၆ ခုနှစ်အတွင်း စတင်ခဲ့သည်။ Shwe Development ၏ Phase 1 သည် ၂၀၁၃ ခုနှစ်တွင် ပြီးစီးခဲ့သည်။ ထွက်ရှိသည့် သဘာဝဓာတ်ငွေ့များကို ၂၀၁၃ခုနှစ်၊ ဇူလိုင်လမှ စတင်၍ မြန်မာနိုင်ငံ ပြည်တွင်းဝယ်လိုအားနှင့် တရုတ်နိုင်ငံ ဝယ်လိုအားတို့အတွက် ထောက်ပံ့ခဲ့သည်။

Phase 2 ဖွံ့ဖြိုးတိုးတက်မှုတွင် ရွှေနှင့် ရွှေဖြူမှ သဘာဝဓာတ်ငွေ့ထုတ်လုပ်မှု အတွက် PIC မှ Environmental Impact Assessment (EIA) Phase 2 ကို ၂၀၁၇ ခုနှစ်တွင် တင်ပြခဲ့ပြီး ၂၀၁၉ ခုနှစ် ဇန်နဝါရီလတွင် အတည် ပြုချက်ရရှိခဲ့ပါသည်။

Phase 3 Development တွင် Low-Pressure Gas Compression Platform (SHK) ၏ တပ်ဆင်ခြင်းနှင့် လည်ပတ်ခြင်း ပါဝင်သည်။ Central Drilling / Production နှင့် Processing Platform (SHP) ကို ၂၀၁၂ ခုနှစ်တွင် ရေအနက် ၁၁၁မီတာ တွင်

တပ်ဆင်ခဲ့ပါသည်။ Low-Pressure Gas Compression Platform (SHK) သည် SHP ၏ အရှေ့တောင်ဘက် ၁၀၀ မီတာခန့်တွင်ရှိပြီး လက်ရှိ SHP Platform နှင့် ချိတ်ဆက်ထားသည်။

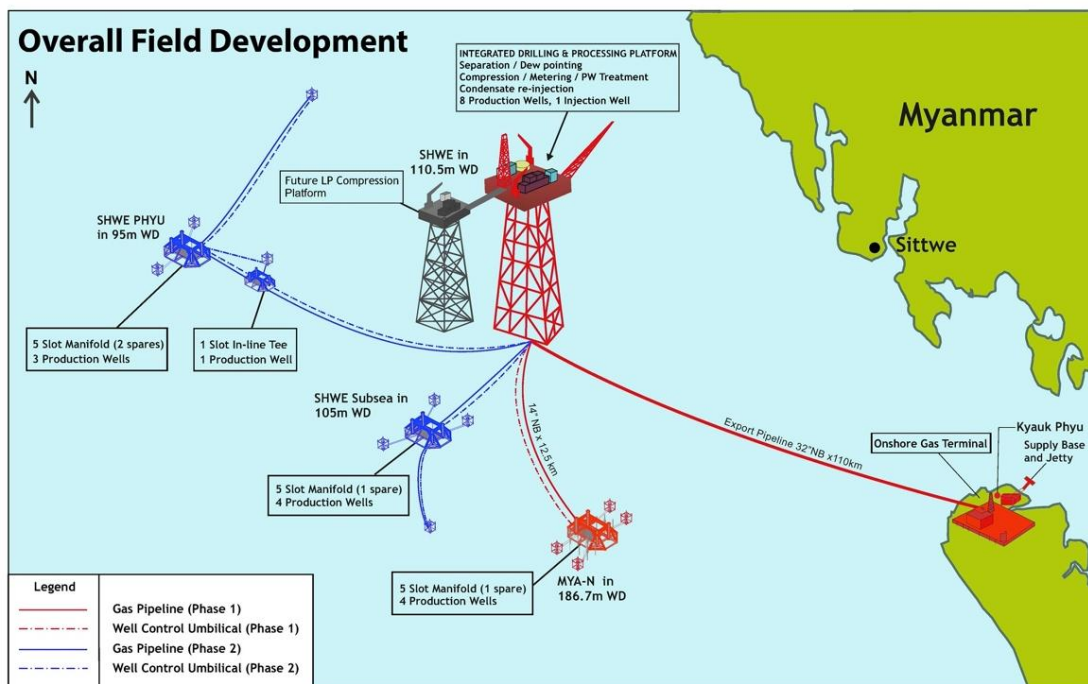
၁.၂.၁ ကမ်းလွန်

Shwe နှင့် Shwe Phyu ကမ်းလွန် လုပ်ငန်းကွက်များသည် ကမ်းလွန် လုပ်ကွက်အမှတ် A-1 ဌ တည်ရှိကြပြီး၊ Mya ကမ်းလွန် လုပ်ငန်းကွင်းမှာ ကမ်းလွန် လုပ်ကွက်အမှတ် A-3 ဌ တည်ရှိသည် (စီမံကိန်းနယ်မြေဧရိယာအဖြစ် သတ်မှတ်ထားသည်)။ စီမံကိန်း၏ ကမ်းလွန်အစိတ်အပိုင်း များတွင် Shwe ပေါင်းစပ်တူးဖော်မှု၊ ထုတ်လုပ်မှု နှင့် စီမံပြုပြင်မှု ကမ်းလွန်ပလက်ဖောင်း (SHP) နှင့် Mya North ကမ်းလွန်ရေအောက် တပ်ဆင်မှုတို့ ပါဝင်ကြပါသည်။

၁.၂.၂ ရေအလယ်ပိုင်းနှင့် ကုန်းတွင်းပိုင်း

ကုန်းတွင်း နေရာအဆောက်အအုံများသည် ရမ်းဗြဲကျွန်း အနောက်မြောက်ဘက်ရှိ ကျောက်ဖြူ၏ တောင်ဘက်၌ တည်ရှိပါသည်။ ကုန်းတွင်းရှိ စီမံကိန်းနယ်မြေဧရိယာ (၅၀.၆ ဟက်တာ/ ၁၀၅.၃၅ ဧက) သည် ကျောက်ဖြူမြို့နယ်၊ လိပ်ခမော်အုပ်စုရှိ မဖွံ့ဖြိုးသေးသော ကျေးလက်နယ်မြေဧရိယာဖြစ်ပြီး ပြည်ထဲရေးဝန်ကြီးဌာန၏ (၁၇-၃-၂၀၁၆) ရက်စွဲပါ အမိန့်ကြော်ငြာစာ အမှတ်(၇၇၄/၂၀၁၆) မြေယာခွင့်ပြုမိန့်ဖြင့် အသုံးပြုရန်ရရှိခဲ့ပါသည်။ ကုန်းတွင်းရှိ ဓာတ်ငွေ့ဂိတ် (OGT) သည် ရမ်းဗြဲကျွန်း၏ အနောက်မြောက်ဘက်သို့ ၁၀၆ ကီလိုမီတာခန့်အကွာရှိ ကမ်းလွန်ရေတိမ်ပိုင်း အစွန်းတွင် တည်ရှိသည့် Shwe Platform (SHP) မှ ဓာတ်ငွေ့ ပိုက်လိုင်းဖြင့် တင်ပို့လာသည့် ဓာတ်ငွေ့ထုတ်လုပ်မှုကို လက်ခံယူသည်။

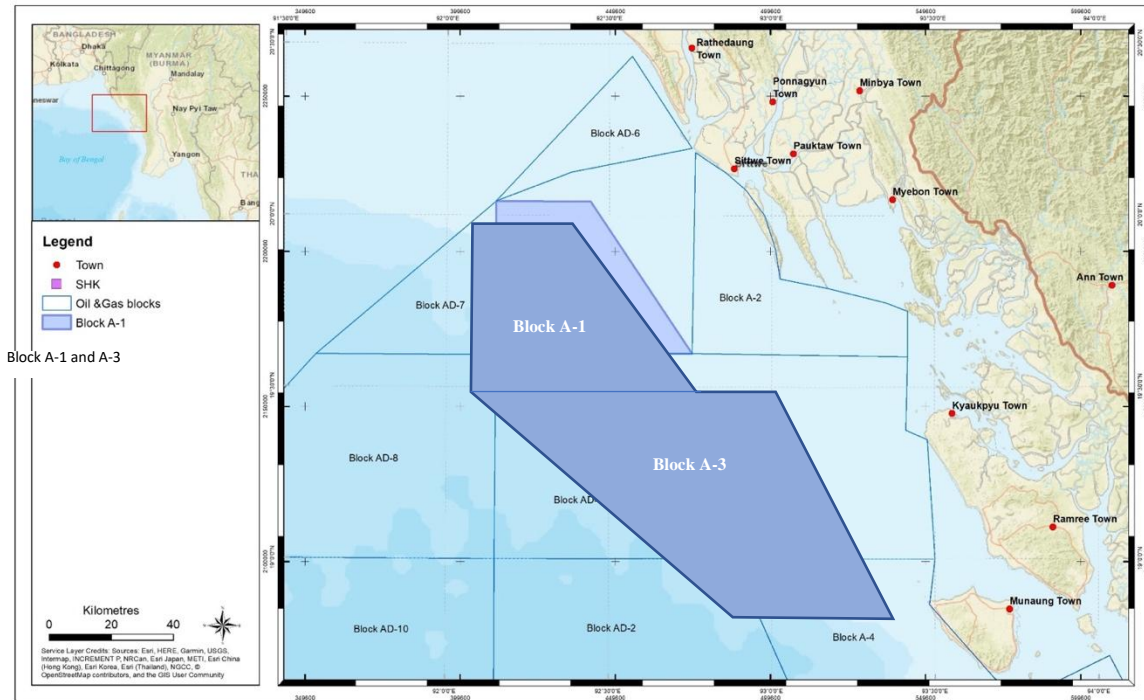
စီမံကိန်းအတွက် အဓိကပါဝင်သောအစိတ်အပိုင်းများ၏ သရုပ်ဖော်ထားသော ပုံကားချပ်ကို ပုံ ၁.၁ တွင် တင်ပြ ထားပါသည်။ အဆင့် (၁) ကို အနီရောင်ဖြင့် ပြထားပါသည်။ အခြားအခြေခံ အဆောက်အအုံသည် အနာဂတ် အဆင့်များနှင့် ဆက်စပ်သဖြင့် ယခု EMP တွင် မပါဝင်ပါ။



ပုံ ၁.၁ အဆင့် (၁) ဆောင်ရွက်မှု၏ ပုံကားချပ် အနီရောင်ဖြင့် ပြထားသည်

၁.၂.၃ စီမံကိန်းအနီးရှိ ကမ်းလွန်လုပ်ကွက်များ

လုပ်ကွက် A-1 နှင့် A-3 တို့အား အခြားသော ကမ်းလွန်ရေနံနှင့် သဘာဝဓာတ်ငွေ့လုပ်ကွက်များဖြစ်သော AD-7၊ A-4၊ AD-1 နှင့် A-2 တို့ ဝန်းရံထားပြီး ပုံ ၁-၂ တွင် ပြသထားပါသည်။



ပုံ ၁.၂ စီမံကိန်းအနီးရှိကမ်းလွန်လုပ်ကွက်များ

ရခိုင်ကမ်းလွန်ပင်လယ်ပြင်တွင် ရေနံနှင့် သဘာဝဓာတ်ငွေ့ တူးဖော်ရေးလုပ်ငန်းများ အများအပြား ရှိလာမည်ဟု မျှော်လင့်ရပြီး ဆိုက်စမစ်စစ်တမ်းကောက်ယူခြင်းနှင့် တူးဖော်ခြင်းကဲ့သို့သော လုပ်ငန်းများသည် အိမ်နီးချင်း လုပ်ကွက်များရှိ အခြားသော ရေနံနှင့် သဘာဝဓာတ်ငွေ့ လုပ်ငန်းများတွင်လည်း ဆောင်ရွက်ခြင်းဖြင့် တိုးပွားလာသော သက်ရောက်မှုများအတွက် ကိုင်တွယ်ဖြေရှင်းရန် အောက်ပါအချက်များအား ထည့်သွင်း စဉ်းစား ပါသည်-

- ရေနေသတ္တဝါများအပေါ် အနှောင့်အယှက်များ၊
- မစီစဉ်ထားသော ယိုဖိတ်မှုများ နှင့်
- ငါးဖမ်းလုပ်ငန်းများ ဖြစ်ပါသည်။

၁.၃ မူဝါဒ နှင့် ဥပဒေ ရေးရာ သတ်မှတ်ချက်များ

PIC တွင် ကျန်းမာရေး၊ ဘေးကင်းရေး နှင့် ပတ်ဝန်းကျင်တို့အတွက် ကုမ္ပဏီ၏ ကတိကဝတ်များပါ ဝင်သည့် Corporate Code of Conduct and Ethics တစ်ရပ် ရှိပါသည်။ ဤစံနှုန်းများတွင် အလုပ်ခန့်အပ်ခြင်း၊ ဒေသခံရပ်ရွာများ၊ အိမ်ရှင်နိုင်ငံများနှင့် တစ်ဦးနှင့်တစ်ဦးတို့နှင့် သက်ဆိုင်သော PIC ၏ တာဝန်များလည်း ပါဝင်ပါသည်။

မြန်မာနိုင်ငံတွင် ပတ်ဝန်းကျင်နှင့် လူမှုစီမံခန့်ခွဲမှုတို့နှင့် တိုက်ရိုက် သို့မဟုတ် သွယ်ဝိုက်၍ စပ်လျဉ်းသည့် အခြားဥပဒေများ ရှိပါသည်။ သို့ရာတွင် ၎င်းဥပဒေများသည် သဘောသဘာဝအရ ယေဘုယျဆန်ပြီး အလေ့အကျင့်ကောင်းများဆိုင်ရာ အကြံပြုချက်များကို အခြေခံအားဖြင့် ရည်ညွှန်းပါသည်။ အဓိကအားဖြင့် EMP ကို မြန်မာနိုင်ငံ ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်း (EIA) ဆိုင်ရာ လုပ်ထုံး လုပ်နည်း (၂၀၁၅) နှင့် အညီ ဆောင်ရွက်ခဲ့ပါသည်။

စီမံကိန်းသည် MARPOL ကွန်ဗင်းရှင်း (MARPOL - ရေယာဉ်များ မှ အညစ်အကြေးများကာကွယ် တားဆီးရေးနှင့် စပ်လျဉ်းသည့် အပြည်ပြည်ဆိုင်ရာကွန်ဗင်းရှင်း (၁၉၇၃) နှင့် MARPOL ပရိုတိုကော (၁၉၇၈) ကို ကျင့်သုံးခဲ့ပြီး၊ ၎င်းကို မြန်မာနိုင်ငံမှ တစ်စိတ်တစ်ဒေသအားဖြင့် အတည်ပြုထားခြင်းဖြစ်ပါသည်။

မြန်မာနိုင်ငံ အမျိုးသားပတ်ဝန်းကျင် အရည်အသွေး ထုတ်လွှတ်မှု လမ်းညွှန်စံနှုန်းများ (NEQG) (၂၀၁၅) သည် လူပုဂ္ဂိုလ်များနှင့် ဂေဟစနစ်ဆိုင်ရာ ရှင်သန်မှုကို ကာကွယ်ရန် ရည်ရွယ်ချက် ညစ်ညမ်းမှုကို တားဆီးရန် အမျိုးမျိုးသော အရင်းမြစ်များမှ ဆူညံသံ နှင့် တုန်ခါမှု၊ ထုတ်လွှတ်မှုအခိုးအငွေ့နှင့် အရည်စွန့်စွန့်မှုတို့အတွက် ကြီးကြပ်ရေးနှင့် ထိန်းချုပ်ရေးအတွက် အခြေခံများကို ပြဋ္ဌာန်း ပေးပါသည်။ ဤလမ်းညွှန်စံနှုန်းများသည် EMP နှင့်စပ်လျဉ်း၍ လျှော့ချရေးကို အကောင်အထည်ဖော်ခြင်းနှင့် သတ်မှတ်ချက် များကို စောင့်ကြပ်ကြည့်ရှုစစ်ဆေးခြင်းဆိုင်ရာ လိုက်နာဆောင်ရွက်ရေးအတွက် ဆုံးဖြတ်ချက်များ၏ အခြေခံများကိုလည်း ပြဋ္ဌာန်း ပေးပါသည်။

၁.၄ ကတိကဝတ်ပြုခြင်း

PIC သည် အောက်ပါတို့ကို ကတိကဝတ်ပြုပါသည် - PIC ၏ ကတိပြုမှုစာအား **နောက်ဆက်တွဲ (က)**တွင် တင်ပြထားပါသည်။

- က. စီမံကိန်း၏ ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ် (EMP) သည် တိကျပြည့်စုံမှုရှိပါသည်။
- ခ. ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ် (EMP) ကို မြန်မာနိုင်ငံ ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်း ဆိုင်ရာ လုပ်ထုံးလုပ်နည်းများ နှင့် ၎င်းနှင့်ဆက်သွယ်သော ဥပဒေများနှင့် အညီ ရေးသား ထားပါသည်။
- ဂ. စီမံကိန်းသည် ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ် (EMP) နှင့် ပတ်ဝန်းကျင်ထိခိုက်မှု လျှော့ချရေး အစီ အစဉ်တို့ကို အစဉ်အမြဲလိုက်နာသွားမည် ဖြစ်ပါသည်။

၁.၅ အနီးပတ်ဝန်းကျင်ဖော်ပြချက်

- အပူချိန်-** မိုးလေဝသ မှတ်တမ်းများအရ ပျမ်းမျှ အပူချိန်သည် ၂၄ မှ ၂၇ ဒီဂရီ စင်တီဂရိတ် အတွင်း ရှိနေကြောင်း သိရသည်။ အနိမ့်ဆုံးအပူချိန်မှာ ၁၉ မှ ၂၄ ဒီဂရီစင်တီဂရိတ်တွင်ရှိပြီး အမြင့်ဆုံးမှာ ၃၄ ဒီဂရီဖြစ်သည်။ အပူဆုံးလများမှာ ဧပြီလမှ အောက်တိုဘာလဖြစ်ပြီး အအေးဆုံးလများမှာ ဒီဇင်ဘာမှ ဖေဖော်ဝါရီလဖြစ်သည်။
- လေတိုက်နှုန်း-** လေတိုက်နှုန်းသည် ယေဘုယျအားဖြင့် လစဉ် လေတိုက်နှုန်းမှာ တစ်စက္ကန့်လျှင် ၃.၂ မီတာ မှ ၇.၁ မီတာ အတွင်း ရှိပါသည်။ ဇွန်လမှ ဩဂုတ်လအတွင်း အနောက်တောင်မုတ်သုံရာသီ အတွင်း အပြင်းထန်ဆုံးဖြစ်ပြီး လေတိုက်နှုန်း (> ၁၀ m/s) ရှိပါသည်။ ပျမ်းမျှလေတိုက်နှုန်း မှာ တစ်စက္ကန့်လျှင် ၂မီတာ အောက်သာရှိပြီး တစ်နှစ်ပတ်လုံး၏ ၇% အောက်တွင်သာ တိုက်ခတ်ပါသည်။
- မုန်တိုင်းနှင့်ဆိုင်ကလုန်း-** လေတိုက်နှုန်း (တစ်စက္ကန့်လျှင် ၁၇.၂ မီတာ နှင့်အထက်) သည် အဓိကအားဖြင့် ဒေသဆိုင်ရာ မိုးသက်လေပြင်းများနှင့် ပြင်းထန်သော အပူပိုင်းမုန်တိုင်းများ သို့မဟုတ် ဆိုင်ကလုန်းများနှင့် ဆက်စပ်နေသည်။ ကမ်းရိုးတန်း အလယ်ပိုင်းဒေသသည် နွေရာသီ တွင် မုတ်သုံလေ အဆိုးဆုံးဖြစ်သည်။ လေတိုက်နှုန်း တစ်စက္ကန့်လျှင် ၃၂.၇ မီတာ အထက်ရှိ ဆိုင်ကလုန်းမုန်တိုင်းများမှာ ကပ္ပလီပင်လယ်ပြင်ကို ဖြတ်သွားခြင်း မရှိသော် လည်း နှစ်စဉ်အချိန်အခါအလိုက် သက်ရောက်မှုရှိသည်။ ၎င်းတို့သည် မေလ လယ်မှ ဒီဇင်ဘာလအစောပိုင်းအထိ အဖြစ်များသည်။
- ငလျင်-** ဩဂုတ်လ ၂၄ ရက်၊ ၂၀၁၆ ခုနှစ်တွင် M6.8 RS သည် ရခိုင်ပြည်နယ်နှင့်ကပ်လျက် ချောက်မြို့ အနောက်ဘက်ဗဟိုချက်တွင် ဖြစ်ပွားခဲ့သည်။ ငလျင်လှုပ်ခတ်မှုဆိုင်ရာ သမိုင်းဝင် မှတ်တမ်းများအရ လေ့လာမှုဧရိယာအတွင်းတွင် ငလျင်ပြင်းအားမှာ အဆင့် ၅ သို့မဟုတ် ၄င်းထက်နည်းသည်ကိုတွေ့ရှိရသည်။ (ပြည်ထောင်စုမြန်မာနိုင်ငံ၊ ၂၀၀၉)။

ဆူနာမီ- ၂၀၀၄ ခုနှစ်တွင် ဆူမကြားငလျင်ကြောင့် ဖြစ်ပေါ်လာသော ဆူနာမီသည် ရခိုင် ကမ်းရိုးတန်းကို အလယ်အလတ် ပျက်စီးစေခဲ့ပြီး အဆိုပါဧရိယာ၏ ဆူနာမီဖြစ်နိုင်ချေနှင့် နှိုင်းယှဉ်ပါက ပို၍ အားနည်းပါသည်။

အတ္ထုပါဗေဒနှင့် ဇီဝဗေဒ- လေ့လာရေးနယ်မြေရှိ မှတ်တမ်းများအရ စီမံကိန်းဧရိယာတွင် အခြားကမ်းရိုးတန်းဒေသများ နီးတူ ဒီရေသည်(၂)မီတာခန့် တက်ရောက်လေ့ရှိပါသည်။

အနည်အမျိုးအစား- ပင်လယ်ကြမ်းပြင်သည် ဂေဟစနစ်တန်ဖိုး သို့မဟုတ် အရေးပါမှုနည်းပါးသော ရွံ့နွံပျော့များဖြင့် ဖုံးလွှမ်းသည့် သွင်ပြင်လက္ခဏာရှိသည်။

ပတ်ဝန်းကျင်အခြေခံအခြေအနေ (2019 ခုနှစ်၏နမူနာရလဒ်)-

ပင်လယ်ကြမ်းပြင်ရှိနှုန်းအနယ်အရည်အသွေး-

- ပင်လယ်ကြမ်းပြင်တွင် တွေ့ရှိရသည့် ဩဂဲနစ်ဒြပ်ပစ္စည်းများ ပါဝင်မှုသည် ညစ်ညမ်းမှုမရှိသော ကမ်းလွန်ပင်လယ်ပြင် ပတ်ဝန်းကျင်၏ ပုံမှန်အဖြစ်သာ သတ်မှတ်တွေ့ရှိခဲ့ပါသည်။
- သတ္တုပါဝင်မှုသည် သဘာဝပတ်ဝန်းကျင်ဆိုင်ရာ စိုးရိမ်ပူပန်မှုတွင် မှတ်တမ်းတင်ထားသော သတ္တုများ ပါဝင်မှုမရှိဘဲ သဘာဝအတိုင်း ဖြစ်ပေါ်နေသော သတ္တုပါဝင်မှုသာဖြစ်သည်ကို ညွှန်ပြသည်ဟု ယူဆရပါသည်။
- ပင်လယ်ကြမ်းပြင်ရှိ နှုန်းအနည်နမူနာအားလုံးတွင် စုစုပေါင်း ဟိုက်ဒရိုကာဗွန်ပါဝင်မှု $< 1 \text{ mg/kg}$ ကို မှတ်တမ်းတင်ထားပြီး နမူနာအားလုံးတွင် ဆီနှင့် အဆီပါဝင်မှုသည် $< 0.1 \%$ ဖြစ်ပါသည်။
- စုဆောင်းထားသော ပင်လယ်ကြမ်းပြင်ရှိ နှုန်းနမူနာများတွင် ဟိုက်ဒရိုကာဗွန်အပိုင်းအစအားလုံးအတွက် ပြင်းအားများနှင့် ပတ်သက်၍ ကန့်သတ်ချက်မရှိသော်လည်း ခြုံငုံကြည့်လျှင် ပတ်ဝန်းကျင်မှ စုဆောင်းထားသော အတ္ထုပါအနည်အနှစ် နမူနာများတွင် ဟိုက်ဒရိုကာဗွန် ညစ်ညမ်းမှု အထောက်အထား မတွေ့ရှိ ရပါ။

ပင်လယ်ရေအရည်အသွေး-

- ပင်လယ်ရေအပူချိန်နှင့် ဆားငန်ဓာတ်သည် နမူနာကောက်ယူသည့် တည်နေရာများကြားတွင် အလွန်ဆင်တူပြီး ပင်လယ်ရေအပူချိန်နှင့် ဆားငန်ဓာတ်အရ Vertical Gradient ကို တွေ့ရှိရပြီး အပူချိန် လျော့နည်းသွားကာ မျက်နှာပြင်မှ အောက်ခြေအထိ ရေငန်ဓာတ် တဖြည်းဖြည်း မြင့်တက်လာသည်။
- Photosynthetic organisms များသည် CO_2 ကို စားသုံးကြပြီး pH တိုးလာစေသဖြင့် မြင့်မားသော pH တန်ဖိုးများသည် phytoplankton မှ မြင့်မားသောထုတ်လုပ်မှု၏ သက်သေဖြစ်ပါသည်။ ပင်လယ်ရေ pH သည် နမူနာကောက်ယူသည့် တည်နေရာများကြားတွင် ဆင်တူပြီး ယေဘုယျအားဖြင့် pH အဆင့်သည် အတိမ်အနက်အလိုက် လျော့နည်းသွားသည်ကို တွေ့ရှိရပါသည်။ နက်ရှိုင်းသည့်ရေအနက်ထက် ပင်လယ်မျက်နှာပြင်ရေများတွင် pH မြင့်မားခြင်းသည် အလင်းရောင် ကောင်းစွာရရှိသဖြင့် phytoplankton ထုတ်လုပ်မှု ပိုမိုမြင့်မားမှုကို ညွှန်ပြနေပါသည်။
- စီမံကိန်း ပတ်ဝန်းကျင်ရှိ ပင်လယ်ရေ၏ TSS အဆင့်များသည် အမျိုးသားပတ်ဝန်းကျင် အရည်အသွေး (ထုတ်လွှတ်မှု) လမ်းညွှန်ချက်များနှင့် နှိုင်းယှဉ်ပါက၊ စွန့်ထုတ်မှုနှုန်းများ (50 mg/L) အတွင်း ကောင်းမွန်စွာ ရှိနေသည်ကို တွေ့ရှိရပါသည်။
- ပင်လယ်ရေနမူနာကောက်ယူသည့် ရေအနက်အားလုံးတွင် အောက်ဆီဂျင်ပမာဏ အတော်လေး နိမ့်ကျလျက်ရှိသည်ကို DO ပြင်းအား $< 4 \text{ mg/l}$ အရ မှတ်တမ်းတင်ထားနိုင်ပါသည်။
- ယေဘုယျအားဖြင့်၊ COD နှင့် BOD တိုင်းတာချက်များသည် အော်ဂဲနစ်ညစ်ညမ်းမှု အထောက်အထားမရှိသည့်အတွက် ဩဂဲနစ်ပါဝင်မှုနည်းပါးကြောင်း ညွှန်ပြနေပါသည်။ အမျိုးသားပတ်ဝန်းကျင် အရည်အသွေး (ထုတ်လွှတ်မှု) လမ်းညွှန်ချက် များနှင့် နှိုင်းယှဉ်ပါက၊ ပတ်ဝန်းကျင်ရေ၏ BOD နှင့် COD အဆင့်များသည် အဆိုပါ စွန့်ထုတ်မှုနှုန်းများ (30 mg/l နှင့် 125 mg/l အသီးသီး) သတ်မှတ်ချက် များအတွင်း ရှိနေပါသည်။

- အမျိုးသား ပတ်ဝန်းကျင်အရည်အသွေး (ထုတ်လွှတ်မှု) လမ်းညွှန်ချက်နှင့် နှိုင်းယှဉ်ပါက၊ စီမံကိန်း ပတ်ဝန်းကျင်ရေတွင် စုစုပေါင်းနိုက်ထရိုဂျင်၊ စုစုပေါင်း ဖော့စဖရပ်နှင့် အမိုးနီးယားအဆင့်များသည် စွန့်ထုတ်မှုစံနှုန်းများ (10 mg/l, 2 mg/l နှင့် 10mg/l အသီးသီး) အောက်တွင် ရှိနေပြီး ကြေးနီ၊ ခဲ၊ ဇင့်၊ ခရိုမီယမ်၊ ကက်မီယမ် နှင့် ပြဒါးအဆင့်များသည်လည်း စွန့်ပစ်စံနှုန်းများအတွင်းတွင် ကောင်းမွန်စွာ တည်ရှိနေပါသည်။
- လေ့လာချက်များအရ စီမံကိန်းဆောင်ရွက်သည့် ပတ်ဝန်းကျင်၏ ရေအရည်အသွေးသည် အမျိုးသား ပတ်ဝန်းကျင် အရည်အသွေး (ထုတ်လွှတ်မှု) လမ်းညွှန်ချက် နှင့်နှိုင်းယှဉ်ပါက၊ ဆီနှင့် ချောဆီပါဝင်မှုပမာဏသည် ကန့်သတ်ချက် ဖြစ်သော စွန့်ပစ်စံနှုန်းများ (10 mg/l နှင့် 10,000 ug/l) အောက်တွင် ရှိသဖြင့် ကောင်းမွန်သည့်အနေအထားတွင် တည်ရှိ ပါသည်။

ဇီဝဗေဒ-

- အဆိုပြုတွင်းနေရာများသည် (၇၀၀ မီတာ မှ ၁၀၀၀ မီတာခန့်) ရှိသော ရေအနက်တွင်ရှိသောကြောင့် အလင်းရောင် မလုံလောက်သဖြင့် သန္တာကျောက်တန်းများ၊ ပင်လယ်မြက်၊ macroalgae သို့မဟုတ် zooxanthellate Scleractinia (သန္တာကျောက်တန်းများဖြစ်တည်မှု) များသည် ပင်လယ်ကြမ်းပြင်တွင် ကြီးထွားလာနိုင်ခြင်း မရှိနိုင်ပါ။
- Plankton ပါဝင်မှု သို့မဟုတ် ကြွယ်ဝမှုသည် သက်ရောက်မှုအတွက် အကန့်အသတ်ရှိခြင်းကြောင့် သဘာဝပတ်ဝန်းကျင် ထိခိုက်နိုင်မှုနည်းပါးသည်ဟု မှတ်ယူနိုင်ပြီး စီမံကိန်းဧရိယာရှိ Plankton တည်ရှိမှုသည် အဆိုပြုစီမံကိန်းဆိုင်ရာ လုပ်ငန်းများကြောင့် သက်ရောက်နိုင်မှု နည်းပါးပါသည်။
- စီမံကိန်းသည် အတော်လေးဝေးကွာသော ကမ်းလွန်ဧရိယာတွင်တည်ရှိသဖြင့် စီမံကိန်းဧရိယာ၏ ဇီဝဗေဒသဘော သဘာဝသည် ကမ်းနီးဒေသများနှင့် နှိုင်းယှဉ်ပါက အနည်းငယ် နည်းပါးသည်ဟု ယူဆရပါသည်။ နက်ရှိုင်းသောရေပြင် ဧရိယာတွင် မြင့်မားသော ဂေဟစနစ်ဆိုင်ရာ အရေးပါသော အသိုင်းအဝိုင်းများကို ထောက်ပံ့ပေးရန် မမျှော်လင့်ထားပေ။ သို့သော်လည်း ရေနေနို့တိုက်သတ္တဝါများ၊ အဏ္ဏဝါလိပ်များနှင့် ပင်လယ်ငှက်များသည် အဆိုပါရေပြင်ကို ရံဖန်ရံခါ ဖြတ်သန်းသွားနိုင်ကြောင်း မှတ်သားရပါသည်။
- စီမံကိန်းဧရိယာအတွင်း ထိလွယ်လွယ်ရေနေသတ္တဝါများ၏ နေထိုင်ရာများ သို့မဟုတ် အကာအကွယ် ပေးထားသည့် နေရာများ မရှိပါ။ ကမာကျွန်းသည် ကီလိုမီတာ ၆၀ အကွာတွင်တည်ရှိသော စီမံကိန်း ဧရိယာနှင့် အနီးကပ်ဆုံးသော ဇီဝမျိုးစုံမျိုးကွဲနယ်မြေ (KBA) ဖြစ်သည်။ အရေးပါသော သားငှက် နှင့် ဇီဝမျိုးစုံမျိုးကွဲများ ပါဝင်သော KBA များကို Bird Life International Partnership မှ ဖော်ထုတ် ထားပါသည်။ IUCN မှ မျိုးသုဉ်းရန်အန္တရာယ်နှင့် စိုးရိမ်ရလောက်အောင် အန္တရာယ်ရှိသည့် အဏ္ဏဝါလိပ်မျိုးစိတ် နှစ်မျိုးဖြစ်သော green turtle နှင့် hawksbill turtle အား ဖော်ထုတ် တွေ့ရှိခဲ့ပြီး ဖြစ်ပါသည်။ မြန်မာ့ရေပိုင်နက်အတွင်း မှတ်တမ်းတင်ထားသော ငါးမျိုးစိတ်အများစုသည် ယေဘုယျအားဖြင့် ထိန်းသိမ်းရေးအတွက် စိုးရိမ်စရာမဟုတ်သော်လည်း မြန်မာ့ပင်လယ်ပြင်နှင့် ကမ်းလွန်ပင်လယ်ပြင် တို့တွင် ရေနေနို့တိုက် သတ္တဝါများနှင့် လိပ်မျိုးစိတ်များစွာရှိပြီး ကမ္ဘာ (သို့မဟုတ်) နိုင်ငံအလိုက် ကာကွယ်ထားသော မျိုးစိတ်များ ဖြစ်သည်ကိုတွေ့ရှိရပါသည်။

လူမှုဝန်းကျင်-

- ၂၀၁၉ ခုနှစ်၊ ESIA လေ့လာမှုမှ အတည်ပြုချက်အရ ရခိုင်ဒေသရှိ ငါးဖမ်းသမားအများစုသည် ပင်လယ်ကမ်းခြေမှ ကီလိုမီတာ ၅၀ အတွင်း ရေပြင်တွင်သာ ငါးဖမ်းပြီး အဆိုပြုစီမံကိန်းသည် စစ်တွေမြို့မှ ၇၀ ကီလိုမီတာနှင့် ကျောက်ဖြူ မြို့မှ ကီလိုမီတာ ၈၀ အကွာတွင် တည်ရှိသောကြောင့် ဒေသခံငါးဖမ်းလုပ်ငန်းနှင့် သိသိသာသာ ထိပ်နေခြင်း မရှိပေ။
- စီမံကိန်းလုပ်ငန်းများ၏ တည်နေရာနှင့် သဘောသဘာဝအရ စီမံကိန်းသည် ရခိုင်ပြည်နယ်ရှိ ဒေသခံ ကျေးရွာများ သို့မဟုတ် လူမှုအသိုင်းအဝိုင်းများအပေါ် သက်ရောက်မှုရှိနိုင်ဖွယ်မရှိပါ။

၁.၆ သက်ရောက်မှုများနှင့် လျော့ချနိုင်မည့်နည်းလမ်းများ၏ အကျဉ်း

ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းလေ့လာမှုများသည် ဆန်းစစ်ထားသော ဖြစ်ပေါ်လာနိုင်သော ပတ်ဝန်းကျင် နှင့် လူမှု သက်ရောက်မှုများအားလုံးအပါအဝင် လည်ပတ်နေသော သဘာဝပတ်ဝန်းကျင်နှင့် လူမှုအခြေအနေများကို နားလည်သဘောပေါက် ကြောင်း ထင်ရှားစေပါသည်။ အကြံပြုထားသော ပတ်ဝန်းကျင် ထိခိုက်မှု ကုစားရေး နှင့် လျော့ချရေးအစီအမံများ (ယခု EMP တွင် တင်ပြထားသည့်သကဲ့သို့) ကို စနစ်တကျ အကောင်အထည်ဖော်ခြင်းဖြင့် အဆိုပြုစီမံကိန်း၏ သဘာဝပတ်ဝန်းကျင်နှင့် လူမှု ပတ်ဝန်းကျင် ထိခိုက်သက်ရောက်မှုများကို PIC မှ ပညာရှင်ဆန်ဆန်နှင့် လက်ခံနိုင်ဖွယ်ရှိသော အနေအထားဖြင့် စီမံခန့်ခွဲ သွားနိုင်မည် ဖြစ်ပါသည်။ ထို့ကြောင့် ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းတွင် ယခုစီမံကိန်းမှ ပတ်ဝန်းကျင် နှင့် လူပုဂ္ဂိုလ်များအပေါ် အရေးပါသည့် ထိခိုက်မှုများ ရှိမည်မဟုတ်ကြောင်း နှင့် ဖော်ထုတ် သတ်မှတ်ထားသော သက်ရောက်မှုများအတွက် ကြွင်းကျန် အန္တရာယ်များအားလုံးကို ကြောင်းကျိုးညီညွတ်စွာ လက်တွေ့ဆောင်ရွက်နိုင်သည့် အနိမ့်ဆုံး (ALARP) သို့ စနစ်တကျ လျော့ချ သွားနိုင်ပါသည်။

ဇယား ၁.၁ လုပ်ငန်းလည်ပတ်ရေးအဆင့်မှ သက်ရောက်မှု၊ လျော့ချနိုင်မည့်နည်းလမ်းများနှင့် ကြွင်းကျန်မည့် သက်ရောက်မှုအကျဉ်း

ပတ်ဝန်းကျင် ဆိုင်ရာ ကိစ္စရပ်များ	လုပ်ငန်း/ သက်ရောက်မှု၏ ရင်းမြစ်	လျော့ချရေး အစီအမံများ	ကြွင်းကျန် သက်ရောက်မှု၏ အရေးပါမှု
လေထု အရည်အသွေး	SHP၊ သင်္ဘောများနှင့် လေကြောင်းပို့ဆောင်ရေး	<ul style="list-style-type: none"> ထိရောက်သော စက်ကိရိယာလုပ်ငန်းများကို အသုံးပြုခြင်း၊ သင့်လျော်သောလည်ပတ်မှုလုပ်ငန်းစဉ်များ၏ ပြုပြင်ထိန်းသိမ်းမှုအားလုံး၏ မှတ်တမ်းများကို ထိန်းသိမ်းထားရှိခြင်း၊ 	မပြောပလောက်သော
	CPP မှ လေထုထုတ်လွှတ်မှု		အရေးမပါသော
ပင်လယ်ရေ အရည် အသွေး	<ul style="list-style-type: none"> ထွက်ရှိသော ရေများ စွန့်ပစ်မှု သင်္ဘောကုန်းပတ် ရေမြောင်းများ၊ သင်္ဘောဝမ်းတွင် စုနေသည့် ရေဆိုး စွန့်ထုတ်မှုများ နှင့် မိလ္လာရေဆိုး နှင့် ရေညစ်များ စွန့်ထုတ်မှု 	<ul style="list-style-type: none"> ထွက်ရှိသော ရေများအားလုံးကို ကမ်းလွန်တွင် သန့်စင်ပြီး၊ ပင်လယ်သို့ စွန့်ထုတ်သွားခြင်း၊ ထွက် ရှိသောရေနှင့် ပတ်သက်၍ ပင်လယ်ထဲသို့ ဆီ စွန့်ထုတ်ရာတွင် မြန်မာနိုင်ငံ၏ EQEG နှင့် ကိုက်ညီရန် (တစ်ရက်လျှင် ပင်လယ်ထဲသို့ ဆီ နှင့် ကြေးဆီ စွန့်ထုတ်မှုသည် 42 mg/l ထက်မပိုရ၊ ရက်ပေါင်း ၃၀ ဌ ပုံမှန် 29 mg/l ထက်မပိုရ)ဆောင်ရွက်ခြင်း၊ ရေတွင် ဆီပါဝင်မှုကို စစ်ဆေးရန် လုံလောက်သော ရေနမူနာများကို ကောက်ယူရန်နှင့် ပင်လယ်ထဲသို့ အန္တရာယ်ရှိသော ဓာတုပစ္စည်းများ စွန့်ပစ်မှုကို လျော့ချနိုင်ရန် ဓာတုပစ္စည်းရွေးချယ်အသုံးပြုရာတွင် ဘေးအန္တရာယ် အခြေပြု ဆန်းစစ်ခြင်း၊ ရေတွင်ဆီပါဝင်မှုမှာ < 30 mg/l (လစဉ်ပုံမှန်) ဖြစ်စေရန် ရေဆိုးထုတ်လွှတ်မှုကို သေချာစွာဆောင်ရွက်နိုင်ရန် ပလက်ဖောင်း အသုံးပြုမှုစနစ် ဒီဇိုင်းစံနှုန်းများနှင့် ရှိနေသော လည်ပတ်ရေးမူဝါဒများကိုလိုက်နာဆောင်ရွက်ခြင်း၊ MARPOL ယာဉ်ကြီးများအတွက် နောက် ဆက်တွဲ (၁) နှင့် (၄) တို့၏ သတ်မှတ်ချက်များနှင့် အညီဆောင်ရွက်ခြင်း၊ လည်ပတ်ဆောင်ရွက်ရာ၌ MARPOL နောက်ဆက်တွဲ (၁) - စွန့်ပစ်မှု၏ ရေတွင် ဆီ ပါဝင်မှုမှာ ၁၅ ppm ထက် မကျော်စေရေးကို လိုက်နာဆောင်ရွက်ခြင်း၊ 	အရေးမပါသော

ပတ်ဝန်းကျင် ဆိုင်ရာ ကိစ္စရပ်များ	လုပ်ငန်း/ သက်ရောက်မှု၏ ရင်းမြစ်	လျှော့ချရေး အစီအမံများ	ကြွင်းကျန် သက်ရောက်မှု၏ အရေးပါမှု
		<ul style="list-style-type: none"> • မိလ္လာရေးဆိုးများအားလုံးကို MARPOL 73/78 နှင့်အညီစွန့်ပစ်ခြင်း၊ • တူးဖော်ရေးပလက်ဖောင်း နှင့် ရေယာဉ်များတွင် ကုန်းပတ်ရေမြောင်းအတွက် ဆီ နှင့် ရေ ခွဲသည့်ကိရိယာများ တပ်ဆင်ခြင်း၊ • သင်္ဘောဝမ်းတွင် စုနေသည့်ရေ စွန့်ပစ်မှုများ အတွက် ဆီ နှင့် ရေ ခွဲသည့် စက်များ တပ်ဆင် ခြင်း • ရှိနေသော အကောင်းဆုံးအလေ့အကျင့်များဖြင့် ပြန်လည်အသုံးပြုရန် သို့မဟုတ် စွန့်ထုတ်ရန် အတွက် အသုံးပြုပြီးသော ဆီ နှင့် ဆီပါဝင်သော စွန့်ပစ်ပစ္စည်းကို ရေဆိုးထည့်တိုင်ကီ (slop tank) သို့ထည့်ခြင်းအား ဆောင်ရွက်ခြင်း၊ 	
အဏ္ဏဝါ သက်ရှိများ	မိလ္လာရေးဆိုး၊ သင်္ဘော ဝမ်းတွင် စုနေသည့် ရေဆိုး နှင့် ဆီညစ်ညမ်းမှုတို့ ကြောင့် အဏ္ဏဝါ သက်ရှိများ အပေါ် အနှောင့်အယှက် ဖြစ်မှု	<ul style="list-style-type: none"> • ပင်လယ်ရေ အရည်အသွေး အတွက် အစီအမံများနှင့် အတူတူဖြစ်သည်။ • ကောင်းစွာထိန်းသိမ်းထားသော ရေယာဉ်များကိုသာ အသုံးပြုခြင်း၊ • လည်ပတ်ရေးကာလအတွင်း ရေယာဉ် များကို ပုံမှန်စစ်ဆေး ဆောင်ရွက်ခြင်း၊ • စက်အရှိန်အား ကြိုးကြားကြိုးကြားအသုံးပြုခြင်း၊ (သို့မဟုတ်) အနိမ့်ဆုံးဖြစ်အောင် စက်အရှိန်ထိန်းခြင်း၊ (သို့မဟုတ်) ပိတ်ခြင်း၊ 	အရေးမပါသော

ပတ်ဝန်းကျင် ဆိုင်ရာ ကိစ္စရပ်များ	လုပ်ငန်း/ သက်ရောက်မှု၏ ရင်းမြစ်	လျှော့ချရေး အစီအမံများ	ကြွင်းကျန် သက်ရောက်မှု၏ အရေးပါမှု
ငါးဖမ်းလုပ်ငန်း များနှင့် ရေကြောင်း သွားလာမှု	ကမ်းလွန်နေရာ အဆောက် အအုံများသည် ရေကြောင်း အန္တရာယ်ရှိလာနိုင်သော အလားအလာရှိခြင်း	<ul style="list-style-type: none"> • အချင်းဝက် ၅၀၀ မီတာရှိ ဘေးကင်းလုံခြုံရေးဇုန်ကို ပလက်ဖောင်း ပတ်ပတ်လည်တွင် ထားရှိ၍ အနီးကပ် စောင့်ကြည့်ရေးအား သတ်မှတ် ပြဋ္ဌာန်းဆောင်ရွက်ခြင်း၊ • သတိပေးရေးနယ်မြေဧရိယာ (ရေမိုင် ၅ မိုင်) ရှိမည်ဖြစ်ပြီး၊ ယင်းနေရာတွင် ရေကြောင်းသွားလာမှုကို ခွင့်မပြုခြင်း၊ • ရေကြောင်းပြ မီးအလင်းရောင်၊ နယ်မြေဧရိယာမီးအလင်းရောင်၊ ဆက်သွယ်မှုကိရိယာ နှင့် ရေဒါရောင်ပြန်ပြားများ အပါအဝင် ရေကြောင်းပြ သတိပေးကိရိယာများကို ပလက်ဖောင်းအတွက် ထားရှိခြင်း၊ • တပ်ဆင်ထားသော နေရာအဆောက် အအုံများ ရှိနေသောကွင်းသို့ ရေ ကြောင်းသွားလာရေး သတိပေးရန် ရေကြောင်းသတိပေးချက်များကို ထုတ်ပြန်ခြင်း၊ • စီမံကိန်းနှင့်ဆက်စပ်နေသည့်ရေယာဉ်အားလုံးသည် မြန်မာနိုင်ငံဥပဒေ၊ ဆိပ်ကမ်းအာဏာပိုင်၏ စည်းမျဉ်းများနှင့် PIC၏ ရေကြောင်းဆိုင်ရာအလေ့အကျင့်များကိုလိုက်နာခြင်း၊ • လုပ်ငန်းဆောင်ရွက်နေမှုအပေါ် အနှောင့်အယှက်ဖြစ်မှု နည်းပါးစေရန်နှင့် ရေကြောင်းမတော်တဆမှုများ လျှော့ချရန် အတွက် ရေယာဉ်သွားလာမှုကို ဆိပ်ကမ်းအာဏာပိုင်နှင့် ဆွေးနွေးဆောင်ရွက်ခြင်း၊ • ထိုဧရိယာတွင်းရှိ အခြားရေယာဉ်များကို လုံလောက်သော သတိပေးမှုပြုနိုင်ရန်အတွက် ဆိပ်ကမ်းနှင့်ရေယာဉ်များ ပေါ်တွင် ရေကြောင်းပြ မီးအလင်းရောင်၊ နယ်မြေ ဧရိယာမီးအလင်းရောင်၊ ဆက်သွယ်မှု ကိရိယာနှင့် ရေဒါရောင်ပြန်ပြားများ အပါအဝင် ရေကြောင်းပြ သတိပေး ကိရိယာများထားရှိခြင်း၊ 	မပြောပလောက်သော

ပတ်ဝန်းကျင် ဆိုင်ရာ ကိစ္စရပ်များ	လုပ်ငန်း/ သက်ရောက်မှု၏ ရင်းမြစ်	လျှော့ချရေး အစီအမံများ	ကြွင်းကျန် သက်ရောက်မှု၏ အရေးပါမှု
စွန့်ပစ်ပစ္စည်း စီမံခန့်ခွဲမှု	အန္တရာယ်မရှိသော စွန့်ပစ်ပစ္စည်းများ	<ul style="list-style-type: none"> ကုမ္ပဏီ၏ HSE မှ စွန့်ပစ်ပစ္စည်း စီမံခန့်ခွဲမှု သတ်မှတ်ချက်များ နှင့် သက်ဆိုင်ရာ ဥပဒေများကို လိုက်နာဆောင်ရွက်ရန်၊ ကန်ထရိုက်တာများအားလုံးကို ပြဋ္ဌာန်းပေးခြင်း နှင့် ၎င်းတို့၏ လိုက်နာဆောင်ရွက်မှုများအတွက် ကန်ထရိုက်တာများ၏ လည်ပတ်ဆောင်ရွက်မှုများကို စောင့်ကြပ် ကြည့်ရှုစစ်ဆေးခြင်း၊ စွန့်ပစ်ပစ္စည်းစွန့်ထုတ်မှုကို လျှော့ချခြင်း၊ သင့်လျော်သည့် အန္တရာယ်ရှိသော စွန့်ပစ်ပစ္စည်း ခွဲခြားထားမှုနှင့် သိုလှောင်မှုကို စွန့်ပစ်ရန် အလေ့အကျင့်ကောင်းများဖြင့် အကောင်အထည်ဖော်ဆောင်ရွက်ခြင်း၊ သင့်လျော်သော စွန့်ပစ်ပစ္စည်းစီမံခန့်ခွဲမှုနှင့် သိုလှောင်မှုအကြောင်း သင်တန်းများ စီမံဆောင်ရွက်ခြင်း၊ အန္တရာယ်ရှိသော စွန့်ပစ်ပစ္စည်းအားလုံးအတွက် စွန့်ပစ်ပစ္စည်းစာရင်းဖြင့် အသုံးပြုဆောင်ရွက်ခြင်း၊ အန္တရာယ်ရှိသော စွန့်ပစ်ပစ္စည်းသယ်ယူပို့ဆောင်ရေး လမ်းညွှန်ချက်ထားရှိခြင်း၊ ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုစနစ်အတွက် Periodical ISO 14001 စာရင်းစစ်ခြင်းကို အကောင်အထည်ဖော်ခြင်း။ 	မပြောပလောက်သော
	အန္တရာယ်ရှိသော စွန့်ပစ်ပစ္စည်း များ		မပြောပလောက်သော
	လုပ်ငန်းခွင်၌ စွန့်ပစ်ပစ္စည်း / လောင်စာ စသည်တို့ သိုလှောင်မှု		မပြောပလောက်သော
	လည်ပတ်ဆောင်ရွက် နေသော ယာဉ်များမှ လည်ပတ်ရေး ဆိုင်ရာ စွန့်ထုတ်မှုများ		မပြောပလောက်သော အဆင့် မှ အတော်အသင့် ဖြစ်သော အဆင့်
	စီးကျရေ၊ နှင့် မိလ္လာရေဆိုး နှင့် ရေညစ်များ စွန့်ပစ်မှု		မပြောပလောက်သော အဆင့် မှ အတော်အသင့် ဖြစ်သော အဆင့်
	တွင်းတူးကမ်းလွန် ပလက်ဖောင်း SHP မှ ယိုဖိတ်မှုများ နှင့် ယိုဖိတ်မှုများ		မပြောပလောက်သော အဆင့် မှ အတော်အသင့် ဖြစ်သော အဆင့်
	ဓာတုပစ္စည်း ယိုဖိတ်မှုများ		မပြောပလောက်သော
	ရေကြောင်းသွားလာရေး စီမံခန့်ခွဲမှု (ရေကြောင်း သတိပေးချက်များ)		အရေးမပါသော

ပတ်ဝန်းကျင် ဆိုင်ရာ ကိစ္စရပ်များ	လုပ်ငန်း/ သက်ရောက်မှု၏ ရင်းမြစ်	လျှော့ချရေး အစီအမံများ	ကြွင်းကျန် သက်ရောက်မှု၏ အရေးပါမှု
လုပ်ငန်းခွင် ကျန်းမာရေး နှင့် ဘေးကင်းလုံခြုံရေး	ရုပ်ပိုင်းဆိုင်ရာ ထိခိုက်ဒဏ်ရာရမှု နှင့် စော်ကားနှောင့်ယှက်မှု	<ul style="list-style-type: none"> စီမံခန့်ခွဲမှုထိန်းချုပ်မှုများနှင့် လုပ်ငန်းခွင်ကျန်းမာရေး၊ ဘေးကင်းရေးစီမံခန့်ခွဲမှုစနစ်များ အားဆောင်ရွက်ခြင်း၊ 	အရေးမပါသော
	နေရာအဆောက် အအုံများ နှင့် ထောက်ပံ့ရေးယာဉ် ဝန်ထမ်းများအပေါ် ထိခိုက်ဒဏ်ရာ နှင့်ပတ်သက်၍ ဘေးအန္တရာယ်	<ul style="list-style-type: none"> ခွင့်ပြုခြင်းဆိုင်ရာစနစ်၊ စီမံခန့်ခွဲမှုဆိုင်ရာ အပြောင်းအလဲများ၊ ကန်ထရိုက်တာ စီမံခန့်ခွဲမှု၊ စောင့်ကြပ်ကြည့်ရှု စစ်ဆေးမှု၊ မတော်တဆမှုအစီရင်ခံခြင်းနှင့် စုံစမ်းစစ်ဆေးမှု၊ စီမံခန့်ခွဲမှု အစီအစဉ်များ ပြင်ဆင်မှုနှင့် ကြိုတင်ကာကွယ်မှု စသည်တို့ အပါအဝင် လည်ပတ်ရေးဆိုင်ရာ ထိန်းချုပ်မှုများ အားဆောင်ရွက်ခြင်း၊ 	မပြောပလောက်သော
	နေရာအဆောက်အအုံ ဝန်ထမ်းများအပေါ် ထိခိုက်ဒဏ်ရာနှင့် ပတ်သက်၍ ဘေးအန္တရာယ်	<ul style="list-style-type: none"> နည်းလမ်းများ၊ ဘေးကင်းရေး ဆောင်ရွက်မှု၊ လုပ်ငန်းခွင် ခွင့်ပြုချက် တောင်းခံခြင်း၊ PPE စသည်ဖြင့် အသုံးပြုရန် ဘေး ကင်းရေး လုပ်ထုံးလုပ်နည်းများကဲ့သို့သော ကျန်းမာရေး နှင့် ဘေးကင်းရေး အကောင် အထည်ဖော်ဆောင်ရွက်မှု လုပ်ငန်းစဉ် နှင့် ကြိုတင် ကာကွယ် မှုဆိုင်ရာ ထိန်းချုပ်ရေး အစီအမံများ နှင့်အညီ အကောင်အထည်ဖော်ဆောင်ရွက် ခြင်း၊ ရှေးဦးသူနာပြု အကူအညီ၊ လိုအပ်သော လိုင်စင်ရ ဆေးကုသမှုများ ငှားရမ်းရန် အစီအစဉ်များ၊ အရေးပေါ် အစီအစဉ်များ နှင့် အရေးပေါ်အခြေအနေတွင် တုံ့ပြန်မှု အစီအစဉ်များကဲ့သို့သော ပြန်လည် ထိန်းသိမ်းရေး/ တုံ့ပြန်ဆောင်ရွက်ရေး အစီအမံများအပေါ်အခြေပြု၍ အကောင်အထည်ဖော် ဆောင်ရွက်ခြင်း၊ ကျန်းမာရေး စစ်ဆေးခြင်း၊ သတင်းအချက်အလက်များ ဖြန့်ဝေခြင်း၊ အကြံပြုခြင်း၊ ဘေးကင်းလုံခြုံရေးသင်တန်းများ ပေးခြင်းနှင့် ကျန်းမာရေးနှင့် ဘေးကင်းရေး / စောင့်ကြပ်ကြည့်ရှု စစ်ဆေးရေးအရာရှိ များ ခန့်အပ်ခြင်း ကဲ့သို့သော အခြား အစီအမံများ နှင့်အညီ အကောင်အထည်ဖော် ဆောင်ရွက်ခြင်း၊ လုပ်ငန်းခွင်ကျန်းမာရေးနှင့် ဘေးကင်းရေးစီမံခန့်ခွဲမှုစနစ်အတွက် Periodical ISO 45001 စာရင်းစစ်ကို အကောင်အထည်ဖော်ဆောင်ရွက်ခြင်း။ 	မပြောပလောက်သော

ပတ်ဝန်းကျင် ဆိုင်ရာ ကိစ္စရပ်များ	လုပ်ငန်း/ သက်ရောက်မှု၏ ရင်းမြစ်	လျော့ချရေး အစီအမံများ	ကြွင်းကျန် သက်ရောက်မှု၏ အရေးပါမှု
သက်ဆိုင်သူ များ	လူမှုရေးဆိုင်ရာ သဟဇာတဖြစ်မှု	<ul style="list-style-type: none"> အားလပ်ချိန်နှင့် အပန်းဖြေမှု အစီအစဉ်များအတွက် နေရာအဆောက်အအုံများပေးခြင်း၊ အလုပ်သမားနှင့် ကန်ထရိုက်တာ အပြုအမူဆိုင်ရာမူဝါဒများနှင့် လေ့ကျင့်သင်ကြားမှုများ ရေးဆွဲအကောင်အထည်ဖော် ခြင်း၊ စီမံကိန်းအမှုထမ်းများနှင့် ကန်ထရိုက်တာများအားလုံး အရက်နှင့်ဆေးဝါးအလွန်အကျွံသုံးစွဲခြင်းကိုတားမြစ်ခြင်း၊ စီမံကိန်းသက်ရောက်သည့်ဧရိယာတွင် ဒေသတွင်းနေထိုင်သူများကို အလုပ်ခန့်အပ်ခြင်း၊ စီမံကိန်း အလုပ်သမားများ နှင့် ကန်ထရိုက်တာများအတွက် ရပ်ရွာ နှင့် ယဉ်ကျေးမှုဆိုင်ရာ အသိအမြင်ပွင့် သင်တန်း အစီအစဉ်များ ရေးဆွဲ အကောင်အထည်ဖော်ခြင်း၊ ထိခိုက်လွယ်သည့် ပုဂ္ဂိုလ်များဆိုင်ရာ မူဝါဒကို ရေးဆွဲအကောင်အထည်ဖော်ခြင်း၊ စီမံကိန်းဆောင်ရွက်မှုကြောင့် အကူးအပြောင်းခက်ခဲမှုကို ရင်ဆိုင်ရသော ဒေသခံများ နှင့် အသစ်လာရောက် နေထိုင်သူများအတွက် လူမှုအထောက်အကူပြု ဝန်ဆောင်မှုများတွင် အစိုးရ မဟုတ်သောအဖွဲ့အစည်းများ နှင့် ပူးပေါင်းဆောင်ရွက်ရန် သင့်လျော်သော မိတ်ဖက်ဖွဲ့စည်းမှုများ တည်ဆောက်ခြင်း၊ ဒေသတွင်း ဦးစားပေး ဝယ်ယူမှုဆိုင်ရာ နည်းဗျူဟာတစ်ရပ်ကို ရေးဆွဲအကောင် အထည်ဖော်လျက် ကျောက်ဖြူ (အထူး သဖြင့် လတ်ဆတ်သော ထုတ်ကုန်များ) ရှိ ပစ္စည်းများ နှင့် ဝန်ဆောင်မှုများကို ဦးစားပေး ဝယ်ယူမှုဖြင့် မိရိုးဖလာလုပ်ငန်းများကို ထောက်ပံ့ခြင်း၊ 	မပြောပလောက်သော
	အများပြည်သူကျန်းမာရေး		မပြောပလောက်သော အဆင့် မှ အရေးမပါသော အဆင့် (အနုတ်သ တောဆောင်သော)
	စီးပွားရေး၊ စက်မှုလုပ်ငန်း နှင့် အလုပ်အကိုင်		မပြောပလောက်သော အဆင့် မှ အတော်အသင့် ဖြစ်သော အဆင့်
	ပညာရေး		မပြောပလောက်သော အဆင့် မှ အရေးမပါသော အဆင့် (အနုတ်သတောဆောင်သော) တိုးတက်ကောင်းမွန်သောနေရာအဆောက်အအုံ များမှ အပြုသဘောဆောင်သော (အရေးပါသောအဆင့်)
	အခြေခံအဆောက်အအုံ		မပြောပလောက်သော အဆင့် မှ အရေးမပါသော အဆင့် (အနုတ်သတောဆောင်သော) တိုးတက်ကောင်းမွန်သော နေရာအဆောက်အအုံ များမှ အပြုသဘောဆောင်သော (အရေးပါသောအဆင့်)
	လူ့အခွင့်အရေး		အတန်အသင့်-အရေးမပါသော
	ပြန်လည်တည်ဆောက်ခြင်းနှင့် လျော်ကြေးပေးခြင်း		အရေးမပါသော-မပြောပလောက်သော

၁.၇ စီမံခန့်ခွဲမှု နှင့် စောင့်ကြပ်ကြည့်ရှုစစ်ဆေးခြင်း

PIC သည် ပတ်ဝန်းကျင်စောင့်ကြပ်ကြည့်ရှုစစ်ဆေးမှုဆိုင်ရာအစီရင်ခံစာကို MONREC ထံသို့ ခြောက်လပြည့် တိုင်း တင်သွင်းသွားမည် ဖြစ်ပါသည်။ အစီရင်ခံစာတွင် စီမံကိန်းကာလအတွင်း စုစည်းထားသော အောက်ပါ အချက်အလက်များ ပါဝင်မည် -

- ပတ်ဝန်းကျင်မှတ်တမ်း၊
- စွန့်ပစ်ပစ္စည်းမှတ်တမ်း၊

စောင့်ကြပ်ကြည့်ရှုစစ်ဆေးမှု နှင့် မှတ်တမ်းများဆောင်ရွက်မှုအကျဉ်းကို ဇယား ၁.၂ တွင် တင်ပြ ထားပါသည်။

ဇယား ၁.၂ A-1 နှင့် A-3 တို့အတွက် စောင့်ကြပ်ကြည့်ရှုစစ်ဆေးမှု နှင့် မှတ်တမ်းဆောင်ရွက်မှုတို့၏ အကျဉ်း

စီမံကိန်း လုပ်ငန်း/ ပတ်ဝန်းကျင်ဆိုင်ရာ ကဏ္ဍ	စောင့်ကြပ်ကြည့်ရှုစစ်ဆေးမှု အစီအမံများ	အစီရင်ခံခြင်း	တာဝန်ရှိမှု
စွန့်ပစ်ပစ္စည်း ထွက်ရှိမှု	<ul style="list-style-type: none"> စွန့်ပစ်သည့် အစိုင်အခဲ စွန့်ပစ်ပစ္စည်း အရေ အတွက် စွန့်ပစ်သည့် အန္တရာယ်ရှိသော စွန့်ပစ်ပစ္စည်း အရေ အတွက် တိုင်းတာလျှင်၊ စွန့်ပစ်သော အရည် များ နှင့် ဟိုက်ဒရိုကာဗွန် ပါဝင်မှု အရေအတွက်များ 	ပတ်ဝန်းကျင်ဆိုင်ရာ စွန့်ပစ်မှု အစီရင်ခံစာ	PIC
စီးပွားဖြစ် ငါးဖမ်းလုပ်ငန်းနှင့် ထိတွေ့မှု	<ul style="list-style-type: none"> ရပ်ရွာမှ မကျေနပ်ချက်များ မှတ်တမ်းတင်မှု 	ရပ်ရွာမှ မကျေနပ်ချက်များတိုင်ကြားခြင်းဆိုင်ရာ ယန္တရားနှင့်အညီ မကျေနပ်ချက် မှတ်တမ်းများ	PIC
သင်တန်း	<ul style="list-style-type: none"> အမှုထမ်းများတက်ရောက်ထားသော လုပ်ငန်းနှင့်ဆိုင်သော အသေးစိတ် သင်တန်းအချက်အလက်များ 	ဝင်ရောက်မှုမှတ်တမ်းစာရွက်	PIC
ဖြစ်ပျက်မှု အစီရင်ခံခြင်း	<ul style="list-style-type: none"> စီမံကိန်းကြောင့် ပတ်ဝန်းကျင် သို့မဟုတ် လူမှုထိခိုက်မှု အဖြစ်အပျက်များဆိုင်ရာ အသေးစိတ်အချက်အလက်များ 	အဖြစ်အပျက် အစီရင်ခံစာပုံစံများ	PIC
လိုက်နာဆောင်ရွက်မှု အစီရင်ခံခြင်း	<ul style="list-style-type: none"> EMP ကို လိုက်နာဆောင်ရွက်မှု 	စုံစမ်းစစ်ဆေးမှုစာရွက်များ အပြီးသတ် ပတ်ဝန်းကျင် ဆိုင်ရာ စွန့်ပစ်ခြင်း အစီရင်ခံစာ	PIC
မတော်တဆ ထွက်ရှိမှုများ နှင့် ယိုစိမ့်မှုများ	<ul style="list-style-type: none"> ဘေးကင်းလုံခြုံရေး မှတ်တမ်း 	စီမံကိန်း ပတ်ဝန်းကျင်စောင့်ကြပ်ကြည့်ရှုစစ်ဆေးမှု အစီရင်ခံစာတွင် ပါဝင်သည့် ဘေးကင်းလုံခြုံရေး မှတ်တမ်း	PIC
လေထုအနိုးအငွေ့ ထုတ်လွှတ်မှု	<ul style="list-style-type: none"> ထုတ်လွှတ်သော ဓာတ်ငွေ့မှ GHG ထုတ်လွှတ်မှုများ တွက်ချက်မှု 	ပတ်ဝန်းကျင် စောင့်ကြပ်ကြည့်ရှုစစ် ဆေးမှု အစီရင်ခံစာ	PIC O&M

စီမံကိန်းသည် MARPOL သတ်မှတ်ချက်များကို လိုက်နာကျင့်သုံးပြီး၊ SOPEP ပြင်ဆင်အကောင်အထည် ဖော်သွားမည် ဖြစ်ပါသည်။ ယိုဖိတ်မှုများဖြစ်ပေါ်လျှင်၊ ၎င်းတို့ကို SOPEP အစီရင်ခံစာ၌ တင်ပြသွားမည် ဖြစ်သည်။

၁.၈ အများပြည်သူများနှင့် တိုင်ပင်ဆွေးနွေးခြင်း

EMP တိုင်ပင်ဆွေးနွေးမှု အစည်းအဝေးများကို စစ်တွေရှိ ဒေသအဆင့် (ရခိုင်) နှင့် ကျောက်ဖြူ မြို့နယ်ရှိ မြို့နယ်အဆင့်တို့၌ အမျိုးမျိုးသော သက်ဆိုင်ရာ သက်ဆိုင်သူများနှင့် ကျင်းပခဲ့ပါသည်။ တိုင်ပင်ဆွေးနွေးမှုများ သည် ဖြစ်ပေါ်လာနိုင်သော ထိခိုက်ခံစားရနိုင်သည့် လူပုဂ္ဂိုလ်များနှင့် ပတ်သက်၍ သတင်းအချက်အလက်များကို စုဆောင်းနိုင်စေခဲ့ပြီး၊ အချက်အလက်များကွာဟနိုင်မှု နှင့် သက်ဆိုင်သူများ၏ စိုးရိမ်မှုများ နှင့် အကြံပြုချက်နှင့် ၎င်းတို့ကို EMP တွင် မည်သို့ထည့်သွင်းသွားရမည်နှင့် ပတ်သက်၍ အထောက်အကူဖြစ်စေခဲ့ပါသည်။

နေ့စွဲ၊ အချိန်၊ နေရာ၊ သက်ဆိုင်သောသူများ နှင့် အစည်းအဝေးတစ်ခုချင်း၏ ရည်ရွယ်ချက်တို့ကို ဇယား ၁.၃ တွင် တင်ပြထားပါသည်။

ဇယား ၁.၃ ၂၀၁၈ အောက်တိုဘာလ နှင့် နိုဝင်ဘာလ တို့တွင် ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ် (EMP) သက်ဆိုင်သူများနှင့် ထိတွေ့ချိတ်ဆက်ဆောင်ရွက်ခြင်း

နေ့စွဲ၊ အချိန် နှင့် နေရာ	သက်ဆိုင်သူများ	တွေ့ဆုံမှု၏ ရည်ရွယ်ချက်
၂၀၁၈ အောက်တိုဘာ ၃၀ ရက် (ဝန်ကြီးချုပ်အစည်း အဝေးခန်းမ)	ရခိုင်ပြည်နယ် အစိုးရ	<ul style="list-style-type: none"> စီမံကိန်းဆိုင်ရာ သတင်းအချက်အလက်များကို တင်ပြခြင်း၊ မြို့နယ် /ကျေးရွာ အဆင့် အစည်းအဝေးအ တွက် ခွင့်ပြုချက် တောင်းခံခြင်း၊ သက်ဆိုင်သူများမှ စိုးရိမ်မှုများ နှင့် အကြံပြုချက် များ ကောက်ယူစုဆောင်းခြင်း၊
၂၀၁၈ အောက်တိုဘာ ၃၁ ရက် (ကျောက်ဖြူ အထွေထွေအုပ်ချုပ်ရေး ဦးစီးဌာန (GAD) အစည်းအဝေး ခန်းမ)	ဒေသဆိုင်ရာ အစိုးရဌာန၊ ကျေးရွာအုပ်စု ခေါင်းဆောင်များ၊ လူထုအခြေပြုအဖွဲ့များ (CSOs) နှင့် အခြား စိတ်ဝင်စားသော အုပ်စုများ	<ul style="list-style-type: none"> စီမံကိန်းဆိုင်ရာ သတင်းအချက်အလက်များကို ဒေသခံ အစိုးရ၊ ကျေးရွာ အုပ်စု ခေါင်းဆောင် များ နှင့် အခြား စိတ်ဝင်စားသော အုပ်စုများ ထံသို့ တင်ပြခြင်း၊ သက်ဆိုင်သူများထံမှ စိုးရိမ်မှုများ နှင့် အကြံပြုချက် များ ကောက်ယူစုဆောင်းခြင်း၊
၂၀၁၈ နိုဝင်ဘာ ၁ ရက် (လိပ်ခမော် ကျေးရွာအုပ်စု)	လိပ်ခမော်ကျေးရွာအုပ်စု၏ ဒေသခံ လူထု	<ul style="list-style-type: none"> စီမံကိန်းဆိုင်ရာ သတင်းအချက်အလက်များကို ဒေသဆိုင်ရာအစိုးရ နှင့် ဒေသခံ လူထုထံသို့ တင်ပြခြင်း၊ လူမှုအခြေပြု အခြေခံအချက်အလက်ကောက်ယူ ဆောင်ရွက်ခြင်း၊ သက်ဆိုင်သူများထံမှ စိုးရိမ်မှုများ နှင့် အကြံပြုချက် များ ကောက်ယူစုဆောင်းခြင်း၊
၂၀၁၈ နိုဝင်ဘာ ၁ ရက် (ဂုံးချိန် ကျေးရွာ အုပ်စု)	ဂုံးချိန် ကျေးရွာအုပ်စု၏ ဒေသခံလူထု	<ul style="list-style-type: none"> စီမံကိန်းဆိုင်ရာ သတင်းအချက်အလက်များကို ဒေသဆိုင်ရာအစိုးရ နှင့် ဒေသခံလူထု ထံသို့ တင်ပြခြင်း၊ လူမှုအခြေပြု အခြေခံအချက်အလက်ကောက်ယူ ဆောင်ရွက်ခြင်း၊ သက်ဆိုင်သူများထံမှ စိုးရိမ်မှုများ နှင့် အကြံပြုချက် များ ကောက်ယူစုဆောင်းခြင်း၊

2. INTRODUCTION

This document is the Environmental Management Plan (EMP) for the Phase 1 Shwe Field Development located in Block A-1 and A-3, offshore Rakhine State, Myanmar (the “Project”). Although referred to in Myanmar legislation as an “EMP”; the scope also covers social impacts and mitigation measures as per the requirements of the EIA Procedure (2015). The Project covers the current development of the Shwe Field and Mya North Field offshore as well as the onshore gas terminal and pipelines associated with the offshore development.

POSCO International Corporation (Myanmar E&P) (PIC) is acting as Operator of the Shwe Project with 51% equity and joint venture partners are Myanma Oil and Gas Enterprise (15%), ONGC Videsh (India) Ltd. (17%), GAIL (India) Ltd. (8.5%) and Korea Gas Corp. (8.5%).

Referring to Article 8 of the Environmental Impact Assessment (EIA) Procedure (29 December 2015), any Project already in existence prior to the issuance of the Environmental Conservation Rules, or the construction of which has already commenced prior to the issuance of the Rules, and which, in either case, shall be required to undertake, within the timeframe prescribed by the Environmental Conservation Department (ECD) of the Ministry of Natural Resources and Environmental Conservation (MONREC), an environmental compliance audit, including on-site assessment, to identify past and/or present concerns related to that Project’s Environmental Impacts, and to:

- Develop an Environmental Management Plan (EMP);
- Obtain an Environmental Compliance Certificate (ECC); and
- Take appropriate actions to mitigate Adverse Impacts in accordance with the Law, the Rules, and other applicable laws.

To comply with the law requirement, PIC is thus required to undertake an EMP and submit to MONREC/ECD for consideration and approval to obtain an ECC. PIC have commissioned **Environmental Resources Management (ERM)** to undertake the EMP Study and revised it accordance with ECD’s comments.

This EMP aims to provide an environmental and social management framework by outlining the compliance requirements, mitigation measures and monitoring program to be undertaken throughout the Project activities. It should be noted that as the Project is fully operational, all aspects related to the construction of the Project are not considered relevant and are hence not discussed here.

2.1 Project Proponent

Contact details for the Project Proponents representative are provided below and the company’s Commitment Letter and registration is described in **Appendix A**.

- **Name:** POSCO INTERNATIONAL Corporation (Myanmar E&P)
- **Address:** Level-3, No. 623, Vantage Tower, Pyay Road, Kamayut Township 11041, Yangon
Myanmar
- **Phone:** +95 9 880 441 240 (Ext.201)
- **Email:** picreception@poscointl-enp.com
- **Website:** <https://www.poscointl.com/eng>

2.2 Environmental and Social Consultant Study Team

Environmental Compliance Consultancy Company Limited (EnvCC) has been commissioned by PIC to update an Environmental Management Plan (EMP) for the Project. The outcomes of the update report will be submitted as an updated EMP report to Environmental Conservation Department (ECD) of Ministry of Natural

Resources and Environmental Conservation (MONREC) in order to inform the decision to award an Environmental Compliance Certificate (ECC).

Environmental Compliance Consultancy Company Limited (EnvCC) is providing the technical capabilities and best practices to solve the challenges of risks and safety through local and international EIA guidelines, procedures, project related laws and regulation, and stakeholders' satisfaction to deliver the right environmental solution.

EnvCC commits to MoNREC and ECD that the EMP has been updated in strict compliance with applicable Environmental Conservation Law (2012), Environmental Conservation Rules (2014) and Environmental Impact Assessment Procedure (2015)'s Chapter (7) and other related laws and regulation for the type of project. The key EnvCC environmental and social consultants that conducted the EMP are presented in Table 2-1.

The impact assessment of the previous version of the Environmental Management Plan (EMP) was conducted by Environmental Compliance Consultancy Company Limited (EnvCC), providing a comprehensive review of the environmental implications associated with the project. In response to the comments and feedback provided by the Environmental Conservation Department (ECD), a revision report was prepared by a study team from POSCO International Corporation (Myanmar E&P) (PIC). PIC commits to MoNREC and ECD that the EMP has been updated in strict compliance with applicable Environmental Conservation Law (2012), Environmental Conservation Rules (2014) and Environmental Impact Assessment Procedure (2015)'s Chapter (7) and other related laws and regulation for the type of project. The details of this revision, along with its correlation to ECD's feedback, are outlined in Appendix R.

Table 2-1 Key Environmental and Social Consultants for the Project

No.	Name	TCR No. Registered at ECD	Academic Experience	Years of Experience in EIA	Area of expertise	Responsibility for the Report
TEAM LEADER						
	U Kyaw Thiha Hla Myint (Alex)	00396	<ul style="list-style-type: none"> MSC (Business Administration), BE (Civil/ Environmental Engineering) 	>5	<ul style="list-style-type: none"> EHS Compliance and Assurance Waste Management Environmental Management EHS Risk management EHS Due Diligence Social Management Stakeholder Management 	<p>Responsibilities</p> <ul style="list-style-type: none"> Team leader for overall project management <p>Report Writing</p> <ul style="list-style-type: none"> Chapter 6: Summary of Impact Chapter 9: Management and Monitoring Program- Operation Phase
TEAM MEMBERS						
Socioeconomic and Environment						
1	Daw Myat Mon Swe*	0069	<ul style="list-style-type: none"> MSc (Energy and Environmental Management -EEM/ SESAM/ARTES) BAgri.Sc Dip (GIS/RS) OHSAS 18001:2007 Internal Auditing, ISO 9001:2008 	>10	<ul style="list-style-type: none"> Socio-economic and Facilitation Meeting Risk Assessment for Energy and Chemicals Environmental Engineering for Pollution Control of Air, Noise, Water, Wastewater, Solid Waste, Soil and Vibration, Renewable Energy Systems and Management (Wind Energy, Solar Energy and Hydro Power) Chemical Risk Assessment, GIS/RS 	<p>Responsibilities</p> <ul style="list-style-type: none"> Team leader for Socio-Economic and Impact Assessment <p>Report Writing</p> <ul style="list-style-type: none"> All Chapters

No.	Name	TCR No. Registered at ECD	Academic Experience	Years of Experience in EIA	Area of expertise	Responsibility for the Report
2	U Aung Kaung Myat (or) U Ye Wai Yan Hlaing*	00352	<ul style="list-style-type: none"> MSc (Environmental Planning and Management) BE (Port and Harbor Engineering), Dip (Environmental Planning and Management) Dip (Civil Service Management) 	>5	<ul style="list-style-type: none"> Environmental pollution control for Air, Noise, Wastewater, Water, Solid Waste and Vibration) Water Quality Management Port Engineering, Civil Service Management 	<p><u>Responsibilities</u></p> <ul style="list-style-type: none"> Team leader for the Physical Environmental baseline survey, traffic survey <p><u>Report Writing</u></p> <ul style="list-style-type: none"> Chapter 6: Summary of Impact Chapter 9: Management and Monitoring Program- Operation Phase
3	Daw Aye Chan Wutyee	00353	<ul style="list-style-type: none"> MSc (Environmental Planning and Management) BE (Naval Architecture & Ocean Engineering) Dip (Environmental Planning and Management) Dip (Civil Service Management) 	>5	<ul style="list-style-type: none"> Waste and Wastewater Management, Socio-economic and Facilitation Meeting, Navigation Management, Civil Service Management 	<p><u>Responsibilities</u></p> <ul style="list-style-type: none"> Deputy Team Leader of socio-economic survey <p><u>Report Writing</u></p> <ul style="list-style-type: none"> Chapter 6: Summary of Impact Chapter 9: Management and Monitoring Program- Operation Phase Chapter 11: Public consultation and Disclosure
4	U Aung Soe Min	00393	<ul style="list-style-type: none"> BE (Civil), Dip (GIS/RS) 	>5	<ul style="list-style-type: none"> Socio-economic and Facilitation Meeting, Environmental baseline survey, Site Risk Assessment, GIS/RS 	<p><u>Responsibilities</u></p> <ul style="list-style-type: none"> Team Leader of Facilitation Meeting <p><u>Report Writing</u></p> <ul style="list-style-type: none"> Chapter 5: Description of Surrounding Environment Chapter 6: Summary of Impact Chapter 9: Management and Monitoring Program- Operation Phase Chapter 11: Public consultation and Disclosure

No.	Name	TCR No. Registered at ECD	Academic Experience	Years of Experience in EIA	Area of expertise	Responsibility for the Report
5	Daw Hsutyi Mon**	00355	<ul style="list-style-type: none"> BE (Civil) Dip (Business Management) Internal Auditing, ISO14001 & 45001 	>2	<ul style="list-style-type: none"> Structural Engineering, Socio-economic and Facilitation Meeting, Site Risk Assessment 	<p><u>Responsibilities</u></p> <ul style="list-style-type: none"> Team leader for the Environmental Risk Management <p><u>Report Writing</u></p> <ul style="list-style-type: none"> Chapter 6: Summary of Impact Chapter 7: Cumulative Impact Assessment Chapter 9: Management and Monitoring Program- Operation Phase Chapter 11: Public consultation and Disclosure
Ecology and Biodiversity						
6	Dr. Nyo Nyo Lwin*	0079	<ul style="list-style-type: none"> PhD (Zoology) MSc (Zoology) BSc (Zoology) Dip. in English 	>10	<ul style="list-style-type: none"> Ecology and Biodiversity (Aquatic and Terrestrial Fauna) 	<p><u>Responsibilities</u></p> <ul style="list-style-type: none"> Team leader of Ecological and Biodiversity <p><u>Report Writing</u></p> <ul style="list-style-type: none"> Chapter 6: Summary of Impact Chapter 9: Management and Monitoring Program- Operation Phase
Legislation						
7	Daw Aye Thiri Aung	00344	<ul style="list-style-type: none"> BA (Law) Dip (Computer Study) 	>2	<ul style="list-style-type: none"> Legislation, State Liaison Officer CSR Officer 	<p><u>Responsibilities</u></p> <ul style="list-style-type: none"> Team leader of Legislation <p><u>Report Writing</u></p> <ul style="list-style-type: none"> Chapter 3: Policy, Legal and Institutional Framework
Community and Occupational Health and Safety						

No.	Name	TCR No. Registered at ECD	Academic Experience	Years of Experience in EIA	Area of expertise	Responsibility for the Report
8	Dr. Chan Myae Soe	00354	<ul style="list-style-type: none"> MBBS 	>2	<ul style="list-style-type: none"> Occupational Health and Safety Public Health Socio-economic and Facilitating Meeting 	<p>Responsibilities</p> <ul style="list-style-type: none"> Team leader of Community and occupational health and safety <p>Report Writing</p> <ul style="list-style-type: none"> Chapter 6: Summary of Impact Chapter 9: Management and Monitoring Program- Operation Phase

Table 2-2 Key Environmental and Social Consultants for Revising the EMP of Shwe Project (Phase 1)

No.	Name	Academic Experience	Years of Experience	Area of expertise	Responsibility for revising the report
TEAM LEADERS (Socioeconomic & Environment, Ecology & Biodiversity, Compliance & Legislation, and Community & Occupational Health & Safety)					
1.	U Phore Kyaw	<ul style="list-style-type: none"> B.E (Mech) YTU NEBOSH IGC NEBOSH ITC Internal Auditor: ISO 14001:2015 EMS Internal Auditor: ISO 45001:2018 OHS Environmental Management System 	>11	<ul style="list-style-type: none"> Socio-economic and Facilitation Meeting Risk Assessment for Energy and Chemicals Chemical Risk Assessment, Socio-economic and Facilitation Meeting, Site Risk Assessment, Occupational Health and Safety Incident Investigation ICS (Incident Command System) Hazard and Risk Register 	<p>Responsibilities</p> <ul style="list-style-type: none"> Team leader for overall project Environmental and Social Impact Management <p>Report Writing</p> <ul style="list-style-type: none"> Summary of Impact and overall report of Environmental Management Plan Management and Monitoring Program- Operational Phase for submission of 6th Monthly Environmental Monitoring reports
2.	U Ye Hlaing Win	<ul style="list-style-type: none"> M.Eng (Environmental Engineering, Kasetsart University) 	>11	<ul style="list-style-type: none"> EHS Compliance and Assurance Waste Management procedure and Waste Management Reports Environmental Management System EHS Risk management EHS Due Diligence 	<p>Responsibilities</p> <ul style="list-style-type: none"> Team leader for overall project Environmental and Social Impact Management Report Writing

No.	Name	Academic Experience	Years of Experience	Area of expertise	Responsibility for revising the report
TEAM LEADERS (Socioeconomic & Environment, Ecology & Biodiversity, Compliance & Legislation, and Community & Occupational Health & Safety)					
		<ul style="list-style-type: none"> B.Eng (Mechanical Engineering, SIIT Thammasat University) Internal Auditor: ISO 14001:2015 EMS Internal Auditor: ISO 45001:2018 OHS Internal Auditor: ISO 27001:2022 ISMS NEBOSH IGC 		<ul style="list-style-type: none"> Social Management Dangerous Goods Handling Life Cycle Assessment Stakeholder Management Environmental Engineering for Pollution Control of Air, Noise, Water, Wastewater, Solid Waste, Soil and Vibration, Air Quality Monitoring Report, Noise Monitoring Report, and Wastewater Quality Monitoring Report GHS (CO2e) Emission Report Water Quality Management Waste and Wastewater Management and Report, Environmental baseline survey, Ecology and Biodiversity (Aquatic and Terrestrial Fauna) Compliance and Legislation, Renewable Energy Systems and Management (Wind Energy, Solar Energy and Hydro Power) 	<ul style="list-style-type: none"> Summary of Impact and overall report of Environmental Management Plan Management and Monitoring Program- Operational Phase for submission of 6th Monthly Environmental Monitoring reports

2.3 Scope of the EMP

The EMP covers the operation phase of the existing Project and activities covering:

- Environmental management;
- Social impact management; and
- Stakeholder impact engagement.

This EMP is the means by which the findings of the environmental and social impact assessment documentation are implemented during the Project. The scope of the EMP covers all of the operational activities as described in the previous EIA and Social Impact Assessment (SIA) Reports, with the objective of demonstrating compliance with the relevant national and international legislation and PIC's Code of Conduct and Ethics Policy.

A list of all the Project Reports completed throughout the life cycle of this Project is provided in *Table 2-3*. At the time of writing these reports the Environmental Conservation Law was not in force and as such these reports were provided to MOGE.

Table 2-3 Existing Documentation on Shwe Field used to support EMP Development

Project Name	Date	EIA Organization
Block A-1, A-3 Gas Development Myanmar: <ul style="list-style-type: none"> - Preliminary Environmental and Social Scoping Study - Impact Identification Study Offshore Platform - Marine Environmental Baseline Study - Environmental Impact Assessment for Upstream (Offshore) Facilities - Drill Cuttings Modelling Study for Upstream (Offshore) Facilities - Marine Environmental Baseline Study for Offshore Midstream Pipeline - Terrestrial Environmental Baseline Study for Onshore Midstream Facilities and Pipeline Landing -February 2008 Survey - Environmental Impact Assessment for Midstream Pipeline and Gas Receiving Station - Terrestrial Environmental Baseline Study for Onshore Midstream Facilities and Pipeline Landing - May 2008 Survey and Nearshore Coral Habitat Verification and Assessment Study - Coral Habitat Verification and Assessment Study - Environmental Impact Assessment for Supply Base - Environmental Impact Assessment and Environmental Management and Monitoring Plan Update 	2006-2008	ERM-Hong Kong Ltd.
Environmental Impact Assessment for Supply Base	2010	ERM-Hong Kong Ltd.
Environmental Impact Assessment for Soil Disposal Area and Road Access to Onshore Gas Terminal	2010	ERM-Hong Kong Ltd.
Supplemental Environmental Impact Assessment for use of Explosives for Pipeline Installation	2010	ERM-Hong Kong Ltd.

Project Name	Date	EIA Organization
Social Impact Assessment - Shwe Project, Blocks A1 & A3	2010	Coffey International
Myanmar Shwe Gas Field <ul style="list-style-type: none"> - Gas Disposal through Venting at OGT: Scoping Study on Potential Impacts on Kyaukpyu Airport - Gas Disposal through Venting at OGT - Gas Disposal through Venting at OGT During Normal Operation 	2013	ERM-Hong Kong Ltd.

This EMP lists the obligations and responsibilities of each party involved in the Project; stipulates methods and procedures that will be followed; as well as outlining the environmental and social management actions that will be implemented.

2.4 Purpose of the Objective of EMP

This EMP has been prepared based on the findings of the EIA/SIA Reports and describes management measures designed to mitigate potential environmental and social impacts of the existing Project. Mitigation strategies have been considered according to a series of responses that address impacts (in descending order of preference) to avoid, prevent or reduce any potential impact on the identified sensitive receptors.

The overarching purpose of this EMP is to:

- Integrate management and mitigation measures into the Project activities in order to reduce or mitigate any potential adverse impacts on natural and socio-economic environments; and
- Establish systems and processes for delivery and implementation of environmental and social requirements in order to meet statutory and compliance standards.

The objectives of the EMP are to:

- Demonstrate continuing compliance with the relevant Myanmar environmental legislation, PIC Code of Corporate Conduct and Ethics Policy and good international industry practices;
- Describe the mechanism for implementing identified control, monitoring and management measures to mitigate potentially adverse impacts;
- Provide assurance to regulators and stakeholders that requirements with respect to environmental and social performance will be met;
- Undertake monitoring to provide assurance that the control and management measures are being implemented; and
- Combine all of the above in a systematic framework of monitoring, reporting and management that will measure the successful implementation of the project in accordance with PIC's standards for social and environmental performance, and respond as needed to maintain those objectives.

3. LEGISLATION, INSTITUTIONAL FRAMEWORKS AND COMMITMENTS

This section of the EMP report details the policy and legal framework for the Project, covering national requirements as well as applicable international treaties and conventions. The intent is to lay out the regulatory and non-regulatory performance requirements for all stages of the Project.

3.1 Project's Environmental, Social and Health Policies

The laws related to environmental and social issues and hence relevant to the Project are shown in **Figure 3-1**.



CODE OF CORPORATE CONDUCT AND ETHICS

Preamble - Our firm commitment:

Consistently aspire to good oil industry practices and high standards of corporate citizenship, not only in exploring petroleum, but also in exploiting this valuable resource in the best possible socio-economic manner for the benefit of all relevant parties, including the host country and local communities.,

Always to be mindful of non-interference in political affairs and respecting the sovereignty of host countries in business conduct and ethics, Recognize that compliance with local laws is a fundamental foundation of our business and seek to embrace and reflect in the conduct of our business:

- the core values of the United Nations Global Compact;
- the Voluntary Principles on Security and Human Rights;
- the ten principles derived from the Universal Declaration of Human Rights;
- the International Labour Organization's Declaration on Fundamental Principles and Rights at Work;
- the Rio Declaration on Environment and Development; and
- the United Nations Convention Against Corruption.

POSCO INTERNATIONAL Corporation has established this Code of Corporate Conduct and Ethics to outline the philosophy, guidelines and standards with which management and employees are expected to comply in conducting all aspects of our business. We recognize that breach of this Code may cause serious damage to our reputation, and therefore all employees (including management and consultants) are required to conduct themselves in accordance with this Code, and to report to POSCO INTERNATIONAL Corporation any breach of which they become aware.

1. Responsibility for Health, Safety and the Environment

The *Policy Statement on Health, Safety and Environment* issued by POSCO INTERNATIONAL Corporation shall be upheld as a cornerstone of the management and overall vision of our company.

Giving proper regard to and minimizing adverse impacts on Health, Safety and the Environment arising out of or in connection with our operations, and giving consideration to relevant international agreements, principles, objectives and standards and aspiring to generally conduct operations in a manner contributing to the wider goal of sustainable development, we are committed to:

- (1) complying with all applicable health, safety, security and environmental laws, regulations and administrative practices in the countries in which we operate, and apply generally accepted oilfield practices where relevant laws and regulations do not exist;
- (2) providing permanently safe, secure and healthy working environments as set forth in local legislation and international human rights and humanitarian laws for all our employees and employees of other companies working on our premises;
- (3) maintaining a precautionary approach to environmental challenges arising out of or in connection with our operations;
- (4) promoting greater environmental responsibility and encouraging higher levels of environmental awareness in areas in which we operate;
- (5) using sound, environmentally friendly technologies as set forth in local legislation or in accordance with international standards;
- (6) implementing possible protection or restoration measures to minimize any negative impact on the environment around operational areas and committing to efforts to improve environmental performance and to make operations and products compatible with the environment throughout our operations;
- (7) executing Environmental Management Plan (EMP) and Environmental Impact Assessments (EIA) for our operations in consideration of our environmental stewardship; and
- (8) periodically reviewing and monitoring our performance in the area of Health, Safety and the Environment.

2. Responsibility in Employment

Recognizing that the value and success of a corporate entity comes from individual performances of employees and the need to maximize employee satisfaction, motivation, integrity and competence, we are committed to:

- (1) promoting and respecting the rights of all employees;
- (2) offering a rewarding, encouraging and competitive working environment;
- (3) implementing human resource development programmes through which every employee has the opportunity to develop his or her skills and talents;
- (4) ensuring equal opportunity and non-discrimination against employees with respect to employment or occupation on such grounds as race, colour, sex, language, religion, political opinion, national or social origin, social status, indigenous status, disability or age;
- (5) ensuring the right of all employees to personal security in the workplace;
- (6) avoiding and contributing to the effective abolition of child labour and to eliminating all forms of forced and compulsory labour; and
- (7) eliminating to the maximum possible extent the occurrence of allegations of human rights and humanitarian abuses within or around our operational areas.

3. Responsibility to Local Communities

In order to ensure that local communities shall benefit from the presence of POSCO INTERNATIONAL Corporation, we are committed to:

- (1) safeguarding the social structure, protecting the economic livelihood and contributing to the general well-being of the local communities within which we operate, as well as mitigating any negative impacts arising from our presence;
- (2) respecting the cultural and traditional values of local communities, as well as complying with local laws and regulations;
- (3) engaging in capacity-building programmes for the local communities;
- (4) creating employment opportunities and facilitating training opportunities for local people where practical;
- (5) enhancing and developing infrastructure to the extent possible in the areas in which we operate; and
- (6) implementing health care, educational support and welfare programmes for local inhabitants.

4. Responsibility to Host Country

Sharing the common goal of promoting internationally proclaimed standards and preserving sustainable development together with the host country as the resource owner, we are committed to:

- (1) respecting the sovereignty of the host country;
- (2) complying with the applicable laws, including but not limited to acts, rules, regulations, notifications and orders of the host country;
- (3) exploring and exploiting natural resources in a professional, ethical and cost effective manner;
- (4) striving to improve legal norms and principles by way of implementing internationally proclaimed standards;
- (5) maintaining our position of political neutrality and not intervening in any political process of the host country, including maintaining our policy of not making political contributions to any political parties, organizations or their representatives. However we reserve the right, in matters involving host governments, to voice our opinions and engage in policy debate should the issue concerned legitimately affect our operation, employees, shareholders or the community in which we are operating; and
- (6) prohibiting involvement in corruption in all its forms, including extortion and bribery.

5. Responsibility to One Another

Reflecting our fundamental principles of honesty, integrity and trust and believing that they are vital in strengthening and maintaining a positive work environment, which benefits both the individual employee and corporate entity, we are committed to:

- (1) strictly enforcing the *Policy Statement on Substance Abuse*, issued by POSCO INTERNATIONAL Corporation
- (2) behaving with the highest moral and ethical standards, including but not limited to honesty, good faith and integrity;
- (3) acting with professionalism and the utmost care, respect, courtesy and diligence;
- (4) utilizing all property in a proper, professional manner and protecting from misuse or mishandling;
- (5) avoiding the use of internet resources for destructive programming, political stimulus or any other unlawful use;
- (6) keeping in strictest confidence all confidentiality information, including but not limited to, proprietary technical information, business plans, status of operations and equipment, detailed financial data and all other non-public information except when disclosure is authorized or required by any applicable law; and
- (7) prohibiting harassment and violence in the work place.

This Code of Corporate Conduct and Ethics, issued as of the date stated below, is designed to ensure the sustainable development in accordance with internationally proclaimed principles and values, and accountability and responsibility, throughout all aspects of the business in which POSCO INTERNATIONAL Corporation engages.



Seungdon Baek
Managing Director
POSCO INTERNATIONAL Corporation
Gas Production Division
January 2024

Figure 3-1 PIC Corporate Code of Conduct and Ethics

3.2 Myanmar EIA Procedure

The Myanmar EIA Procedure (dated 29 December 2015) sets out the requirements for development, assessment and subsequent monitoring of an EIA. The requirements to conduct an EIA are outlined in the Environment Conservation Law (2012) and Environment Conservation Rules (2014).

The full EIA Process undertaken for the Project is shown in **Figure 3.2**. This Project is currently in the EMP investigation and Reporting Phase.

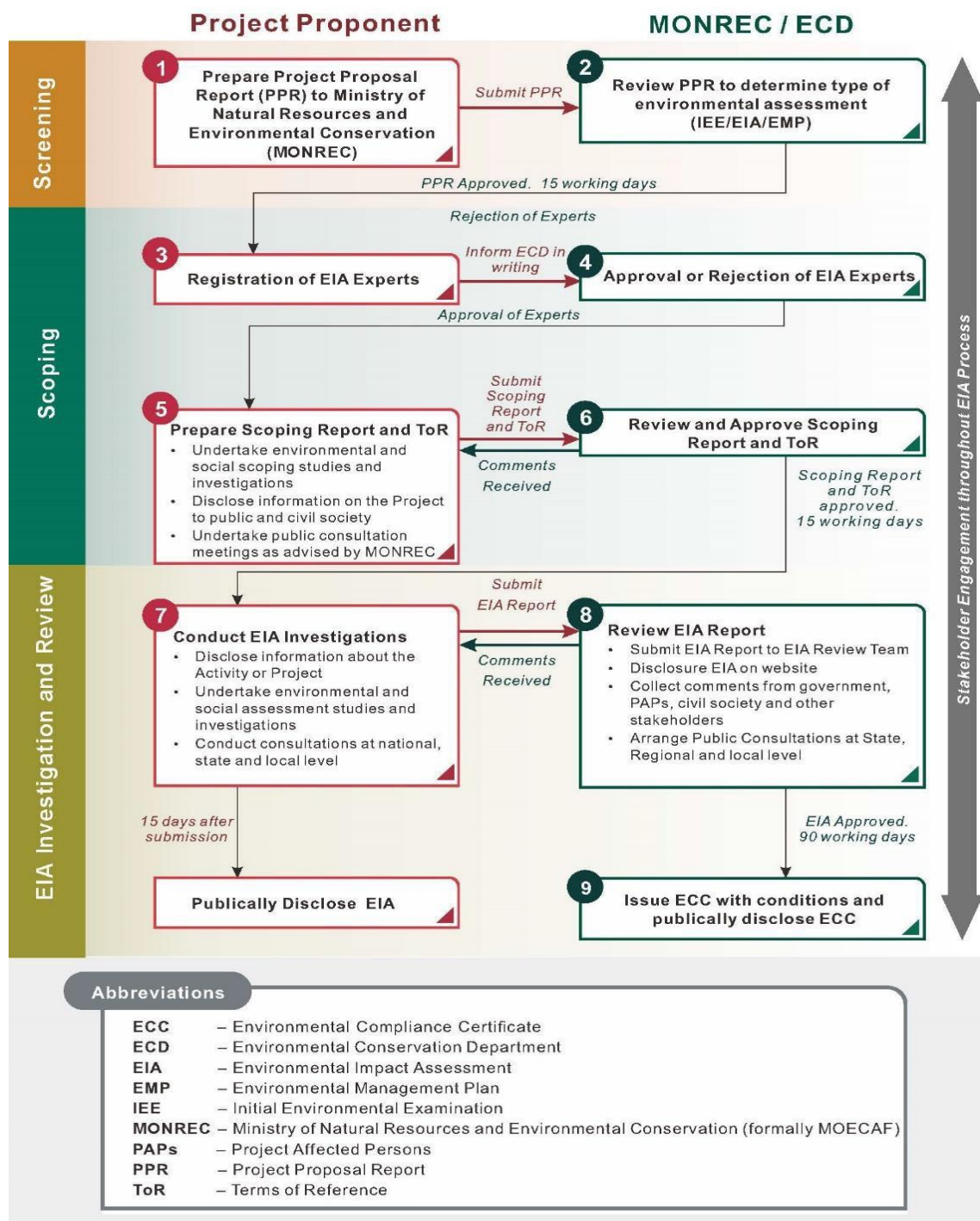


Figure 3-2 EIA Process in Myanmar

3.3 Myanmar Legislation Relevant to the Project Adopted by the Company

A number of other laws exist in Myanmar which, either directly or indirectly, relate to environmental and social management, however these laws are general in nature and refer primarily to good practice recommendations.

Laws relating to environmental and social issues and hence their relevance to the EIA Study for the proposed Project are included in **Table 3-1**.

Table 3-1 Myanmar Legislation of Relevance to the Project Adopted by PIC

Relevant Laws, Rules and Regulations	Relevant Articles	Commitments
ENVIRONMENTAL LEGISLATION		
The National Environment Policy, 2019	Paragraph 7	<p>This Policy builds on Myanmar's 1994 National Environmental Policy and reaffirms its core values:</p> <ul style="list-style-type: none"> (a). The wealth of the nation is its people, its cultural heritage, its environment and its natural resources. (b). It is the responsibility of the State and every citizen to preserve our natural resources in the interests of present and future generations. (c). Environmental protection should always be the primary objective in seeking development. <p>In order to meet the visions, the Government of the Republic of the Union of Myanmar adopts the following 23 National Environmental Policy principles as the guiding framework for achieving: a clean environment and healthy, functioning ecosystems; sustainable economic and social development; and the mainstreaming of environmental protection and management:</p> <p>The project proponent wishing to implement the project to align with this policy and comply the rules and regulations in order to support this.</p>
Myanmar Climate Change Policy, 2019	Paragraph 12	<p>This is established with the vision to be a climate-resilient, low carbon society that is sustainable, prosperous and inclusive, for the wellbeing of present and future generations.</p> <p>There clearly set-up guiding principles for:</p> <ul style="list-style-type: none"> • Sustainable development • Precaution Prevention • Environmental integrity • Shared responsibility and cooperation • Inclusiveness Good governance • Climate justice and equity • Gender equality and women's empowerment

Relevant Laws, Rules and Regulations	Relevant Articles	Commitments
The Constitution of the Republic of the Union of Myanmar, 2008	Section 37(a) (b), 45, 390	<p>To support the Government in order to meet the Myanmar Climate Change Policies Visions by following the above-mentioned principles</p> <p>The Constitution of the Union of Myanmar is the supreme law of the country and has provisions regarding the protection of the environment in Myanmar.</p> <p>The Project Proponent commits to comply as these three Articles in the Constitution provide a basis for legalizing and institutionalizing environmental health impact assessment and social impact assessment. There stipulates that:</p> <p>The Union is the ultimate owner of all lands and the natural resources above and below the ground, above and beneath the water and in the atmosphere in the Union; The Union shall enact necessary law to supervise extraction and utilization of State-owned natural resources by economics forces;</p> <p>The Union shall protect and conserve natural environment.</p> <p>Every citizen has the duty to assist the Union in carrying out the following matters:</p> <ul style="list-style-type: none"> (a) preservation and safeguarding of cultural heritage; (b) environmental conservation; (c) striving for development of human resources; and (d) protection and preservation of public property.
Environmental Conservation Law, 2012	Section 7(o), 14, 15, 24, 29	<p>The Project Proponent commits to comply with the following:</p> <p>That MONREC has the right to manage a proponent to (1) provide compensation for environmental impact and contribute funds, (2) the need for prior permission from MONREC for businesses that have been categorized for potentially causing impact on the environment and (3) the right to issuing permit with terms and conditions relating to environmental conservation.</p>

Relevant Laws, Rules and Regulations	Relevant Articles	Commitments
		<ul style="list-style-type: none"> - To treat, emit, discharge and deposit substances which cause pollution in the environment in accordance with stipulated environmental quality standards. That the owner or occupier of any business, material or place which causes a point source of pollution have to install or use an on-site facility or controlling equipment in order to monitor, control, manage, reduce or eliminate environmental pollution. If it is impracticable, it has to be arranged to dispose the wastes in accordance with environmentally sound methods. - To comply the Ministry may, in issuing the prior permission, stipulate terms and conditions relating to environmental conservation. It may conduct inspection whether or not it is performed in conformity with such terms and conditions or inform the relevant Government departments, Government organizations to carry out inspections. - To not violate any prohibition contained in the rules, notifications, orders, directives and procedures under the Environmental Conservation Law.
Environmental Conservation Rules, 2014	Rule 69(a) (b)	The Project Proponent commits: <ul style="list-style-type: none"> - Not to emit, cause to emit, dispose, by any means, the pollutants and the hazardous waste or material (stipulated as such under the Law) at any place which may affect the public directly or indirectly. - Not to damage the ecosystem and the natural environment which is changing due to such system, except for carrying out with the permission of MONREC in the interest of the people.
Environmental Impact Assessment Procedure, 2015	Paragraph 87, 102(a) (b) (d), 103, 104, 105, 106, 107, 108, 110, 113, 115, 117	The EIA Procedure sets out the procedures for completing an IEE, EIA and/or EMP in Myanmar. This includes information on project categorization, responsibilities of project developers and ministries, EIA review, monitoring and auditing, amongst other issues.

Relevant Laws, Rules and Regulations	Relevant Articles	Commitments
		<p>The Project Proponent commits to bear full legal and financial responsibility:</p> <p>For their actions and omissions and those of its contractors, subcontractors, officers, employees, agents, representatives, and consultants employed, hired, or authorized by the Project acting for or on behalf of the Project, in carrying out work on the Project; and</p> <p>To support programs for livelihood restoration and resettlement in consultation with the PAPs, related government agencies, and organizations and other concerned persons for all Adverse Impacts until PAPs have achieved socio-economic stability at a level not lower than that in effect prior to the commencement of the Project.</p> <p>For EMP, the Project Proponent commits:</p> <ul style="list-style-type: none"> - to implement the EMP, all Project commitments, and conditions, - to ensure that all contractors and subcontractors of the Project comply fully with all applicable Laws, the Rules, this Procedure, the EMP, Project commitments and conditions when providing services to the Project. - to include number and type of non-compliance with the EMP and proposed remedial measures and timelines for completion of remediation. Responsible for, and to fully and effectively implement the requirements set forth in ECC, applicable Laws, Rules, EIA Procedure and standards. <p>Project commitments and conditions when providing services to the Project and inform the Ministry with detailed information as to the proposed project's potential adverse impacts.</p> <p>For monitoring and reporting, Project Proponent commits:</p> <ul style="list-style-type: none"> - To notify and identify in writing to the Ministry, providing detailed information as to the proposed Project's potential Adverse Impacts. - To engage in continuous, proactive, and comprehensive self-monitoring of the Project and activities related thereto, all Adverse Impacts, and compliance with applicable laws, the Rules, this EIA Procedure, standards, the ECC, and the EMP during all phases of the Project (pre-construction, construction, operation, decommissioning, closure and post-closure).

Relevant Laws, Rules and Regulations	Relevant Articles	Commitments
		<ul style="list-style-type: none"> - To notify and identify in writing to the Ministry for any breaches of his obligations or other performance failures or violations of the ECC and EMP as soon as reasonably possible and in any event, in respect of any breach which would have a serious impact or where the urgent attention of the Ministry is or may be required, to undertake within not later than twenty- four (24) hours, and in all other cases within seven (7) days of the Project Proponent becoming aware of such incident. - To submit monitoring reports to the Ministry not less frequently than every six (6) months, as provided in a schedule in the EMP, or periodically as prescribed by the Ministry. The monitoring report will be publicly disclosed within ten (10) days of completing a monitoring report. - To make a monitoring report as contemplated in Article 108 and Article 109 in accordance with the EMP schedule, (except as may relate to National Security concerns) publicly available on the Project's website, at public meeting places (e.g. libraries, community halls) and at the Project offices within ten (10) days of completing - To submit a digital copy of a monitoring report within ten (10) days of receiving such request via email or as may otherwise be agreed upon with the requestor for the request of any organization or person. <p><i>For the purposes of monitoring and inspection, the event of emergency,</i> the Project Proponent commits to grant the ministry and/or its representatives, at any time during normal working hours, access to the Project's offices and to the Project site and any other location at which the Project activities or activities related to the Project are performed; grant, from time to time as and when the Ministry may reasonably require, the Ministry access to the Project's offices and to the Project site and any other location at which the Project activities or activities related to the Project are performed grant full and immediate access to the Ministry at any time as may be required by the Ministry in the event of an emergency, or where, in the opinion of the Ministry, there is or may exist a violation or risk of violation of the compliance by the Project with all applicable environmental and social requirements.</p>

Relevant Laws, Rules and Regulations	Relevant Articles	Commitments
		<p>Ensure that the Ministry's rights of access can extend to access by the Ministry to the Project's contractors and subcontractors.</p> <p>For the Conditions and Revisions to Conditions prescribed in Environmental Compliance Certificate, the Project Proponent commits to commence the implementation of the Project in accordance with the conditions attached to the ECC and including the EMP, within such time as may be prescribed by the Ministry upon receipt of the written approval from the relevant authority.</p>
Environmental Quality (Emissions) Guidelines (EQEG), 2015		The Project Proponent commits to comply with the EQEG guidelines and its setting out for emission standards for air, noise, and effluent discharges for sector specific operations. The Project Proponent considers this emission standards in its environment impact assessment and environmental management plan.
Conservation of Water Resources and Rivers Law, 2006 & Amendment (2017)	Section 8(a), 10, 11(a) (c), 19	<p>The Project Proponent commits to comply prohibitions for the following activities:</p> <ul style="list-style-type: none"> - No person shall carry out any act or channel shifting with the aim to ruin the water resources and rivers and creeks - No person shall anchor the vessels where vessels are prohibited from anchoring in the rivers and creeks. - No person shall dispose of engine oil, chemical, poisonous material and other materials which may cause environmental damage, or dispose of explosives from the bank or from a vessel which is plying, vessel which has berthed, anchored, stranded or sunk. - No person shall dispose of disposal soil and other materials in the river and creek, into the river and creek or into the water outlet gully, which can flow into the river and creek. - No one shall dispose of any substance into the river creek that may cause damage to waterway or change of watercourse from the bank or vessel.

Relevant Laws, Rules and Regulations	Relevant Articles	Commitments
The Protection of Biodiversity and Protected Areas Law, 2018	Section 35 (a) (c) (d), 39(d) (e)	<p>The Project Proponent commits to comply the stipulation that there may be charge with fine or imprisonment or both if guilty of:</p> <p>Entering a prohibited area without permission.</p> <p>Digging on the land, cultivating or carrying out any activity.</p> <p>Extracting, collecting or destroying in any manner, any kind of wild flora or cultivated plant.</p> <p>using dynamite or explosive chemicals, electrocuting, destroying water flow or poisoning water, intentionally pollutes the soil, water, air in the conservation area;</p> <p>Disposing or handling chemical waste and poisoning materials in the conservation area.</p>
SOCIO-ECONOMIC LEGISLATION		
Territorial Sea and Maritime Zone law (2017)	Section 30, 31, 32	<p>The Project Proponent commits to comply prohibitions for the following activities:</p> <ul style="list-style-type: none"> - No one shall move any objects, including ancient objects and historic objects at the seabed of the contiguous zone without the prior permission of the Government. - No one shall act any of the followings in the exclusive economic zone without the prior permission of the Government: <ul style="list-style-type: none"> (a) exploration; (b) exploitation of natural resources; (c) doing research; (d) excavating or drilling for any purpose; (e) establishing, maintaining or using artificial island, off-shore terminal, installations and structures. - No one shall act any of the followings in the continental shelf without the prior permission of the Government: <ul style="list-style-type: none"> (a) exploration; (b) exploitation of natural resources; (c) doing research; (d) searching, excavating or drilling for any purpose; (e) establishing, maintaining or using artificial island, off-shore terminal, installations and structures; (f) extending or maintaining submarine cables and pipelines.

Relevant Laws, Rules and Regulations	Relevant Articles	Commitments
The Protection and Preservation of Cultural Heritage Region Law, 2019	Section 13, 15, 21, 22	<p>The Project Proponent commits:</p> <ul style="list-style-type: none"> - To apply for prior permission and must abide by provisions of existing laws for certain land-based construction works. - To comply the stipulation for the person desirous of carrying out construction works to abide by the provisions of other existing laws and also apply in accordance with the stipulations to the Department to obtain prior permission under this law. Without prior permission granted under this Law, not to carry out any of the following in the cultural heritage region; <ul style="list-style-type: none"> (a) carrying out renovation and maintenance work on an ancient monument (b) carrying out archaeological excavation; (c) building road, constructing bridge, irrigation canal, embankment or extending the same (d) digging well, pond, fish-breeding pond or extending the same; - To conform to conditions prescribed by the Ministry of Culture for buildings in cultural heritage region.
The Protection and Preservation of Antique Objects Law, 2015	Section 12	<p>Project Proponent commits to comply the stipulation:</p> <p>For person who finds any object which has no owner or custodian, needs to inform the relevant Ward or village-tract administrator if he knows or it seems reasonable to assume that the said object is an antique object.</p>
The Protection and Preservation of Ancient Monuments Law, 2015	Section 12, 15, 20	<p>Project Proponent commits to comply the stipulations:</p> <p>For a person who finds an ancient monument over one hundred years old under the water or above ground to promptly inform the relevant Ward or Village-Tract Administrative Office.</p> <ul style="list-style-type: none"> - To apply prior permission from the Department before implementing (a).extending towns, wards and villages; (b).constructing or extending or repairing new buildings including hotels, factories and residential buildings or fencing or extending a fence; (c).digging to search petroleum, natural gas, gem or mineral, piping petroleum and natural gas, constructing factories, connecting national grid, constructing communication tower, constructing or extending infrastructures such as road,

Relevant Laws, Rules and Regulations	Relevant Articles	Commitments
		<p>bridge, airfield, irrigation and embankment;</p> <p>(d). connecting underground electric cable, communication cable and other underground works;</p> <p>(e). digging or extending wells, lakes, cannels and ponds;</p> <p>(f). gold sieving, digging, burning bricks, digging well, lake, creek, ditch, gully, pit digging, refilling, levelling, mining, quarry, gravel digging and unearth sand, removing the mounds and hills which can damage the physical feature of the land;</p> <p>(g). placing and fencing ancient monuments in a private compound and area;</p> <p>(h). constructing a building which is not consistent with the terms and conditions stipulated according to the region by the Ministry near and at the surrounding of an ancient monument.</p> <p>For prohibitions not to damage to an ancient monument within the specified area of an ancient monument without a written prior permission by carrying out:</p> <p>(a). taking photo, video, film or copying and modeling an ancient monument stipulated as a listed ancient monument for commercial purposes;</p> <p>(b). using machines which causes vibration within the specified place of an ancient monument and running various types of vehicles;</p> <p>(c). cultivating, gardening, breeding, fencing by blocking nearby an ancient monument or doing any other act which can affect an ancient monument;</p> <p>(d). emission of gas such as hot-air balloon which can affect an ancient monument;</p> <p>(e). landing and taking off and, flying airplane and helicopter which can directly or indirectly affect an ancient monument;</p> <p>(f). discarding chemical substance and rubbish which can affect an ancient monument and the environment.</p> <p>Project proponent commits for conducting survey and cooperate with the Department of Archaeology and National Museum (Sittwe Township) if ancient objects and monuments are found at underground and surface of land and sea throughout lifespan of the project.</p>

Relevant Laws, Rules and Regulations	Relevant Articles	Commitments
Myanmar Fire Force Law, 2015	Section 25	<p>The Project Proponent commits:</p> <ul style="list-style-type: none"> - To obtain the opinion of the Fire Services Department for the purpose of fire precaution and prevention, when laying down plans for construction for town, village and downtown or village development plans. - To comply the stipulations for the factory, workshop, highway bus, airport, jetty, hotel, motel, guest house, collective-owned building, market, work-site or business exposed to fire hazard of the owner or manager; <ul style="list-style-type: none"> (a). Not fail to form a reserve fire brigade (b). Not fail to provide materials and apparatuses for fire safety; in conformity with the directive of the Fire Services Department.
Public Health Law, 1972	Section 3, 5	<p>The Project Proponent commits to cooperate with the authorized person or organization in line with the stipulations:</p> <p>To abide by any instruction or stipulation for public health. To accept any inspection, anytime, anywhere if it is needed.</p>
The Protection and Prevention of Communicable Disease Law, 1995	Section 3(a), 9, 11	<p>The Project Proponent commits to comply the stipulations according to section 4:</p> <p>For the Department of Health to carry out immunizations and health education activities related to communicable diseases</p> <p>For all responsible persons to prepare report for an outbreak of a communicable disease to the nearest Health Officer.</p> <p>For Health Officer to undertake investigations and medical examinations to prevent the control the spread of Principal Epidemic Disease.</p>
Occupational Safety and Health Law, 2019	Section 12(a) (b), 14, 16, 17, 18, 26, 27, 34, 36	<p>The Project Proponent commit to take the responsibility prescribed for Employers to:</p> <p>Appoint the occupational safety and health responsible person in order to closely inspect for the safe and health of workers as per types of business defined by Ministry of Labour, Immigration and Population.</p> <p>Organize the Safety and Health Committee in accordance with the stipulations of the Ministry including the equal numbers of representative from employees and employers for the purposes to implementing the working environment, which is in safe and healthy for the business where the number of workers are not less than</p>

Relevant Laws, Rules and Regulations	Relevant Articles	Commitments
		the number stipulated by the Ministry. In this case, the committee will be formed for the considerations Persons In-charge for Occupational Safety and Health to make the Workplace to be a safe Workplace that is good for health.
		<p>Inspection Officers shall enter the Workplaces to which this Law applies and inspect Occupational Safety and Health conditions and direct Employers for their compliance and report the findings to the Chief Inspection Officer.</p> <p>Inspection Officers have the powers to perform the following for Occupation Safety and Health in accordance with their codes of conduct: -</p> <ul style="list-style-type: none"> (a) the power to enter, inspect and inquire at any Workplaces related to this Law at any time by showing the Inspection Officer's identity without warrant; (b) the power to look at, make copies of and seize as evidence as required documents and records in connection with Workplaces and Processes; (c) the power to take photos and record videos in connection with Workplaces and Processes that may be harmful to Occupational Safety and Health; (d) the power to assess and measure and take records of the extent of impairment and duration caused to the environment of the Workplace due to loudness, light, heat, coldness, particles, gas and Hazardous Materials, and obtain the assistance of the expert in the relevant field of study if required; (e) the power to inquire of any person in the Workplace during working hours with the assistance of the Recognized Doctor to check any conditions that put or are likely to put Workers in contact with Occupational Disease; and (f) the power to require responsible persons at clinics or hospitals to deliver, with the stipulated security grade, medical treatment records of the Worker who is under treatment or information relating to death due to Occupational Accident or Occupational Disease, or autopsy results asked by the Department in the stipulated form

Relevant Laws, Rules and Regulations	Relevant Articles	Commitments
		<p>Inspection Officers shall, with the approval of the Chief Inspection Officer, order the Employer to temporarily close a whole or part of the Workplace, and notify the relevant Departments if required, if they believe that an Occupational Accident, Occupational Disease, Hazardous Event or Major and Serious Occupational Accident occurs or is likely to occur because:</p> <ul style="list-style-type: none"> (a) it is not appropriate to continue doing the Industry/Business due to dangerous Workplace condition, or unsafe operation carried by Workers, or existence of Hazardous Materials and Hazardous Machines, or layout and function of Workplace, part of the machine or equipment; (b) it is not appropriate to continue doing the Industry/Business due to breach or incompliance with any of the provisions of this Law; (c) it deems that Workers in the Workplace are in danger due to acts, omissions, negligence or carelessness; or (d) it needs to evacuate Workers from hazards because an Occupational Accident or accident is about to occur. <p>The Employer shall be responsible to:</p> <ul style="list-style-type: none"> (a) arrange as required to assess the risks of Workplace, Process and machines and materials used thereat; (b) arrange as required to assess the likelihood of occurrence of hazards at the Workplace and to the environment; (c) arrange to have Workers medical checked-up by the Recognized Doctor in accordance with stipulations whether they suffer from any Occupational Disease; (d) arrange to improve the Workplace until it is safe and good for health based on the findings as per sub-sections (a), (b) and (c);

Relevant Laws, Rules and Regulations	Relevant Articles	Commitments
		<ul style="list-style-type: none"> (e) provide Workers with sufficient number of personal protective clothing, materials and facilities prescribed and approved by the Department on free of charge basis and cause Workers to wear them while working; (f) prescribe precautionary plans and plans for emergency; (g) provide a clinic, appoint the Registered Doctors and nurses and provide medicines and supporting equipment for any Industry/Business where the number of Workers is not less than the number determined by the Ministry; (h) make necessary arrangements for managers, Workers and members of the Occupational Safety and Health Committee including (Employer) himself/herself to attend Occupational Safety and Health training courses stipulated by the Ministry in accordance with their departments or types of work; (i) make necessary arrangements to enable immediate reporting to the Person In-charge for Occupational Safety and Health or manager in case where a Worker suffers an Occupational Accident or his/her life or health is likely to be in danger; (j) arrange to prevent any persons in the Workplace from Occupational Safety and Health risks occurred due to materials, machines or wastes used in the Workplace or Process; (k) immediately stop the Process, evacuate Workers and conduct necessary rescue plans if any Occupational Accident is about to occur. If possible, Workers will be relocated to another appropriate safe Workplaces; (l) display Occupational Safety and Health instructions,

Relevant Laws, Rules and Regulations	Relevant Articles	Commitments
		<p>danger signs, notices, posters and signage for directions in accordance with stipulations;</p> <p>(m) arrange to be complied with precautions when entering restricted hazardous Workplaces;</p> <p>(n) arrange to disseminate Occupational Safety and Health manuals and guidelines issued by the relevant Ministries for knowledge, technology, information and skills not only to Workers but also to related persons or raise their awareness or knowledge thereof;</p> <p>(o) lay down the fire safety plan, perform fire drilling and train Workers to use fire extinguishers systematically;</p> <p>(p) allow the Chief Inspection Officer and Inspection Officers to enter Workplaces, inquire, request documents and information or seize exhibits;</p> <p>(q) cause Workers to work only for the specified working hours if they have to work in Hazardous Industry/Business and Workplace; and</p> <p>(r) Incur the expenses for Occupational Safety and Health matters.</p> <p>No Employer shall dismiss or demote a Worker: -</p> <p>(a) during any period before a medical certificate is issued by the Registered Doctor for occupational injury or by the Recognized Doctor for contact with Occupational Disease;</p> <p>(b) because the said Worker has addressed a complaint for hazardous or health detrimental condition;</p> <p>(c) because the said Worker has conducted the responsibilities of Occupational Safety and Health Committee; or</p> <p>(d) because the said Worker has refused to work in any condition where an Occupational Accident or Occupational Disease is about to occur.</p>

Relevant Laws, Rules and Regulations	Relevant Articles	Commitments
		<p>The Employer is responsible to undertake the following in accordance with the stipulations: -</p> <ul style="list-style-type: none"> (a) informing the Department in case of an Occupational Accident, Hazardous Event or Major and Serious Occupational Accident; (b) if a Worker is in contact with a stipulated Occupational Disease or contaminated or likely to be contaminated due to materials or Process used, sending a report to the Department together with a medical report prepared by the Recognized Doctor. <p>The Employer shall be responsible to:</p> <ul style="list-style-type: none"> (a) Inspection Officers must perform inspection as required if any Occupational Accident, Hazardous Event, Occupational Disease or Occupational Contamination breaks out. (b) No one shall, without consent of the Chief Inspection Officer, remove, conceal, add or change a whole or part of the materials, machines, equipment, layout, documents or signs relating to the occurrence of an Occupational Accident, Hazardous Event, Occupational Disease or Occupational Contamination. (c) The prohibition in sub-section (b) shall not apply to rescuing and doing related activities required for saving life, property and safety of people. (d) The Chief Inspection Officer can approve the removal, dismantling, adding or changing of materials, machine and equipment and layout if the prohibition under sub-section (b) is likely to cause subsequent negative impacts

Relevant Laws, Rules and Regulations	Relevant Articles	Commitments
Employment and Skill Development Law, 2013	Section 5, 14, 30	<p>The Project Proponent commits to comply the stipulation For the agreement, training and probation period as prescribed in:</p> <ol style="list-style-type: none"> 1. If the employer has appointed the employee to work for an employment, the employment agreement shall be made within 30 days. But it shall not be related with government department and organization for a permanent employment. 2. If pretraining period and probation period are stipulated before the appointment the said trainee shall not be related with the stipulation of sub-section (1). <p>For particulars to be included in the employment agreement:</p> <ol style="list-style-type: none"> 1. the type of employment; 2. the probation period; 3. wage, salary; 4. location of the employment; 5. the term of the agreement; 6. working hour; 7. day off, holiday and leave; 8. overtime; 9. meal arrangement during the work hour; 10. accommodation; 11. medical treatment; 12. ferry arrangement to worksite and travelling; 13. regulations to be followed by the employees; 14. if the employee is sent to attend the training, the limited time agreed by the employee to continue to work after attending the training; 15. resigning and termination of service; 16. termination of agreement; 17. the obligations in accord with the stipulation of the agreement;

Relevant Laws, Rules and Regulations	Relevant Articles	Commitments
		<p>18. the cancellation of employment agreement mutually made between employer and employee;</p> <p>19. other matters;</p> <p>20. specifying the regulation of the agreement, amending and supplementing;</p> <p>21. Miscellaneous.</p> <p>For the worksite regulations contained in the employment agreement to follow any existing law and the benefits of the employee not to be less than those of the any existing law.</p> <p>(a). For the employment agreement, the Ministry can issue the notification for paying the stipulated compensation to the employee by the employer, if the work is completed earlier than the stipulated period or the whole work or any part of it have to be terminated due to unexpected condition or the work has to be terminated due to various conditions.</p> <p>(b). For the employment agreement made under sub-section (a) to be related with daily wage workers, piece rate workers who are appointed temporarily in the government department and organization.</p> <p>(c). For the worksite regulations and benefits contained in the employment agreement mutually made between the employer and employee or among the employees to be amended as necessary, in accord with the existing law.</p> <p>(d). For the employer to send a copy of the employment agreement made between the employer and employee, to the relevant employment and labour exchange office within the stipulated period and to get the approval of it.</p> <p>(e). For the employment agreement made before the enforcement of this law has to be confirmed up to the end of the term of the original agreement.</p> <p>To carry out the training program in accordance with the work requirement in line with the policy of the skill development team to develop the skill relating to the employment for the workers who are proposed to appoint and working at present.</p>

Relevant Laws, Rules and Regulations	Relevant Articles	Commitments
		<p>For the employer of the industry and service business to put in to the fund monthly as put in fees without fail for the total wages of the subordinates and the supervisors' salary for not less than 0.5%;</p> <p>To put in money paid under sub-section (a) not to be deducted from the wage and salary of the employees.</p>
The Settlement of Labour Dispute Law, 2012	Section 3, 38, 39, 40, 51	<p>The Project Proponent commits to comply: Formation of the Workplace Coordinating Committee</p> <p>Not to fail to negotiate and coordinate in respect of a complaint within the prescribed period without sufficient cause</p> <p>Not to alter the conditions of service of workers involved in disputes prior to investigation by tribunals</p> <p>For no party to strike or lock-out without negotiation, conciliation and arbitration by Arbitration Body. For the employer if commits acts without sufficient cause, to be liable to pay full compensation to workers as determined by Arbitration Body or Tribunal.</p>

Relevant Laws, Rules and Regulations	Relevant Articles	Commitments
The Workmen Compensation Act, 1923 (amended in 1955, 1957, 2005)	Section 3, 13	<p>The Project Proponent commits to comply the stipulations:</p> <p>For the payment by certain classes of employers to their workmen of compensation for injury by accident.</p> <p>For the liability for compensation of employer's, amount of compensation, compensation to be paid when due and penalty for default, method of calculating wages, review, commutation of half-monthly payments, payment of a lump sum amount, distribution of compensation, compensation not to be assigned, attached or charged, notice and claim, power to require from employers statements regarding fatal accidents, reports of fatal accidents and serious bodily injuries, medical examination, contracting, remedies of employer against stranger, compensation to be first charge on assets transferred by employer, special provisions relating to masters and seamen.</p> <p>For any updating for revising the monetary amount as per the amendment law.</p> <p>To ensure the compensations to injured employee while implementing in line with the above law and pay the prescribed compensations in various kinds of injury. This law focuses as follow;</p> <p>The project proponent has to pay the compensation in line with the provisions of said law base on kind of injury and case by case.</p>

Relevant Laws, Rules and Regulations	Relevant Articles	Commitments
Labour Organisation Law, 2011	Section 17, 18, 19, 20, 21, 22	<p>This Law was enacted, to protect the rights of the workers, to have good relations among the workers or between the employer and the worker, and to enable to form and carry out the labour organizations systematically and independently.</p> <p>Project Proponent commits to comply the stipulations as there mentions: That Labour Organizations are free to organize and negotiate workers' rights if not meeting labour laws.</p> <p>That Labour Organizations may demand re-appointment of worker if cause of dismissal is related to labour organization membership or activities or not conform to labour laws.</p> <p>That Labour Organizations have the right to send representatives to conciliation tribunals.</p> <p>That Labour Organizations have the right to participate and discuss workers' rights and interests with government and employers</p> <p>That Labour Organization have the right to participate in collective bargaining in accordance with labour laws.</p> <p>That Labour Organization shall carry out peacefully in carrying out holding of meetings, going on strike and carrying out other collective actions in accordance with the relevant procedures, regulations and law.</p>
Minimum Wages Law, 2013	Section 12(a-e), 13(a-g)	<p>This Law was enacted to meet with the essential needs of the workers, and their families, who are working at the commercial, production and service, agricultural and livestock breeding businesses and with the purpose of increasing the capacity of the workers and for the development of competitiveness.</p> <p>Project Proponent commits to comply the stipulations:</p> <p>For the employer not to pay wage less than the minimum wage stipulated, do not have the right to deduct any other wage</p> <p>For the employer to inform rates of minimum wage relating to the business, allow the entry and inspection of the inspection officer, give the sick worker holiday for medical treatment in accord with stipulation and give holiday for the matter of funeral of the family of worker without deducting from the minimum wage.</p>

Relevant Laws, Rules and Regulations	Relevant Articles	Commitments
Payment of Wages Law, 2016	Section 3, 4, 5, 7(ii), 8, 9, 10, 14	<p>The Project Proponent commits to comply the stipulations:</p> <p>That salaries are to be paid at the end of the month or, depending on the size of the employing enterprise, between 5-10 days before the end of the month. The employer is permitted and required to withhold income tax and social security payments. Other deductions, e.g. for absence, may only be withheld in accordance with the law.</p> <p>For the employer (a) to pay for salary either Myanmar Kyats or Foreign Cash permitted by National Bank of Myanmar. When delivery the salary (b) If the employer needs to pay the other opportunities or advantages, he can pay cash together with other materials according employee's attitude.</p>
		<p>For finishing the contract, employer need to pay the salary (not more than one month) to employees. For the permanent worker, need to pay per monthly. If more than 100 employees, need to pay within the five (5) days from the end of month. If fire the employees, need to pay salary within two (2) days after fire. When employee dies due to the accident, need to pay money as an insurance to employee's family within two days.</p> <p>For the employer to report to the Department with evidence of payment at later date agreed with the employee if the employer has difficulties to pay wages on time because of significant events (e.g. natural disaster).</p> <p>For the employer to deduct expense which are allowance for accommodation and ferry service arranged by the employer, meal allowance, electricity charges, water service charges and income taxes liable to be paid by workers and cash paid in excess under mistake, which are not included in the expression of wages under this Law and not to deduct from the wages of the worker except the deduction as per Section 7. For any deducting from the salary due to the employees' absence, the total cut salary not to be more than 50 % of his salary.</p> <p>For overtime work, to allow the presiding overtime rate as set by the Law.</p>

Relevant Laws, Rules and Regulations	Relevant Articles	Commitments
Leaves and Holidays Act, 1951	Section 4	<p>The Project Proponent commits to comply with the stipulations:</p> <p>For employee to be granted to pay public holidays as announced by the Government in the Myanmar Gazette. On average, Myanmar has 26 public holidays per year, depending on the date of the variable holidays.</p> <p>For additional rules to apply in accordance with other laws, such as the Social Security Law (2012) for employees contributing to the Social Security Fund.</p> <p>To grant earned leave with average wages or average pay for a period of ten consecutive days by his employer during the subsequent period of twelve months to every employee who has completed a period of twelve months continuous service.</p> <p>The employees can take the leaves and get the holidays legally and to ensure the right to get the holidays and leaves. This law focuses the following matters;</p> <p>The project proponent has to allow the leaves and holidays in line with the law.</p>
Social Security Law, 2012	Section 11(b), 15(a) (b), 18(b), 48(b), 49(a), (b), 51 b), 75	<p>The Project Proponent commits to comply the stipulations:</p> <p>For provisions of compulsory registration under sub-section (a) to continue to be applied by this Law even though any of the following situations occurs if it continues to carry out such work:</p> <ul style="list-style-type: none"> i. carrying out work by employing under stipulated minimum number of workers but more than one worker; ii. changing the employer or changing the type of business. <p>(a) For the Social security fund, to include the funds for health and social care, family assistant, invalidity benefit, superannuation benefit and survivors' benefit, unemployment benefit, other social security fund for social security system of compulsory registration and contribution stipulated by the Ministry of labour, other social security fund and social security housing plan fund. (b) The employers and workers of establishments shall pay contributions after effecting compulsory registration to the fund.</p>

Relevant Laws, Rules and Regulations	Relevant Articles	Commitments
		<p>For the employer to deduct contributions to be paid by worker from his wages together with contribution to be paid by him and pay to the social security fund and in such case, he can incur the expense.</p> <p>The employers may affect insurance by registering voluntarily for the workers who are not applied to provisions of compulsory registration for employment injury benefit insurance system and by paying stipulated contribution to employment injury benefit insurance fund.</p> <p>For the inapplicability to the Workmen's compensation act.</p> <p>For the employer to pay defaulting fee stipulated under section 88, in addition to the contribution if fails to contribute after effecting insurance for employment injury benefit.</p> <p>For the employer (a) to report to the relevant township social security office immediately if a serious employment accident occurs to his insured worker. There shall not be any delay without sufficient cause to report as such. (b) A team of officers and other staff who inspect the establishments, if it is found out the employment injury, death, and contracting disease, shall report to the relevant township social security office in accord with the stipulations.</p> <p>For keeping records of work and lists.</p>
The Ethnic Rights Protection law, 2015	Section 5, 22, 23, 24	<p>The Project Proponent commits to comply the stipulations</p> <p>For the Equal right between the Ethnic living in Myanmar. It enacted that if an ethnic loose the right, he can complain to the Regional or State Government to get the equal chance and find the equal right.</p> <p>That project matters shall be informed, coordinated and undertaken in consultation with ethnic groups if projects are in areas with ethnic groups. No one shall prohibit the rights and privileges of the ethnic groups without credible reasons.</p> <p>No one shall misuse the provisions of this Law for political purposes.</p> <p>No one shall behave any act which is intended or is likely to promote feelings of hatred, enmity, and discord among the ethnic groups.</p>

Relevant Laws, Rules and Regulations	Relevant Articles	Commitments
Occupational Safety and Health, 2019 (not come into force yet)	Chapter 8, 9, 10	Responsibilities of the employers and the employee Responsibilities of the manufacturer, traders, installation or deployment, and construction and demolition Information/Notice, investigation and reporting
SECTOR SPECIFIC / DEVELOPMENT		
The Petroleum Rules, 1937	Chapter 3, 4	The Project Proponent commits to comply the stipulations for The import, transport or store of any petroleum that cannot be made save in accordance to the rules. The needs and exemptions from license and authorize for the testing of petroleum by the President of the Union and rules that might issue rules on that regard.
The Petroleum and Petroleum Product Law, 2017	Section 8, 9, 10, 11	The Project Proponent commits to comply the stipulations: <ul style="list-style-type: none"> ■ The Ministry shall carry out the following functions relating to any petroleum and petroleum product:

Relevant Laws, Rules and Regulations	Relevant Articles	Commitments
		<ul style="list-style-type: none"> (a) issuing licenses relating to refining, transit, transport by pipeline, sale and distribution, inspection, and testing; issuing joint license or compound license for carrying out more than a type of business activities; (b) determining the period, form, conditions, means of applying license, permitting authority and fees to be assessed for licenses in subsection (a); (c) determining procedures and conditions relating to refining, transit, transport by pipeline, sale and distribution, inspection and testing; (d) determining procedures and conditions to be followed by the shippers, acceptors, transporters, storekeepers to free from hazard in carrying out petroleum and petroleum product business activities; (e) determining standard and quality of receptacles for transport, and procedures and conditions for the pipelines; (f) determining and prohibiting portion and volume of toxic chemicals and metal chemicals that may damage the machineries, to be contained in any petroleum and petroleum product, which do not contain in the prohibitions and restrictions under the existing laws; (g) determining procedures and conditions to have correctness in standard, quality and measurement; (h) seizure or deal with otherwise of any petroleum and petroleum product which is not in conformity with the stipulated quality according to testing; (i) determining the place for refining, place for storage and procedures and conditions to be abided by in storage; (j) determining conditions relating to possession, and sale and distribution; (k) determining procedures and conditions necessary to appropriately supervise petroleum and petroleum product business activity adopting appropriate measures for energy sector development of the Union and ensuring for energy demand and energy security; (l) inspecting the transport, transit, testing, sale and distribution, and refining in accordance with the procedures. (m) adopting appropriate measures for energy sector development of the Union and ensuring for energy demand and energy security; (n) inspecting the transport, transit, testing, sale and distribution, and refining in accordance with the procedures.

Relevant Laws, Rules and Regulations	Relevant Articles	Commitments
		<ul style="list-style-type: none"> ■ The Ministry shall perform the following tasks with regard to petroleum and any types of petroleum products: <ul style="list-style-type: none"> (a) Issuance of licenses for the refinery, transportation, transportation with pipelines, distribution, testing, and analyzing; issuance of separate or combined licenses for the operation of more than one business; (b) with regard to the licenses referred to in sub-section (a), specifying the application period, forms and terms, application procedures, issuing body and fees to be collected; (c) specifying the procedures and terms for refinery, transportation, transportation with pipelines, distribution, testing, and analyzing; (d) specifying the procedures and terms for the safe operation of petroleum and petroleum products businesses by exporters, recipients, transporters, and keepers; (e) specifying the standard quality of containers used for transportation and the procedures and terms for pipelines; (f) specifying and prohibiting the ratios and quantity of harmful chemicals in petroleum and petroleum products which are not included in the restrictions under a law in force, and minerals in petroleum and petroleum products which can cause harm to engines; (g) specifying the procedures and terms for complying with a standard, quality and measurement; (h) storing and managing petroleum and petroleum products which do not comply with the specified quality according to tests and analysis;

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		<ul style="list-style-type: none"> ■ The Ministry shall perform the following tasks with regard to petroleum and any types of petroleum products: <ul style="list-style-type: none"> (a) Issuance of licenses for the refinery, transportation, transportation with pipelines, distribution, testing, and analyzing; issuance of separate or combined licenses for the operation of more than one business; (b) with regard to the licenses referred to in sub-section (a), specifying the application period, forms and terms, application procedures, issuing body and fees to be collected; (c) specifying the procedures and terms for refinery, transportation, transportation with pipelines, distribution, testing, and analyzing; (d) specifying the procedures and terms for the safe operation of petroleum and petroleum products businesses by exporters, recipients, transporters, and keepers; (e) specifying the standard quality of containers used for transportation and the procedures and terms for pipelines; (f) specifying and prohibiting the ratios and quantity of harmful chemicals in petroleum and petroleum products which are not included in the restrictions under a law in force, and minerals in petroleum and petroleum products which can cause harm to engines; (g) specifying the procedures and terms for complying with a standard, quality and measurement; (h) storing and managing petroleum and petroleum products which do not comply with the specified quality according to tests and analysis; (i) inspecting the transport, transit, testing, sale and distribution, and refining in accordance with the procedures. ■ adopting appropriate measures for energy sector development of the Union and ensuring for energy demand and energy security;

Relevant Laws, Rules and Regulations	Relevant Articles	Commitments
		<ul style="list-style-type: none"> ■ The Ministry shall perform the following tasks with regard to petroleum and any types of petroleum products: <ul style="list-style-type: none"> (a) Issuance of licenses for the refinery, transportation, transportation with pipelines, distribution, testing, and analyzing; issuance of separate or combined licenses for the operation of more than one business; (b) with regard to the licenses referred to in sub-section (a), specifying the application period, forms and terms, application procedures, issuing body and fees to be collected; (c) specifying the procedures and terms for refinery, transportation, transportation with pipelines, distribution, testing, and analyzing; (d) specifying the procedures and terms for the safe operation of petroleum and petroleum products businesses by exporters, recipients, transporters, and keepers; (e) specifying the standard quality of containers used for transportation and the procedures and terms for pipelines; (f) specifying and prohibiting the ratios and quantity of harmful chemicals in petroleum and petroleum products which are not included in the restrictions under a law in force, and minerals in petroleum and petroleum products which can cause harm to engines; (g) specifying the procedures and terms for complying with a standard, quality and measurement; (h) storing and managing petroleum and petroleum products which do not comply with the specified quality according to tests and analysis; (i) adopting appropriate measures for energy sector development of the Union and ensuring for energy demand and energy security; (j) inspecting the transport, transit, testing, sale and distribution, and refining in accordance with the procedures.

Relevant Laws, Rules and Regulations	Relevant Articles	Commitments
		<ul style="list-style-type: none"> ■ The Ministry shall perform the following tasks with regard to petroleum and any types of petroleum products: <ul style="list-style-type: none"> (a) Issuance of licenses for the refinery, transportation, transportation with pipelines, distribution, testing, and analyzing; issuance of separate or combined licenses for the operation of more than one business; (b) with regard to the licenses referred to in sub-section (a), specifying the application period, forms and terms, application procedures, issuing body and fees to be collected; (c) specifying the procedures and terms for refinery, transportation, transportation with pipelines, distribution, testing, and analyzing; (d) specifying the procedures and terms for the safe operation of petroleum and petroleum products businesses by exporters, recipients, transporters, and keepers; (e) specifying the standard quality of containers used for transportation and the procedures and terms for pipelines; (f) specifying and prohibiting the ratios and quantity of harmful chemicals in petroleum and petroleum products which are not included in the restrictions under a law in force, and minerals in petroleum and petroleum products which can cause harm to engines; (g) specifying the procedures and terms for complying with a standard, quality and measurement; (h) storing and managing petroleum and petroleum products which do not comply with the specified quality according to tests and analysis; (i) adopting appropriate measures for energy sector development of the Union and ensuring for energy demand and energy security; (j) inspecting the transport, transit, testing, sale and distribution, and refining in accordance with the procedures.

Relevant Laws, Rules and Regulations	Relevant Articles	Commitments
		<ul style="list-style-type: none"> ■ The Ministry shall perform the following tasks with regard to petroleum and any types of petroleum products: <ul style="list-style-type: none"> (a) Issuance of licenses for the refinery, transportation, transportation with pipelines, distribution, testing, and analyzing; issuance of separate or combined licenses for the operation of more than one business; (b) with regard to the licenses referred to in sub-section (a), specifying the application period, forms and terms, application procedures, issuing body and fees to be collected; (c) specifying the procedures and terms for refinery, transportation, transportation with pipelines, distribution, testing, and analyzing; (d) specifying the procedures and terms for the safe operation of petroleum and petroleum products businesses by exporters, recipients, transporters, and keepers; (e) specifying the standard quality of containers used for transportation and the procedures and terms for pipelines; (f) specifying and prohibiting the ratios and quantity of harmful chemicals in petroleum and petroleum products which are not included in the restrictions under a law in force, and minerals in petroleum and petroleum products which can cause harm to engines; (g) specifying the procedures and terms for complying with a standard, quality and measurement; (h) storing and managing petroleum and petroleum products which do not comply with the specified quality according to tests and analysis; (i) specifying the procedures and terms relating to the place for refinery, place for storage, and storage; (j) specifying the terms relating to possession and distribution; (k) specifying the procedures and terms for the relevant supervision of petroleum and petroleum products businesses; (l) making plans for the development of the Union's energy sector, energy requirement and guarantee of energy security;

Relevant Laws, Rules and Regulations	Relevant Articles	Commitments
		<ul style="list-style-type: none"> (i) inspection, according to the procedures, of the transportation, transit, testing, distribution and refinery; ■ That the Ministry of Transport and Communications shall carry out the following functions relating to any petroleum and petroleum product <ul style="list-style-type: none"> (n) issuing licenses relating to refining, transit, transport by pipeline, sale and distribution, inspection, and testing; issuing joint license or compound license for carrying out more than a type of business activities; (d) taking action, as necessary, in accordance with the existing laws if it occurs spill or accident in carrying out import, export, transport, and sale and distribution of petroleum and petroleum product by water; (e) determining standard and quality of receptacles for transport, and procedures and conditions for the pipelines; ■ That the Ministry of Transport and Communications shall carry out the following functions relating to any petroleum and petroleum product <ul style="list-style-type: none"> (a) issuing license for the right to store for the storage tanks and warehouses; (b) issuing transport permit for the vehicles, vessels and barges that shall carry any petroleum and petroleum product; (c) If it occurs environmental impacts in carrying out petroleum and petroleum product business activities, taking action, as necessary in accordance with the existing laws of on-site inspection (d) For stating warning sign of danger or if not possible, writing shall be displayed on all receptacles containing any dangerous petroleum and petroleum product.

Relevant Laws, Rules and Regulations	Relevant Articles	Commitments
The Oilfields Act, 1918 (amended in 1919, 2010)		This act provides clarification on activities within the oil and gas industry, and provides the Government with the power to define and alter limits of any notified oilfield. In addition, the Government may make rules for regulating all matters connected with many operations related to the extraction of oil and/or gas. The Project Proponent commits to comply guidance and issues such as preventing oil and gas wastes, reporting of fires, accidents and other occurrences and regulating the collection and disposal of both oil and gas.
The Oilfields Act, 1918 (amended in 1919, 2010)		This act provides clarification on activities within the oil and gas industry, and provides the Government with the power to define and alter limits of any notified oilfield. In addition, the Government may make rules for regulating all matters connected with many operations related to the extraction of oil and/or gas. The Project Proponent commits to comply guidance and issues such as preventing oil and gas wastes, reporting of fires, accidents and other occurrences and regulating the collection and disposal of both oil and gas.
Oilfields (Labor & Welfare) Act, 1951 (amended in 1953)		The Project Proponent commits to comply the stipulations For the labors' working hours: Higher physical danger risk establishment (e.g. an oil rig): 8 hours/day or 40 hours/week, Medium physical danger risk establishment (e.g. factory, oilfield, open mine): 8 hours/day or 44 hours/week. If factory work is part of a continuous process (i.e. technical reasons): admissible 48 hours/week, 10 hours a day Max. 6 days/week (i.e. Sunday = weekly holiday). For Overtime: 2x normal pay rate. Work on weekly holiday = alternative day off within a period of 2 months. In Practice: No specific rules for offshore workers except in old law—oilfields act. Workers in industrial zones work around 11 hours a day, 6 days a week. Many in oilfields the same, but more dangerous jobs, 40/ week.
Prevention of Hazard from Chemical and Related Substances Law, 2013	Section 15, 16, 17, 23, 27	The Project Proponent commits to comply the stipulations: For the requirements: (a) before works, license holder to be inspected by the relevant supervising and inspection team for safety and machinery/equipment check and (b) The persons who are discharging the duty to be asked to attend foreign training or preventative trainings conducted by government departments and organizations. For License holders to (a) follow the license regulations,

Relevant Laws, Rules and Regulations	Relevant Articles	Commitments
		<p>(b).follow directives on safe handling and shall ask workers to strictly follow</p> <p>(c).shall provide necessary safety equipment and issue free personal protective equipment to workers,</p> <p>(d).provide training in occupational safety</p> <p>(e). determine the hazard to the environment, people and animals</p> <p>(f). provide fit for work medical check-up and keep records</p> <p>(g). send permission letter to Department of Township Administration if the chemicals and associated material are permitted to store</p> <p>(h).acquire in advance guidance and agreement from fire service department if using inflammable materials or explosives</p> <p>(i). transport only the permitted amount of chemicals in accordance with prescriptive stipulations</p> <p>(j). obtain approval of central supervising body if transporting chemical and associated material from the permitted region to any other region</p> <p>(k).abide and operate in accordance with related environmental laws to avoid impacts and damage to the environment.</p> <p>For the license holder to have insurance in accordance with stipulations in case of compensation is required for losses related to people, animals and environment.</p> <p>For the registered certificate holder shall apply again for using chemical which are not in the registered list.</p> <p>For the license holder to</p> <p>(a). classify the hazard level of chemicals and related substances in advance</p> <p>(b).show Material Safety Data Sheet and warning signage</p> <p>(c).provide safety equipment, personal protective equipment and training on their use</p> <p>(d).possess, transport, store, use and discharge chemicals and related materials in accordance with stipulations,</p> <p>(e).not import or export chemicals and related materials banned by the central supervising board.</p>

Relevant Laws, Rules and Regulations	Relevant Articles	Commitments
Prevention of Hazard from Chemical and Related Substances Rules, 2016	Section 61 (a)	<p>The Project Proponent commits to comply the stipulations:</p> <p>For organizations and license holders who store the chemical and related substances to abide by the following facts for safety:</p> <ul style="list-style-type: none"> (a). installing the fire protection system in building to be stored in accordance with prescribed provisions of the Department of Fire Brigade and being the building, which is constructed to correspond for storing the chemical and related substances; (b).sticking the warning sign according to hazard class, and keeping the safety equipment at the stored places; (c).storing only after checking certainly to the chemical and related substances which are kept completely with the pictogram, and packing system by the importers and possessors; <p>To be safe, the user of chemical and related substances shall:</p> <p>use only the registered restricted or conditional chemical and related substances;</p> <p>not us the unregistered, without labelled, unknown, damaged or expired chemical and related substances.</p>
Myanmar Investment Law, 2016	Section (36), (50) (d), (51), (65), (67), (73)	<p>The Project Proponent commits to comply with:</p> <p>The stipulation to register the land lease contract at the office of Registry of Deeds in accordance with the Registration Act.</p> <p>To mention appointment, replacement, providing employment of staff and workers, ensuring to comply the entitlements and rights in the labour laws and rules, settling dispute regarding human rights issues. The stipulation:</p>

Relevant Laws, Rules and Regulations	Relevant Articles	Commitments
		<ul style="list-style-type: none"> (a). To respect and comply with the customs, traditions, and traditional culture of the ethnic groups; (e). To inform to the Commission if natural mineral resources or antique objects are found that are not related to the investment permitted; (f). Not to make any significant alteration of topography or elevation of the land on which is entitled to lease or to use, without the approval of the Commission; (g). To abide by applicable laws, rules, procedures and best standards practiced internationally for this investment so as not to cause damage, pollution, and loss to the natural and social environment and not to cause damage to cultural heritage; (h). To list and keep proper records of books of account and financial statement and necessary financial matters relating to the investments performed by permit or endorsement in accordance with internationally and locally recognized accounting standards; (i). To close and discontinue the investment only after the payment of compensation to employees in accordance with applicable laws for any breach of employment contracts, closure of investment, sale and transfer of investment, discontinuation of investment, or reduction of workforce; (j). To pay wages and salaries to employees in accordance with applicable laws, rules, procedures, directive and so forth during the period of suspension of investment for a credible reason; (k). To pay compensation and indemnification in accordance with applicable laws to the relevant employee or his successor for injury, disability, disease or death due to the work; (l). To supervise foreign experts, supervisors and their families, who employ in their investment, to abide by the applicable laws, rules, orders and directives, and the culture and traditions of Myanmar;

Relevant Laws, Rules and Regulations	Relevant Articles	Commitments
		<p>(m). To respect and comply with the labour laws;</p> <p>(n). To have the right to sue and to be sued in accordance with the laws; (o). To pay effective compensation for loss incurred to the victim, if there is damage to the natural environment and socioeconomic losses caused by logging or extraction of natural resources which are not related to the scope of the permissible investment, except from carrying out the activities required to conduct investment in a permit or an endorsement;</p> <p>(p). To allow the Commission to inspect in any places, when the Commission informs the prior notice to inspect the investment;</p> <ul style="list-style-type: none"> ■ To take in advance permit or endorsement of the Commission for the investments which need to obtain prior approval under the Environmental Conservation Law and the procedures of environmental impact assessment, before undertaking the assessment, and shall submit the situation of environmental and social impact assessment to the Commission along the period of activities of the investments which obtained permit or endorsement of the Commission. ■ The investor shall submit a proposal to the Commission and invest after receiving the Permit for the following businesses stipulated in the rules; <ul style="list-style-type: none"> (a) Investment businesses that are essential to the Union strategy; (b) Large capital-intensive investment projects; (c) Projects which are likely to cause a large impact on the environment and the local community; (d) Investment businesses which use state-owned land and building; (e) Investment businesses which are designated by the government to require the submission of a proposal to the Commission. <p>The investors shall comply with all responsibilities stipulated under section 65 from the date of this law comes into effect.</p> <p>The project proponent has to insure the prescribed insurance by rules, under section 73 of said law.</p>

Relevant Laws, Rules and Regulations			Relevant Articles	Commitments
Myanmar 2017	Investment	Rules,	Section 190, 202, 203, 206, 212,	<p>The Project Proponent commits:</p> <ul style="list-style-type: none"> ■ To comply with all terms and conditions in the permit and other applicable laws when the investment is carried out. ■ To fully assist while negotiating with the Authority for settling the grievances of the local community that have been affected due to Investments. ■ To appoint expert foreigner as senior manager, technical and operational expert or advisor according to subsection (a) of the section 51 of the Law. ■ To obtain the permit or tax exemption or relief to insure the relevant insurance out of the following types of the insurance at any insurance business entitled to carry out insurance business within the Union based on the nature of the business: Property and Business Interruption Insurance; Engineering Insurance; Professional Liability Insurance; Bodily Injury Insurance; Marine Insurance; or Workmen Compensation Insurance; Life Insurance; Fire Insurance. ■ An investor to whom section 65(q) of the law applies shall submit confirmation of its compliance with the applicable requirements of the Environmental Conservation Law, rules and environmental impact assessment procedures to undertake, obtain and implement an initial environmental examination, assessment, certificate and management plan as those requirements are met. The approval of Commission for continuation of the investment shall base on its compliance.
The Myanmar Companies Law (2017)			Section 4(a), 5(a)	<p>Essential Requirements of Companies are as follows,</p> <ul style="list-style-type: none"> • A company registered under the Myanmar Companies Law shall have the following facts: under section-4, sub-section (a) of said law. • a name; • a constitution • at least one share in issue (provided that a company limited by guarantee need not have a share capital) • at least one member • subject to sub-section (vi), at least one director who shall be ordinarily resident in the Union;

Relevant Laws, Rules and Regulations	Relevant Articles	Commitments
		<ul style="list-style-type: none"> • if the company is a public company, at least three directors, one of whom shall be a Myanmar citizen who is ordinarily resident in the Union; and • a registered office address in the Union, under section-4, sub-section (a), sub-section i, ii, iii, iv, v, vi and vii of said law. <p>Capacity and powers of companies are as follows, A company: under section-5, sub-section (a) of said law.</p> <ul style="list-style-type: none"> • will be a legal entity in its own right separate from its members having full rights, powers, and privileges and continuing in existence until it is removed from the register: under section-5, sub-section (a), sub-section (i) of said law. • subject to this law and any other law, has both within and outside the Union full legal capacity to carry on any business or activity, do any act, or enter into any transaction, including the power to: under section-5, sub-section (a), sub-section (ii) of said law. • issue shares, debentures or securities which convert into shares in the company; under sub-section (ii), sub-section (aa) of said law. • grant options to subscribe for shares or debentures in the company: under sub-section (ii), sub-section (bb) of said law. • grant a security interest over any of its property: under sub-section (ii), sub-section (cc) of said law. • distribute any of the company's property among the members, in kind or otherwise, under sub-section (ii), sub-section (dd) of said law. • The constitution of a company may contain a provision relating to the capacity, rights, powers, or privileges of the company only if the capacity of the company or those rights, powers and privileges are restricted, under section-5, sub-section (b) of said law. <p>A company may act as a holding company of another company and incorporate and hold shares in any number of subsidiaries, under section-5, sub-section (c) of said law.</p>
The Import and Export Law, 2012	Section 7	The Project Proponent, as a license holder, commits to comply not to violate the conditions contained in the license.

Relevant Laws, Rules and Regulations	Relevant Articles	Commitments
Natural Disaster Management Law (2013)	Section 13a(i) (ii) (iii), 14(b), (d), 25, 26, 29, 30(a)	<p>Objectives: To implement natural disaster management programs and to coordinate with national and international organizations in carrying out natural disaster management activities; to conserve and restore the environment affected by natural disaster and to provide health, education, social and livelihood programs in order to bring about better living conditions for victims;</p> <p>The project proponent commits to comply with</p> <ul style="list-style-type: none"> • to perform preparatory and preventive measures for natural disaster risks reduction before the natural disaster strikes. • to undertake emergency response while in natural disaster strikes. • to proceed rehabilitation and reconstruction activities for improving better living standard after the natural disaster strikes and conservation of the environment that has been affected by natural disaster • to carry out better improvement on early warning system of natural disaster. • to carry out together with the measures of natural disaster risk reduction in development plans of the State. • Whoever if the natural disaster causes or is likely to be caused by any negligent act without examination or by willful action which is known that a disaster is likely to strike, shall be punished with imprisonment for a term not exceeding three years and may also be liable to fine under section 25 of said law. • Whoever interferes, prevents, prohibits, assaults or coerces the department, organization or person assigned by this law to perform any natural disaster management shall, on conviction, be punished with imprisonment for a term not exceeding two years or with fine or with both under section 26 of said law. • Whoever violates any prohibition contained in rules, notifications and orders issued under this law shall, on conviction, be punished with imprisonment for a term not exceeding one year or with fine or with both under section 29 of said law. • Whoever willful failure to comply with any of the directives of the department, organization or person assigned by this law to perform any natural disaster management shall, on conviction, be punished with imprisonment for a term not exceeding one year or with fine or with both under sub section (a) of section 30 of said law.

Relevant Laws, Rules and Regulations	Relevant Articles	Commitments
Factories Act ,1951	To follow the Act	<p>Purpose: to ensure health, safety, welfare, fair working time the clean environment for the employees working inside a factory. This law focuses on all stipulations for the employer (project owner).</p> <p>The project proponent commits to comply by all provisions for healthy, safety, welfare, working-hours, special applications, employment of young persons and other needs provided in this Act.</p>
The Industrial Explosive Materials Law, 2018	Section 6(c), 7 (c), 11(b), 13,14(b), 15,16,18,19,20,21	<p>PIC commits to comply with the following sections in respect to the application, grant of permission for license.</p> <ul style="list-style-type: none"> • On receipt of the directions from the Ministry under sub-section (b), the Chief Inspector shall notify the applicant to construct a magazine with specified features on the approved plot. (sec 6(c)) • If the Office of the Commander-in-Chief (Army) finds that the findings and remarks of the sub-committee for procurement, provision, storage and distribution of explosives are in conformity with the specifications, the office shall grant permission to the applicant to carry out any one or more of import, transport, store, manufacture, use, process or transfer of industrial explosive materials. A copy of permission shall be sent to the Ministry. (sec 7(c)) • The Chief Inspector shall inspect whether the magazine is constructed in specified features by receiving the licence application under section 10 and grant a licence with the approval of the Ministry. (sec 11(b)) • The licensee shall apply for a renewable licence to the Chief Inspector before it expires to store industrial explosive materials. (sec 13) • The Chief Inspector may approve of renewing a licence with the approval of the Ministry after inspecting the magazine with the norms when the renewal application is received according to the section 13. (sec 14(b))

Relevant Laws, Rules and Regulations	Relevant Articles	Commitments
		<ul style="list-style-type: none"> PIC commits <ul style="list-style-type: none"> (a) to store industrial explosive materials systematically without exceeding the permitted limits. (sec 15(a)) (b) to accept the inspection of the Chief Inspector or an inspector from time to time. (sec 15(b)) (c) to inform to the nearest police station if the damage to the property and injury or death of people occurs due to the loss, burn or explosion of industrial explosive materials. (sec 15(c)) (d) to pay licence fees stipulated by the Ministry to the Department. (sec 15(d)) to store only in the licensed magazine and take necessary preventive measures to avoid harm in transport, manufacture, use or possession of industrial explosive materials. (sec 16) not to refuse inspection of the Chief Inspector or an inspector. (sec 18) to comply section 19 for importing, transporting, storing, manufacturing, using and possessing and destroying and rules, regulations, by-laws, notifications, orders and directives issued under this Law. not to accept and deliver industrial explosive materials to store in an unlicensed magazine. (sec 20) not to store more than permitted in licence by the Ministry. (sec 21 (a)) not to fail to inform and report the nearest police station for the occurrence mentioned in sub-section (c) of section 15. (sec 21 (a)) <p>not to store industrial explosive materials with the extension of the renewal license. (sec 21(c))</p>

Relevant Laws, Rules and Regulations	Relevant Articles	Commitments
Myanmar Climate Change Policy, 2019	Paragraph 10, 11	<p>Vision: Myanmar's vision is to be a climate-resilient, low carbon society that is sustainable, prosperous and inclusive, for the wellbeing of present and future generations.</p> <p>Purpose: The purpose of this Policy is to provide long term direction and guidance to: (a) Take and promote climate change action on adaptation and mitigation in Myanmar; (b) Integrate climate change adaptation and mitigation considerations into Myanmar's national priorities and across all levels and sectors in an iterative and progressive manner; and (c) Take decisions to create and maximize opportunities for sustainable, low carbon, climate resilient development, ensuring benefits for all.</p>
National Energy Policy, 2014	Chapter 3, Paragraph 4	<p>The national energy policy aims to systematically explore the available energy resources of the country in order to supply the demand of the country and to export as value added products for surplus resources, thus ultimately targeting to sustainably improve the living standard of the country people. There mentions national energy policy, energy sector development plan, energy and electric power sector restructuring program, energy sector framework and strategy and work program.</p> <p>The Project Proponent commits to implement the project to support this policy.</p>
Myanmar Insurance Law, 1993	Section 15, 16	<p>The Project Proponent commits to comply as follow;</p> <p>Owners of motor vehicles shall affect compulsory Third Party Liability Insurance with the Myanmar Insurance.</p> <p>An entrepreneur or an organization operating an enterprise which may cause loss to State-owned property or which may cause damage to the life and property of the public or which may cause pollution to the environment shall affect compulsory General Liability Insurance with the Myanmar Insurance.</p>

Relevant Laws, Rules and Regulations	Relevant Articles	Commitments
Myanmar Engineering Council Law, 2013	Section 34, 37	<p>The Project Proponent commits to comply as follow;</p> <p>The Executive Committee may, if it finds the violation of any of the provisions of this Law, or any prohibition of rules, orders and directives issued under this Law, or any condition mentioned in the register certificate by any person who has obtained the register certificate, impose any of the following administrative penalties against him/her:</p> <ul style="list-style-type: none"> a) warning; b) causing to pay the stipulated fine; c) suspending the register certificate for a limited period; d) cancelling the register certificate <p>Any person without the register certificate issued by the Council, except engineering civil service personnel appointed at the Government departments and Government organizations carrying out the public works, shall not practice engineering and technical works which may endanger the public safety and which are stipulated under the rules made under this Law.</p>
Myanma Port Authority Law, 2015	Section 19	<p>The Project Proponent commits to comply as follow;</p> <p>The Myanma Port Authority may claim damages from the relevant organization and person if the water pollutions, destructions and losses to environmental resources occur within a port limit, because of leakage of petroleum, oil or chemical from the tanker of petroleum, oil or chemical navigated within a port limit or from oil test wells ,oil wells and oil pipelines; or from collision or grounding of vessels, or for any other causes; because of discharge and disposal of pollutants and wastes from vessels and natural resource exploration rigs and structures from above and under water;</p> <p>The Myanma Port Authority as the right, relating to the destructions and losses contained in sub-section (a), to retain the relevant vessels, from above and under water natural resource exploration rigs and structures before obtaining the compensations.</p>

Relevant Laws, Rules and Regulations	Relevant Articles	Commitments
Myanma Port Authority Law, 2015	Section 19	<p>The Project Proponent commits to comply as follow;</p> <p>The Myanma Port Authority may claim damages from the relevant organization and person if the water pollutions, destructions and losses to environmental resources occur within a port limit, because of leakage of petroleum, oil or chemical from the tanker of petroleum, oil or chemical navigated within a port limit or from oil test wells ,oil wells and oil pipelines; or from collision or grounding of vessels, or for any other causes; because of discharge and disposal of pollutants and wastes from vessels and natural resource exploration rigs and structures from above and under water;</p> <p>The Myanma Port Authority as the right, relating to the destructions and losses contained in sub-section (a), to retain the relevant vessels, from above and under water natural resource exploration rigs and structures before obtaining the compensations.</p>
Myanmar Marine Fisheries Law, 1990	-	The Project Proponent commits to comply the stipulations set out in this law.

3.4 International Agreements and Convention

Relevant international conventions to which Myanmar is a signatory include those related to waste management, biodiversity conservation and labour conventions. The key international conventions of relevance to the Project are included in Table 3-2.

Table 3-2 International Agreement and Conventions of Relevance to the Project

Legislation	Relevance to the Project	Ratification Status (in Myanmar)
Environmental		
The International Convention for the Prevention of Pollution from Ships 1973, as modified by the Protocol of 1978 relating thereto and by the Protocol of 1997 (MARPOL)	The Project vessels will comply with emissions and discharge standards. Annex I, IV, V and VI are of relevance to the Project.	Ratified Annexes I to IV
Vienna Convention for the Protection of the Ozone Layer 1988 and Montreal Protocol on Substances that Deplete the Ozone Layer 1989	Not relevant to the Project as the Project will not use any ozone depleting substances.	Accession 16 th Sep 1998 (Vienna) & Accession 24 th Nov 1993 (Montreal)
Convention on Biological Diversity 1992	The Project will be undertaken in offshore habitats.	Ratified 25 th Nov 1994
Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal	The Project may generate hazardous wastes.	Entered into force 6 th April 2015
United Nations Framework Convention on Climate Change 1992 (UNFCCC) and Kyoto Protocol 1997	The Project will form part of Myanmar's total emissions output.	Entered in force 23 rd Feb 1995 (UNFCCC) and 16 th Feb 2005 (Kyoto Protocol)
Asia Least Cost Greenhouse Gas (GHG) Abatement Strategy (ALGAS) 1998	The Project will produce air emissions from the vessels.	1998
United Nations Agenda 21	Not relevant to Project. Relevant to the government.	Since 1997
International Convention on Civil Liability for Bunker Oil Pollution Damage (BUNKER)	The Project could lead to hydrocarbon spill.	Ratified January 19, 2018
Social		
The International Convention for the Safety of Life at Sea (SOLAS) 1974	The Project vessels will comply with safety standards.	Entered into Force 11 th Feb 1988
Convention on the International Regulations for Preventing Collisions at Sea (COLREG) 1972	The Project vessels will comply with navigation rules.	Entered into Force 11 th Nov 1987

Legislation	Relevance to the Project	Ratification Status (in Myanmar)
International Convention on Standards of Training, Certification and Watch-keeping for Seafarers 1978 (STCW)	The Project vessels will comply with training requirements.	Entered into Force 1988

3.5 Good International Industry Practice Guideline

Applicable guidelines which PIC will consider in preparing its approach include:

- International Finance Corporation (IFC) Performance Standards on Environmental and Social Sustainability (2012): The IFC PS's represent the 'policy framework' for the EIA and sustainable social and environmental management for the Project, whereas the World Bank Group's Environmental, Health, and Safety (EHS) Guidelines provide guidance on general and industry best practice, as well as recommended numerical limits for emissions to the atmosphere, noise, liquid and solid wastes, hazardous wastes, health and safety, and other aspects of industrial facilities and other types of development projects.
- IFC Environmental, Health and Safety (EHS) guidelines, including:
 - General EHS Guidelines (2007): The EHS Guidelines are technical reference documents with general and industry-specific examples of Good International Industry Practice (GIIP). The EHS Guidelines contain the performance levels and measures that are generally considered to be achievable in new facilities by existing technology at reasonable costs; and
 - EHS Guidelines for Offshore Oil and Gas Development (2015): These latest guidelines for offshore oil and gas development (June 2015) consider industry-specific impacts and management relevant to the environment, occupational health and safety and community health and safety, as well as the development of performance indicators and monitoring programs. The applicability of the EHS Guidelines should be tailored to the hazards and risks established for each project on the basis of the results of the environmental assessment.
- United Nations Environment Program (UNEP) Guidelines on Environmental Management for Oil and Gas Exploration and Production (1997): This document provides an overview of the environmental issues and the technical and management approaches to achieving high environmental performance in the activities necessary for oil and gas exploration and production.
- Worker's Accommodation: Process and Standards (IFC and EBRD 2009).
- The ASEAN Marine Water Quality Criteria (2002).
- Other good international industry practice guidelines from organizations such as the International Maritime Organization (IMO), American Petroleum Institute (API), International Petroleum Industry Environmental Conservation Association (IPIECA) and International Association of Oil and Gas Producers (IOGP).
- IPIECA. The Oil Gas Industry: Operating in Sensitive Environments (2003).
- IOGP. Environmental Management in oil and gas exploration and production (1997). The applicable international standards to be adopted by the Project are provided in Table 3.3.

Table 3. 3 International Standards of Relevance to the Project

Environmental Parameter	Standard	Details
Air emissions	MARPOL Annex VI	The vessels will comply with applicable MARPOL requirements, for the prevention of air pollution from ships, including Vessels will hold a valid International Air Pollution Prevention (IAPP) Certificate, comply with allowable NOx emission from diesel engines, the sulphur content of any fuel oil used on board ships shall not exceed 3.5% m/m and regulation of shipboard incineration.
Waste discharges	MARPOL Annex I, IV & V	<p>The support vessels will comply with applicable MARPOL requirements, including the discharge of untreated sewage into the sea is prohibited, except when the ship has in operation an approved sewage treatment plant or when the ship is discharging comminuted and disinfected sewage using an approved system at a distance of more than 3 nm from the nearest land. Sewage which is not comminuted or disinfected has to be discharged at a distance of more than 12 nm from the nearest land.</p> <p>The support vessels will operate in compliance with MARPOL Annex I: any oil-in-water content of discharges should not exceed 15 ppm. General waste (excluding food) will not be disposed of to sea in line with MARPOL Annex V requirements. Combustible wastes will be segregated and disposed by incinerator on-board, should an incinerator be available on the selected vessel. Non-combustible and recyclable wastes will be stored in containers and returned to the shore base for disposal. Food waste will be macerated into smaller pieces (25 mm) prior to discharge overboard (if discharged <12 nm from shore).</p> <p>Hazardous wastes will be stored on the vessels in appropriate containers with labels. Hazardous waste storage will be designated in accordance with their SDS. Hazardous wastes will be returned to the vessels' selected shore base and sent to a licensed disposal facility by a licensed waste contractor.</p>
Underwater noise generation	International good practice	<p>Visual check for marine mammals and turtles within 500 m (observation zone) of the or vessel for 20 minutes prior to commencing VSP operations.</p> <p>Visual inspections of the observation zone (500 m) must be maintained continuously to identify if there are any marine mammals or turtles present.</p> <p>During the pre-start meeting, alert all crews to immediately report to the trained observer when they observe any marine mammals or turtles during and prior to the activity. The pre-start meeting will cover the likelihood of whale observations and required actions if they are sighted.</p> <p>All information on marine fauna sightings will be reported to MONREC following completion of the platform installation campaign.</p>
Spills	MARPOL Annex I	Support vessel standard operating procedures to be prepared and implemented. Contingency plans will be prepared and implemented, e.g. vessel SOPEPs and POPEP.

3.6 EMP Requirement

3.6.1 General EMP Requirement

The following article mentions the general requirements for development of an EMP:

EIA Procedures, Article 3

Pursuant to Section 21 of the Law and Articles 52, 53 and 55 of the Rules, all Projects and Project expansions undertaken by any ministry, government department, organization, corporation, board, development committee and organization, local government or authority, company, cooperative, institution, enterprise, firm, partnership or individual (and/or all Projects, field sites, factories and businesses including expansions of such Projects, field sites, factories and businesses identified by the Ministry, which may cause impact on environmental quality and are required to obtain Prior Permission in accordance with Section 21 of the Law, and Article 62 of the Rules) having the potential to cause Adverse Impacts, are required to undertake IEE or EIA or to develop an EMP, and to obtain an ECC in accordance with this Procedure.

3.6.2 EMP Requirements for Existing Projects and Changes to Existing Projects

In addition, there are particular articles relevant to existing projects, as well as changes to projects, which are directly applicable to the Project:

EIA Procedures, Article 8

Any Project already in existence prior to the issuance of the Procedure, or the construction of which has already commenced prior to the issuance of the Rules, and which, in either case, shall be required to undertake, within the timeframe prescribed by the Department, an environmental compliance audit, including on-site assessment, to identify past and/or present concerns related to that Project's Environmental Impacts, and to:

- a) develop an EIA or IEE or EMP;
- b) obtain an ECC; and
- c) take appropriate actions to mitigate Adverse Impacts in accordance with the Law, the Rules, and other applicable laws.

It is noted that Article 8 of the EIA Procedures indicates there may also be requirement for IEE or EIA for projects already in existence. This determination is ultimately up to the discretion of MONREC on a project-by-project basis. However, the further elaboration in Articles 9 and 11 below indicate that an EMP alone may be sufficient to obtain the ECC, so long as any project changes or expansions are not large enough to warrant new IEEs or EIAs themselves.

EIA Procedures, Article 9

Any Project already in existence prior to the issuance of the Rules, or the construction of which has already commenced prior to the issuance of the Rules, shall be required to carry out an IEE or EIA as determined by the Ministry in accordance with this Procedure in respect of any proposed extension or expansion of such Project which would increase the Project size or production or would necessitate additional construction, renovation, installation or other extension or expansion related activities, if the nature and scale of such extension or expansion are such that, regarded as an independent Project without reference to the nature or scale of the Project already in existence or under construction, they would have been subject to the requirement to carry out an IEE or EIA. If no IEE or EIA is required to be carried out in respect of such Project extension or expansion, then the EMP and ECC for such Project shall be revised as necessary within the timeframe prescribed by the Department to take into consideration such extension or expansion.

EIA Procedures, Article 11

Any expansion in respect of a Project implemented after the issuance of the Rules and which does not require an IEE or EIA (as the case may be), but such expansion would cause that Project to require an IEE or EIA (as the case may be), then the Department shall determine whether an IEE or EIA (as the case may be) of that Project shall be required and/or whether an updated, revised *EMP shall be required, and then report to the Ministry.*

It is also noted that future revisions to EMPs may be required, as prescribed in Article 101 of the EIA Procedures below:

EIA Procedures, Article 76

For Project Types which require EMP according to the Article 55 (a) of the Rules or Article 24 of the Procedure, the Project Proponent may prepare an EMP by itself or may appoint a person or organization who/which is licensed according to the Article 18. The EMP process is outlined in the diagram in Annex B.

EIA Procedures, Article 101

In case the Department finds that changes to the Project, the Project site or Adverse Impacts of the Project warrant revisions to the EMP, Construction Phase EMP, or Operational Phase EMP as the case may be, then the Department may require the Project Proponent to prepare and submit a revised EMP, Construction Phase EMP, or Operational Phase EMP, as the case may be to the Department for review and approval.

3.6.3 Authority of MONREC for Determining EMP Requirements

As noted in Article 24 of the EIA Procedures, the final decision of whether an EMP is required for a particular project is to be determined by MONREC.

EIA Procedures, Article 24

The Ministry shall also make a determination whether an EMP shall be required in respect of any Project.

3.6.4 Review and Approval Process

With regards to the review and approval process after submission of the EMP to MONREC (formerly MOECAP), this is clearly stated in Articles 80 and 81 below. It is also noted that MNREC (formerly MOECAP) may, after review of the EMP, determine that an IEE or EIA is required for the Project.

Article 80

Upon completion of its review of the EMP, the Ministry shall;

- a) approve the EMP, subject to any conditions it may prescribe, and issue an ECC; or
- b) require that the Project carry out an IEE or EIA, citing the reasons for this decision and informing the Project Proponent of its decision; and, in either case
- c) publicly disclose its decision.

Article 81

The Department shall deliver the final decision of the Ministry within thirty (30) working days of receipt of an EMP. If the Ministry requires an EMP to be amended, then the due date for delivery of the Ministry's decision shall be extended accordingly.

3.7 Institutional Framework

3.7.1 Project Proponent

The structure for the organization responsible for environmental and social management is set out in **Table 3-3**.

Table 3-3 Environmental and Social Management Organization Roles and Responsibilities

Position	Responsibility
Office-based Personnel	
PIC O&M Director	<ul style="list-style-type: none"> Ensure operations are undertaken as per the Environmental Management Plan (EMP). Provide sufficient resources to implement the management measures in the EMP. Ensure the MODU and support vessel personnel are provided with an Environmental Induction at the start of the exploration drilling activity. Mitigation measures as detailed in the EMP are actioned, as required, before drilling commences.
PIC Head of HSE	<ul style="list-style-type: none"> Prepare environmental component of relevant Induction Package Assist with the review, investigation and reporting of environmental incidents. Ensure environmental monitoring and inspections/audits are undertaken as per requirements of the EMP. Liaise with regulatory authorities as required. Assist in preparation of external regulatory reports required, in line with environmental approval requirements and PIC incident reporting procedures. Monitor and close out corrective actions identified during environmental monitoring and audit inspections.
PIC Managing Director	<ul style="list-style-type: none"> Implement the stakeholder engagement plan (SEP) Report on stakeholder consultation Ongoing liaison as required.
MODU-based Personnel	
MODU Offshore Installation Manager	<ul style="list-style-type: none"> Ensure that the MODU's management system and procedures are implemented. Ensure that personnel starting work on the MODU receive an environmental induction and are competent to undertake the work they have been assigned. Ensure that emergency drills are conducted as per the MODU's schedule. Ensure that the MODU's Emergency Response Team has been given sufficient training to implement the MODU's SOPEP. Ensure that any environmental incidents are reported immediately to the PIC Senior Drilling Supervisor.
PIC Senior Drilling Supervisor	<ul style="list-style-type: none"> Ensure that the drilling / completions programs are undertaken as detailed in the EMP. Ensure that the management measures detailed in this EMP are implemented on the MODU. Ensure that Environmental incidents are reported to the Drilling Superintendent and periodic environmental inspections are completed.
PIC HSE Adviser Offshore	<ul style="list-style-type: none"> Ensure that the activities are undertaken as outlined in the EMP. Support the Senior Drilling Supervisor to ensure the monitoring requirements are met and the EMP is implemented on the MODU. Ensure environmental incidents are reported. Ensure periodic environmental inspections are completed.

Position	Responsibility
Vessel-based Personnel	
Vessel Master	<ul style="list-style-type: none"> Ensure that the vessel management system and procedures are implemented. Ensure that personnel commencing work on the vessel receive an environmental induction and that personnel are competent to undertake the work they have been assigned. Ensure that SOPEP drills are conducted as per the vessel's schedule. Ensure that the vessel Emergency Response Team has been given sufficient training to implement the SOPEP. Ensure that any environmental incidents or breaches of the EMP are reported immediately to the PIC Senior Drilling Supervisor.

3.7.2 Myanmar Regulatory Authorities

Matters pertaining to the EIA Study requirements are generally under the jurisdiction of the ministries and state-owned enterprises in the oil and gas sector. Key ministries, agencies and state-owned enterprises that have jurisdiction or are typically involved in IEEs and EIAs related to oil and gas operations in Myanmar are included in **Table 3-4**.

Table 3-4 Key Ministries, Agencies and State-Owned Enterprises

Ministry/Agency	Responsibility
Ministry of Natural Resources and Environmental Conservation (MONREC)	The Environmental Conservation Department (ECD) of MONREC has ultimate responsibility in the review and approval, or otherwise, of submissions under the IEE/EIA process.
Myanmar Oil and Gas Enterprise (MOGE)	MOGE is the state-owned enterprise responsible for working together with oil and gas companies (local and international) in Myanmar and oversees the PSCs in cooperation with foreign oil companies. MOGE is involved in direct communication and coordination with various levels of different government agencies for HSE related issues.
Ministry of Electricity and Energy (MOEE)	MOEE jointly works with MOGE in managing HSE issues of oil and gas operators in Myanmar, in which MOEE encourages operators to establish a HSE Management System and prepare their own EIA/SIA for their project.
Myanmar Investment Commission (MIC)	MIC is a government agency responsible for coordinating with ministries (such as the MOEE) and other state entities to facilitate foreign investment in Myanmar. The MIC is also responsible for granting MIC permits which enable foreign investors to carry out business activities under the Myanmar Investment Law (2016).
General Administration Department (Sittwe and Kyaukphyu)	GAD is a government agency responsible for coordination with other departments for stakeholder engagement and public consultation for social issue.

3.8 Report Format and Outline

The report format and outline for an EMP is clearly described within the *Myanmar Administrative Instruction of Environmental Impact Assessment Procedure*, under Annex 5 "Format for an Environmental Management Plan". This report complies with the required format and outline.

3.9 National Environmental Standards

The *Myanmar National Environmental Quality Emission Guidelines (NEQG) (2015)* provide the basis for regulation and control of noise and vibration, air emissions, and liquid discharges from various sources in order to prevent pollution for purposes of protection of human and ecosystem health. These guidelines will provide the basis for compliance determination when implementing mitigation and monitoring requirements for the EMP.

The national governing parameters for this Project are the Myanmar National Environmental Quality (Emissions) Guidelines (NEQEG).

3.9.1 Air Emissions / Noise and Vibration

The air and noise emission parameters are taken from *Section 1.2* and *1.4* of the NEQEG and shown in Table 3-5 and Table 3-6 respectively.

Table 3-5 Air Emissions Parameters

Parameter	Averaging Period	Guideline Value $\mu\text{g}/\text{m}^3$
Dichloromethane	24-hour	3,000
Nitrogen dioxide	1-year	40
	1-hour	200
Ozone	8-hour daily maximum	100
Particulate matter PM ₁₀ ^a	1-year	20
	24-hour	50
Particulate matter PM _{2.5} ^b	1-year	10
	24-hour	25
Sulphur dioxide	24-hour	20
	10-minute	500

a PM 10 = Particulate matter 10 micrometers or less in diameter

b PM 2.5 = Particulate matter 2.5 micrometers or less in diameter

Table 3-6 Noise Level Parameters

Receptor	One-hour LAeq (dBA) ^a	
	Daytime 07:00 – 22:00 (10:00 - 22:00 for Public holidays)	Night Time 22:00 – 07:00 (22:00 - 10:00 for Public holidays)
Residential, institutional, educational	55	45
Industrial, commercial	70	70

^a Equivalent continuous sound level in decibels

3.9.2 Effluent Discharges

Any activity that may generate water discharges should comply with the following parameters as provided in **Table 3-7** and Table 3-8 for offshore oil and gas and crude oil and petroleum product terminals guidelines, respectively (taken from *Section 2.1.5* of the NEQEG).

Table 3-7 Offshore Oil and Gas Guidelines (Operation Phase)

Parameter	NEQEG guidelines
Produced water	Re-inject, discharge to sea maximum one day oil and grease discharge should not exceed 42 mg/l; 30-day average should not exceed 29 mg/l.
Cooling water	The effluent should result in a temperature increase of no more than 3°C, at edge of the zone where initial mixing and dilution take place; where the zone is not defined, use 100 meters from point of discharge
Desalination brine	Mix with other discharge waste streams if feasible ^b
Sewage	Compliance with MARPOL 73/78 ^b (as per vessel class)
Food waste	Compliance with MARPOL 73/78 ^b (as per vessel class)
Storage displacement water	Compliance with MARPOL 73/78 ^b (as per vessel class)

b: In nearshore waters, carefully select discharge location based on environmental sensitivities and assimilative capacity of receiving waters

Table 3-8 Crude Oil and Petroleum Product Terminals Guidelines (Operation Phase)

Parameter	Unit	Maximum Concentration
Biological oxygen demand	mg/l	30
Chemical oxygen demand	mg/l	125
Oil and grease	mg/l	10
pH	S.U. ^a	6-9
Total coliform bacteria	100 ml	400
Total nitrogen	mg/l	10
Total phosphorus	mg/l	2
Total suspended solids	mg/l	50

^a Standard Unit

3.10 International Standards

The specific emission limit values and environmental quality standards that are relevant to the Project are shown in **Table 3-9**.

Table 3-9 Environmental Standards of Relevance to the Project

Environmental Parameter	Standard	Details
Air emissions	MARPOL Annex VI	The MODU and vessels will comply with applicable MARPOL requirements, for the prevention of air pollution from ships, including Vessels will hold a valid International Air Pollution Prevention (IAPP) Certificate, comply with allowable NOx emission from diesel engines, the sulphur content of any fuel oil used on board ships shall not exceed 3.5% m/m and regulation of shipboard incineration.

Environmental Parameter	Standard	Details
Waste discharges	MARPOL Annex I, IV & V	<p>The support vessels will comply with applicable MARPOL requirements, including: discharge of untreated sewage into the sea is prohibited, except when the ship has in operation an approved sewage treatment plant or when the ship is discharging comminuted and disinfected sewage using an approved system at a distance of more than 3 nm from the nearest land. Sewage which is not comminuted or disinfected has to be discharged at a distance of more than 12 nm from the nearest land.</p> <p>General waste (excluding food) will not be disposed of to sea in line with MARPOL Annex V requirements. Combustible wastes will be segregated and disposed by incinerator on-board, should an incinerator be available on the selected vessel. Non-combustible and recyclable wastes will be stored in containers and returned to the shore base for disposal. Food waste will be macerated into smaller pieces (25 mm) prior to discharge overboard (if discharged <12 nm from shore).</p> <p>Hazardous wastes will be stored on the vessels in appropriate containers with labels. Hazardous waste storage will be designated in accordance with their SDS. Hazardous wastes will be returned to the vessels' selected shore base and sent to a licensed disposal facility by a licensed waste contractor).</p>
Spills	MARPOL Annex I	Support vessel standard operating procedures to be prepared and implemented. Contingency plans will be prepared and implemented, e.g., vessel shipboard Oil Pollution Emergency Plans (SOPEPs) and PIC Oil Spill Contingency Plan.

3.11 Project Developer's Contractual and Commitments for Proposed Project

PIC confirm the following as per Article 62 of the EIA Procedure (2015):

- the accuracy and completeness of the EIA;
- that the EIA has been prepared in strict compliance with applicable laws including this Procedure and with the TOR for the EIA; and
- that the Project will at all times comply fully with the commitments, mitigation measures, and plans in the EIA Report.

The Production Sharing Agreement between MOGE and PIC notes that the Project shall be undertaken in accordance with the laws and regulations of Myanmar.

"Art. 17.2c: The CONTRACTOR shall be responsible for execution of Work Programmes which shall be implemented in a work-man like manner and by appropriate scientific methods, and CONTRACTOR shall take such precautions for protection of navigation and fishing and the prevention of environmental pollution as are consistent with international oilfield practices. It is also understood that the execution of the Work Programme shall be exercised so as not to conflict with the laws of the Republic of the Union of Myanmar as they exist as of the Effective Date."

All necessary national and international standards PIC's commitments are illustrated in Table 3-10.

The commitment letter of PIC is attached as Appendix A.

Table 3-10 List of PIC's Commitments

Legislation	Commitment
3.POLICY, LEGAL AND INSTITUTIONAL FRAMEWORK AND COMMITMENTS	
POSCO INTERNATIONAL Corporation strongly commits to follow the related laws, rules, regulations, standards and guideline which was described in the EMP report.	
3.1 Project's Environmental, Social and Health Policies	POSCO INTERNATIONAL Corporation has adopted a comprehensive Corporate Code of Conduct and Ethics, which includes the company's commitments to health, safety and environment.
3.2 Myanmar EIA Procedure	POSCO INTERNATIONAL Corporation commits to certainly follow Myanmar EIA Procedure (dated 29 December 2015).
3.3 Myanmar Legislation Relevant to the Project	<p>POSCO INTERNATIONAL Corporation commits to certainly follow the following Environmental Legislations:</p> <ul style="list-style-type: none"> • The National Environmental Policy, 2019 (Section 7) • Myanmar Climate Change Policy, 2019 (Section 12) • The Constitution of the Republic of the Union of Myanmar, 2008 (Article 37(a) (b), 45, 390) • Environmental Conservation Law, 2012 (Section 7(o), 14, 15, 24, 29) • Environmental Conservation Rules, 2014 (Rule 69(a) (b)) • Environmental Impact Assessment Procedure, 2015 (Paragraph 87, 102(a) (b) (d), 103, 104, 105, 106, 107, 108, 110, 113, 115, 117) • Environmental Quality (Emissions) Guidelines (EQEG), 2015 • Conservation of Water Resources and Rivers Law, 2006 & Amendment (2017) (Section 8(a), 10, 11(a) (c), 19) • The Protection of Biodiversity and Protected Areas Law, 2018 (Section 35 (a) (c) (d), 39(d) (e)) • The Protection and Preservation of Antique Objects Law, 2015 (Section 12) <p>POSCO INTERNATIONAL Corporation commits to certainly follow the following Socio-economic Legislations:</p> <ul style="list-style-type: none"> • Territorial Sea and Maritime Zone law (2017) (Section 30, 31, 32) • The Protection and Preservation of Cultural Heritage Region Law, 2019 (Section 13, 15, 21, 22)
	<ul style="list-style-type: none"> • The Protection and Preservation of Ancient Monuments Law, 2015 (Section 12, 15, 20) • Myanmar Fire Force Law, 2015 (Section 25) • Public Health Law, 1972 (Section 3, 5) • The Protection and Prevention of Communicable Disease Law, 1995 (Section 3(a), 9, 11) • Occupational Safety and Health Law, 2019 (Section 12(a) (b), 14, 16, 17, 18, 26, 27, 34, 36)

Legislation	Commitment
	<ul style="list-style-type: none"> • Employment and Skill Development Law, 2013 (Section 5, 14, 30) • The Settlement of Labour Dispute Law, 2012 (Section 3, 38, 39, 40, 51) • The Workmen Compensation Act, 1923 (amended in 1955, 1957, 2005) (Section 3, 13) • Labour Organization Law, 2011 (Section 17, 18, 19, 20, 21, 22) • Minimum Wages Law, 2013 (Section 12(a-e), 13(a-g)) • Payment of Wages Law, 2016 (Section 3, 4, 5, 7(ii), 8, 9, 10, 14) • Leaves and Holidays Act, 1951 (Section 4) • Social Security Law, 2012 (Section 11 (b), 15(a)(b), 18(b), 48(b), 49(a) (b), 51 (b), 75) • The Ethnic Rights Protection law, 2015 (Section 5, 22, 23, 24) • Occupational Safety and Health, 2019 (not come into force yet) (Chapter 8, 9, 10) <p>POSCO INTERNATIONAL Corporation commits to certainly follow Sector Specific/ Development:</p> <ul style="list-style-type: none"> • The Petroleum Rules, 1937 (Chapter 3, 4) • The Petroleum and Petroleum Product Law, 2017 (Section 8, 9, 10, 11) • The Oilfields Act, 1918 (amended in 1919, 2010) • Oilfields (Labor & Welfare) Act, 1951 (amended in 1953) • Prevention of Hazard from Chemical and Related Substances Law, 2013 (Section 15, 16, 17, 23, 27) • Prevention of Hazard from Chemical and Related Substances Rules, 2016 (Section 61 (a)) • Myanmar Investment Law, 2016 (Section (36), (50) (d), (51), (65), (67), (73)) • Myanmar Investment Rules, 2017 (Section 190, 202, 203, 206, 212) • The Myanmar Companies Law, 2017 (Section 4(a), 5(a)) • The Import and Export Law, 2012 (Section 7)
	<ul style="list-style-type: none"> • National Energy Policy, 2014 (Chapter 3, Section 4) • Myanmar Insurance Law, 1993 (Section 15, 16) • Myanmar Engineering Council Law, 2013 (Section 34, 37) • Myanmar Port Authority Law, 2015 (Section 19) • Myanmar Marine Fisheries Law, 1990
3.4 International Agreements and	POSCO INTERNATIONAL Corporation commits to certainly follow

Legislation	Commitment
Conventions	<ul style="list-style-type: none"> • The International Convention for the Prevention of Pollution from Ships (1973), as modified by the Protocol of (1978) relating thereto and by the Protocol of (1997) (MARPOL) • Vienna Convention for the Protection of the Ozone Layer 1988 and Montreal Protocol on Substances that Deplete the Ozone Layer (1989) • Convention on Biological Diversity (1992) • Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal • United Nations Framework Convention on Climate Change (1992) (UNFCCC) and Kyoto Protocol (1997) • Asia Least Cost Greenhouse Gas (GHG) Abatement Strategy (ALGAS) (1998) • United Nations Agenda 21 • International Convention on Civil Liability for Bunker Oil Pollution Damage (BUNKER) • The International Convention for the Safety of Life at Sea (SOLAS) (1974) • Convention on the International Regulations for Preventing Collisions at Sea (COLREG) (1972) • International Convention on Standards of Training, Certification and Watch-keeping for Seafarers (1978) (STCW)
3.5 Good International Industry Practice	<p>POSCO INTERNATIONAL Corporation commits to certainly follow</p> <ul style="list-style-type: none"> • International Finance Corporation (IFC) Performance Standards on Environmental and Social Sustainability (2012) • General EHS Guidelines (2007) • EHS Guidelines for Offshore Oil and Gas Development (2015) • United Nations Environment Program (UNEP) Guidelines on Environmental Management for Oil and Gas Exploration and Production (1997) • Worker's Accommodation: Process and Standards (IFC and EBRD 2009) • The ASEAN Marine Water Quality Criteria (2002) • Other good international industry practice guidelines from organizations such as the International Maritime Organization (IMO), American Petroleum Institute (API), International Petroleum Industry Environmental Conservation Association (IPIECA) and International Association of Oil and Gas Producers (IOGP) • Operating in Sensitive Environments (2003) • IOGP. Environmental Management in oil and gas exploration and production (1997)

Legislation	Commitment
3.6 EMP Requirement	POSCO INTERNATIONAL Corporation commits to certainly follow the <i>EIA Procedures, Article 8, 9, 11, 24, 76, 80, 81 and 101</i>
3.7 Institutional Framework	POSCO INTERNATIONAL Corporation commits to certainly follow the structure of the organization responsible for environmental and social management is set out for Office-based Personnel, SHK-based Personnel, and Vessel-based Personnel.
3.7.1 Project Proponent	POSCO INTERNATIONAL Corporation commits to structure for the organization responsible for environmental and social management.
3.7.2 Myanmar Regulatory Authorities	Key ministries, agencies and state-owned enterprises that have jurisdiction over HSE matters in oil and gas operations are Ministry of Natural Resources and Environmental Conservation (MONREC), Myanmar Oil and Gas Enterprise (MOGE), Ministry of Electricity and Energy (MOEE), and Myanmar Investment Commission (MIC).
3.8 Report Format and Outline	POSCO INTERNATIONAL Corporation commits to follow described within the <i>Myanmar Administrative Instruction of Environmental Impact Assessment Procedure</i> , under Annex 5 “ <i>Format for an Environmental Management Plan</i> ”.
3.9 National Environmental Standard	POSCO INTERNATIONAL Corporation commits to certainly follow National Environmental Quality (Emissions) Guidelines on Air Emissions and National Environmental Quality (Emissions) Guidelines on Effluent Discharge Levels.
3.10 International Standards	POSCO INTERNATIONAL Corporation commits to certainly follow <ul style="list-style-type: none"> • MARPOL Annex VI for air emissions • MARPOL Annex I, IV & V for waste discharges • International good practice for Underwater noise generation • MARPOL Annex I for spills
3.11 Contractual and Other Commitments	POSCO INTERNATIONAL Corporation confirm the following as per Article 62 of the EIA Procedure (2015): <ol style="list-style-type: none"> a. the accuracy and completeness of the EIA; b. that the EIA has been prepared in strict compliance with applicable laws including this Procedure and with the TOR for the EIA; and c. that the Project will at all times comply fully with the commitments, mitigation measures, and plans in the Report.
4. PROJECT DESCRIPTION AND ALTERNATIVES	
4.1 Project Background and Overview	The Shwe Project is a multi-field integrated development within Block A-1 and Block A-3 in the Bay of Bengal, offshore Rakhine State in western Myanmar. The Shwe Project began with exploration activities (seismic and

Legislation	Commitment
	exploratory drilling) that were conducted between 2003 and 2006. The overall field development scheme for the Shwe Project consists of three (3) phases. The Phase 3 development comprises provision of LP compression, to support ongoing production from the existing (Phase 1 and Phase 2) fields and meet the required contracted quota for gas export.
4.2 Project Location	The Shwe and Shwe Phyu fields are located within Block A-1 and the Mya field is located in Block A-3 (defined as the Project Area). The Shwe, Shwe Phyu and Mya fields are essentially gas field (gas composition 99+% methane) with limited liquids present and low in carbon dioxide (less than 0.5%) and low H ₂ S (0.2-0.4 ppmv). The water depth across Shwe Phyu and Shwe fields varies from approximately 90 m to 140 m and the water depth of Mya field varies from approximately 140 m in the north to 950 m in the south. The closest populated areas of significance to the Project Area are Rakhine capital Sittwe (70 km away) and Kyaukpyu on Ramree Island (105 km away).
4.1.3 Project Implementation and Time Schedules	POSCO INTERNATIONAL Corporation strongly commits to follow as per described in Project Schedule.
4.2.2 Proposed Project Facilities and Activities	POSCO INTERNATIONAL Corporation strongly commits that the information and data about the project and the proposed project activities were accurate and correct.
4.3.3 Status of Permits issued by Relevant Departments	POSCO INTERNATIONAL Corporation strongly commits that the information and data about the Permits issued by Relevant Departments for proposed project activities were accurate and correct.
4.3.5 Waste Generation	<p><u>General Waste:</u> Waste from the current operations has been recorded by PIC throughout the operations phase of the Shwe Platform (SHP) (2013-2022 y.t.d.). The waste is on average 50,182 Kg per year. This mostly consists of packaging waste, food waste, domestic waste, scrap metals, scrap wood (i.e., pallets) and some spent lube oils and other chemicals.</p> <p><u>Produce Water Treatment System:</u> Due to the guideline mentioned in Section 2.1.5 for Offshore Oil and Gas of NEQEG (2015), the guideline said that “Re-inject, discharge to sea maximum one day oil and grease discharge should not exceed 42 mg/l; 30 days average should not exceed 29 mg/l”.</p> <p>To improve oil/ water separation, a chemical (water clarifier) is continuously injected at the inlet of the Produced Water Degassing Drum using an injection pump to achieve the recommended concentration (300 – 400 ppm water clarifier in produced water). The water clarifier helps in breaking oil/water emulsion and coalescence of small oil droplets into larger ones, thus improving the removal of oil from the produced water. The oil floats to the top of the Produced Water Degassing Drum and overflows through a weir to the oil section where it is sent for re-injection. The produced water leaving the bottom of the Produced Water Degassing Drum is then treated in the Produced Water Deoiler Hydrocyclones to further reduce the oil content before it is discharged to the Hazardous Open Drain</p>

Legislation	Commitment
	(HOD) Caisson. The HOD Caisson is the last treatment unit in the produced water system where any residual oil is recovered and pumped back to the topside process system by the HOD Pump. The whole treatment system ensures that the water which exits the HOD Caisson (at a point 18.5 meters below mean sea level) is almost oil-free.
4.3.6 Waste Collection and Discharge for Non-Hazardous and Hazardous Waste	<p><u>Non-Hazardous:</u> The POSCO INTERNATIONAL Corporation commits to follow the following plans to mitigate the impacts related to the natural hazards.</p> <ul style="list-style-type: none"> ■ <u>Emergency and Crisis Management Plan</u> ■ <u>Emergency Response Plan</u> <p><u>Hazardous:</u> The POSCO INTERNATIONAL Corporation commits to follow the control plans to cope with the impacts caused by the chemical hazards.</p> <ul style="list-style-type: none"> ■ The contractor will develop and implement standard operational procedures (SOPs) which will define procedures that involve the handling of fuels/oils that aim to minimize the potential for spillages; ■ PIC will develop an Emergency Response Plan and an Oil Spill Contingency Plan; and <p>All employees will have the appropriate training, qualification and certification to undertake the tasks required during the installation and operation of the platform.</p>
4.4 Project Decommissioning Phase	The POSCO INTERNATIONAL Corporation commits that the Decommissioning will be conducted in accordance with the relevant national laws and good international industry practice at the time.
5.DESCRPTION OF SURROUNDING ENVIRONMENT	
	<p>POSCO INTERNATIONAL Corporation strongly commits not to disturb the Existing Environment Conditions expressed in:</p> <p><u>Physical Environment:</u> POSCO INTERNATIONAL Corporation strongly commits that physical environment (sediment characteristics and quality and water quality) were measured with the proper devices and compared the results with the National Environmental (Emission) Guideline.</p> <p><u>Biological Components:</u> POSCO INTERNATIONAL Corporation strongly commits that biological components (benthic communities, plankton, marine mammals, marine turtles, seabirds, protected and environmentally sensitive areas, seasonally restricted fishing areas) were measured with the appropriate methods and compared the results with 2007 and 2017 study results and IUCN list. The project proponent strongly commits that marine mammals sighting data shall be collected as baseline survey within six months after obtaining EIA report approval.</p> <p><u>Socio- economic Components:</u> POSCO INTERNATIONAL Corporation strongly commits that socio- economic components that administration and demographics, livelihood and economy, social indicators, fishing operations and resources, shipping lanes, oil and gas infrastructure and activities were correctly described.</p>

Legislation	Commitment
	<p><u>Cultural Components:</u> Mrauk-U, the ancient capital city of Rakhine State, is one of well-known archaeological sites in Myanmar.</p> <p><u>Visual Components:</u> There are three (3) major ports for interstate transportation, which include Sittwe, Kyauk Phyu and Thandwe Ports and three inter-state highways that connect with other main regions.</p> <p>Regarding air transport, airports exist in main cities such as Sittwe, Kyauk Phyu, Thandwe and Ann and Mann Aung. The Kyauk Phyu Special Economic Zone is located at the South of Kyauk Phyu town.</p> <p>Ponnagyun Industrial Zone is the second industrial zone project, and Ka Nyin Chaung Economic Zone is being developed by the Maungdaw Border Merchants Association together with the Union of Myanmar Federation of Chambers of Commerce and Industry (UMFCCI).</p>
6. SUMMARY OF IMPACTS	
6.1 Impact Assessment Methodology	Project risks and potential impacts have been identified through a systematic process whereby the activities associated with the Project have been considered with respect to their potential to interact with resources or receptors.
6.2 Residual Impact Assessment	As this Project already exists, the Operational Phase impacts only as the installation and construction related activities have already taken place.
6.3 Impacts and Mitigation Measures	<p><u>Impacts on Air Quality:</u> POSCO INTERNATIONAL Corporation specifically commits to follow the mitigation measures for air pollution during the operation phase.</p> <ul style="list-style-type: none"> ■ Low sulphur fuel (0.05% sulphur by mass) will be used where available. ■ Engine maintenance to minimize emissions of unburned hydrocarbons. ■ The platform and maintenance vessels will follow applicable MARPOL 73/78 Regulations for the prevention of air pollution from ships (Annex VI) (as applicable or required by vessel class); and <p>The platform and maintenance vessels will have a Ship Energy Efficiency Management Plan (SEEMP) providing for fuel efficient vessel operations, in accordance with the requirements of Annex VI MARPOL 73/78 (as applicable or required by vessel class).</p>
	<p><u>Impacts on Water Quality:</u> POSCO INTERNATIONAL Corporation specifically commits to follow the mitigation measures for water pollution during the operation phase.</p> <ul style="list-style-type: none"> ■ No solid waste is allowed to be disposed overboard; ■ The platform and maintenance vessels should be well maintained and inspected before use to limit any potential discharges to the marine environment; and

Legislation	Commitment
	<ul style="list-style-type: none"> ■ The platform and maintenance vessels must have a clean ballast system; ■ The temperature of cooled water will be logged through online analyzers in accordance with operational manual and procedures; <p>Cooling water discharges will be in line with EQEG standards (i.e., reduced to 3°C of ambient within 100 m from the outfall).</p> <p><u>Impacts to Marine Organisms:</u></p> <p>POSCO INTERNATIONAL Corporation specifically commits to follow the mitigation measures for fish and plankton during the operation phase.</p> <ul style="list-style-type: none"> ■ Discharges from the vessels will be in line with EQEG Standards mentioned in Section 3.5; ■ Marine works shall not cause foam, oil, grease, litter or other objectionable matter to be present in the water within and adjacent to the works site; ■ Wastewater from potentially contaminated area on working vessels should be minimized and collected. These kinds of wastewater shall be brought back to port and discharged at appropriate collection and treatment system; ■ No solid waste is allowed to be disposed overboard; and ■ Appropriate screen system design will be provided as per manufacturer's recommendations for seawater application.
	<p><u>Impacts to Marine Mammals and Turtles:</u></p> <p>POSCO INTERNATIONAL Corporation specifically commits to follow the mitigation measures for marine turtles and mammals during the operation phase.</p> <ul style="list-style-type: none"> ■ Detailed lighting design information will be developed during detailed engineering design and it is anticipated that most of the lighting will be kept minimal and facing downward at the platform; ■ Lighting of the platform will be designed with the objective of reducing light spill, subject to meeting all workplace health and safety, and navigational requirements; ■ Major lighting sources will be pointed inward and downwards to avoid disturbance to wildlife; and ■ Limit the occurrence and duration of flaring, where possible. <p><u>Impacts to Seabed Habitats:</u></p> <p>POSCO INTERNATIONAL Corporation specifically commits to follow the mitigation measures for seabed habitats during the operation phase.</p> <ul style="list-style-type: none"> ■ Marine works shall not cause foam, oil, grease, litter or other objectionable matter to be present in the water within and adjacent to the works site. ■ Wastewater from potentially contaminated area on working vessels should be minimized and collected.

Legislation	Commitment
	<p>These kinds of wastewater should be brought back to port and discharged at appropriate collection and treatment system</p> <ul style="list-style-type: none"> ■ No solid waste is allowed to be disposed overboard. ■ All vessels should be well maintained and inspected before use to limit any potential discharges to the marine environment; and ■ All vessels must have a clean ballast system ■ Vessels refueling must be done systematically ■ Vessels will comply with international regulations for collision avoidance, navigation and maintenance ■ Consider vessels thrusting or the need for anchors in order to have least impact on the seabed ■ Any chemicals, lubricating and hydraulic oils, used for work are registered and updated in the chemical register, required under YGG- OM-MP-0307-0026 Chemical Handling and COSHH procedure. <p>Marine biodiversity management plan, marine invasive species management plan, ballast water management plan and oil spill contingency plan shall be implemented properly.</p>
	<p><u>Impacts to Fisheries and Livelihoods:</u></p> <p>POSCO INTERNATIONAL Corporation specifically commits to follow the mitigation measures for fisheries and livelihoods during the operation phase.</p> <ul style="list-style-type: none"> ■ Support vessels will comply with international regulations for collision avoidance, navigation and maintenance; ■ Myanmar speaking crew members will be available on board the vessels and platform; ■ Timely sharing of information on the details of the Project in order to inform stakeholders (in the form of a Notice to Mariners); ■ Disclosure and implementation of the grievance mechanism for the Project and timely investigation of any grievances; and ■ A Stakeholder Engagement Plan will be developed that will support timely sharing of information on the details of the Project in order to inform stakeholders, especially fishers.
Collisions with Fishing and Shipping Vessels	<p>The POSCO INTERNATIONAL Corporation commits to apply the following mitigation measures;</p> <ul style="list-style-type: none"> ■ A 500 m radius safety exclusion zone will be maintained around the platform as required; ■ Platform and support vessels will comply with international regulations for collision avoidance, navigation and maintenance; ■ Myanmar speaking crew members will be available on board the vessels; ■ Timely sharing of information on the details of the Project in order to inform stakeholders (in the form of a Notice to Mariners);

Legislation	Commitment
	<ul style="list-style-type: none"> ■ Disclosure and implementation of the grievance mechanism for the Project and timely investigation of any grievances; and ■ The platform and support vessels will also be equipped with extensive navigation, radio/satellite communication equipment and dual radar systems.
Explosion and Fire	<p>The POSCO INTERNATIONAL Corporation specifically commits to make sure that the following control measures will be applied for prevention, mitigation of impacts caused by fire and explosion.</p> <ul style="list-style-type: none"> ■ The occurrence of mass movements triggered by events such as earthquakes will be taken into account, in designing the platform, and maintain the integrity to withstand such natural hazards; ■ Implementation of ongoing maintenance and inspection procedures to maintain facility integrity; ■ If design environmental conditions are reached or where an unplanned event may have impacted on infrastructure, immediate inspection and maintenance will be undertaken; and ■ An Emergency Response Plan will minimize the potential environmental consequences of such events. The Emergency Response Plan will be prepared by the contractor and will define actions to be taken during a gas release.
7. CUMULATIVE IMPACT ASSESSMENT	
POSCO INTERNATIONAL Corporation commits to certainly follow the cumulative impact assessment methodology and cumulative impacts management	
7.1 Objective and Scope	<ul style="list-style-type: none"> ■ Identify VECs that could be impacted cumulatively in areas potentially affected by the Project, considering input from stakeholders through the consultation process and the scientific community; ■ Identify other existing and planned projects and external environmental and social drivers that could cumulatively impact VECs; ■ Undertake a high-level assessment of potential cumulative impacts on VECs, considering the Project and the other identified existing and planned projects and external drivers in the area; and Recommend a management framework for the integrated management of potential cumulative impacts.
7.5 Assessment of Cumulative Impacts on VECs	The cumulative impacts discussed consider potential impacts assessed for the Project, other existing and future projects, and external drivers.
7.6 Cumulative Impacts Management	POSCO INTERNATIONAL Corporation specifically commits to implement effective application of the mitigation hierarchy (avoid, reduce and remedy) to manage individual contributions of cumulative impacts is recommended as best practice.

Legislation	Commitment
8. OVERALL BUDGET FOR IMPLEMENTATION OF THE EMP	
<p>POSCO INTERNATIONAL Corporation commits to use overall estimated budget for implementation of the mitigation measures is around US\$ 500,000 per year (including around US\$150,000 for environmental monitoring and US\$ 135,000 for implementing sub-plans). If the estimated budget is not enough, additional budget shall be used.</p>	
9. ENVIRONMENTAL MANAGEMENT PLAN AND MONITORING PROGRAM- OPERATION PHASE	
<p>POSCO INTERNATIONAL Corporation commits to certainly follow the Environmental and Social Management Plan (ESMP). POSCO INTERNATIONAL Corporation commits that the EIA has assessed the potential impacts and proposed mitigation to reduce the level of the impact. During the Operation phase, impacts to seabed habitats is negligible to both significance of impact and residual impact. Explosion and Fire is moderate to both significance of impact and residual impact in OPERATION.</p>	
Air Quality Management Plan	<p>POSCO INTERNATIONAL Corporation commits to certainly follow the following activities</p> <ul style="list-style-type: none"> • Low sulphur fuel (0.05% sulphur by mass) will be used where available • Engine maintenance to minimize emissions of unburned hydrocarbons • Installation vessels shall follow applicable MARPOL 73/78 Regulations for the prevention of air pollution from ships (Annex VI) (as applicable or required by vessel class) • Installation vessels shall have a Ship Energy Efficiency Management Plan (SEEMP) providing for fuel efficient vessel operations, in accordance with the requirements of Annex VI MARPOL 73/78 (as applicable or required by vessel class) • Discharges from the vessels shall be in line with international and national standards mentioned in Section 3.5
Water Quality and Marine Sediment Management Plan	<p>POSCO INTERNATIONAL Corporation commits to certainly follow the following activities</p> <ul style="list-style-type: none"> • All vessels shall be well maintained and inspected before use to limit any potential discharges to the marine environment • Minimize physical footprint where possible • Avoid the reefs and sensitive habitats for coral colonies in choosing the foundation area for the platform and consider the options for restoration in order to assist the recovery of damaged or destroyed habitats • Optimize the vessel uses to ensure the number of vessels required is as low as possible • Consider vessels thrusting or the need for anchors in order to have least impact on the seabed • All vessels must have a clean ballast system • No solid waste is allowed to be disposed overboard

Legislation	Commitment
	<ul style="list-style-type: none"> The temperature of cooled water will be logged through online analyzers in accordance with operational manual and procedures
Benthic and Plankton Management Plan	<p>POSCO INTERNATIONAL Corporation commits to certainly follow the following activities</p> <ul style="list-style-type: none"> Where possible, use of more environmentally friendly percussive piling – hydraulic hammering (replace conventional diesel hammering) In case single round piles are used these and the hammer will be enclosed in protective screen Piles will be carefully aligned with hammer for correct contact Marine works shall not cause foam, oil, grease, litter or other objectionable matter to be present in the water within and adjacent to the works site Wastewater from potentially contaminated area on working vessels shall be minimized and collected. These kinds of wastewater shall be brought back to port and discharged at appropriate collection and treatment system No solid waste is allowed to be disposed overboard Appropriate screen system design will be provided as per manufacturer's recommendations for seawater application Discharges from the vessels shall be in line with EQEG Standards mentioned in Section 3.5
Marine Biodiversity Management Plan	<p>POSCO INTERNATIONAL Corporation commits to certainly follow the following activities</p> <ul style="list-style-type: none"> Contractors shall develop appropriate HSE plans and hazards to marine biodiversity are adequately controlled The installation and operation of the facilities shall receive the appropriate permits Contractors shall have awareness of PIC's environmental management requirements Contractors to ensure workers instructed to report any marine mammals sighting to the trained observer. Any observation of marine fauna will be reported to MONREC via the Environmental Monitoring Report. All contractors shall comply with PIC HSE management requirements and contractor operations audited for compliance with specified requirements Larger vessels shall operate compliance with requirements of MARPOL, Annexes I and IV All sewage must be treated before discharge into the offshore environment Oil-water separators shall be installed for deck drains in platform and vessels

Legislation	Commitment
	<ul style="list-style-type: none"> Oil-water separators shall be installed for bilge water discharges Used oil and oil contaminated waste shall collect into slop tank for recycling or disposal by license contractor Only well-maintained installation equipment shall be used Service and inspect equipment shall be carried out regularly during installation programme Machines and equipment shall be shut down that are in intermittent use (or throttle down to minimum)
Marine Invasive Species Management Plan	<p>POSCO INTERNATIONAL Corporation commits to certainly follow the following activities</p> <ul style="list-style-type: none"> Vessels shall maintain valid Fouling Coating Certificates. Vessels shall maintain records of ballast water uptake and discharge locations Vessels shall minimize time spent in non-destination shallow coastal water Remove requirements for harbor/ port stops and route wherever possible Optimize the vessel uses to ensure the number of vessels required is as low as possible Consider dry tows options long-distance movements, particularly where transfer of invasive species is known to be a key concern Where vessels are being moved on and/or removed from the water, <ul style="list-style-type: none"> Remove obvious fouling Hose clean Drain all sources of water Clean hull and Dry vessel shall be carried out to minimize invasive species transmission
Waste Management Plan	<p>POSCO INTERNATIONAL Corporation commits to certainly follow the following activities.</p> <ul style="list-style-type: none"> Waste generation will be monitored through a waste inventory Waste Consignment Notes for all wastes transferred to shore will also be held Production of waste will be minimized through good design All waste will be managed in accordance with the Waste Management Plan developed by PIC All waste from offshore and onshore activities/operations are temporarily stored at the OGT and collected by MOGE for onward disposal

Legislation	Commitment
<p><u>Management and Monitoring Sub-Plans</u></p>	<p><u>POSCO INTERNATIONAL Corporation commits to certainly follow the following sub-plans.</u></p> <p><u>Onshore gas terminal (OGT) emergency response plan</u></p> <p>POSCO INTERNATIONAL Corporation commits to certainly follow the following activities</p> <ul style="list-style-type: none"> • Incident Severity Assessment and Notification; • Emergency Support Centre (ESC); • Evacuation of Expatriate Personnel; • Business Continuity Planning (BCP); • Competency Management; • Training <p><u>Shwe platform emergency response plan</u></p> <p>POSCO INTERNATIONAL Corporation commits to certainly follow the following activities</p> <ul style="list-style-type: none"> - Emergency Response Organization; - Escape Evacuation and Rescue; - Precautionary Down-manning and Evacuation; - Emergency Communications; - Drills and Exercises; - Organization and Arrangements; - Competence; - Direction of Incidents
	<p><u>Oil Spills Contingency Plan</u></p> <p>POSCO INTERNATIONAL Corporation commits to certainly follow the following activities</p> <ul style="list-style-type: none"> • Monitor (by air if a larger spill), assess severity, and select appropriate response. • Apply dispersants, aerial observation to guide the spray operation and assess success. • Deploy booms to deflect (redirect) oil or to contain oil. • Use skimmers to recover oil on water. • Use sorbents to recover oil on deck and prevent secondary contamination.

Legislation	Commitment
	<ul style="list-style-type: none"> • Use tanks and containers for temporary storage of recovered oil. • Shoreline protection and clean-up. • Disposal of recovered oil and oily waste
Public Health Management Plan (PHMP)	<p>POSCO INTERNATIONAL Corporation commits to certainly follow the following activities</p> <ul style="list-style-type: none"> • Develop coordination and collaboration mechanisms with key response stakeholders • Necessary control measures are in place and relevant guidelines if work involves chemicals or other hazardous substances • Public health risk messaging aimed at both the public and local health care providers Participation in community awareness, education messages, and emergency response exercises • Capacity building and establish working systems for detecting, alerting, and responding to crude oil release
Occupational Health and Safety Management Plan	<p>POSCO INTERNATIONAL Corporation commits to certainly follow the following activities</p> <ul style="list-style-type: none"> • All personnel, including visitors, working at project facilities are aware of substances that they could be exposed to and associated risks to health through awareness briefings and that appropriate PPEs are used where applicable • Necessary control measures are in place according to the safety document and relevant guidelines • Ensuring to the Occupational Health Hazard Risk Assessment Process and establishing suitable controls • Liaise with the site doctor on occupational health issues and occupational disease • Enforce all workers to follow all work guidelines and safety practices and procedures relating to items which may have an occupational health impact • Enforce all workers use all necessary PPEs provided for the assigned work
Decommissioning Plan	<p>POSCO INTERNATIONAL Corporation commits to certainly follow the following activities</p> <ul style="list-style-type: none"> • Decommissioning activities shall be undertaken in accordance with good international industry practices and with the applicable international and national legislation and regulations prevailing at that time, and in liaison with the relevant regulatory authorities • Identify and assess potential for impacts due to decommissioning activities and appropriate mitigation measures shall be implemented to reduce risks and consequences to the surrounding environment, marine biodiversity, seabed habitats and social receptors
Environmental Monitoring and Reporting	<p>POSCO INTERNATIONAL Corporation commits to report the compliance monitoring report every six months along with the environmental monitoring plan for the installation and operation phase. Monitoring items are</p>

Legislation	Commitment
	<ul style="list-style-type: none"> • Waste generation • Aqueous discharge • Commercial fishery interaction • Incident reporting • Compliance reporting • Accidental releases and leaks • Air emission • Water quality and marine sediment • Benthic and plankton • Marine mammals
Community Grievance Mechanism	POSCO INTERNATIONAL Corporation commits that a Community Grievance Mechanism with local people has established to solve the problems and complaints concerns with the project.
Capacity Development Training Reporting	POSCO INTERNATIONAL Corporation commits to implement training programs for their personnel and each contractor is responsible for Health, Safety and Environment (HSE) awareness training for personnel working on the Project.
Corporate Social Responsibility (CSR) Program	POSCO INTERNATIONAL Corporation commits to implement the Corporate Social Responsibility Plan to support 2% of annual net profits for education, health, water supply, infrastructure, social welfare, disaster relief and environment sector of Rakhine State.
10. PUBLIC CONSULTATION AND DISCLOSURE	
	<p>POSCO INTERNATIONAL Corporation commits that the time, date, list of attendants, the place and subject of discussion were correct.</p> <p>POSCO INTERNATIONAL Corporation commits to resolve any social and environmental related grievances locally in consultation with the aggrieved party to facilitate smooth implementation of the project</p>
Disclosure	POSCO INTERNATIONAL Corporation commits that information on the Project was disclosed on their website. There will also be adverts in one English and one Myanmar newspaper and hard copies of the report will be made available in Yangon, Sittwe and Kyauk Phyu.

4. PROJECT DESCRIPTION

4.1 Background and Overview

4.1.1 *Project Description of the Shwe Field Development*

During exploration activities, PIC identified extensive offshore gas reserves at the Shwe and Shwe Phyu fields in Block A-1 and the Mya field immediately to the south in Block A-3.

The overall field development scheme for the Shwe Project consists of four (4) phases.

This Environmental Management Plan covers the existing infrastructure in the Shwe Project (Phase 1). This Phase was conducted between 2011 and 2013. The overall Shwe Development for PIC will be conducted in 4 Phases. It is noted that this EMP covers the existing infrastructure Phase 1 only.

PIC is acting as Operator of the Shwe Project with 51% equity and joint venture partners are Myanmar Oil and Gas Enterprise (15%), ONGC Videsh (India) Ltd. (17%), GAIL (India) Ltd. (8.5%) and Korea Gas Corp. (8.5%).

4.1.2 *Overview of Project Facilities Covered by this EMP*

The following is a list of the existing Project facilities shown in Figure 4-1.

- **Shwe Field**
 - One conventional steel jacket with integrated drilling, production and processing platform (SHP);
 - 8 production wells and 1 disposal well.
- **Mya North Field**
 - One subsea manifold with five slots (inclusive of one spare) for 4 subsea wellheads;
 - One 14" flowline from Mya North to SHP (about 12 km long)
 - One 32" export pipeline from SHP to OGT (about 110 km long), which is composed of offshore part from SHP to landfall (about 105 km long) and onshore part from landfall to OGT (about 5 km long).
- One onshore gas terminal including supply base (OGT) in Ramree Island.
- One jetty facility at Kyaukpyu in Ramree Island; and
- A helicopter operation base and Hangar at Kyaukpyu Airport.

4.1.3 *Overview of the Schedule of Project Activity Schedule –Phase 1*

The overall Project activity schedule for the construction phase was from September 2010 to June 2013; when the operational phase began. The Project is currently still operating at the time of writing this report.

An overview is provided below and a construction timeline of the Project activities covered by this EMP is provided in Figure 4-1.

- Shwe Field development – constructed between **February 2012 and March 2012** for jacket and **December 2012** for topsides;
- Subsea Production System at Mya North – 4 nos. subsea wells & X-mas Trees, 1 no. Manifold, 1 no. Umbilical Distribution Module; **July, 2011 - April, 2012**
- 12.5 km long, Umbilical and 14" Infield Pipeline from Mya North to SHP; **January, 2012 - February, 2012**
- 110 km long, 32" Export Pipeline from SHP to OGT; **December, 2011 - March, 2012**
- Onshore Gas Terminal (OGT), Jetty and Hanger at Kyaukpyu; **September, 2010 - June, 2013**

Phase1 Development

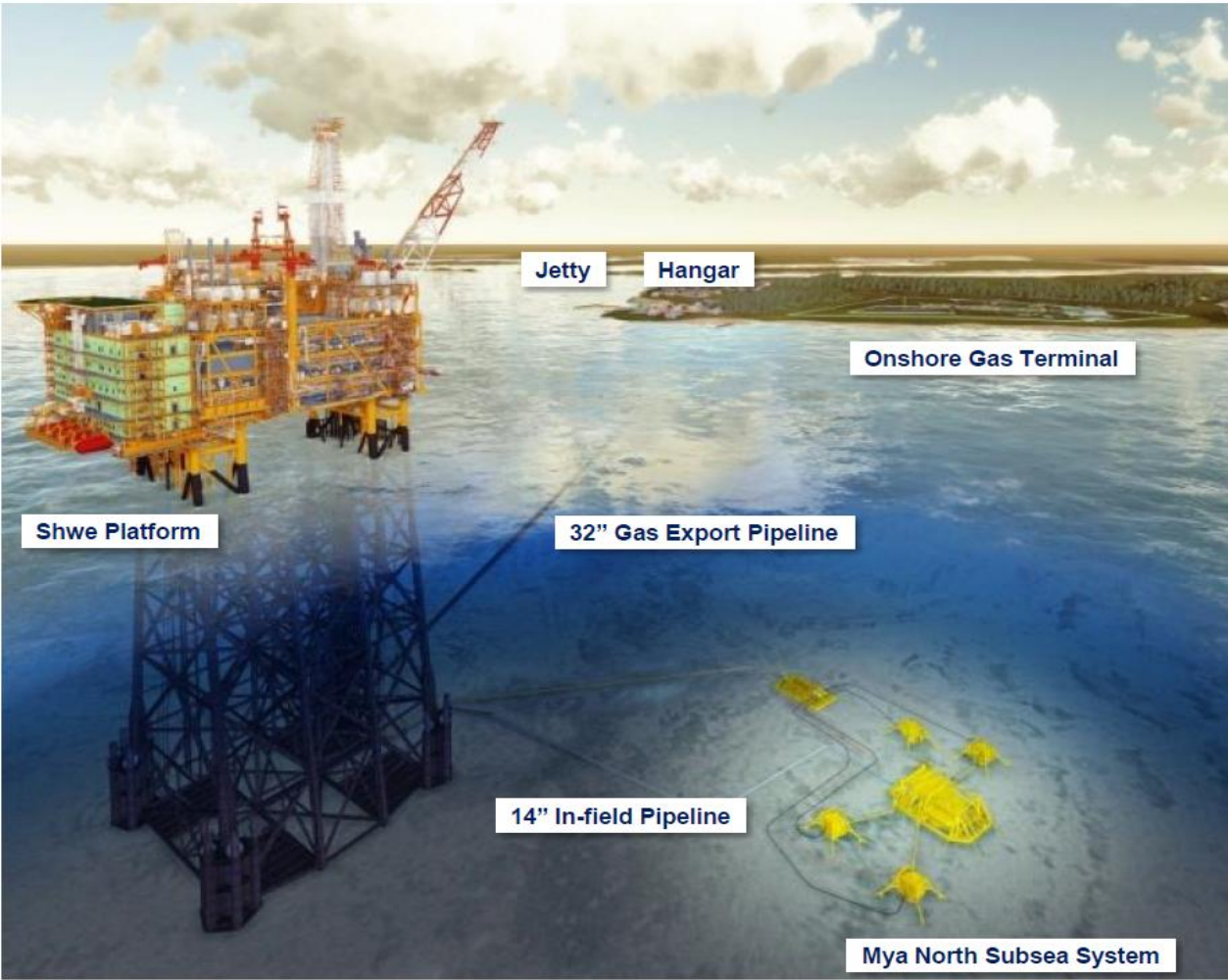


Figure 4-1 Existing Facilities in the Shwe Development

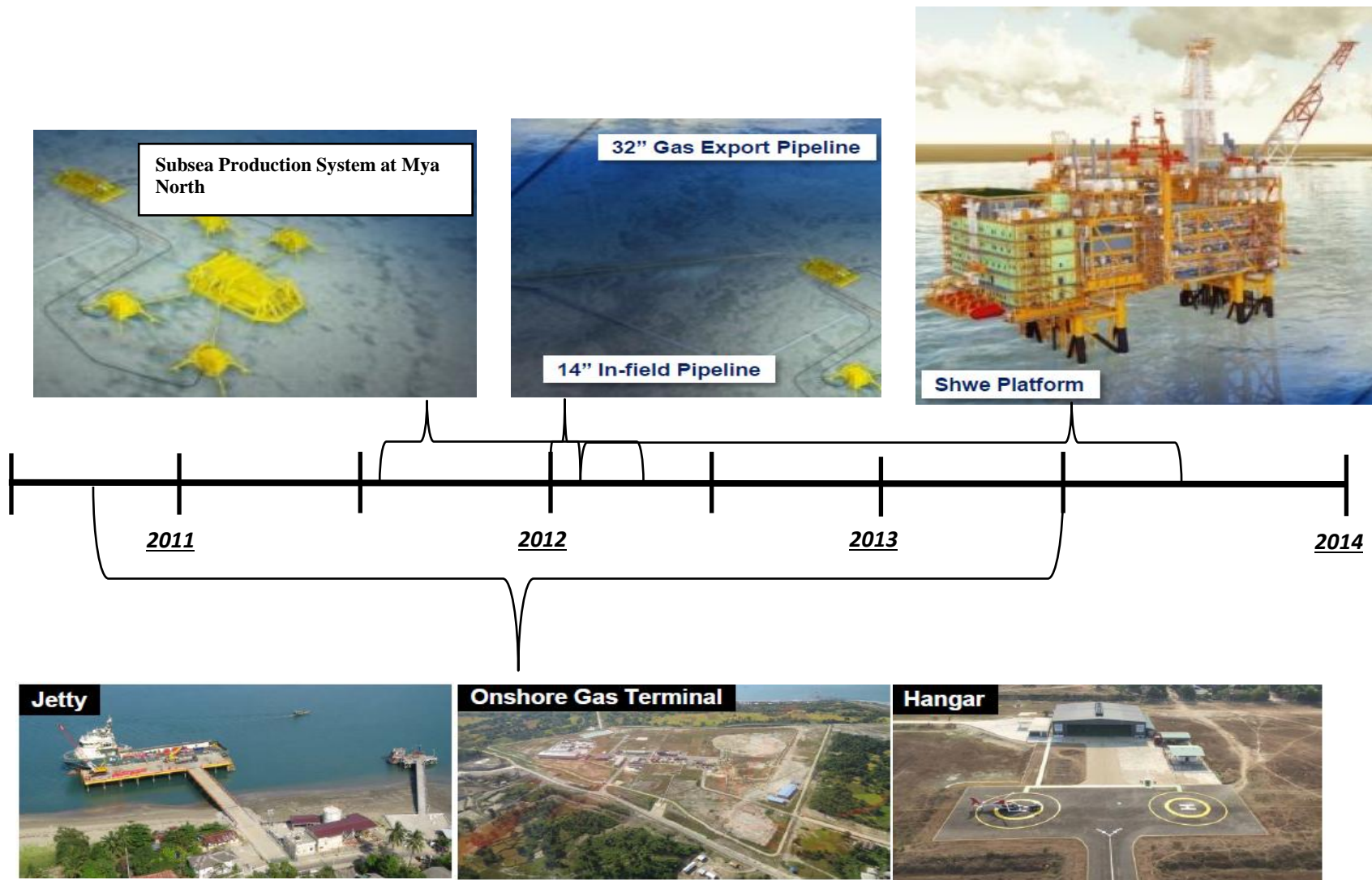


Figure 4-2 Project Activity Construction Schedule

4.2 Shwe, Shwe Phyu and Mya Fields

4.2.1 Location

The Shwe and Shwe Phyu fields are located within Block A-1 and the Mya field is located in Block A-3 (defined as the Project Area). The Shwe, Shwe Phyu and Mya fields are essentially gas field (gas composition 99+% methane) with limited liquids present and low in carbon dioxide (less than 0.5%) and low H₂S (0.2-0.4 ppmv). The water depth across Shwe Phyu and Shwe fields varies from approximately 90 m to 140 m and the water depth of Mya field varies from approximately 140 m in the north to 950 m in the south. The closest populated areas of significance to the Project Area are Rakhine capital Sittwe (70 km away) and Kyaukpyu on Ramree Island (105 km away).

The location of the Shwe and Mya fields relative to each other are presented in **Figure 4-3**.

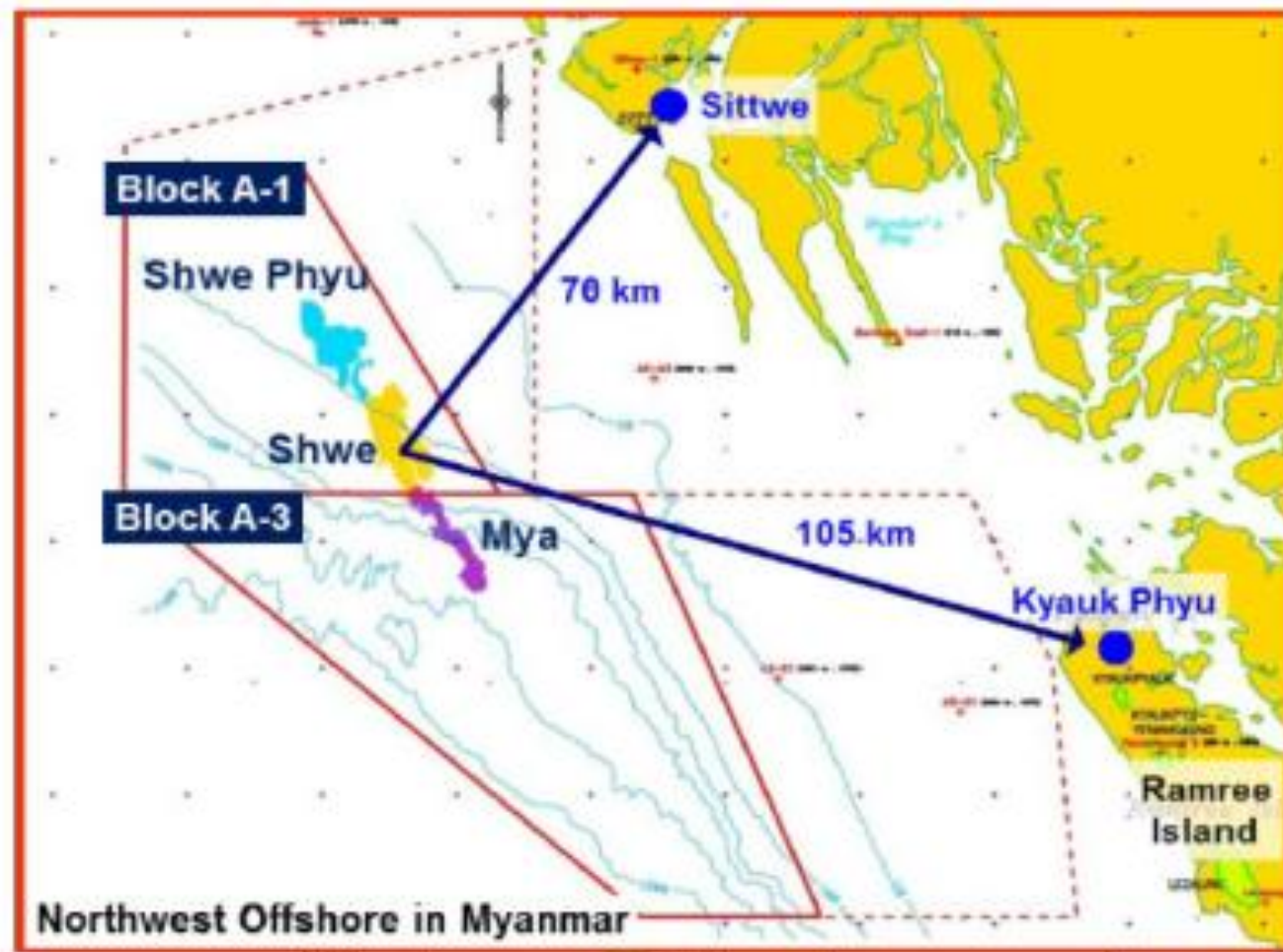


Figure 4-3 Location of Shwe, Shwe Phyu and Mya Fields in Blocks A-1 and A-3 in Offshore Myanmar

4.2.2 Project Facilities and Activities

The offshore parts of the Project cover the Shwe integrated drilling, production and processing Platform (SHP) and the Mya North subsea installation. A schematic diagram of the main components for the offshore parts of the Project is presented in Figure 4-4. Phase 1 is shown in red. The other infrastructure relates to the future phases and is therefore not covered by this EMP.

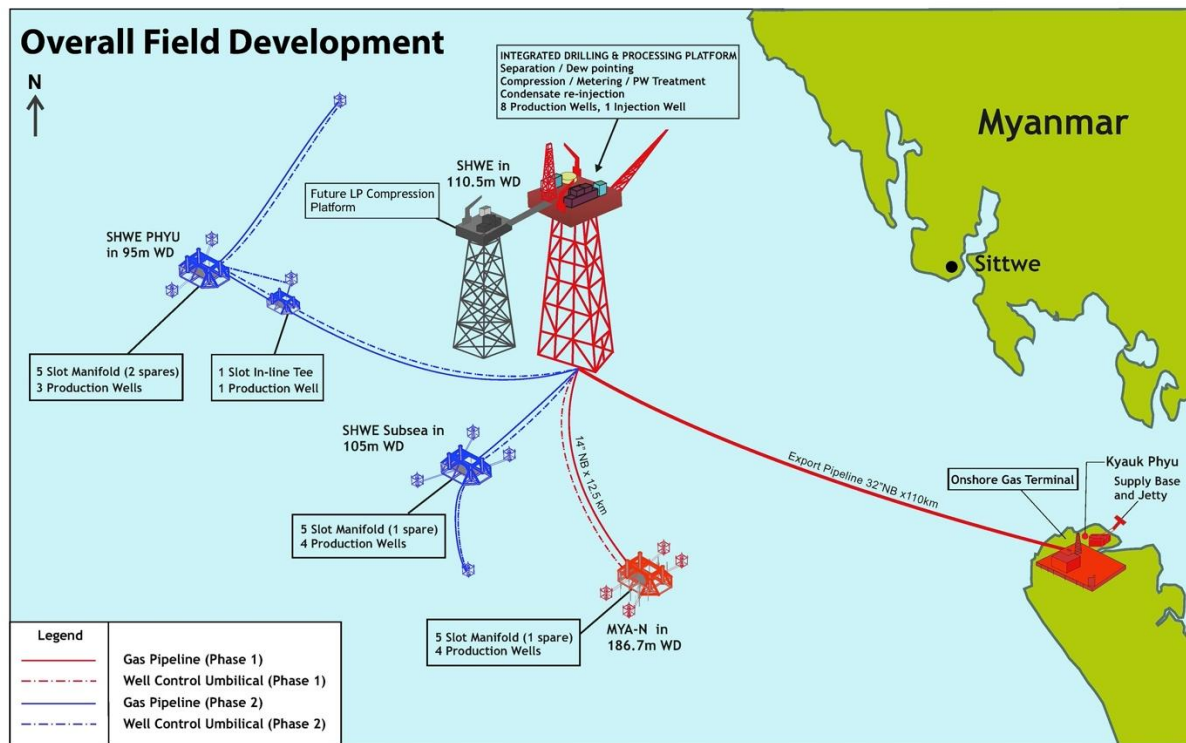


Figure 4-4 Schematic of Phase I Development (Source: PIC) Shown in Red

4.2.2.1 Integrated drilling, production and processing Platform

The integrated drilling, production and processing platform (SHP) is a manned process/ utilities/ accommodation platform in approximately 110 m water depth located in the Shwe field. Accommodation is provided with permanent living quarters for a maximum of 215 persons.

- SHP has the following features: Process systems, including wellheads, flowlines, production header, production separators, water and hydrocarbon gas dew pointing, gas compression and produced water treatment and disposal and export pipeline;
- Utility systems, including flare and drain systems, chemical injection system, instrument Air and Nitrogen generation system;
- Auxiliary systems, including cranes, potable water and diesel fuel facilities, power generation and lighting, process control, and communications equipment; and
- Safety systems, including emergency shutdown (ESD) system, manual ESD stations, personnel safety, safety equipment and escape routes, and navigational aid systems.

Access to SHP is currently provided by boat or predominantly by helicopter.

A photo of SHP in the Shwe Field is presented in **Figure 4-5**.



Figure 4-5 Photo of the Shwe Integrated drilling, production and processing Platform (Source: PIC)

4.2.2.2 Mya North Field Subsea Wells and infield flowline

The Mya North field has been developed with four subsea wells connected to a five-slot subsea manifold. A 14" infield flowline connects Mya North manifold to SHP.

4.2.2.3 Supply, Support and Logistics

Supply vessels travel to the offshore facility monthly on average. The materials and supplies are mainly transported via vessels and transportation of personnel is carried out by helicopter.

Three offshore Support Vessels are presently chartered to support Shwe Platform and the onshore facility. There is one Platform Supply Vessel, one Standby Vessel and one Utility Vessel. There will be more offshore support vessels chartered during future drilling and offshore construction periods. The Platform Supply Vessel travels to Singapore every three to four weeks with occasional transit to Ranong Port in Thailand or other ports as required. Loyang Offshore Supply Base in Singapore is the major mobilization point for the Project. The Standby Vessel is assigned for safety standby at the Shwe Platform. The Utility Vessel works as an alternative field standby vessel when the dedicated field standby vessel is engaged in supply duties between Onshore Gas Terminal (OGT) Jetty and Shwe Platform (SHP). The Utility Vessel may also work as a drilling support vessel during drilling operations. Two helicopters (Rotary Wing aircraft) are chartered for personnel transfer and cargo transport to/ from Shwe Platform. Normal Supply Vessel routes to/from Kyauk Phyu /Singapore Shown as red line in Figure 4-6.



Figure 4-6 Normal Supply Vessel Routes

4.2.2.4 Vessels used in implementation

The type and numbers of vessel is subjected to operational requirements which vary throughout the entire project life cycle. Table 4-1 illustrated the type and number of vessels to be used in the implementation of the proposed work, fuel type with used volume and the workforce.

Table 4-1 Type and number of vessels, fuel type with used volume and the workforce

Number of Vessels			Fuel		Average of Workforce of Vessels
Platform Supply Vessel	Stand-by Vessel	Utility Vessel	Type	Used Volume (m ³ /month average)	
1	1	1	MGO	450	12 crew members

4.2.2.5 Navigation of Seagoing Vessels

The operations will be supported by 3 support vessels. The support vessels will be used to transport equipment, fuel, materials and waste between the Platform and the supply bases (located in Kyauk Phyu and/or Singapore and / or Thailand). The Project will use an existing supply base and follow established navigational routes to and from the supply base. Navigation Map is illustrated in **Figure 4-7**.

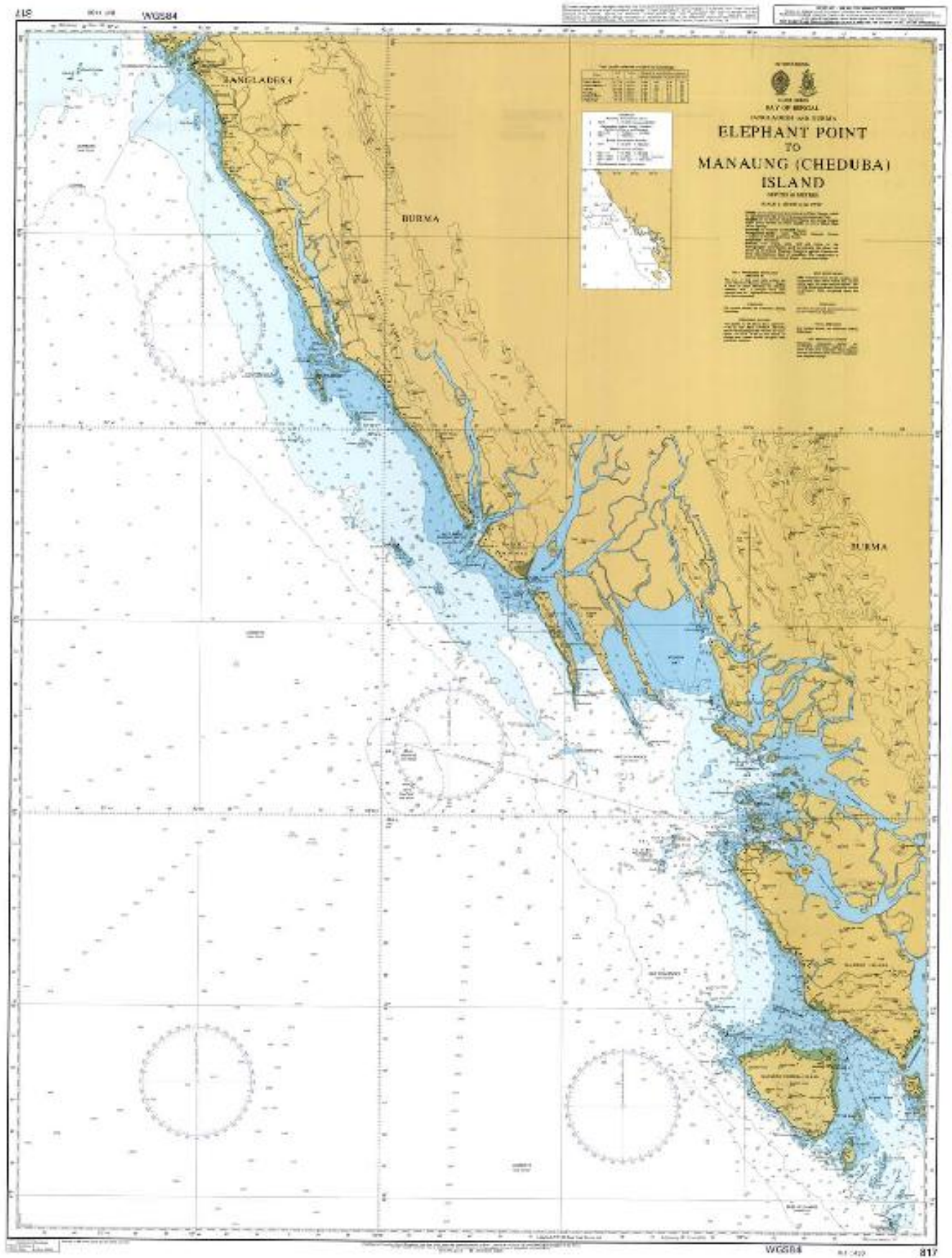


Figure 4-7 Navigation Map

4.2.2.6 Air conditioner and Refrigerant Using Offshore Facilities

The designated refrigerant used for offshore operation is Pentafluoroethane (R-407C), a non-ozone-depleting blend of hydrofluorocarbons (HFCs). R407C is widely utilized in air conditioning and refrigeration systems due to its efficiency in heat transfer and lower environmental impact compared to older refrigerants like R22. Global warming potential (GWP): While R407C has no ozone depletion potential (ODP), it possesses a moderate GWP, necessitating responsible handling and leakage prevention.

Table 4-2 presents the refrigerant consumption data for R-407C used in HVAC (Heating, Ventilation and Air Conditioning) systems from 2022 to 2024, along with the corresponding CO₂-equivalent emissions. The sharp increase in 2023 indicates a higher demand for refrigerant, due to increased HVAC operation and system inefficiencies. However, the 2024 reduction suggests better refrigerant handling and leakage prevention efforts.

Leak Management: Regular system inspections, leak detection programs and preventive maintenance measures are implemented to minimize refrigerant loss and reduce environmental impact. Regular system audits would be conducted to detect and repair leaks promptly. Material safety data sheet of R407C is attached in **Appendix T** and the recommended instructions would be followed while handling and maintaining the refrigerant. The lists of HVAC equipment installed offshore facilities are attached in **Appendix S**.

Table 4-2 Emissions from Refrigeration/ AC Equipment: User Based Approach (R-407C)

Refrigerant Used for HVAC	Consumption (kg)			Conversion Factor (ton/kg)	GWP of Refrigerant	CO ₂ -Equivalent Emission (tons)		
	2022	2023	2024			2022	2023	2024
R-407C (11kg Cylinder)	110	385	220	1 E-03	1,774	195.14	682.99	390.28

The CO₂-Equivalent Emission in tonnes = (Emission x Conversion Factor x GWP)

Reference for GWP: <https://www.infraserv.com/en/services/facility-management/expertise/f-gas/gwp-calculator/>

UNDP Guidance Note: Assessing Greenhouse gas emissions from refrigerants use in UNDP Operations

4.3 Project Description of Midstream and Onshore Development – Phase 1

4.3.1 Location

Onshore facilities are located to the south of Kyaukpyu at northwest Ramree Island. The setting of the onshore Project Area comprised typically of undeveloped rural area.

The OGT site is 50.6 ha (105.35 Ac) in size and lies within degraded low hilly terrain at the edge of a flat lowland area and is located about 0.5 km from the coastline. The OGT site and the immediate surrounding areas are sparsely populated and located away from main villages. The onshore section of pipeline traverses' flat lowland areas and is routed through predominantly agricultural land and orchard away from main village areas. Existing infrastructure in proximity to the OGT is limited to an existing access track, which serves Lakekhamaw village to the south.

The OGT receives gas production via export gas pipeline from SHP, located at the edge of the continental shelf approximately 106 km northwest of Ramree Island. A schematic of the main components for the Shwe and Mya field developments and their link to the midstream facilities, namely the export gas pipeline and Onshore Gas Terminal with the Overall Field Development.

The Area of Influence of the Project's midstream facilities is described in **Table 4-3**.

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Table 4-3 Midstream Facilities Project Area of Influence

Categorization of Areas	Areas Impacted
The primary Project Site and associated Facilities that PIC develops or controls	OGT, Access Road (existing), Right of Way access road, onshore pipeline and landing, offshore pipeline.
Associated related facilities	Jetty and Hangar
Cumulative Impacts	None identified.
Unplanned but predictable developments caused by the Project that may occur later or at a different location.	None identified.
Other associated area of impact	Includes Malakyun village areas to the north, Lakekhamaw village to the south

4.3.2 Project Facilities and Activities

The midstream facilities of the Shwe and Mya Field development comprise of the following facilities and infrastructure:

- A 32" nominal diameter offshore carbon steel midstream pipeline for dry gas transport (105 km in length) from SHP to the onshore landing point;
- An onshore pipeline from the landing point to the onshore gas terminal (5 km in length);
- An onshore gas terminal (OGT); and,
- A jetty & jetty facility supply base and a hangar.

4.3.2.1 Export Pipelines

With the exception of the shore approach where trenching was undertaken, the export pipeline is laid on the surface of the seabed. The landing point of the pipeline and the route onshore are shown in **Figure 4-8**.

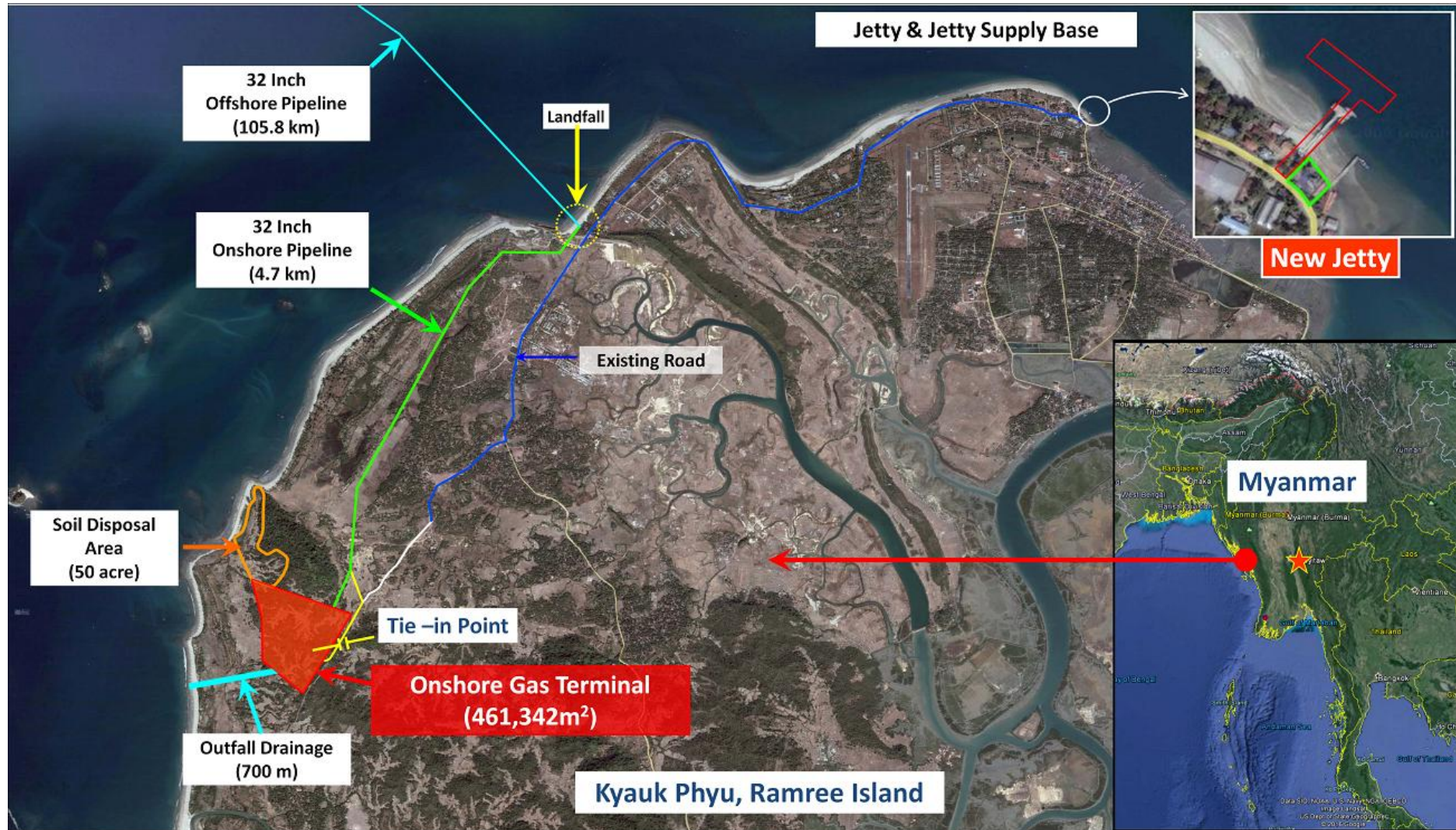


Figure 4-8 Location of the Supply Base and Jetty (Source: PIC)

4.3.2.2 Onshore Gas Terminal (OGT)

The SHP export pipeline links to the Onshore Gas Terminal (OGT) consisting of a Receiving Station and a Metering Station and the site contains:

- A reception terminal and metering station including process facilities, utility facilities and metering skid;
- An accommodation area including administration building, ware house, staff living quarters, common building, technical building, workshop and laboratory;
- Open storage areas (e.g., pipe yard, container storage area, scrap area, garbage area and equipment parking area), car park, internal access roads, drains, culverts, perimeter security fencing and gates.
- A reserved area for future extension of facilities;
- A reserved safe zone area around the perimeter of the site; and
- Power generation facilities, sewage treatment, vent, water supply and fuel storage.

Onshore, in addition to the OGT, there is also a hangar and jetty with access roads. Details of the infrastructure are provided in the following sections. The OGT is shown in **Figure 4-9**.



Figure 4-9 Photo of OGT

4.3.2.3 Hangar Facility

Hangar construction commencement September 2012 and base set up has been completed at KPU since 16th June 2013 (Figure 4-10). KPU MOB (Kyaukpyu Main Operations Base) is utilized as the permanent RW (Rotary Wing) MOB and is located at the Kyaukpyu airfield in Rakhine State which is near the On-shore Gas Terminal. The structure of main hangar measure 120ft wide x 150ft long, with sidewalls that consists of concrete tilt up panels more than 24ft high. Floor type is concrete construction. Load bearing specifications exceed criteria established by the pre-engineering building manufacturer.



Figure 4-10 Photo of Hangar Facility

It is able to accommodate two helicopters, side by side and allows full maintenance to be carried out on the aircraft. Apron area of hangar taxiway measures 200ft wide x 100ft long, it is a path for aircraft at an airport connecting runways with hangar.

A Jet A-1 Fuel facility area measure 98ft wide x 164ft long, with a capability to store and safely dispense fuel to Helicopters from a 50,000 liters storage and fueling system. These are constructed to meet NFPA 407 standards for aircraft fuel servicing. Helicopters are limited to 9000lbs Maximum Take Off Weight (MTOW). Airport facilities include access to the 7500ft x 100ft airport runway, Non-Directional Beacon (NDB) radio navigation aid, identification of which is Kyaukpyu on 250 MHz. The airport includes a Control Tower and passenger handling facilities.

4.3.2.4 Helicopter, Vehicles and Machineries

Crew changes are likely by fixed wing from Yangon to Kyaukphyu and by helicopter from Kyaukphyu to offshore. The information of the helicopter, machineries and vehicles used is shown in the following tables.

Table 4-4 Helicopter's Data

Model of Helicopter	Frequency of the helicopter used per year	Fuel			Machineries	
		Type of Fuel Tank	Number of Storage Tanks	Volume	For Lighting	For Safety of Fire
AW 139 B-72CX and AW 139 B-72 CV	300 Flights	25000LTR Double wall and Carbon Steel with Epoxy Coated tank	2	50000LTR	Generator for alternative	Fire Fighting Truck

Table 4-5 Vehicle Fuel Usage (2024)

Month	No. of Vehicles	Total KM	Total Litres
Jan	19 Vehicles	2623	1529
Feb		2825	1235
Mar		3155	1345

Month	No. of Vehicles	Total KM	Total Litres
Apr		1723	2696
May		3302	1410
Jun		3171	1506
Jul		2903	668
Aug		2473	1727
Sep		2903	1281
Oct		2488	1429
Nov		2643	1229
Dec		2870	1656
Monthly Average			2725

Although unlikely to impact to the sensitive habitats and species in the project area and the seabed where the drilling is occurring as small-scale potential impact by emission from the helicopter, **SANGEA software shall be used for calculation of GHG Emission from helicopters, vehicles and Machineries.**

Table 4-6 GHG Emission (Ton CO₂e) (2024)

Location	Monthly GHG Emission (Ton CO ₂ e)											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
SHP	13730	13179	10841	13387	14292	13014	14440	14293	12835	13261	12683	13662
OGT	338	315	440	1495	378	367	364	356	356	371	341	344

Source: GHG calculation by SANGEA software

4.3.2.5 Jetty

A 70 m long, 8 m wide, Jetty Trestle has been constructed over a short stretch of sandy shores, at Kyaukpyu. At the end of the Jetty lies an 80 m x 20 m loading / unloading platform in coastal waters with a water depth of approximately 7 m at Lowest Astronomical Tide (LAT). The Jetty area is flood-lit and has fire pumps and fire-fighting equipment installed. The Jetty layout is presented in **Figure 4-11**.

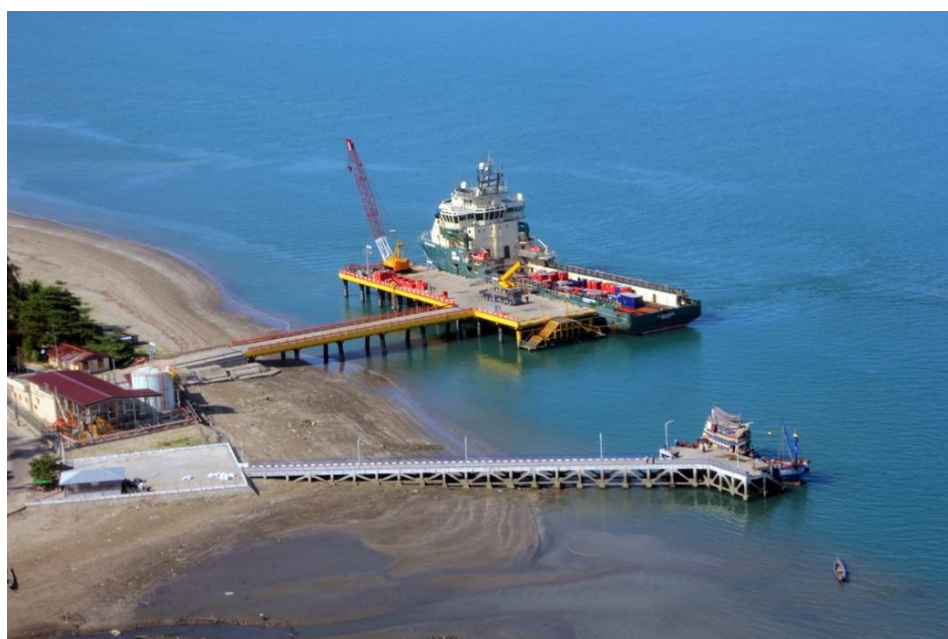


Figure 4-11 Photo of Existing Jetty

4.3.2.6 Access Road

Connecting the Access Road and Jetty is a 15 m long, 7 m wide restricted area with a gate to control access to the Jetty. A 3 m x 3 m guard house sits at the end of the Access Road next to the gate.

4.3.2.7 Air conditioner and Refrigerant Using at OGT

The designated refrigerant used for OGT operations is 1,1,1,2-Tetrafluoroethane (R-143A), a hydrofluorocarbon (HFC) refrigerant widely utilized in industrial cooling systems, air conditioning units, and refrigeration applications. R-134a is a non-ozone depleting substance and is preferred for its thermal efficiency and stability.

Table 4-7 provides data on R-143A refrigerant consumption for HVAC (Heating, Ventilation and Air Conditioning) systems from 2021 to 2024, along with the associated CO₂-equivalent emissions. The peak consumption in 2022 and 2023 indicates increase refrigerant demand, possibly due to system maintenance, refilling or leakage. However, 2024 shows a notable decrease, suggesting improved refrigerant management practices.

Leak Management: Regular system inspections, leak detection programs and preventive maintenance measures are implemented to minimize refrigerant loss and reduce environmental impact. Regular system audits would be conducted to detect and repair leaks promptly. To optimize refrigerant use and minimize environmental impact, low-GWP alternative refrigerants would be potentially adopted in future. The list of HVAC equipment for OGT is mentioned in **Appendix S**. Material safety data sheet of R-143A is attached in **Appendix T** and the recommended instructions would be followed while handling and maintaining the refrigerant.

Table 4-7 Emissions from Refrigeration/ AC Equipment: User Based Approach (R-143A)

Refrigerant Used for HVAC	Consumption (kg)				Conversion Factor (ton/kg)	GWP of Refrigerant	CO ₂ -Equivalent Emission (tons)			
	2021	2022	2023	2024			2021	2022	2023	2024
R-143A (13.6kg Cylinder)	299.20	571.20	476.00	285.60	1 E-03	1,430	427.86	161.13	680.68	408.41

The CO₂-Equivalent Emission in ton = (Emission x Conversion Factor x GWP)

Reference for GWP: <https://www.infraserv.com/en/services/facility-management/expertise/f-gas/gwp-calculator/>

UNDP Guidance Note: Assessing Greenhouse gas emissions from refrigerants use in UNDP Operations

4.3.3 Status of Permits issued by relevant Departments

Regarding the project area located in the inland part, the Land permit for the OGT's area was obtained for land use through Ministry of Home Affairs' Notification No. (774/2016) dated 17th March 2016. The issued permits for all project facilities are as follow and all permits described in **Appendix C**.

- Certificate of Registration for Overseas Corporation
- MIC Permit No. 444 (A1 & A3)
- MIC Permit No. 445 (A1 & A3)
- MOE Permit (1229) Consumable Chemical
- Land Release Notification of Ministry of Home Affairs (774/2016)

4.3.4 Waste Generation

4.3.4.1 General Waste and Discharge

Waste from the current operations has been recorded by PIC throughout the operations phase of the Shwe Platform (SHP) (2013-2022 y.t.d.). The waste is on average 50,182 Kg per year. This mostly consists of

packaging waste, food waste, domestic waste, scrap metals, scrap wood (i.e., pallets) and some spent lube oils and other chemicals (*Table 4-8*).

All waste is managed in accordance with the Waste Management Procedure (WMP) prepared for the Project. General Non-Hazardous Wastes to reuse are offered to and collected by MOGE in accordance with the Waste Management Procedure (WMP) prepared for the Project.

Other General wastes such as Accommodation, Food waste is macerated and disposed overboard at SHP and Food and Kitchen Wastes from the onshore facility are collected by a Third-Party Company. Hazardous wastes are collected, disposed, and treated by certified waste handling company at their onshore treatment facility.

Table 4-8 Waste Generation per year from SHP/ OGT

Year	Count of Waste Weight Kg (SHP/OGT)
2013	246,742.0
2014	
2015	
2016	
2017	
2018	46,706.0
2019	14,060.0
2020	83,771.0
2021	76,415.0
2022	34,127.0 till to June 2022
Average/year	50,182

The waste weights recorded reduced after 2015 because the Shwe Drilling Program, from SHP, was completed at the end of 2015. The waste generated during operational phase is significantly less than the waste generated during the drilling phase.

4.3.4.2 Produced Water Treatment System

Produced water generated offshore is estimated to be an average of 600 barrels (bbl.) per day (i.e., around 95 m3 per day). All produced water is first routed to the Produced Water Degassing Drum for bulk oil and water separation. To improve oil/water separation, a chemical (water clarifier) is continuously injected at the inlet of the Produced Water Degassing Drum using an injection pump to achieve the recommended concentration (300 – 400 ppm water clarifier in produced water). The water clarifier helps in breaking oil/water emulsion and coalescence of small oil droplets into larger ones, thus improving the removal of oil from the produced water. The oil floats to the top of the Produced Water Degassing Drum and overflows through a weir to the oil section where it is sent for re-injection. The produced water leaving the bottom of the Produced Water Degassing Drum is then treated in the Produced Water Deoiler Hydrocyclones to further reduce the oil content before it is discharged to the Hazardous Open Drain (HOD) Caisson. The HOD Caisson is the last treatment unit in the produced water system where any residual oil is recovered and pumped back to the topside process system by the HOD Pump. The whole treatment system ensures that the water which exits the HOD Caisson (at a point 18.5 meters below mean sea level) is almost oil-free. This complies with the guideline mentioned in Section 2.1.5 for Offshore Oil and Gas of NEQEG (2015) which states “Re-inject, discharge to sea maximum one day oil and grease discharge should not exceed 42 mg/l; 30 days average should not exceed 29 mg/l”. The schematics of the produced water treatment system is shown in Figure 4-12. A sample point is provided at the outlet of the Produced Water Deoiler Hydrocyclones for periodic sampling; however, it is not possible to collect a sample from the immediate outlet of the HOD Caisson (at 18.5 meters below mean sea level).

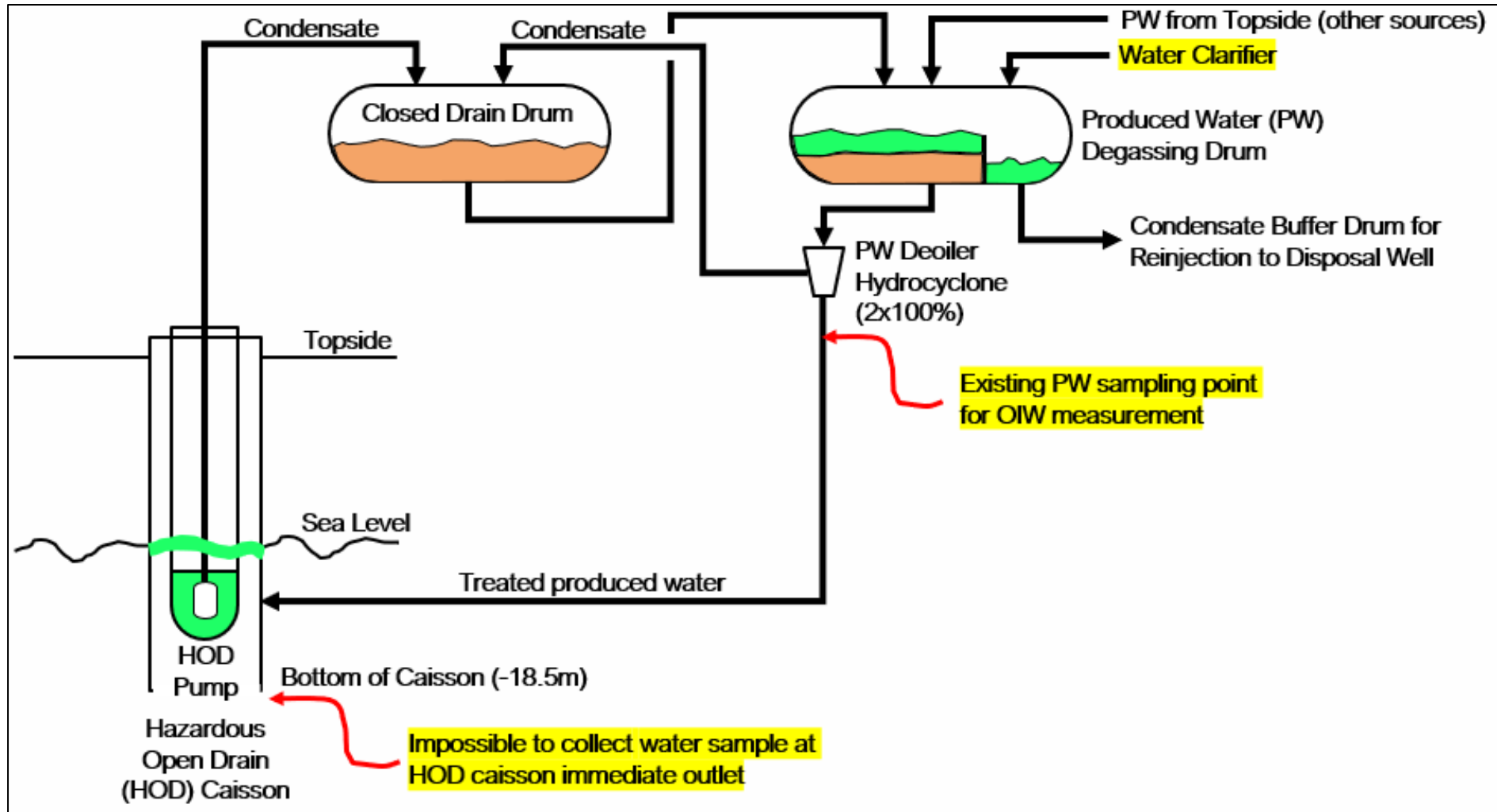


Figure 4-12 The Produced Water System and Measurement Point of OIW Content

4.3.4.3 Workforce for Offshore and PIC YANGON

The manpower for the PIC's Offshore and Yangon Office is described in **Table 4-9**.

Table 4-9 Workforce for Offshore and PIC YANGON

PIC YANGON MANPOWER		Korean		National				TOTAL
		Office		Office		Rotational	MOGE	
		M	F	M	F	M/F	M	
1	Management	1		0	0	10	0	1
2	ICT TF	1		6	4	0	0	11
3	HR & Administration Department	2	1	3	7	0	0	13
4	Finance & Accounting Department	3		1	10	0	0	14
5	Operations & Maintenance Department - Operations Section	7		10	6	95	0	118
	Operations & Maintenance Department - Maintenance Section	7		22	4	95	0	128
6	Procurement & Logistics Department	2		8	14	0	0	24
7	External Relations & CSR Group			4	1		1	6
TOTAL		23	1	54	46	200	1	315
		23	1	100		200	1	315
PIC OFFSHORE MANPOWER								
BRITISH								7
FILIPINO								6
INDONESIAN								0
MYANMAR								257
KOREAN								31
MALAYSIAN								11
MEXICAN								2
CROATIAN								1
FRENCH								1
INDIAN								5
VIETNAMESE								4
THAILAND								1
TOTAL								315

4.3.5 Operational Phase of onshore (midstream) activities and facilities

This section describes the operational phase onshore (midstream) activities and facilities in relation to the Shwe Project.

4.3.5.1 Waste Collection and Discharge

Non-Hazardous Waste: A permanent sewage treatment system has been provided in the OGT for the treatment of black and grey water. There is also a sanitary waste system consisting of a collection system and purpose designed and fabricated package sewage treatment unit. Domestic waste from the administration building, various terminal control rooms and accommodation and recreation facilities is treated by the sewage treatment unit prior to discharge via the interceptor pond outfall weir system and hence into a drainage channel which is routed to sea. Sewage treatment is performed via chemical and biological treatment methods. The total maximum daily sewage treatment capacity is 15,000 L. All the permanent, non-piped, drains are lined with concrete or bricks.

Hazardous Waste: Fuel supplies including that needed for land transport and diesel generator are stored at the OGT. Stationary equipment that could release hydrocarbons and that are not located in a curbed area are installed on skids containing drip pans. An open drain system collects spills and rainwater from all equipment skids and other appropriate areas. The drained fluids are collected in an underground, lined sump and contaminated drain water is routed to an underground open drains tank. Any oil separates out in this tank and is removed by portable pump into drums etc. for correct disposal.

Drainage from open areas that are not subject to hydrocarbon spills flows via storm drains to the interceptor pond. Should a hydrocarbon spill in these areas occur from mobile equipment, such as fuel, or oil prompt spill clean-up will occur using strategically placed spill clean-up supplies. The interceptor pond includes a weir system to prevent oily water from leaving the OGT plant area.

Engine wastes, such as lube oil, hydraulic fluid, engine coolant and solid wastes are collected, under contract, by a certified collection and disposal company in accordance with the Waste Management Procedure (WMP) prepared for the Project. Storage and handling of such wastes are designed to minimize opportunities for accidental release. Similarly, the production of waste has been minimized through good design and management procedures, as practicable.

4.3.5.2 Supply, Support & Logistics

The materials, supplies and personnel for onshore operations are currently transported to the onshore receiving facilities by road access.

4.3.5.3 Buildings



At the onshore facilities there are currently the following buildings:

- An office building for administration;
- An accommodation camp building for residential housing for site staff, this also houses the mess/recreation, kitchen and laundry facilities for staff;
- A control room building which houses the control room and contains all facility control functions. The control room also contains all plant monitoring, safety and control equipment consoles. An operations lab is located beside the control room;
- A warehouse building which houses all warehousing for equipment spare parts; and
- A workshop building for equipment maintenance.

4.3.5.4 Workforce for OGT

There is workforce of OGT is up to 137 personnel including one foreigner.

Table 4-10 Detail OGT Manpower

<div>   </div>					
OGT MANPOWER					
No.	Position	Nationality	Company	Department	Remark
1	Superintendent	Myanmar	PICM	OMD	
2	Superintendent	British	COENS	OMD	
3	HSSE Supervisor	Myanmar	PICM	OMD	
4	HSSE Supervisor	Myanmar	PICM	OMD	
5	Production Supervisor/Lead Operator	Myanmar	PICM	OMD	
6	Production Supervisor/Lead Operator	Myanmar	PICM	OMD	
7	Production Supervisor/Lead Operator	Myanmar	PICM	OMD	
8	Production Supervisor/Lead Operator	Myanmar	PICM	OMD	
9	Production Tech	Myanmar	PICM	OMD	
10	Production Tech	Myanmar	PICM	OMD	
11	Production Tech	Myanmar	PICM	OMD	
12	Production Tech	Myanmar	PICM	OMD	
13	Production Tech	Myanmar	PICM	OMD	
14	Production Tech	Myanmar	PICM	OMD	
15	Production Tech	Myanmar	PICM	OMD	
16	Production Tech	Myanmar	PICM	OMD	
17	Production Tech	Myanmar	SMART	OMD	
18	Production Tech	Myanmar	SMART	OMD	
19	Maintenance Supervisor	Myanmar	PICM	OMD	
20	Maintenance Supervisor	Myanmar	PICM	OMD	
21	Electrical Lead Technician	Myanmar	PICM	OMD	
22	Electrical Lead Technician	Myanmar	PICM	OMD	
23	Electrical Technician	Myanmar	PICM	OMD	
24	Electrical Technician	Myanmar	PICM	OMD	
25	Electrical Technician	Myanmar	PICM	OMD	
26	Electrical Technician	Myanmar	M&A	OMD	
27	Mechanical Lead Tech	Myanmar	PICM	OMD	
28	Mechanical Lead Tech	Myanmar	PICM	OMD	
29	Mechanical Technician	Myanmar	PICM	OMD	
30	Mechanical Technician	Myanmar	PICM	OMD	
31	Mechanical Technician	Myanmar	PICM	OMD	
32	Mechanical Technician	Myanmar	PICM	OMD	
33	Instrument Lead Technician	Myanmar	PICM	OMD	
34	Instrument Lead Technician	Myanmar	PICM	OMD	
35	Instrument Technician	Myanmar	PICM	OMD	
36	Instrument Technician	Myanmar	PICM	OMD	
37	Instrument Technician	Myanmar	PICM	OMD	
38	Instrument Technician	Myanmar	PICM	OMD	
39	Warehouse Supervisor				
40	Warehouse Supervisor	Myanmar	PICM	OMD	
41	Warehouse Lead	Myanmar	PICM	OMD	
42	Warehouse Lead	Myanmar	PICM	OMD	



OGT MANPOWER



No.	Position	Nationality	Company	Department	Remark
43	CSR Representative	Myanmar	PICM	OMD	
44	Admin	Myanmar	M&A	OMD	
45	Admin	Myanmar	M&A	OMD	
46	Crane Operator	Myanmar	M&A	OMD	
47	Crane Operator	Myanmar	M&A	OMD	
48	Storeman	Myanmar	M&A	OMD	
49	Storeman	Myanmar	M&A	OMD	
50	Truck Driver/Helper	Myanmar	M&A	OMD	
51	Truck Driver/Helper	Myanmar	M&A	OMD	
52	Assistant Storeman	Myanmar	M&A	OMD	
53	Assistant Storeman	Myanmar	M&A	OMD	
54	Assistant Storeman	Myanmar	M&A	OMD	
55	Assistant Storeman	Myanmar	M&A	OMD	
56	Ferry Driver	Myanmar	M&A	OMD	
57	Ferry Driver	Myanmar	M&A	OMD	
58	Campboss	Myanmar	M&A	OMD	
59	Campboss	Myanmar	M&A	OMD	
60	Chief Cook	Myanmar	M&A	OMD	
61	Chief Cook	Myanmar	M&A	OMD	
62	Assistant Cook	Myanmar	M&A	OMD	
63	Assistant Cook	Myanmar	M&A	OMD	
64	Baker	Myanmar	M&A	OMD	
65	Baker	Myanmar	M&A	OMD	
66	Laundry Man	Myanmar	M&A	OMD	
67	Laundry Man	Myanmar	M&A	OMD	
68	Mess Boy	Myanmar	M&A	OMD	
69	Mess Boy	Myanmar	M&A	OMD	
70	Cleaning Lady	Myanmar	M&A	OMD	
71	Cleaning Lady	Myanmar	M&A	OMD	
72	Cleaning Lady	Myanmar	M&A	OMD	
73	Cleaning Lady	Myanmar	M&A	OMD	
74	Cleaning Lady	Myanmar	M&A	OMD	
75	Cleaning Lady	Myanmar	M&A	OMD	
76	Cleaning Lady	Myanmar	M&A	OMD	
77	Site Doctor	Myanmar	Leo Medicare	OMD	
78	Site Doctor	Myanmar	Leo Medicare	OMD	
79	MOGE Rep	Myanmar	MOGE	OMD	
80	MOGE Rep	Myanmar	MOGE	OMD	
81	MOGE Driver	Myanmar	Asteroid	OMD	
82	Security Supervisor	Myanmar	M&A	OMD	
83	Security Supervisor	Myanmar	M&A	OMD	
84	Security guard	Myanmar	M&A	OMD	
85	Security guard	Myanmar	M&A	OMD	



OGT MANPOWER



No.	Position	Nationality	Company	Department	Remark
86	Security guard	Myanmar	M&A	OMD	
87	Security guard	Myanmar	M&A	OMD	
88	Security guard	Myanmar	M&A	OMD	
89	Security guard	Myanmar	M&A	OMD	
90	Security guard	Myanmar	M&A	OMD	
91	Security guard	Myanmar	M&A	OMD	
92	Security guard	Myanmar	M&A	OMD	
93	Security guard	Myanmar	M&A	OMD	
94	Security guard	Myanmar	M&A	OMD	
95	Security guard	Myanmar	M&A	OMD	
96	Security guard	Myanmar	M&A	OMD	
97	Security guard	Myanmar	M&A	OMD	
98	Security guard	Myanmar	M&A	OMD	
99	Security guard	Myanmar	M&A	OMD	
100	Security guard	Myanmar	M&A	OMD	
101	Security guard	Myanmar	M&A	OMD	
102	Security guard	Myanmar	M&A	OMD	
103	Security guard	Myanmar	M&A	OMD	
104	Security guard	Myanmar	M&A	OMD	
105	Security guard	Myanmar	M&A	OMD	
106	Security guard	Myanmar	M&A	OMD	
107	Security guard	Myanmar	M&A	OMD	
108	Security guard	Myanmar	M&A	OMD	
109	Security guard	Myanmar	M&A	OMD	
110	Security guard	Myanmar	M&A	OMD	
111	Security guard	Myanmar	M&A	OMD	
112	Security guard	Myanmar	M&A	OMD	
113	Security guard	Myanmar	M&A	OMD	
114	Security guard	Myanmar	M&A	OMD	
115	Security guard	Myanmar	M&A	OMD	
116	Security guard	Myanmar	M&A	OMD	
117	Security guard	Myanmar	M&A	OMD	
118	Security guard	Myanmar	M&A	OMD	
119	Security guard	Myanmar	M&A	OMD	
120	Groundsman	Myanmar	M&A	OMD	
121	Groundsman	Myanmar	M&A	OMD	
122	Groundsman	Myanmar	M&A	OMD	
123	Groundsman	Myanmar	M&A	OMD	
124	Groundsman	Myanmar	M&A	OMD	
125	Groundsman	Myanmar	M&A	OMD	
126	Groundsman	Myanmar	M&A	OMD	
127	Groundsman	Myanmar	M&A	OMD	
128	Tree Keeper	Myanmar	M&A	OMD	
129	Tree Keeper	Myanmar	M&A	OMD	
130	Tree Keeper	Myanmar	M&A	OMD	
131	Tree Keeper	Myanmar	M&A	OMD	
132	Tree Keeper	Myanmar	M&A	OMD	
133	Tree Keeper	Myanmar	M&A	OMD	
134	Tree Keeper	Myanmar	M&A	OMD	
135	Tree Keeper	Myanmar	M&A	OMD	
136	Tree Keeper	Myanmar	M&A	OMD	
137	Tree Keeper	Myanmar	M&A	OMD	

4.3.5.5 Power Supply

The OGT uses on-site gas-powered engines to generate electric power. A diesel generator is available for use on start-up and in abnormal cases when fuel gas is unavailable. In the event primary power is interrupted, a battery supplied system (UPS) powers the Emergency Shutdown (ESD) and fire and gas systems to ensure the operation of critical systems in the event of a complete failure of the main power.

4.3.5.6 Water Supply

The fresh water supply is pumped from four wells installed to the aquifer, to the North of OGT, near the ROW and stored in water a storage tank. Two fire water storage tanks are also provided. Connections at utility stations provide wash down water for the facility.

4.3.5.7 Fuel Storage

The facility receives bulk diesel from supply trucks which pump the diesel into the raw diesel storage tank. The diesel is centrifuged and transferred into the treated diesel storage tanks. It is then distributed to users, including the facility vehicle fueling station, by motor driven diesel transfer pumps.

4.4 Project Decommissioning Phase

The Project facilities will only be decommissioned and removed once the gas reserves have been exhausted or when it is no longer economical to recover them. It is currently envisaged the decommissioning procedures will include:

- **Offshore platform and associated infrastructure:** Decommissioning of the offshore platform and infrastructure will be examined at a later stage and options may include the pipelines being abandoned in place with the pipe flushed and filled with seawater.
- **Onshore gas export pipeline:** Decommissioning of the onshore gas pipeline will be examined at a later stage and options may include the pipeline being cleaned and abandoned in place, or removed.
- **Metering station / OGT:** Any hydrocarbon handling equipment (piping, meter, pig receiver, valves, etc.) will be flushed, removed, and scrapped for salvage value or reused elsewhere. Any buildings, fences, utilities etc. will be retained for other uses, if feasible, otherwise demolished and removed.

It should be noted that decommissioning has not been covered as part of this EMP as a decommissioning plan will realistically only be developed during the latter stages of the Project's lifecycle. Assessment of the significance of the environmental impacts associated with decommissioning will, however, need to be conducted once the decommissioning plan is finalized and fully defined. Decommissioning will be conducted in accordance with the relevant national laws and good international industry practice at the time.

5. DESCRIPTION OF SURROUNDING ENVIRONMENT

5.1 Setting the Study Limits

The following section describes the physical, biological and human system (mainly fishing) within the waters of offshore Myanmar and the potential Study Area and Area of Influence (AOI).

It is considered important to note the definition of the following terminology used within this Section and throughout the report:

1. Project Area – the area in which the drilling may take place.
2. Study Area – the wider area in which environmental and social conditions are evaluated for interactions with project activities in order to determine the area of potential impacts from the Project.
3. Area of Influence - the area in which potential impacts could occur

As the Project Area located over 70 km from the nearest land, the focus of the baseline information is on open water habitats. The physical properties of the project's Study Area are not considered to be particularly sensitive and would be expected to be relatively homogenous in nature.

The Area of Influence varies depending on the receptor and activity. The Area of Influence (AOI) was defined as the operational area encompassing waters in the vicinity (up to 5 km away) of offshore field infrastructure and works areas within Block A-1 and A-3 and the surrounding waters offshore Rakhine State.

For environmental receptors, the Area of Influence is limited to the waters of the Project Area and the surrounding offshore waters of Rakhine State. For the social assessment, AOI includes Sittwe, the key decision-making centers (Yangon and Naypyidaw) and any towns where fishermen could potentially fish in the waters of offshore Rakhine. The closest receptors are located in the Rakhine State; the Project is 70 km from the Sittwe and 80 km from Kyauk Phyu. Given the location and nature of the project activities, the Project is not likely to have an impact on local villages or communities in Rakhine State. Therefore, the focus of the impact assessment was on large, offshore fisheries and fishing vessels.

The following provides information on the potential Area of Influence per activity/ receptor:

- Impacts to fisheries and fishing activity either through unplanned collision or from physical displacement of vessels will be limited to within the Project Area;
- Impacts to marine species could arise from drilling fluids and cuttings discharge, presence of the vessel, routing discharges of waste, and vessel noise. The Area of Influence for these impacts is limited to within the Project Area; they are not expected to impact the coastal sensitive receptors (such as seagrass and mangroves) or onshore receptors.
- Impacts from spills or leaks will on the marine environment will also be limited to the Project Area. As wells are targeting gas and not oil, unplanned spill events are also unlikely to impact the coastline.

Given the Area of Influence is offshore open waters the environmental impact assessment will focus on habitats and species in this area. Information on coastal areas and protected areas is included to provide a general baseline description.

5.2 Methodology and Objectives

The purpose of reviewing the baseline conditions is to present an understanding of the potential environmental and social sensitivities of the surrounding environment that could be impacted by the Project activities. Reviewing the baseline conditions allows PIC and its advisors to make an informed judgement on the appropriate level of impact assessment for the Project.

The information provided in this section is based on data collected by PIC from primary and secondary sources. Primary data sources used are provided in Table 5-1.

Table 5-1 Primary Data Collection for the Project

Receptor	Data Source
Water Quality	
Sediment Characteristics	<ul style="list-style-type: none"> Environmental data collected during the previous Phase 1 EIA Studies between 2008 and 2013 Environmental data collected in 2017 for this Phase 2 EIA Study to supplement and update previous Phase 1 data
Fish	
Plankton	
Macrobenthos	
Coral surveys	<ul style="list-style-type: none"> Environmental data collected during the previous Phase 1 EIA Studies between 2008 and 2013

5.3 Offshore Environmental Baseline Survey

5.3.1 Survey Locations and Parameters

Primary offshore marine environmental baseline surveys were conducted as part of the Phase 1 Shwe Development Project in **2007**. A total of 70 sampling locations were surveyed.

To supplement the previously collected data, 26 sampling locations were surveyed in March **2017** for the proposed Phase 2 Shwe Development. Sampling Location is described in **Figure 5-1**.

In order to provide an up-to-date characterization of marine environmental conditions in the surrounds of the proposed SHK location, four sampling locations were surveyed at Block A-1 in February/March **2019**.

Figure 5-2 is illustrated for the sampling Location.

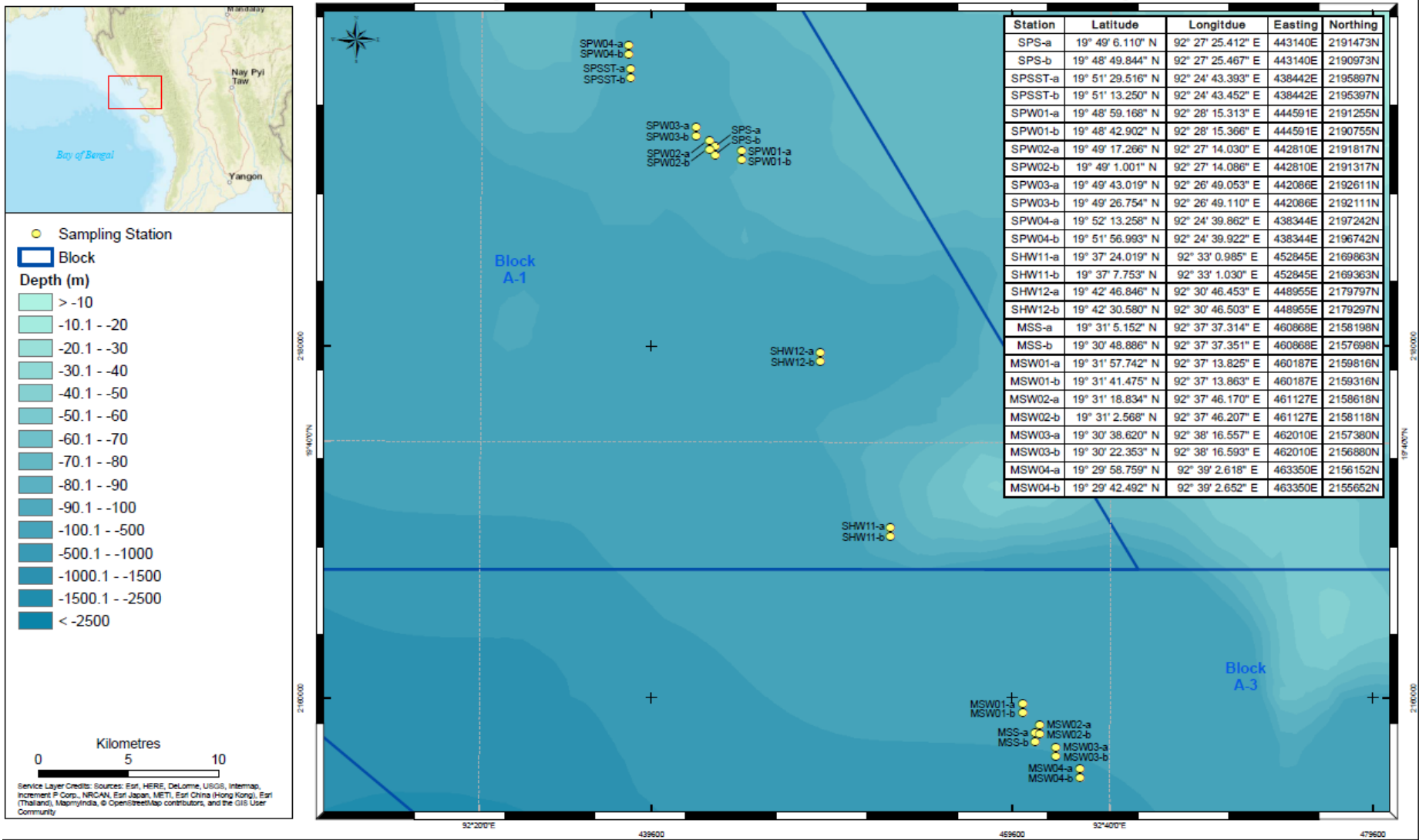


Figure 5-1 Sampling Stations Marine Environmental Baseline Study (2017) in Block A-1 and A-3

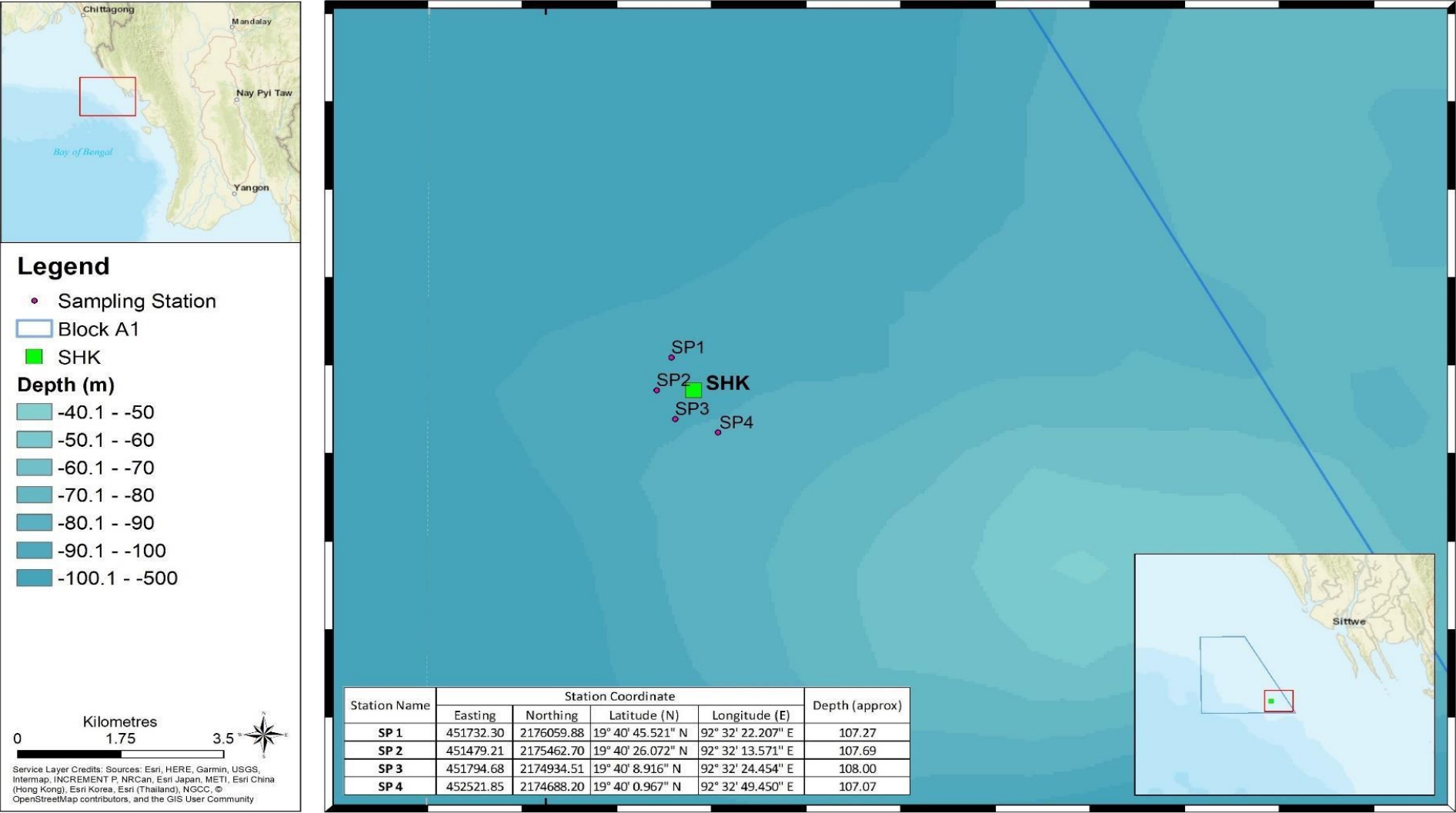


Figure 5-2 Sampling Stations for Marine Environmental Baseline Study in Block A-1 (2019)

5.3.2 Sampling Procedures

Seawater Sampling

Seawater samples were collected using a 7.5 litter capacity Niskin Water Sampler attached to a clean steel cable of the winch. Using the winch to lower the sampling equipment through the water column, seawater samples were collected from 10m depths at each sampling station. Once the sampler was retrieved on board the vessel, water probes were used to immediately record in-situ measurements and samples directly transferred to the appropriate pre-labelled storage bottles, labelled, preserved as applicable and stored at <4°C. In addition, a Secchi disk attached to a rope was used to take a measurement of the transparency depth of the water column.

Representative photographs of the seawater sampling conducted for the primary marine baseline survey are presented in **Figure 5-3**.



Figure 5-3 Representative Photos of Seawater sampling Equipment and Procedures from the Primary Marine Baseline Surveys

Sediment and Macrobenthos Sampling

Sediment samples were collected from the seabed using a 0.1m² day grab sampler deployed on a clean cable wire, designed for operation in a deep-sea environment. After retrieval, each collected grab sample was inspected and once accepted labelled and photographed. Sediment samples for hydrocarbon analysis were transferred into appropriate pre-labelled storage bottles using a seawater rinsed metal utensil while samples for metals analysis were collected using seawater rinsed plastic utensil and then stored at <4°C. The day grab and all other utensils were rinsed with seawater after each sample has been collected to avoid cross contamination between samples.

Sediment for macrobenthos analysis was sieved on-board the survey vessel by 1 mm and 0.5 mm mesh sieves. The sediment was washed onto a sieve stack and gently rinsed with seawater to remove all fine material. The remaining fauna was collected and transferred to zip lock plastic bags and preserved in formalin solution to ensure tissue preservation prior to delivery to the laboratory for taxonomic sorting and identification.

Representative photographs of the sediment sampling equipment conducted for the primary marine baseline survey and sieve stack are presented in **Figure 5-4**.



Figure 5-4 Representative Photos of Sediment Sampling Equipment and Procedures from the Primary Marine Baseline Surveys

Plankton Sampling

Plankton samples were collected by towing a plankton net vertically from a depth of 25m (i.e. vertical haul method). The plankton mesh size for phytoplankton sampling was 20 μm while 50 μm was used for zooplankton. On retrieval, the outsides of the plankton net were washed down with seawater in order to wash any plankton adhered to the net down into the cod end. The samples were transferred to glass bottles and preserved in Lugol's solution for phytoplankton and formalin solution for zooplankton prior to delivery to the laboratory for taxonomic identification.

Representative photographs of the plankton sampling equipment conducted for the primary marine baseline survey are presented in **Figure 5-5**.



Figure 5-5 Representative Photos of Plankton Sampling Equipment and Procedures from the Primary Marine Baseline Surveys

Laboratory Analysis

All seawater and sediment samples transferred from the survey vessel to the laboratory were accompanied by Chain of Custody (COC) forms to ensure the accuracy of the records. Analysis was conducted by an accredited laboratory and the methods used are American Public Health Association (APHA) and Environmental Protection Agency of United States (USEPA) where applicable, and/or other acceptable international analytical methods. Standard Quality Assurance and Quality Control (QA/QC) procedures were employed during the laboratory analysis of samples.

For macro-benthos analysis, standard and accepted techniques were used for sorting organisms from the sediments. Samples were placed in a petri dish under a 10-power magnification dissecting microscope. The petri dish was scanned systematically and all animals and fragments were removed using forceps. Organisms representing major taxonomic groups including Polychaeta, Arthropoda, Mollusca, and miscellaneous taxa were sorted into separate, labelled vials containing ethanol solution.

Taxonomic identifications were performed (using stereo dissecting and high-power compound microscopes) to the family level except for dominants, which will be identified, where possible, to species level. Careful sampling procedure minimizes fragmentation of organisms, however, if breakage of soft-bodied organisms occurred; only anterior portions of organism fragments were counted. All fragments were retained and weighed to determine biomass. Rare or questionable taxa were compared against reference collection specimens for confirmation and consistency of identification. Biomass determinations were made by taking the blotted wet mass of each taxonomic fraction.

5.4 Social Baseline Surveys

As part of the EIA procedure, a detailed baseline data collection was undertaken to update the baseline data and adequately assess the potential impacts from the Project on the local communities. This baseline will be established on the basis of Focus Group Discussions (FGD) and interviews with local communities and other interested stakeholders in all Townships. Stakeholders will be asked questions using both checklists and informal interviews to find out the village and household level information on demographics, income, infrastructure, fishing and livelihoods.

Stakeholder engagement was conducted across administrative levels, subject to permissions of responsible authorities. Engagement was conducted in March/April and September 2019. A consultation team consisting of MOGE, ERM, EQM, and PIC representatives conducted meetings and consultations at the administrative levels. To ensure village level representation, a request was made to the Township GAD offices for village tract leaders from the potentially impacted fishing villages to be present.

The key stakeholders engaged included:

- General Administrative Department (GAD) (Township);
- Department of Fisheries;
- Myanmar Fisheries Federation (MFF);
- Village Tract Leaders and Elders;
- Fishing Communities;
- Civil society organizations; and
- Non-Governmental Organizations (NGOs).

In order to inform stakeholders about the Project and share information on the activities, a two-page flyer was produced which contained Project information and details on how to feedback into the Project. All information was communicated through the use of visual media (including posters and power point presentations) and was provided in local Myanmar language. To gather more environmental and social baseline data and to identify potentially affected communities, FGDs were undertaken with village leaders, and were guided by questionnaires covering information relating to:

- Generic village profile: Collected information on demographic patterns, communities, occupations, and communication and grievance systems.
- FGD questionnaires: Collected information at the fishing group level.
- Environment: Collected information on marine species and protected areas.

All information collected was summarized and confirmed with stakeholders at the end of the discussion. Stakeholders were also given time to share their concerns and views and any further clarifications they required at the end of the meetings.

Any queries raised by the stakeholders were responded to, and noted to feed into the impact assessment process for the EMP.

5.4.1 Desktop Research

Secondary data sources include but not limited to; Fauna and Flora International (FFI) documentation, Wildlife Conservation Society (WCS) documentation, and GAD Township Reports were reviewed. In addition, desktop literature reviews by, ERM and REM of scientific papers, other publications and previous EIA Reports were carried out.

These data have also been supplemented by information provided by various stakeholders, including government bodies (e.g. Ministry of Education's Department of Marine Science), scientific organizations (e.g. Marine Science Association Myanmar), and local communities.

5.5 Physical Environment

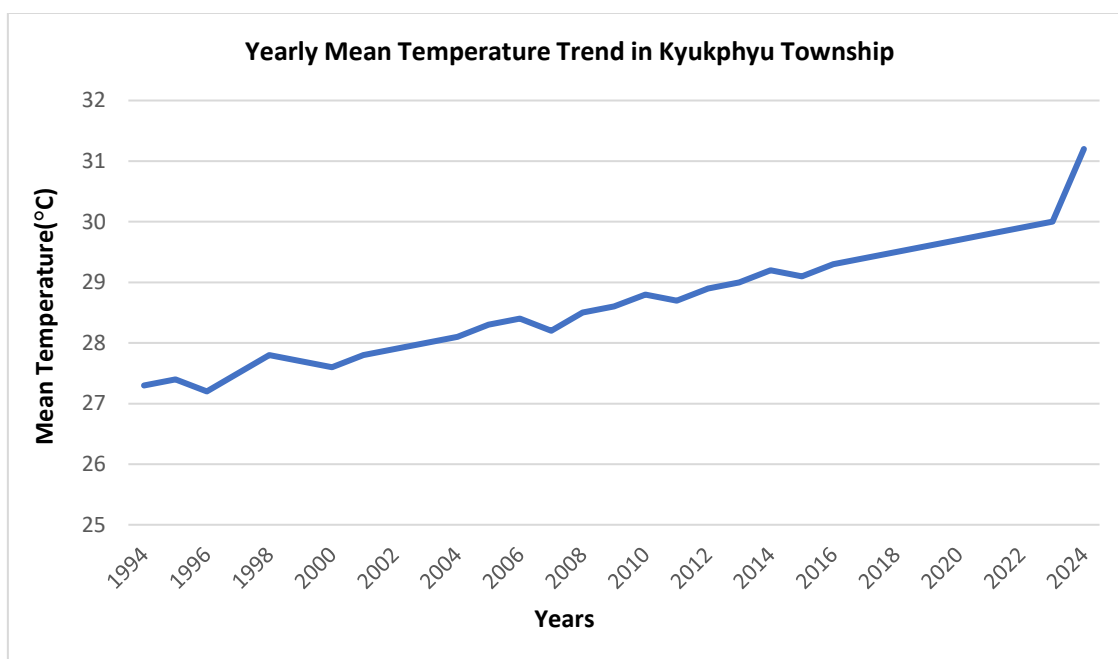
5.5.1 Climate and Meteorology

The weather and climate of Myanmar are primarily influenced by the northeast and the southwest monsoons and the short transitional periods between them. The southwest monsoon (June to September) is characterized by extensive cloud cover, light rain almost daily, interspersed with rain squalls or thunderstorms. The northeast monsoon (December to April) brings less cloud, scant rainfall, mild temperatures and lower humidity during winter (Suwannathatsa, et al, 2012).

The spring and autumn transition periods between the monsoons (April and May, October and November) are generally hot with very variable weather and heavy squalls. The transition periods are governed by the Inter-Tropical Convergence Zone (ITCZ) which separates the main wind streams of the northern and southern hemispheres. The ITCZ moves seasonally over the area (northwards in spring and southwards in autumn), with no well- defined weather pattern (Suwannathatsa, et al, 2012).

Based on meteorological records at the Shwe Field (in Block A-1), the mean temperature is reported to be in the range of 24 - 27°C. The minimum temperature is between 19 - 24°C, while the maximum is approximately 34°. The warmest months are April to October while the coolest months are December to February.

Winds are generally light to moderate, with mean monthly wind speeds falling in the range of 3.2 m/s to 7.1 m/s. Strong winds (> 10 m/s) are most persistent during the southwest monsoon season in the months of June to August. Wind speed less than 2 m/s only occur less than 7 % of the time during the year. The period (from November to March) corresponds to cooler and drier months and the windspeed would be light winds (2-5 km/h), which may be associated with stable atmospheric conditions. During the monsoon season (from May to October), moderate winds (5-10 km/h) become more dominant with seasonal changes. The steady breezes (10-20 km/h) are the most common during May to September and are frequently observed, influencing weather conditions such as increased rainfall and possible storm formations. The stronger winds (20-30 km/h) may contribute to occasional rough weather conditions, including storm surges or increased wave activity in coastal areas and sporadically observed from June to September.



Source: https://www.meteoblue.com/en/climate-change/kyaukpyu_myanmar_1316752

Figure 5-6 Yearly Mean Temperature Trend in Kyaukphyu Township (1994-2024)

Table 5-2 Yearly Precipitation in Kyaukphyu Township (1994-2024)

No.	Year	Total Precipitation (mm)	Description
1.	1994	1950	wetter year
2.	1995	1930	wetter year
3.	1996	1900	average year
4.	1997	1850	average year
5.	1998	2000	wetter year
6.	1999	2050	wetter year
7.	2000	1980	wetter year
8.	2001	2020	wetter year
9.	2002	2070	wetter year
10.	2003	2100	wetter year
11.	2004	2150	wetter year
12.	2005	2200	wetter year
13.	2006	2170	wetter year
14.	2007	2190	wetter year
15.	2008	2230	wetter year
16.	2009	2250	wetter year
17.	2010	2300	wetter year
18.	2011	2280	wetter year
19.	2012	2320	wetter year
20.	2013	2340	wetter year
21.	2014	2360	wetter year
22.	2015	2390	wetter year
23.	2016	2410	wetter year
24.	2017	2440	wetter year
25.	2018	2470	wetter year
26.	2019	2490	wetter year
27.	2020	2500	wetter year
28.	2021	2530	wetter year

No.	Year	Total Precipitation (mm)	Description
29.	2022	2550	wetter year
30.	2023	2570	wetter year
31.	2024	2600	wetter year

Source: Meteoblue.com/ https://www.meteoblue.com/en/climate-change/kyaukpyu_myanmar_1316752

5.5.2 Natural Hazards

5.5.2.1 Storms and Cyclones

Gale force winds (17.2 m/s or over) are mainly associated with local rain squalls and with severe tropical storms or cyclones. The central region off the coast receives the worst buffeting during the summer monsoon. The threat of cyclones with winds above 32.7 m/s affects different areas at different times of the year, affecting all areas though the major tracks do not pass over the Andaman Sea. They are most frequent from mid-May to early December.

5.5.2.2 Earthquakes

A review of available literature has shown that Myanmar is seismologically unstable and vulnerable to earthquakes due to its location in the active Alpide seismotectonic belt and the young Alpine-Himalayan-Sumatran orogenic belt (Theilen and Pararas-Carayannis, 2009). Historic records show that at least 15 major earthquakes with magnitudes $M \geq 7.0$ RS have occurred in Myanmar in the last hundred years. These earthquakes occurred within Myanmar in the last century, at Bago (5 May 1930), at Yangon (27 March, 16 May and 21 May 1931), at Sagaing (16 July 1956) and at Bagan (8 July 1976) (Union of Myanmar, 2009). More recently, a M6.8 RS occurred with an epicentre west of Chauk, adjacent to Rakhine State (24 August 2016). Historical records of earthquakes are noted within the Study Area and the magnitudes of the earthquakes were ranked 5 or less (Union of Myanmar, 2009).

5.5.2.3 Tsunami

Myanmar is an earthquake-prone country and at moderate risk for tsunamis. Tsunamis have been recorded in the Myanmar coastal areas. The recent 2004 tsunami generated by the Sumatra earthquake caused moderate damage to the Rakhine Coast, Ayeyarwady Delta and the Tanintharyi Coast with more than 60 lives and hundreds of boats lost (Union of Myanmar, 2009). The southern Rakhine Coast, including Thandwe and Gwa, is generally rocky and sandy without mangrove protection. As such, it is considered that this area is comparatively more vulnerable to a potential tsunami.

5.5.3 Oceanography and Hydrology

The surface circulation of the Bay of Bengal moves generally clockwise from January to July and counter-clockwise from August to December, in accordance with the reversible monsoon wind systems. The flow is not constant and depends on the strength and duration of the winds. The effects of a strong wind blowing for a few consecutive days are reflected in the rate of flow. Currents to the northeast generally persist longer and flow at greater speed because of the stronger southwest monsoons. An important vertical circulation in the Bay of Bengal is a surge very similar to up-welling. In this process, sub-surface water is brought toward the surface.

Tides in the Study Area are semi-diurnal with a recorded tidal range of approximately 2 m at the Shwe Field, which is similar to coastal areas of the Study Area (Table 5-3).

Table 5-3 Tidal Information for the Study Area

Tidal Descriptor	Tidal Height in relation to Mean Sea Level (MSL)
Highest Astronomical Tide	+1.57
Mean High Water Level on Spring Tide	+1.03

Mean High Water on a Neap Tide	+0.38
Mean Low Water on a Spring Tide	-0.38
Mean Low Water on a Neap Tide	-1.03
Lowest Astronomical Tide	-1.50

Source: Fugro 2007

5.5.4 Sediment Characteristics and Quality

Surveys in March 2007 and March 2017 established that seabed areas in the Shwe and Shwe Phyu field were found to mostly consist of sandy sediment whereas deeper areas in the Mya field were composed of finer silty and muddy sediment. The organic content of marine sediments collected in 2017 was found to be similar across the three fields and is typical of unpolluted offshore marine environments.

The sections below present the findings of the marine baseline environmental survey conducted in February/March 2019.

5.5.4.1 Particle Size Distribution

Sediment composition is an important factor in determining the short- and long-term fate of contaminants in the marine environment. It is well established that the ability of many contaminants to become associated with sediments is a function of the particle size (specific surface area) of the sediment, thus finer sediments have a greater potential to contain higher concentrations of contaminants if present.

Primary marine environmental baseline surveys in February/March 2019 established that seabed areas in Block A-1 were found to consist of sandy (silt/clay) sediment. A summary of the seabed characteristics for samples collected in 2019 and 2017 are presented in **Table 5-4** and **Table 5-5**. The survey location maps of 2007, 2017 and 2019 are presented in **Figure 5-7** and **Figure 5-8**.

Table 5-4 Physical Characteristics of Marine Sediment Recorded in February/March 2019

Location	Clay (%)	Silt (%)	Sand (%)	Gravel (%)	Modified Folk Classification
SP1	15	27	58	0	Dark grey, sandy SILT/CLAY
SP2	14	25	61	0	Dark grey, sandy SILT/CLAY
SP3	14	22	55	9	Dark grey, slightly sandy SILT/CLAY
SP4	15	21	58	6	Dark grey, slightly sandy SILT/CLAY

Table 5-5 Physical Characteristics of Marine Sediment Recorded Previously in 2017 near Project Location

Location	Clay (%)	Silt (%)	Sand (%)	Gravel (%)	Modified Folk Classification
SHW11-a	29	15	55	0	Sandy SILT/CLAY
SHW11-b	36	14	48	0	Sandy SILT/CLAY
SHW12-a	21	21	57	0	Sandy SILT/CLAY
SHW12-b	21	27	55	0	Sandy SILT/CLAY

Sediments from Shwe WHP (SWHP), Shwe Production Wells (SHPA), Mya North Production Wells (MYCA) and Pipeline (P) were predominated by sand (>90%; particle size = 0.063 – 2 mm) (ERM, 2007. Block A-1, A-3 Gas Development, Myanmar – Marine Environmental Baseline Study)

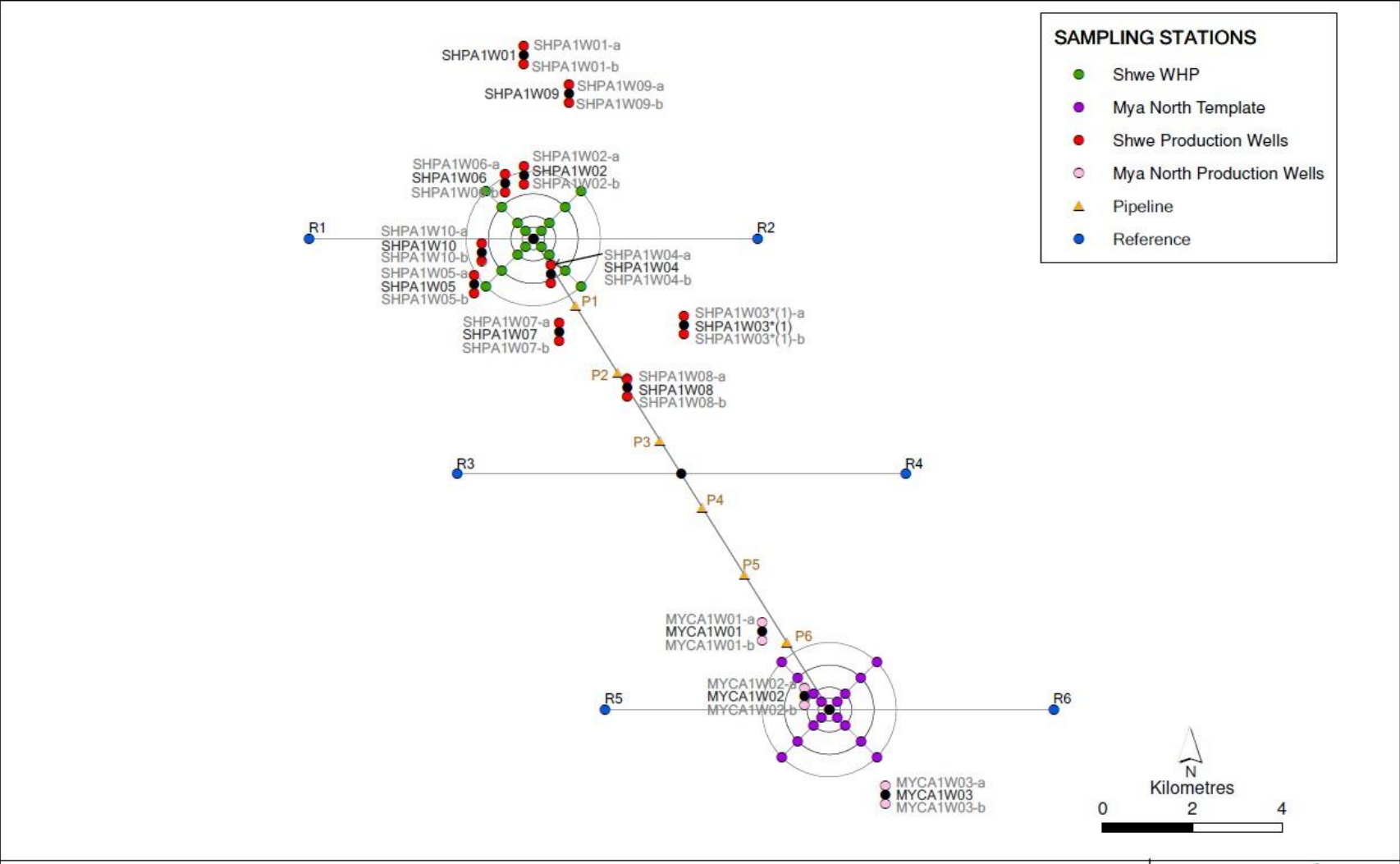


Figure 5-7 Sampling Locations of 2007 Survey

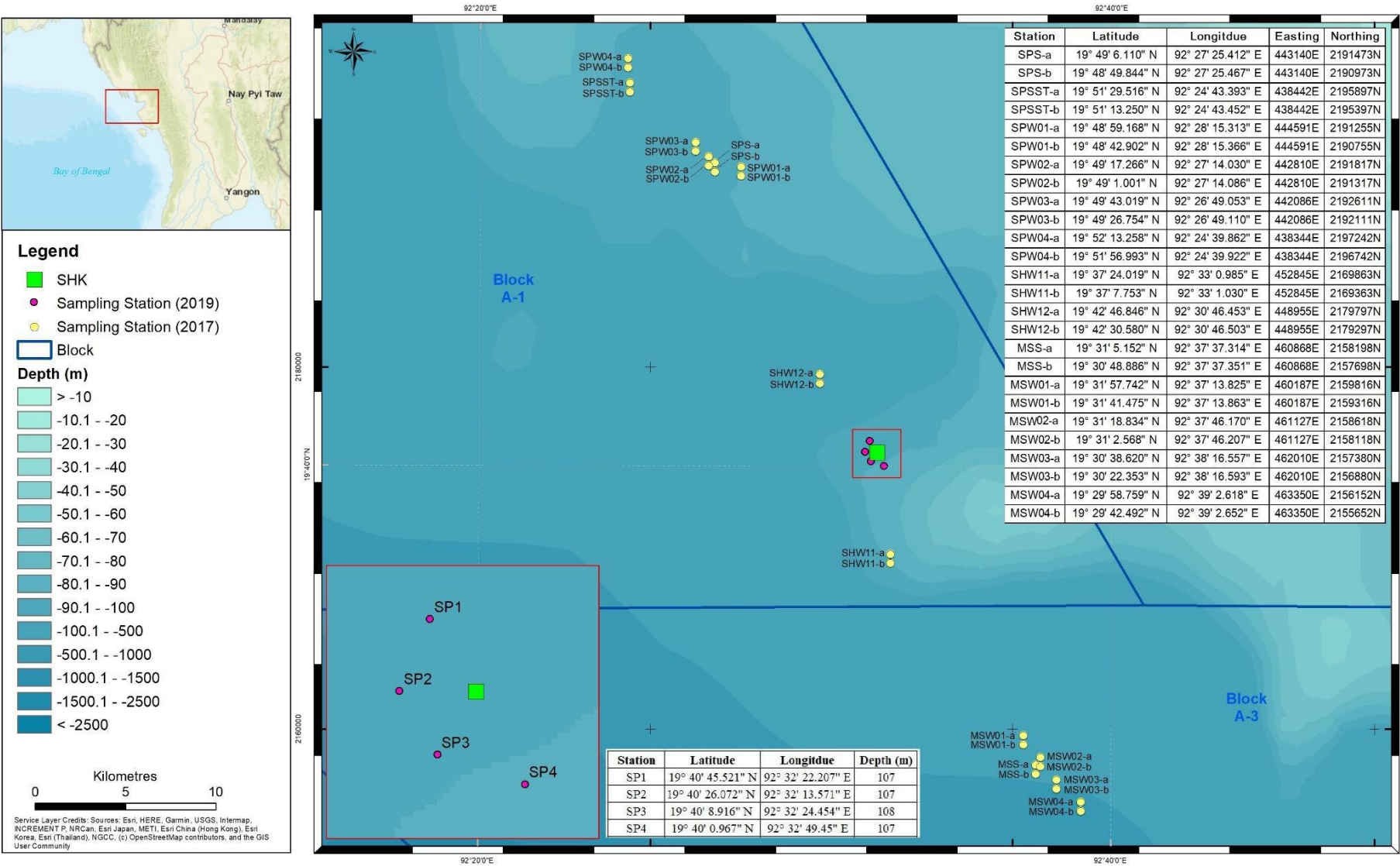


Figure 5-8 Sampling Locations of 2017 and 2019 Surveys

5.5.4.2 Total Organic Carbon

Total Organic Carbon (TOC) is the material derived from decaying organisms, bacterial growth, and metabolic activities of living organisms. It is generally considered to be both a measure of the amount of available food for detritus feeders within sediments and a measure of the total amount of oxidizable organic material. The amount of TOC can be an important influence on the community structure of benthic assemblages and is also an important factor governing sediment quality as it influences the chemical partitioning and bioavailability of any contaminants present.

The content of organic matter found to occur in seabed sediment from samples collected in the Marine Environmental Baseline Survey in February/March 2019 are presented in **Table 5-6**. The organic content of marine sediments was found to be similar at all sampling stations ranging from 2.20 to 4.51%. These values were considered to reflect natural background organic matter content at the seabed.

5.5.4.3 Metals

Concentrations of metals in different sampling locations from the Marine Environmental Baseline Survey in February/March 2019 are presented in Table 5.7. Based on the results, overall concentrations analyzed metals (i.e. Arsenic, Barium, Cadmium, Chromium, Copper, Lead, Manganese, Nickel, Selenium, Iron and Mercury) were similar at stations with few marked spatial differences in metal concentrations in the marine sediments between the sampling stations, which were located at similar distances from the existing Shwe offshore drilling, production and processing platform (SHP). Metal concentrations recorded at the sampling stations near the proposed SHK location were considered to be influenced by past discharges of drill cuttings which deposited on the seabed near SHP as indicated by the elevated concentration of Barium in the collected sediments. The elevated Barium concentrations are considered to be from Barium contained in barite (Barium sulphate), which is insoluble and relatively persistent in the marine environment. However, barite is rated as non-toxic and therefore rated as PLONAR substances (OSPAR 2004).

There are no national sediment quality guidelines in Myanmar. For context, metal concentrations were therefore compared against Australian and New Zealand interim sediment quality guidelines (ANZECC/ARMCANZ, 2000). This comparison indicated background Arsenic concentrations were observed to be higher than ISQG-Low value (20 mg/kg) at all sampled stations (SP1 to SP4). Nickel was observed to have similar concentrations at all sampling stations that were in excess of the ISQG-Low value (21 mg/kg). Overall, no metals at concentrations of environmental concern were observed in sediment samples collected in the surrounds of the proposed SHK location.

5.5.4.4 Oil & Grease and Total Petroleum Hydrocarbons

The concentration of oil & grease in all sediment samples collected in February/March 2019 was < 0.5 %. Similarly, total petroleum hydrocarbon concentration in all sediment samples was below detection limits in all collected samples, except at SP2.

TPH were analyzed according to their carbon fractions (C6 – C9, C10 – C14, C15 – C28 and C29 – C36). Concentrations of the C6 – C9, C10 – C14, C15 – C28 and C29 – C36 fractions in all sediment samples were < 2, < 50, <100 and < 100 mg/kg respectively, except at SP2. In this sample, trace amounts of hydrocarbons in the fractions C10 – C14 (84 mg/kg) and C15-C28 (178 mg/kg) were detected. In comparison to Australian and New Zealand interim sediment quality guidelines, the TPH concentration in sediment collected at SP2 was well below ISQG-Low value (280 mg/kg).

Overall, no evidence of hydrocarbon contamination at levels of environmental concern was found in the collected marine sediment samples from the surrounds of the proposed SHK location.

Table 5-6 Marine Sediment Quality Survey Results (2019)

Parameter	SP1	SP2	SP3	SP4	ISQG Trigger Level Low	High
Total Organic Carbon (%)	4.51	3.83	3.46	2.20	-	-
Arsenic (mg/kg)	53	32	27	36	20	70
Barium (mg/kg)	8460	5940	1790	6380	-	-
Cadmium (mg/kg)	0.2	0.2	<0.2	0.2	1.5	10
Chromium (mg/kg)	62	56	46	51	80	370
Copper (mg/kg)	19	19	15	16	65	270
Lead (mg/kg)	25	18	14	19	50	220
Manganese (mg/kg)	542	495	449	549	-	-
Nickel (mg/kg)	50	51	46	47	21	52
Selenium (mg/kg)	3	3	3	2	-	-
Zinc (mg/kg)	58	54	42	48	200	410
Iron (mg/kg)	46900	36700	29400	33900	-	-
Mercury (mg/kg)	0.07	0.05	<0.05	<0.05	0.15	1.0
Oil & Grease (%)	<0.5	<0.5	<0.5	<0.5	-	-
TPH (mg/kg)					280	550
C6-C9	<2	<2	<2	<2	-	-
C10-C14	<50	84	<50	<50	-	-
C15-C28	<100	178	<100	<100	-	-
C29-C36	<100	<100	<100	<100	-	-

Interim Sediment Quality Guidelines (ISQG) are Australian criteria for marine sediments provided for reference only in the absence of Myanmar national criteria.

5.5.5 Water Quality

Primary baseline environmental surveys were conducted in 2007 and 2017 at the Shwe and Mya fields for previous EIA Studies for the Phase 1 and 2 Development area. In both the phase 1, 2007 and phase 2, 2017 surveys, seawater temperature and salinity were largely similar among the sampling locations and vertical gradient in seawater temperature and salinity was observed, in which temperature decreased and salinity increased progressively from the surface to the bottom. Summary of seawater temperature and salinity is presented in **Table 5-7**.

Table 5-7 Water Temperature and Salinity Recorded in the Shwe Field (SHW) Areas in 2007 and 2017

Location	Mean Temperature Range (°C)	Mean Salinity Range (ppt)
Shwe Field (16 Stations sampled in 2007)		
Surface	26.2 – 27.8	23.3 – 24.3
Middle	24.3 – 25.0	24.9 – 25.7
Bottom	20.8 – 22.3	26.7 – 27.5
Shwe Field (2 stations sampled in 2017)		
Surface	28.5 – 28.6	27.7 – 29.1
Middle	27.0 – 27.1	31.0 – 31.1
Bottom	22.8 -23.6	31.7 – 32.0

Seawater temperature and salinity were largely similar among the sampling locations and vertical gradient in seawater temperature and salinity was observed, in which temperature decreased and salinity increased progressively from the surface to the bottom. In both the 2007 and 2017 surveys, very low Total Suspended Solids (TSS) concentrations were recorded in collected seawater samples, which is typical of conditions in offshore environments away from the influence of coastal processes. In comparison to National Environmental Quality (Emissions) Guidelines, TSS levels of ambient waters were well below discharge standards (50 mg/l) for this parameter.

Based on the analysis of water samples collected in 2017, metals concentrations were found to be low and are considered representative of an unpolluted offshore environment. Overall, no clear spatial trends were discernible with similar concentrations of metals found to occur at the three field areas. Total petroleum hydrocarbon (TPH) and oil and grease concentrations in all water samples collected in March 2007 and March 2017 were below their respective detection limits with no evidence of detectable hydrocarbon contamination in the water column of the Study Area.

The sections below present the findings of the marine baseline environmental survey conducted in February/ March 2019.

5.5.5.1 Water Temperature and Salinity

Based on primary data collected in Marine Baseline Survey in February/March 2019, seawater temperature and salinity were largely similar among the sampling locations. A summary of seawater temperatures and salinity levels at 10m depths at sampling locations are presented in Table 5.9.

5.5.5.2 pH

Photosynthetic organisms consume CO₂, which in turn generates an increase in pH, High pH values are thus evidence of a high production by phytoplankton. Seawater pH was similar among sampling locations. The higher pH in surface waters than at depth was indicative of the higher phytoplankton production in these well-lit surface waters. A summary of pH levels recorded at 10 m depths at sampling locations is presented in Table 5-8. In comparison to National Environmental Quality (Emissions) Guidelines, pH levels of ambient waters were well within discharge standards (pH 6-9) for this parameter.

5.5.5.3 Total Suspended Solids

The amount of total suspended solids (TSS) refers to the weight of particulate matter in a water sample, which is an indication of the water turbidity or clarity. Water turbidity is due to the presence of suspended matter consisting of silt, detritic origin particles and planktonic organisms. In the marine environment, turbidity is

subject to sharp variations due to the episodic, dynamic events, which remobilize the sediment in suspension (such as swells or currents). Inshore coastal waters tend to be more turbid than offshore open ocean waters due to suspension of sediment by wave action in shallow waters and sediment-laden runoff from the land. In surface waters, turbidity can be influenced by the presence of phytoplankton.

Low TSS concentrations were recorded in water samples collected from the Marine Baseline Survey in February/March 2019, which is typical of conditions in offshore environments away from the influence of coastal processes. In 2019, TSS concentrations in all seawater samples collected from 10 m water depths were found to have <2 mg/L of suspended solids (**Table 5-8**). Overall, the TSS results revealed high water clarity indicative of oceanic conditions, which were further corroborated by both the low turbidity (23.2 – 34.5 FNU) in situ measurements and the measured deep light penetration with the black and white Secchi disk visible to observers on deck down to 15 to 25 (**Table 5-8**).

In comparison to National Environmental Quality (Emissions) Guidelines, TSS levels of ambient waters were well below discharge standards (50mg/L) for this parameter.

5.5.5.4 Dissolved Oxygen, Chemical Oxygen Demand and Biological Oxygen Demand

At the time of sampling in February/March 2019, dissolved oxygen (DO) concentrations were found to be similar among the sampling stations, ranging from 3.59 to 4.34 mg/l in surface water (**Table 5-8**). These values were indicative of relatively low natural background levels of DO in the water column, of which DO concentrations at SP1, SP2, SP3 were found slightly lower than the ASEAN marine water quality criterion (4 mg/l) for this parameter.

Biological oxygen demand (BOD) and chemical oxygen demand (COD) measures the content of organic matter in the seawater. At the time of sampling in February/March 2019, COD and BOD recorded in the collected water samples was low with all samples exerting <20 mg/l of COD and < 2 mg/l of BOD, with the exception of water sample obtained from surface (10 m depth) at SP3 and SP4 which exerted 22 mg/l of COD for an unknown reason, but possibly due to survey vessel discharge (**Table 5-8**). Overall, the COD and BOD measurements in 2019 indicated low organic content with no evidence of organic pollution.

In comparison to National Environmental Quality (Emissions) Guidelines, BOD and COD levels of ambient waters were well below discharge standards (30 mg/l and 125 mg/l respectively) for these parameters.

5.5.5.5 Nutrients

Nutrients in seawater are represented by dissolved inorganic substances including nitrogen forms (ammonia, nitrites, nitrates), phosphorous, silica, sulphur and various other trace elements. In the marine environment, the main source of nutrients is runoff from the land and rivers (including sewage and fertilisers), wind-driven continental upwelling and cycling of nutrients from decomposition of organic remains. Nitrogen is considered the key nutrient in the marine environment, as its availability is the most important factor governing the rate of phytoplankton growth (primary production).

Water samples collected in the Marine Baseline Environmental Survey in 2019 were found to contain total nitrogen (TN) concentrations ranging <0.1 mg/l to 0.1 mg/l in surface waters (10 m depth) (**Table 5.7**). Nitrate, Ammonia and Phosphate concentrations were all found <0.01 mg/l in surface waters (10 m depth) at all four sampling locations (**Table 5-8**). Overall, the results of the marine baseline survey indicated the occurrence of low nutrient conditions at Block A-1 waters, which is typical of offshore oceanic environments. These low nutrient availability conditions were found to also be reflected in the low phytoplankton standing crop that occurred in the collected water samples.

In comparison to National Environmental Quality (Emissions) Guidelines, total nitrogen and ammonia levels of ambient waters were well below discharge standards (10 mg/l and 10 mg/l respectively) for these parameters.

5.5.5.6 *Metals*

Dissolved metals are naturally present at trace levels in the marine environment which is related to the mineral composition of regional geology. In offshore environments, oil and gas operations can introduce metals into the marine environment via the temporary discharge of drilling fluids (although these metals are tightly bound to barite and clay and thus of low bioavailability), and through operational discharge of produced water (although due to low initial concentrations and dilution effects, concentrations are reduced to undetectable levels beyond the immediate vicinity of offshore facilities). Corrosion (e.g., from sacrificial anode anticorrosion system) also result in the introduction of dissolved metals, although at undetectable low concentrations.

A summary of metal concentrations recorded in seawater samples collected in the Marine Baseline Environmental Survey in 2019 is presented in Table 5.9. Based on the analysis of the water samples, metal concentrations were found to be low and are considered to be representative of an unpolluted offshore environment with concentrations reflecting natural background conditions.

In comparison to National Environmental Quality (Emissions) Guidelines, arsenic, copper, lead, zinc, chromium, cadmium, iron and mercury levels of ambient waters were below of discharge standards (100 µg/l, 500 µg/l, 100 µg/l, 2,000 µg/l, 500 µg/l, 100 µg/l, 3,500 µg/l and 10 µg/l respectively) for these parameters.

5.5.5.7 *Total Petroleum Hydrocarbons (TPH) and Oil & Grease*

Total petroleum hydrocarbon (TPH) and oil and grease concentrations in all water samples collected in the Marine Environmental Baseline Survey in February/March 2019 were below their respective detection limits with no evidence of detectable contamination in the water column at the surrounds of the proposed platform. Overall, the Marine Baseline Survey was taken as indicating no evidence of hydrocarbon contamination at levels of environmental concern.

In comparison to National Environmental Quality (Emissions) Guidelines, oil and grease levels of ambient waters were well below discharge standards (10 mg/l equivalent to 10,000 ug/l) for this parameter.

Table 5-8 Marine Water Quality Survey Results Collected at Surface (S) (10m) Depths within the Water Column at Stations (2019)

Parameter	SP1	SP2	SP3	SP4	ASEAN Marine Water Quality Criteria
Temperature (°C)	28.81	29.8	28.11	25.57	Increase not more than 2°C above the maximum ambient temperature
Salinity (psu)	32.46	32.38	31.81	32.59	-
pH	8.2	8.22	8.19	8.21	-
DO (mg/L)	3.59	3.57	3.71	4.34	4
Turbidity (FNU)	25.9	25.7	26.9	26	-
Secchi Depth (m)	23	25	24	15	-
BOD (mg/L)	<2	<2	<2	<2	-
COD (mg/L)	<20	<20	22	22	-
TSS (mg/L)	<2	<2	<2	<2	Permissible 10% maximum increase over seasonal average concentration
Ammonia (mg/L)	<0.01	<0.01	<0.01	<0.01	0.07 mg/L
Nitrate (mg/L)	<0.01	<0.01	<0.01	<0.01	0.06 mg/L
Total Nitrogen (mg/L)	<0.1	<0.1	0.1	<0.1	-
Phosphate (mg/L)	<0.01	<0.01	<0.01	<0.01	0.015 mg/L
Arsenic (µg/L)	<10	<10	<10	<10	-
Barium (µg/L)	8	8	8	8	-
Cadmium (µg/L)	<0.2	<0.2	<0.2	<0.2	10 µg/L

Parameter	SP1	SP2	SP3	SP4	ASEAN Marine Water Quality Criteria
Chromium (µg/L)	<1	<1	<1	<1	50 µg/L
Copper (µg/L)	<1	<1	<1	<1	8 µg/L
Lead (µg/L)	<1	<1	<1	<1	8.5 µg/L
Manganese (µg/L)	<1	<1	<1	<1	-
Nickel (µg/L)	<1	<1	<1	<1	-
Selenium (µg/L)	<50	<50	<50	<50	-
Zinc (µg/L)	<10	<10	<10	<10	-
Iron (µg/L)	<0.5	<0.5	<0.5	<0.5	-
Mercury (µg/L)	<0.05	<0.05	<0.05	<0.05	0.16 µg/L
Oil & Grease(mg/L)	<2	<2	<2	<2	0.14 mg/L
TPH (µg/L) C6-C9	<20	<20	<20	<20	-
C10-C14	<50	<50	<50	<50	-
C15-C28	<100	<100	<100	<100	-
C29-C36	<50	<50	<50	<50	-

Seawater samples were collected at two monitoring points located 100 meters (MWQ1) and 500 meters (MWQ2) from the SHP Platform on 8th August, 2024. The analytical methods applied in these assessments included the Gravimetric Method (EPA Method 1664) using the infraCal TOG/TPH Analyzer and the Soxhlet Extraction Method (5520D). Both methods were deemed acceptable and reliable for monitoring hydrocarbon contamination in marine environments. The results of Oil in Water (OIW) tests conducted at both monitoring points confirmed that the seawater is free of oil contamination. Specially, Total Petroleum Hydrocarbon (TPH) levels were recorded at 0 mg/L at both points, adhering to stringent environmental guidelines, including the one-day maximum limit of 42 mg/L and the 30-day average limit of 29 mg/L, as specified by the NEQ(E)G Standards. For oil and grease, MWQ1 showed no detectable levels, while MWQ2 recorded a value of 2 mg/L, in compliance with the ASEAN Marine Water Quality Management Guideline limit of 0.14 mg/L (**Table 5-9**).

The SHP faces ongoing challenges from the frequent intrusion of fishing boats and other unauthorized vessels into the 5-nautical-mile restricted zone surrounding the facility. These errant vessels not only breach security protocols but also contribute significantly to the degradation of seawater quality in the vicinity. The presence of these unauthorized vessels increases the risk of oil spills, discharge of untreated wastewater and improper disposal of solid waste, all of which can lead to elevated levels of oil and grease, as well as other pollutants in the marine environment. Strict adherence to environmental management plans and monitoring plans will further safeguard the water quality around the SHP.

Table 5-9 Seawater Quality Results Collected at Surface (S) (1m) Depths within 100m and 500m (2024)

No.	Parameter	Unit	MWQ 1 (100 m)	MWQ 2 (500 m)	Sampling Depth (m)	Guidelines	Method
1	Total Petroleum Hydrocarbon	mg/l	0	0	1	42 (one day max) 29 (30-day average) (NEQ(E)G)	PIC SHP: Gravimetric Method (EPA method 1664), The InfraCal TOG/TPH Analyzer (Baker Hugues, SHP Platform)
2	Total Petroleum Hydrocarbon	mg/l	0	0	1		Intergovernmental Oceanographic Commission, Manual for monitoring oil and dissolved/dispersed petroleum hydrocarbon in marine waters and on beaches,1984(REM-UAE Lab, Thailand)
3	Oil and Grease	mg/l	Nil	2	1	0.14 (Asian Marine Water Quality Management Guideline)	(a) 5520D, Soxhlet Extraction Method (Pro Lab Analytical Laboratory)



Figure 5-9 Seawater Sampling Locations

5.5.6 Wastewater Quality

On October 30, 2023, the water quality monitoring assessment was conducted at these locations located at the outlet of the wastewater treatment plant discharge pipe and storm water drainage. The monitoring process included an evaluation of key water quality parameters such as pH, biochemical oxygen demand (BOD), chemical oxygen demand (COD), total suspended solids (TSS), oil and grease, total nitrogen, and total phosphorus. The result of the analysis indicate that most parameters comply with the standards set forth in the Myanmar National Environmental Quality (Emission) Guidelines (2015), as detailed in **Table 5-10**. However, total phosphorus levels were found to be slightly above the standard value.

To address this exceedance, it is recommended that the wastewater treatment plant undergo a thorough inspection to identify potential inefficiencies. Necessary improvements should be made to optimize treatment processes and enhance overall system performance, ensuring that all effluent parameters remain within regulatory limits.

Table 5-10 Wastewater Quality of Wastewater Treatment Plant from OGT

Monitoring Station	Parameter	Unit	Monitoring Result	Standard ¹
Wastewater Quality from Wastewater Treatment Plant				
At the outlet of wastewater treatment plant pipe	pH	-	7.4	6-9
	Biological oxygen demand	mg/L	14.4	30
	Chemical oxygen demand	mg/L	29	125
	Total suspended solids	mg/L	6.7	50
	Oil and grease	mg/L	ND (<3)	10
	Total nitrogen	mg/L	4.08	10
	Total phosphorus	mg/L	2.20*	2
	Total coliform bacteria	MPN/100L	240	400
Wastewater Quality from Storm Water Drainage				
Storm water drainage 1 (SW1)	Oil and grease	mg/L	ND (<3)	≤10
Storm water drainage 2 (SW2)		mg/L	ND (<3)	≤10
Storm water drainage 3 (SW3)		mg/L	ND (<3)	≤10

¹ Myanmar National Environmental Quality (Emission) Guidelines (2015) in part of crude oil and petroleum product terminals

ND: Non-detectable

*Not comply with the standard

5.6 Biological Components

5.6.1 Benthic Communities

Benthic grab sampling of the seabed habitat within the operational area at the Shwe Phyu, Shwe and Mya Fields were previously conducted in 2007 and 2017. In March 2007, a total of 2,059 individual organisms, with a total biomass of 343.7 g, were found in the 140 seabed sediment samples collected from the Shwe and Mya North fields.

The survey in March 2017 recorded a total of 828 individual organisms, with a total biomass of 633.9 g in 52 seabed sediment samples. The specimens belong to four Phyla (Annelida, Arthropoda, Mollusca and Echinodermata), from a total of 33 Families in six Classes.

These studies have revealed a sparse abundance, high variability and low diversity of infauna dominated by *bristleworms (polychaetes)* with other fauna including gastropods, crustaceans and bivalves. The overall

numerical abundance (density) of microbenthic organisms was similar between the 2007 and 2017 surveys but assemblages surveyed in 2017 had a slightly higher biomass and diversity.

In February/March 2019, it was found that, overall, the majority (67.6%) of the number of macrobenthic organisms (i.e. abundance) recorded at the sampling locations were from the Class Polychaeta (*Phylum Annelida* (marine worms), followed by Class Gastropoda (*Phylum Mollusca*, 11.8% of the total), Class Anthozoa (Phylum, Cnidaria, 11.8%) and Class Bivalvia (*Phylum Mollusca*, 8.8% of the total). At sampling locations, assemblages were dominated by polychaete worms (*Phylum Annelida*), except at SP1, where marine snails (*Phylum Mollusca*) contributed the highest abundance on the locations studied, the abundance and biomass of macrobenthos were not stable which might be subjected to underwater topography and sea current of the study area.

Comparing with 2007, 2017 and 2019 study results, it was found that three main groups of Macrobenthos (Polychaeta, Bivalvia and Gastropoda) were found in all sample locations.

In conclusion, benthic grab sampling in the surrounds of the proposed SHK location at Block A- 1 in February/March 2019 have revealed a sparse abundance, high variability and low diversity of infauna generally dominated by bristleworms (polychaetes) with other fauna including gastropods, bivalves and small deep-water solitary corals (anemone-like organisms). The benthic habitat within the Study Area spanning open water environment of the continental shelf consists of bare, unconsolidated muddy sediments supporting a sparse assemblage of benthic organisms. Based on the grab samples collected in 2019, the abundance of macrobenthic organisms inhabiting the seabed near the proposed SHK location was found to be patchy but with similar low abundance at each sampled location with benthic organisms in samples mainly consisting of small-bodied individuals. Overall, the infauna associated with the soft unconsolidated sediment in the Project Area are expected to be widespread and well-represented across the continental shelf in the region and thus regarded as low sensitivity.

Given the deeper water depths at the proposed Project site, insufficient light reaches the seabed to allow the growth of primary producers such as seagrass, macroalgae or zooxanthellate Scleractinia (reef building) corals and these groups are absent from the seabed in the vicinity of Project site.

5.6.2 Plankton

Moderate Resolution Imaging Spectrometer (MODIS) Aqua satellite datasets (NOAA 2015) from the area within and surrounding Block A-1 show that chlorophyll concentrations and inferred phytoplankton standing crop levels in the surface layer are higher in the northeast season (November to March) than in southwest (June to September). As it is typical, highest chlorophyll levels ranging up to 10 mg/m³ occur closest to the coast likely due to nutrient inputs from the land such as from rivers.

Plankton communities respond to naturally changing physiochemical and biological conditions, typically undergoing an annual cycle of succession due mainly to competition with species reappearing at approximately the same time each year in roughly the same concentrations. Surveys to investigate phytoplankton and zooplankton at the Shwe and Mya fields were previously conducted in March 2007 for previous EIA Studies for the Phase 1 Development. At the time of sampling, surveys found plankton were dominated by common cosmopolitan and tropical neritic planktonic diatom species (Bacillariophyceae). Common phytoplankton species included representatives of *Rhizosolenia*, *Chaetoceros*, *Guinardia*, *Ceratulina* and *Thalassionema*. Zooplankton was dominated by jellies (*Crambionella annandalei*), copepods (*Calanus* and *Pseudocalanus*) and euphausiid crustaceans (Thysanopoda).

The composition, abundance and distribution of phytoplankton species were recorded in November 2007 (Boonayapiwat et al., 2008) during the northeast monsoon period, which spans from December to April. During this survey, the northern part of the Bay of Bengal (located offshore of the waters of Myanmar between Myanmar and India) was found to be the most productive area with high phytoplankton densities recorded, likely associated with nutrient-rich discharges from large rivers on the north coast. Phytoplankton in the eastern part of the Bay of Bengal was found to be dominated by *Oscillatoria erythraea*. Phytoplankton

and zooplankton sampling of the water column at the four sampling locations within the surrounds of the proposed SHK location were conducted in February/ March 2019.

For phytoplankton, the survey recorded a total of between 16,956 to 46,961 algal cells/m³ in four (4) depth-integrated samples from the upper 25 m of the water column. The specimens belong to two (2) Divisions (Cyanophyta, Chromophyta), three (3) Classes (Cyanophyceae, Bacillariophyceae, Dinophyceae), 18 Families and 24 Species. Of the major algal groups (Classes), surveys found phytoplankton was dominated by diatoms (Bacillariophyceae). As is typical, dinoflagellates (Dinophyceae) and cyanobacteria (Cyanophyceae) contributed only a small portion of the phytoplankton community. Common phytoplankton species included representatives of *Thalassionema*, *Coscinodiscus* and *Ornithocerus*, which are common cosmopolitan and tropical neritic species.

For zooplankton, the survey in February/March 2019 recorded a total of between 7,738 to 16,088 individuals/ m³ from the four (4) vertical haul samples from the upper ~25m of the water column. The specimens belonged to seven (7) Phyla (Protozoa, Chaetognatha, Annelida, Arthropoda, Mollusca, Echinodermata and Chordata) and 9 Classes (Sarcodina, Ciliata, taxa. A summary of the numerical abundance and taxonomic richness of zooplankton inhabiting the pelagic habitat near the proposed SHK location in 2019.

In February/ March 2019, it was found that, overall, the majority (95.1%) of the number of zooplankton organisms (i.e. abundance) recorded near the proposed SHK location at Block A-1 were from the Class Crustacea (Phylum Arthropoda), followed by Class Larvacea (Phylum Chordata, 1.8% of the total) and the Class Polychaeta (Phylum Annelida, 1.1 % of the total). At sampling locations, zooplankton assemblages were dominated by copepods (*Phylum Arthropod*). Given the limited scope to impact plankton concentrations or abundance as well as high turnover rates, the plankton community in the Area of Influence is thus regarded as of low environmental sensitivity to the proposed Project activities.

5.6.3 Marine Mammals

A total of 25 cetaceans (whale and dolphin) species have been recorded as either Confirmed or Probable in Myanmar waters (Table 5.18); Holmes et al, 2014; IUCN, 2017). One sirenian (dugong; *Dugong dugon*) also has a confirmed presence in the coastal waters of Myanmar (Tun and Ilangakoon, 2006). Two coastal water species, the Irrawaddy dolphin (*Orcaella brevirostris*) and dugong (*Dugong dugon*), have been protected under the Myanmar Protection of Wildlife and Conservation of Natural Areas Law since 1994 under the category “completely protected”. Given the proposed offshore location of the SHK (70 km from the coast), open water species of marine mammal are of primary interest. Of the whale and dolphin species potentially present in Myanmar waters, most are oceanic, far-ranging, migratory species though there are several coastal species with closer affinities to shallow water habitat areas and estuarine areas.

Two cetacean species listed by the IUCN have a confirmed or probable occurrence in Myanmar oceanic waters: the blue whale (*Balaenoptera musculus*; Endangered) and sperm whale (*Physeter macrocephalus*; Vulnerable). Another Endangered cetacean, the fin whale (*Balaenoptera physalus*) has a possible occurrence in Myanmar waters (Holmes et al. 2014). The blue whale and the fin whale are also listed as endangered species recognised as of prime importance to the Region and deserving special attention under the ASEAN Agreement on the Conservation of Nature and Natural Resources (ASEAN, 1985). Other deep-water specialist species include Bryde’s whale (*Balaenoptera edeni*), Longman’s beaked whale (*Indopacetus pacificus*), strap-toothed whale (*Mesoplodon layardii*), Blainville’s beaked whale (*Mesoplodon densirostris*), Risso’s dolphin (*Grampus griseus*), dwarf sperm whale (*Kogia sima*), Fraser’s dolphin (*Lagenodelphis hosei*), and rough-toothed dolphin (*Steno bredanensis*), however, these species are either listed as Data Deficient or Least Concern (IUCN, 2017).

POSCO INTERNATIONAL Corporation strongly commitments that baseline marine mammals survey shall be carried out within 6 months after obtaining approval for this EIA report. The locations of marine mammal sightings collected during oil and gas operations in the Rakhine Basin is provided in **Figure 5.10**. The ‘Total Survey Area’ in the figure represents the locations for the marine seismic surveys from which the marine

mammal observation data were recorded. **Figure 5.11** shows photographs of the three main marine mammal groups recorded by the collated MFO dataset: baleen whales, toothed whales and dolphins.

Table 5-11 Cetaceans with Confirmed or Probable Occurrence in Myanmar

Common Name	Scientific Name	Occurrence in Myanmar	Recorded in Rakhine Basin in 2015-2017 MFO Surveys	IUCN Listing
Mysticete (baleen whale)				
Bryde's whale	<i>Balaenoptera edeni</i>	Confirmed	✓	Data Deficient
Blue whale	<i>Balaenoptera musculus</i>	Confirmed		Endangered
Common minke whale	<i>Balaenoptera acutorostrata</i>	Probable		Least Concern
Fin whale	<i>Balaenoptera physalus</i>	Possible		Endangered
Humpback whale	<i>Megaptera novaeangliae</i>	Confirmed	✓	Least Concern
Omura's whale	<i>Balaenoptera omurai</i>	Confirmed	✓	Data Deficient
Sei whale	<i>Balaenoptera borealis</i>	Confirmed	✓	Endangered
Odontocete (toothed whale)				
Longman's beaked whale	<i>Indopacetus pacificus</i>	Confirmed		Data Deficient
Indo-Pacific finless porpoise	<i>Neophocaena phocaenoides</i>	Confirmed		Vulnerable
Irrawaddy dolphin	<i>Orcaella brevirostris</i>	Confirmed		Endangered
Indo-Pacific humpback dolphin	<i>Sousa chinensis</i>	Confirmed		Vulnerable
Pantropical spotted dolphin	<i>Stenella attenuata</i>	Confirmed	✓	Least Concern
Spinner dolphin	<i>Stenella longirostris</i>	Confirmed	✓	Data Deficient
Indo-Pacific bottlenose dolphin	<i>Tursiops aduncus</i>	Confirmed	✓	Data Deficient
Strap-toothed whale	<i>Mesoplodon layardii</i>	Confirmed, anomaly		Data Deficient
Blainville's beaked whale	<i>Mesoplodon densirostris</i>	Probable		Data Deficient
Long-beaked common dolphin	<i>Delphinus capensis</i>	Probable	✓	Data Deficient
Pygmy killer whale	<i>Feresa attenuata</i>	Probable		Data Deficient
Short-finned pilot whale	<i>Globicephala macrorhynchus</i>	Confirmed	✓	Data Deficient
Risso's dolphin	<i>Grampus griseus</i>	Confirmed	✓	Least Concern

Common Name	Scientific Name	Occurrence in Myanmar	Recorded in Rakhine Basin in 2015-2017 MFO Surveys	IUCN Listing
Pygmy sperm whale	<i>Kogia breviceps</i>	Probable		Data Deficient
Dwarf sperm whale	<i>Kogia sima</i>	Probable		Data Deficient
Fraser's dolphin	<i>Lagenodelphis hosei</i>	Probable		Least Concern
Killer whale	<i>Orcinus orca</i>	Probable		Data Deficient
Melon-headed whale	<i>Peponocephala electra</i>	Confirmed	✓	Least Concern
Sperm whale	<i>Physeter macrocephalus</i>	Confirmed	✓	Vulnerable
False killer whale	<i>Pseudorca crassidens</i>	Confirmed	✓	Data Deficient
Striped dolphin	<i>Stenella coeruleoalba</i>	Confirmed	✓	Least Concern
Rough-toothed dolphin	<i>Steno bredanensis</i>	Probable		Least Concern
Common bottlenose dolphin	<i>Tursiops truncatus</i>	Confirmed	✓	Least Concern

Source: Holmes et al. 2014; IUCN 2019, and ERM 2018

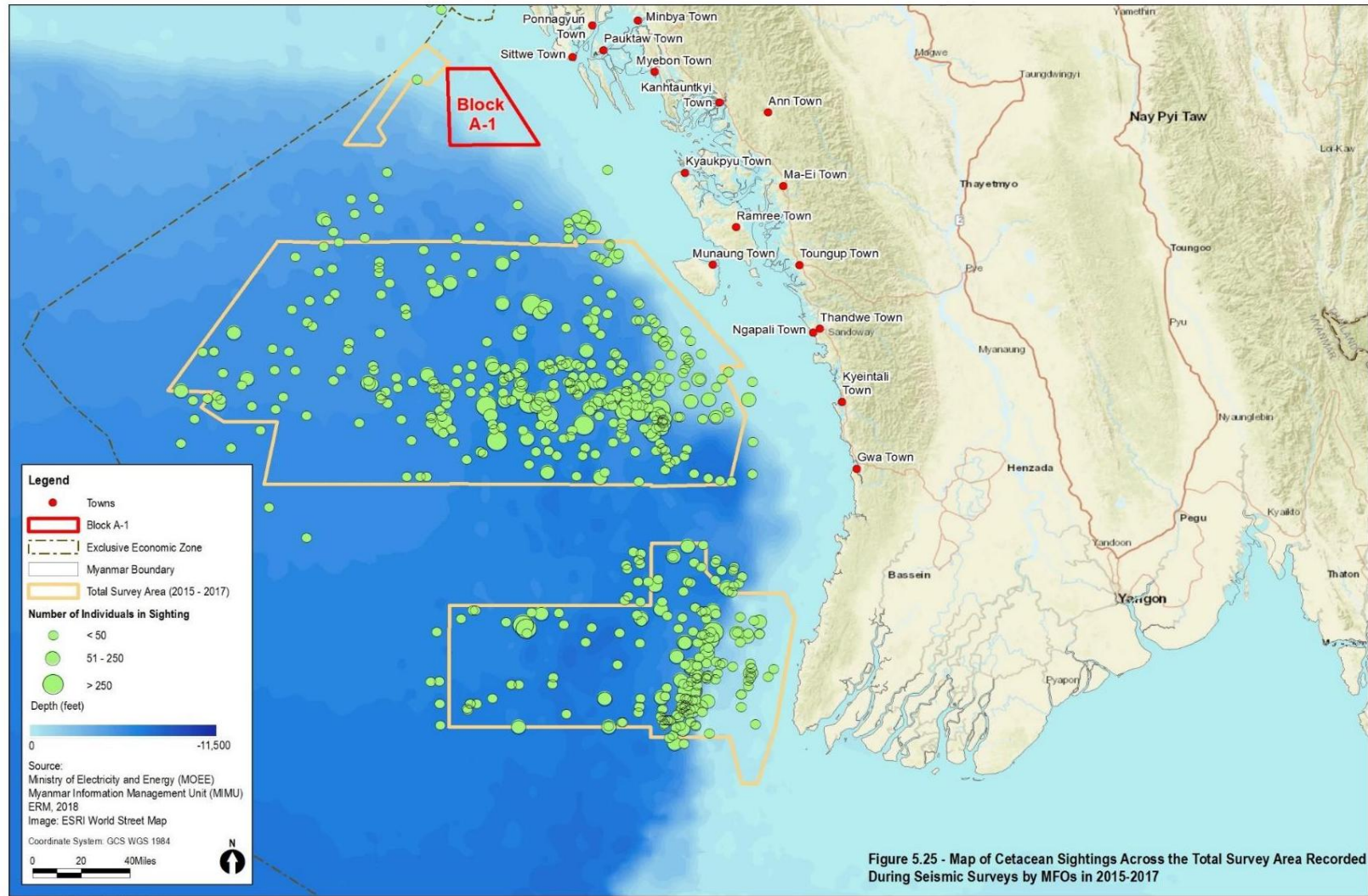


Figure 5-10 Map of the Distribution of Cetacean Sightings across the Total Survey Area Recorded During Seismic Surveys by MFOs in 2015- 2017
(Source: ERM 2018)

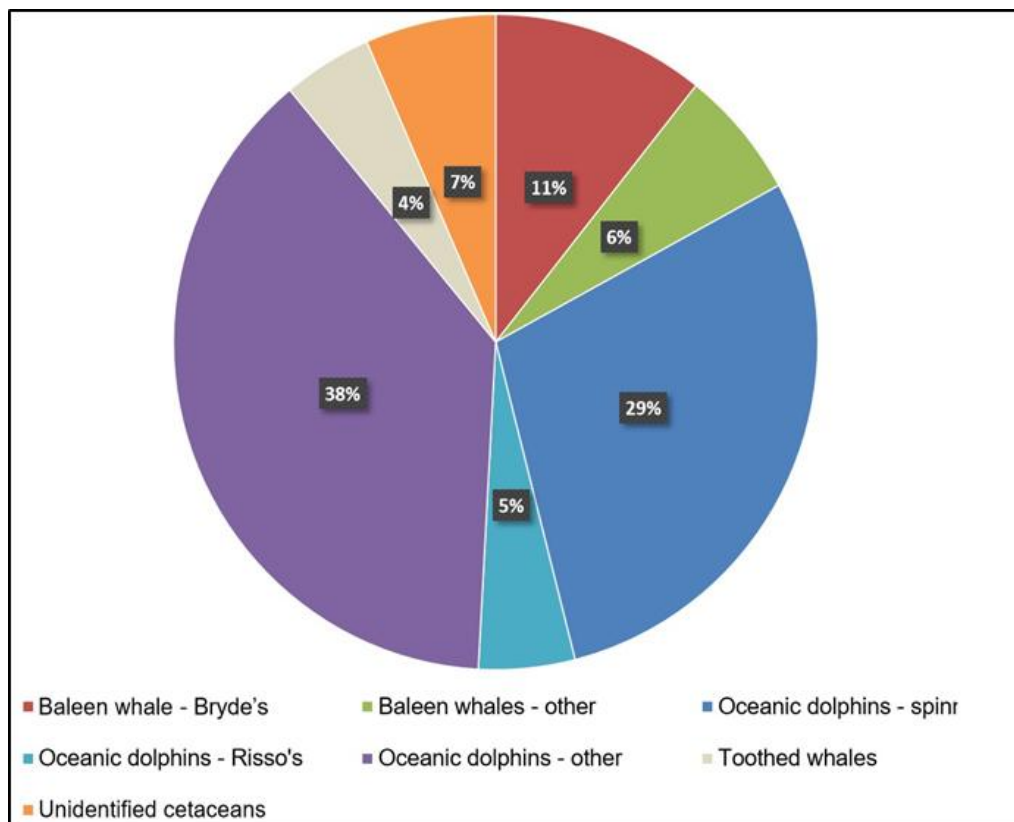


Source: ERM, 2018. Note: species from top to bottom; Baleen whales (e.g. Bryde's whale), Toothed whales (e.g. pilot whale), Oceanic dolphins (e.g. spinner dolphin)

Figure 5-11 Example images of species groups recorded by MFOs during seismic surveys in 2015-2017

The most common species group recorded during oil and gas operations was the oceanic dolphins, contributing 72% of the total sightings and most of these were spinner dolphins. The proportion of sightings per species group is provided in Figure 5.10. The species recorded included: The Common bottlenose dolphin, Indo-Pacific bottlenose dolphin, Long-beaked common dolphin, Pantropical spotted dolphin, Risso's dolphin, Spinner dolphin, and the Striped dolphin. These species are listed as Least Concern or Data Deficient on the IUCN Red List and are not considered species of conservation concern.

Baleen whales made up 17% of total sightings for the collated dataset; the majority of which are the Bryde's whale and other baleen whale groups (Figure 5.10).

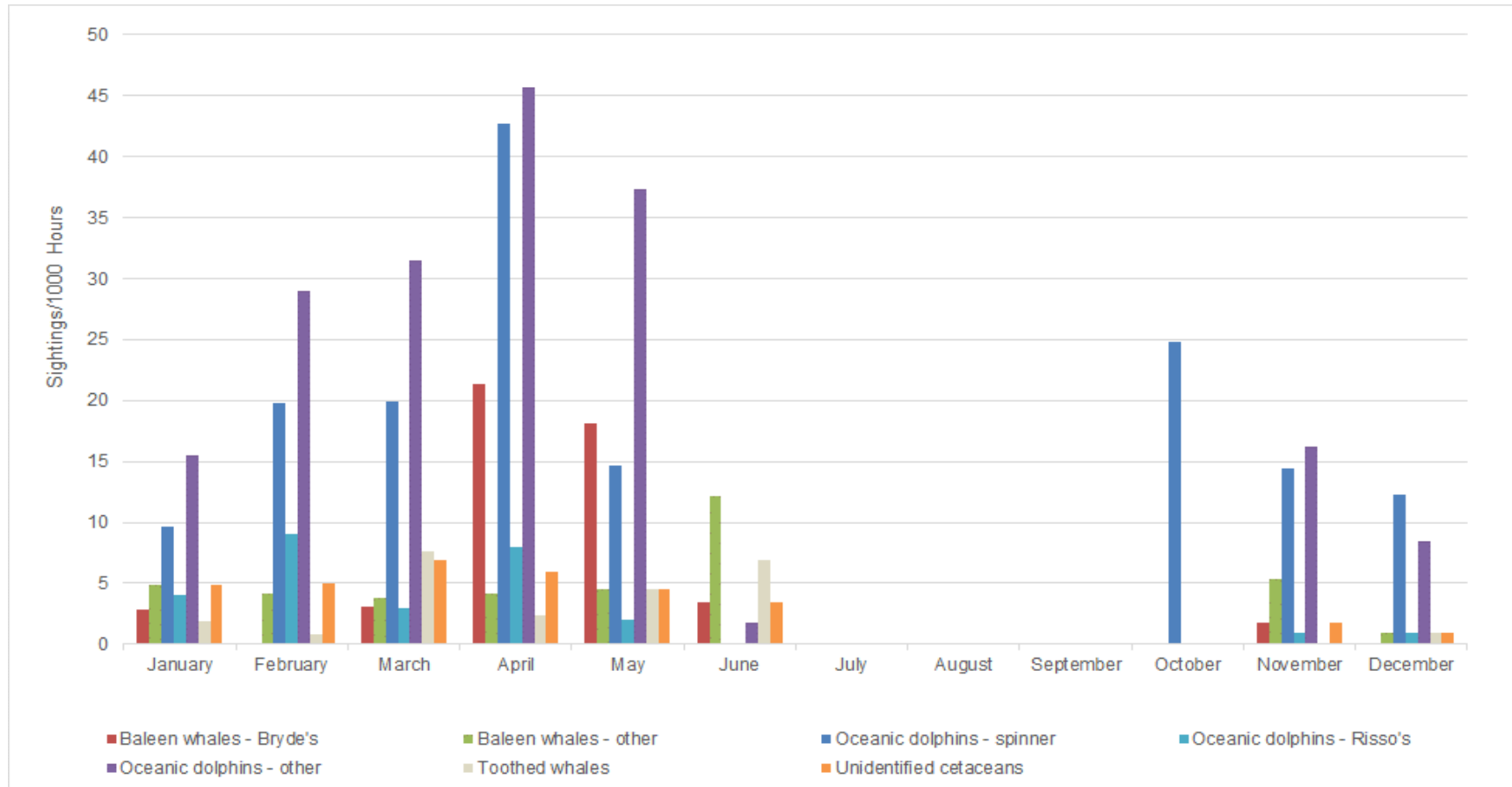


Source: ERM 2018

Figure 5-12 Proportion of Sightings of Cetacean Groups for the Combined Survey Data

Marine mammal presence is year-round as indicated by the MFO dataset (ERM 2018). The sighting data collected between 2015 and 2017 analyzed changes in the number of observations between months and seasons (ERM 2018; **Figure 5.12**). Sightings of dolphins were consistently high across most months of the year, other than June and July (note that no surveys were undertaken during August and September so there are no data for these months). Bryde's whales were sighted in six of the ten months of the year surveyed with highest rate of sightings in April and May. The two sightings of humpback whales were recorded in April and the sightings of Omura's and sei whales were recorded in January/February.

It is noted that no marine mammal observations were recorded during the VSP activities of the drilling of Aung Siddhi -1 in AD-1 in May and June, 2018.



Source: ERM 2018

Figure 5-13 Total Sightings per 1000 hours for Cetacean Groups across the Total Survey Area by Month (Data for All Years Combined)

5.6.4 Marine Turtles

Five species of marine turtles, all of which are IUCN-listed threatened species are reported for the Rakhine State waters. These are the olive ridley turtle (*Lepidochelys olivacea*) (Vulnerable), loggerhead turtle (*Caretta caretta*) (NE Indian Ocean subpopulation - Critically Endangered), green turtle (*Chelonia mydas*) (Endangered), hawksbill turtle (*Eretmochelys imbricata*) (Critically Endangered), and the leatherback turtle (*Dermochelys coriacea*) (Endangered). The hawksbill turtle and leatherback turtle have been occasionally reported by fishers from some parts of the Rakhine coastal area and the green turtle has been recorded in offshore waters.

All five species share similar life cycle characteristics, which include migration, which can be > 2,000 km, from foraging areas to mating (inter-nesting) and nesting areas (Miller, 1997). In general, mature adult turtles (approximately 30 to 50 years old) undertake the migration from their coastal shallow benthic foraging areas to shallow water inter-nesting areas waters near nesting beaches every two to eight years. On arrival, turtles mate and females may nest multiple times at about two week intervals before returning to foraging areas. Eggs hatch after eight to ten weeks of incubation with hatchlings dispersing into the open ocean surface waters where they forage for the next 5 to 20 years.

Annual turtle nesting activity for coastal locations in Rakhine waters is reported to occur between September and March with the peak period of activity occurring from December to January. Given the location of Block A-1 and A-3 in relation to know nesting beaches, there is a potential for marine turtles to be present within Block A-1 and A-3 when foraging in or traversing open waters to and from seasonal nesting areas and adjacent mating areas. All known nesting beaches are outside Block A-1 and given the deep offshore location, the operational area is away from shallow water inter-nesting habitat where most breeding activity occurs (**Figure 5.14**).



Figure 5-14 Photo Recorded of Green Turtles Sighted at Mya Field in 2007 and 2017

5.6.5 Seabirds

Terns are the most abundant group of seabirds in offshore Myanmar waters, of which 13 species regularly occur. Other seabirds which may use these waters include gulls, storm petrels, jaegers (also known as skuas), tropic birds, boobies, noddies and frigatebirds. Seabird species tend to be highly migratory, far ranging and widely distributed away from breeding areas. Offshore Myanmar waters are used by seabirds for foraging as well as resting for some species. Terns, which feed by snatching prey from the water surface, lack waterproof plumage and cannot rest on the sea.

Only two species, the little tern (*Sterna albifrons*) and the brown booby (*Sula leucogaster*), are reported to have breeding colonies in Myanmar. Given there are no emergent features (islets or islands) within the Area of Influence, the operational area of existing and proposed project activities is distant from breeding areas. Isolated islets in shallow coastal waters outside the Study Area, are expected to be potential suitable nesting sites for individuals of these species. No Important Bird and Biodiversity Areas are reported for the Area of Influence.

The distribution range of one IUCN-listed threatened seabird species, the Christmas Island frigatebird (*Fregata andrewsi*) (Critically Endangered) extends as far as southern Myanmar waters. However, Myanmar waters are at the outer limit of its range. Given this and its rarity, the potential for the occurrence of this seabird in the block is considered very low.

Although detailed data on distribution, abundance, habitat utilization and seasonality of seabirds specific to the Study Area are currently limited, incidental records during offshore surveys for the previous EIA Study for Phase 1 development indicate seabirds (terns and gulls) were reported to be commonly sighted in offshore areas at Shwe and Mya Fields. During the February/March 2019, marine environmental baseline survey, no incidental sightings were recorded of seabirds or migratory birds at Block A-1.

5.6.6 Seasonally Restricted Fishing Areas

There are four seasonally restricted fishing areas within the Study Area which are based on the DoF Fishing Blocks A1, A2, A5 and A6 (Figure 5.13). The Sittwe DoF states that these areas are restricted for fishing from June to August for the conservation of species (e.g. fish, dugong, turtles, dolphin, shark, whale and coral). The following gears are prohibited: trawl, surrounding net, stow net and long line as well as small engine boats. Although this ban is in place the level of enforcement is unknown.

5.6.7 Summary

Due to the relatively remote offshore location of the Project, the biological nature of the works area is considered to be of relatively low ecological value compared to more productive nearshore areas. The deep waters are not expected to support communities of high ecological importance; however, it is noted that marine mammals, marine turtles and seabirds may occasionally pass through these waters.

5.7 Legally Protected & Environmentally Sensitive Areas

Information from Instituto Oikos and Biodiversity and Nature Conservation Association (2011) and WCS (2013) reported a total of 43 designated or proposed protected areas with IUCN categories exist for Myanmar; however, none of these lies within Block A-1 and A-3 there are no protected areas within 50 km.

There are a number of Key Biodiversity Areas (KBAs) within the Study Area. KBAs have been identified based on stakeholder consultation undertaken by Wildlife Conservation Society (WCS) Myanmar in 2011 (WCS, 2013) however they are not classified as legally protected areas in Myanmar. Information on the size of the KBAs and key species identified as potentially present is presented in **Figure 5-15**. Oyster Island is the closest KBA to Block A-1 at ~56 km and to at A-3 ~60 km. This area has been identified due to the presence of two marine turtle species listed as species of conservation concern on the IUCN Red List; green turtle and hawksbill turtle; which are listed as endangered and critically endangered respectively by the IUCN.

Table 5-12 KBAs in the Study Area

Name	Area (km ²)	Key species and IUCN Status	Distance from Block A-1(km)	Distance from Block A-3(km)
Manaung Kyun (marine)	766	Hawksbill turtle (CR), green turtle (E), loggerhead turtle (E), and olive ridley turtle	132	100
Kyaukphyu (Wunbike)	2,591	Hawksbill turtle (CR), mangrove terrapin (CR), green turtle (E), olive ridley turtle (VU), and mangrove species.	104	95
Oyster Island	80	Hawksbill turtle (CR) and green turtle (E).	56	60
May Yu		Mangrove species.	68	65
Nantha Island	11	Hawksbill turtle (CR), green turtle (E), loggerhead turtle (E), spoon-billed sandpiper (CR), spotted greenshank (E), great knot (VU), and congregatory waterbirds.	65	65
Myebon	793	Green turtle (E), olive ridley turtle (VU) and India skimmer (VU).	88	80
Kaladan River	199	Burmese narrow-headed softshell turtle (CR), mangrove terrapin (CR), Burmese peacock softshell turtle (EN), Asiatic softshell turtle (VU), Sarus crane (VU), Indian skimmer (VU), and congregatory waterbirds. Mangrove spp. Sonneratia griffithii (CR), Heritiera fomes (EN), and Moluccan ironwood Intsia bijuga (VU).	65	60

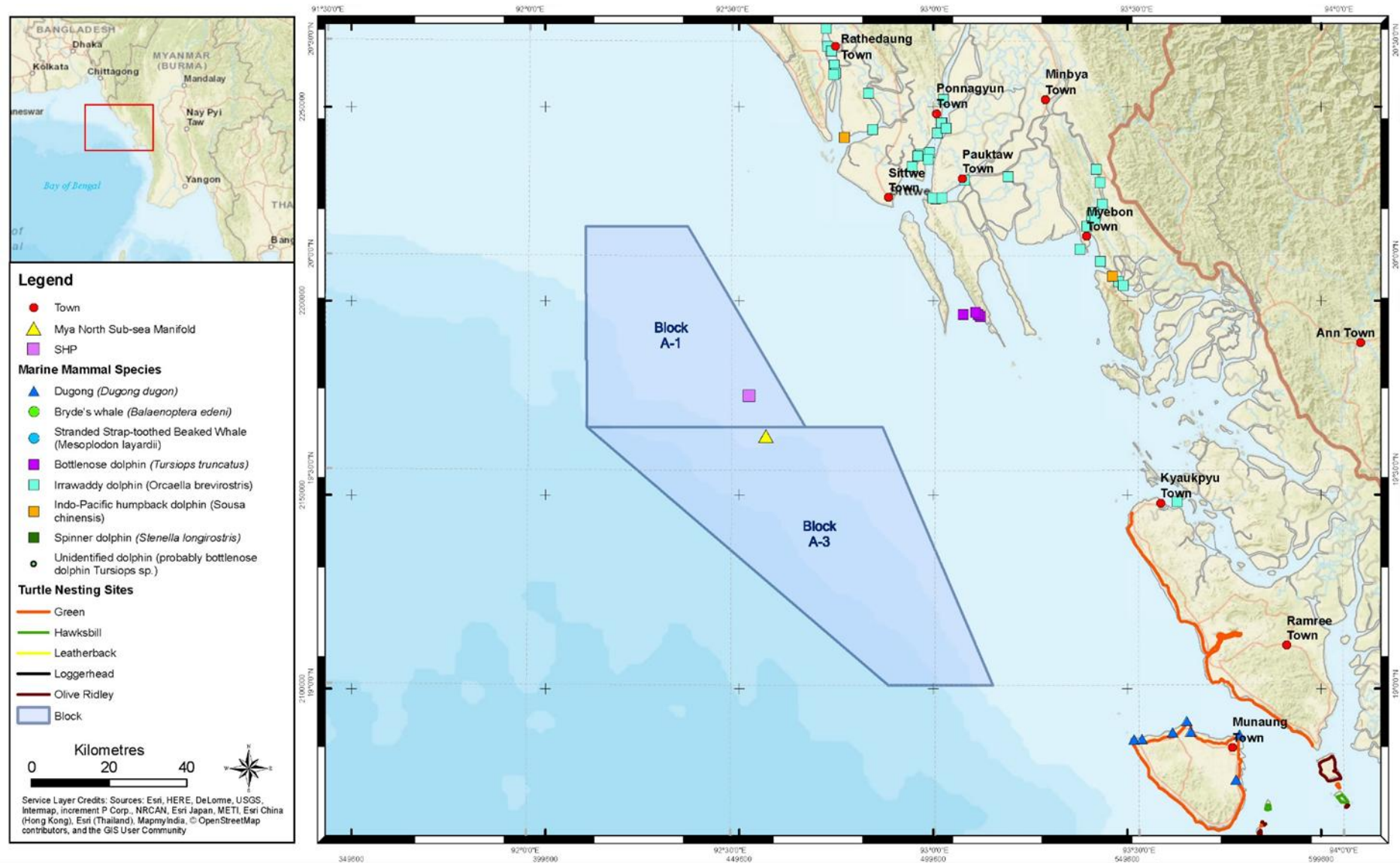


Figure 5-15 Key Biodiversity Area around the Project

5.8 Socio-Economic Components

This section aims to outline the socio-economic background of the Study Area. It includes the following components:

- Physical Characteristics and Land Use;
- Administration and Demographics;
- Livelihood and Economy;
- Social indicators;
- Fishing Operations and Resources;
- Shipping Lanes;
- Oil and Gas Infrastructure and Activities;
- Public Health Components;
- Hotel and Tourism Sector;
- Cultural Components; and
- Visual Components.

5.8.1 *Physical Characteristics and Land Use*

Rakhine State is located in Western Myanmar, and is bordered by the Chin State in the North, Magway, Bago and Ayeyarwady Division in the east, the Bay of Bengal in the west and Chittagong Division of Bangladesh in the Northwest. It is the eighth largest region in the country, and has a total land area of 36,780 km². The area is characterized by a long coastline along the Bay of Bengal, with a number of islands being located within the state's boundaries. It is also a mountainous territory which is difficult to access and separated from the rest of Myanmar by the Arakan Yoma Mountain range (UNICEF, 2011).

The land use in the region is characterized by a dominance of forests, with approximately 44 percent of the total land area being covered by evergreen forest, while 7 percent of the area is covered by deciduous forest. The eastern boundary of the state is mostly covered by deciduous forest (UNDP, 2011a). Apart from forest cover, the main land use in the region is agriculture, with twenty-eight percent of the land being categorised as agriculture land. Agricultural land is an important resource for the local community for livelihood purposes. The area occupied by settlements is only one percent of the total land area. The settlement area density is higher in the northern part of the state, than in the south. The capital, Sittwe, situated in the north, covers approximately 10 percent of the total land classified as settlements (UNDP, 2011a).

5.8.2 *Administration and Demographics*

Rakhine State is divided into five (5) districts and 20 townships/sub-townships of which five (5) are located entirely on islands and several more have parts of their territory on islands (Rakhine State Report, the 2014 Myanmar Population and Housing Census, May-2015). The Study Area from a social perspective covers two (2) districts and eight (8) townships, the details of which have been provided in **Table 5-13**. Rakhine State is the eighth largest and the second most populous state (after Shan State), characterised by a population density of 86.7 individuals per square kilometre and a sex ratio of 92 males per 100 females. Approximately 23.2 % of the households in Rakhine are female headed. Most of the population is concentrated around the coast and in the northern townships; the populations in the eastern, hilly forests of the State having particularly small populations. Among the 20 townships, Sittwe is the most densely populated (Rakhine State Report, 2014 Myanmar Population and Housing Census, May-2015).

Table 5-13 Administrative Structure of Study Area

District	Township	Number of Village Tracts	Area (km ²)	Population (2017)			Population Density (Hab./km ²)
				Male	Female	Total	
Kyauk Phyu	Total	170	9,593.31	207,508	230,275	442,293	46.10
	Kyauk Phyu	54	1,756.92	77,750	84,949	167,209	95.17
	Manaung	36	523.31	28,056	32,817	60,873	116.32
	Ramree	51	1,312.42	45,171	53,099	98,270	74.88
Sittwe	Total	260	2,445.84	333,640	357,297	690,927	282.49
	Ponnagyun	92	1,138.64	67,344	70,501	137,845	121.06
	Rathedaung	88	1,133.79	66,438	70,278	136,706	120.57
	Sittwe	27	231.13	155,860	162,654	318,514	1378.07

Source: Township GAD Data (2019)

5.8.3 Livelihood and Economy

Rakhine State is rich in natural resources including the scenic beauty of coastal beaches with high potential for tourism, unexplored potential for oil and natural gas, coastline to support fisheries, and lands supporting rice production and plantation.

The main sources of livelihood are agriculture, fisheries and livestock holdings, small businesses and the service industry. More than 50 percent of the population is dependent upon agriculture for their livelihood, while 13 percent engage in fishing, and 10 percent in livestock farming. The remaining 25 percent of the population is dependent upon the service industry, small businesses and other activities (UNDP, 2011a). According from the survey result conducted in Pauktaw, Kyauk Phyu, Minbu and Myebone Townships, it was found that 54% of households sold their crops, livestock, aquaculture or fishing products during the 12 months preceding the survey (CARE, November 2014).

Small amounts of inferior-grade crude oil are produced from basic, shallow, hand dug wells. In recent years, there has been significant investment in the tourism sector. However, issues such as poor infrastructure, particularly road infrastructure, weak connectivity to the rest of the country, lack of electricity, poor communication facilities, the mountainous terrain and social conflict amongst ethnic groups have resulted in major challenges for the state's socio- economic development (UNDP, 2011b). region. Apart from paddy, the main crops are rubber, pepper, pigeon pea, beans, sunflower, mustard, and oil seeds.

Fishing constitutes a quarter of Rakhine's estimated economic value with several studies by independent organizations (Oliver et.al. 2014) indicating that around 43 percent of the population in the state relies either on fishing or a combination of fishing/agriculture. The fishing sector also employs a number of landless coastal households (FAO website).

The fisheries sector plays a critical role in terms of employment (Oxfam, 2014). It is estimated that in the Rakhine region, almost 600,000 individuals are involved in capture fisheries and/or aquaculture, while 150,000 individuals are involved in other stages of the value chain, including processing, wholesale and export (this figure however only includes 489 registered fish traders and more traders may be involved in an informal basis). The fisheries sector is also important for casual labour, with 24 percent of the casual labour workforce in Myanmar reporting the fisheries sector as the first source of income.

Fishing and related activities are present all along the coastline. Key species captured in the Area of Interest include tiger prawn and pomfret (the most valuable catch), small and large prawns, small and large tuna,

groupers, mackerel, mullet, red snapper, catfish, squid, anchovy, sardines, shark, eel, lobsters, mahi mahi, scad, and sea bass. In deep-water, herring is also part of the catch.

Agricultural activities (predominantly paddy cultivation and groundnut with a minor proportion of maize, pulses, wheat and soybean (FAO website) are observed in the coastal areas in Kyauk Phyu, Ramree and Manaung. Agricultural activity varies in coastal communities depending on access to land. Some coastal communities have limited access to land and are highly dependent on fishing for income and subsistence.

5.8.4 Social Indicators

UNICEF (2013) reports that Rakhine State is characterised by high malnutrition, generally low enrolment and completion in primary education, and poor access to clean water and sanitation. It is also prone to natural hazards such as storms and floods increasing the vulnerability at the community level. It is reported that the inter-community violence in 2012 led to a worsening of social indicators with thousands displaced, suffering from food insecurity, interrupted livelihoods and education, as well as a lack of access to markets.

Literacy levels and access to educational infrastructure in Rakhine State are reported to be significantly lower than the national averages. Rakhine State has the lowest pre-school attendance among children aged three to five years in the country at five percent, in comparison to the national average of twenty-three percent. Only about a third of children enrolled at primary school complete their education on time.

The number of schools in Townships is shown in the following **Table 5.14**. Kyauk Phyu has the most schools, while Ramree has the least. Manaung and Rathedaung do not have monastic education. A representative photo of a Basic Education High School in Kyauk Phyu Township is shown in **Figure 5-16**. Furthermore, Sittwe has three (3) universities and Kyauk Phyu has one (1) college, one (1) institute and one (1) vocational school. Government technical institute in Kyauk Phyu is shown in **Figure 5.17**.

Table 5-14 Number of Schools within the Townships in the Study Area

Township	University		Institute	Training School	High School	Sub-High School	Middle School	Sub-Middle School	Primary School	Primary School	Nursery School	Monastic Education	Total
Ann	-				8	4	1	35	43	140	3	6	240
Kyauk Phyu	-	1	1	1	12	6	14	44	2	213	10	5	309
Manaung	-	-	-	-	6	6	2	9	12	101	16	-	152
Ramree	-	-	-	-	10	8	7	15	1	1	3	6	51
Pauktaw	-	-	-	-	5	7	7	27	38	152	1	14	251
Ponagyun	-	-	-	-	5	7	6	10	58	108	3	5	202
Rathedaung	-	-	-	-	8	5	4	17	38	174	13	-	259
Sittwe	3	-	-	-	8	6	6	7	24	94	3	4	155

Source: Township GAD Data (2019)



Source: ERM, 2019

Figure 5-16 High School in the Study Area (Kyauk Phyu Township)



Source: ERM, 2019

Figure 5-17 Government Technical Institute in Kyauk Phyu

A World Bank analysis of 2014 household survey data suggests that Rakhine State, with a poverty rate of 78 percent (the national average is 38 percent) may be the poorest region in the country. This is of particular concern given the high level of poverty at the national level and suggests that the population of Rakhine State may be particularly vulnerable.

According to Myanmar Population and Housing Census Township Report (2014), improve water source of drinking water in Rakhine State include tap water/piped; tubed well, borehole; protected well/spring and bottled/ purifier water and is shown. Additionally, the unimproved water source of drinking water includes unprotected well/spring; pool/pond/lake; river/stream/canal and waterfall/rainwater. These improved and unimproved water sources of drinking water. For domestic usage, most of the water get from pool/pond/lake and protected well/spring. The type of toilets in Rakhine State are improved sanitation facilities, include water seal improved pit latrine and flush. However, some areas use surface latrine and traditional pot latrine.

Most of the households from Rakhine State (59%) use candle for the main source of energy for lighting. In addition, only 12.8 % of the households access the electricity for lighting and they depend on candle, kerosene, private generator and battery for the lighting (Myanmar Population and Housing Census Township Report (2014).

5.8.5 Fishing Operations and Resources

The Department of Fisheries (DoF) controls fishing activities and issues licenses. The DoF has also instituted two fishing zones which provide a restriction on fishing activities and a degree of protection to fisheries resources. Zones are designated for specific fishing gear, classes of fishing vessels and ownership. Fishing Zone 1, for traditional coastal fisheries, extends from the shoreline to 5 nautical miles in the northern area including Rakhine coastal areas, and 10 nautical miles from the shore in southern coastal areas. Fishing Zone 2 extends from the outer limit of Fishing Zone 1 to 200 nautical miles Exclusive Economic Zone (EEZ) limit.

Fishing vessels are classified as commercial or traditional. Commercial offshore fishing vessels use trawl nets, purse seines, drift nets and gill nets. Traditional inshore fishing vessels use methods such as hook-and-line, cast net, bag net, gill net, lift net and traps. In 2012 – 13, approximately 1,900 licensed offshore commercial vessels and 24,500 licensed inshore traditional vessels operated in Myanmar waters. Total fisheries production for human consumption was 1.9 million tonnes in 2012.

Engagements were undertaken in March, April and September in 2019 in Rakhine State. Consultation meetings involved face-to-face meetings with a range of stakeholders including local fishers and villagers. Stakeholders confirmed that Rakhine fishers usually fish no further than 50 km from the coast. Only larger offshore fishing vessels are likely to be present in Block A-1 and A-3. The general consensus from the meeting was that the Project activities would be unlikely to interact with local fishing which is conducted closer to shore. Trawlers and purse seiners are the two types of offshore (>50 km from the coast) vessels in Rakhine. This information was confirmed by the DoF in Sittwe. Information on the vessels and fishing activities undertaken is presented in **Table 5.15** and **Table 5.16**.

Table 5-15 Fishing Data Collected

Type of Boats	Size	Distance covered (units)	Usually moves in Depth of (units)	Average fishing trip (time spent at
Large / offshore	>30 ft.	<30 miles (50 km) from coast	300 ft. (100 m)	2-3 days

Table 5-16 Fishing Methods for Offshore Fishers

Fishing Method	Location	Type of fish	Season	Boat Size	Dimensions of net (length, width, height)	Location in water column
Trawling	Up to 30 miles from the coast	Catfish, tuna, prawn, crab, anchovy	Year round	Large offshore	120 ft. (long)	Along seabed
Purse seine	Up to 30 miles from the coast	All the above except crab and prawn	October to April	Large offshore	180 ft. (long)	Surface to Mid-water

The majority of fishing is conducted within 10 nautical miles (16 km), i.e. within Fishing Zone 1, of the coast and sometimes up to 50 km from the coast. As the Project Area is located over 70 km from the nearest coastline, there are unlikely to be any interactions between local artisanal fishing vessels and the proposed Project activities. However, it was noted that large commercial trawlers from outside Rakhine State (i.e. either from other areas of Myanmar or international trawlers) may operate within the deep offshore waters of Rakhine. The seasonality of fishing in Rakhine is present in **Table 5.17**.

Table 5-17 Fishing Seasonality

Fishing Calendar	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Months with maximum fish catch (quantity (tonnes) caught)												
Months with lowest fish catch (quantity (tonnes) caught)												
Type of net used – Trawler												
Fishing Calendar	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Type of net used – Purse Seine												
Fishing reduced due to Cyclones or high tides												
Fishing restricted by Government (in some areas)												

Any increases in vessel movements will be negligible and are unlikely to have an impact on commercial fishing or shipping in the area. In addition, only a small number of fishers are expected to fish in or in the vicinity of Block A-1 and A-3 due to the distance to the shoreline that is approximately 55 km and according to the consultation meetings with fishermen, fishing activities are not conducted further than 50 km from the shoreline.

As per MOEE Notification No. (103/2017) dated in 17th November 2017, the project area has been declared as Shwe Gas Field whereby unauthorized activities are prohibited. (**Appendix E**)

Due to the Notice to Marina for declaration marine exclusive zone for Shwe and Mya Gas field (No. 15/2012) and for Shwe Phyu (No. 24/2022) shown in **Appendix F**, the unauthorized navigation, anchoring, trawling and other under water operation are prohibited for Shwe development area.

5.8.6 Shipping Lanes

From available ship frequency tracking data, the Bay of Bengal has relatively limited shipping activity with shipping lanes from ports in the north (Kolkata, Chittagong etc.) heading to the southern tip of India

and the Straits of Malacca in the south (Marine Traffic Website) (**Figure 5.18**). Block A-1 is located within this shipping route. The high vessel activity shown in Block A-1 is the activity associated with the existing SHP (**Figure 5.18**). Potential interactions between the proposed Project activities and shipping traffic could occur and have been considered as part of the assessment.

5.8.7 Oil and Gas Infrastructure and Activities

Block A-1 is surrounded by other offshore oil and gas blocks: AD-7, A-4, AD-1 and A-3. It is understood that oil and gas activities are being carried out in these blocks which may lead to cumulative impacts with the Project activities. Planned activities will be discussed with the Block holders (Shell and Woodside). An assessment of the potential cumulative impacts with other oil and gas operations is provided in Section 7.

5.8.8 Summary

Given that the proposed SHK location will be a minimum of 70 km from the mainland coast and in water depths of over 100 m, there is unlikely to be any significant overlap with local fishing activity. Similarly, the waters are not expected to be heavily used for transboundary shipping routes.

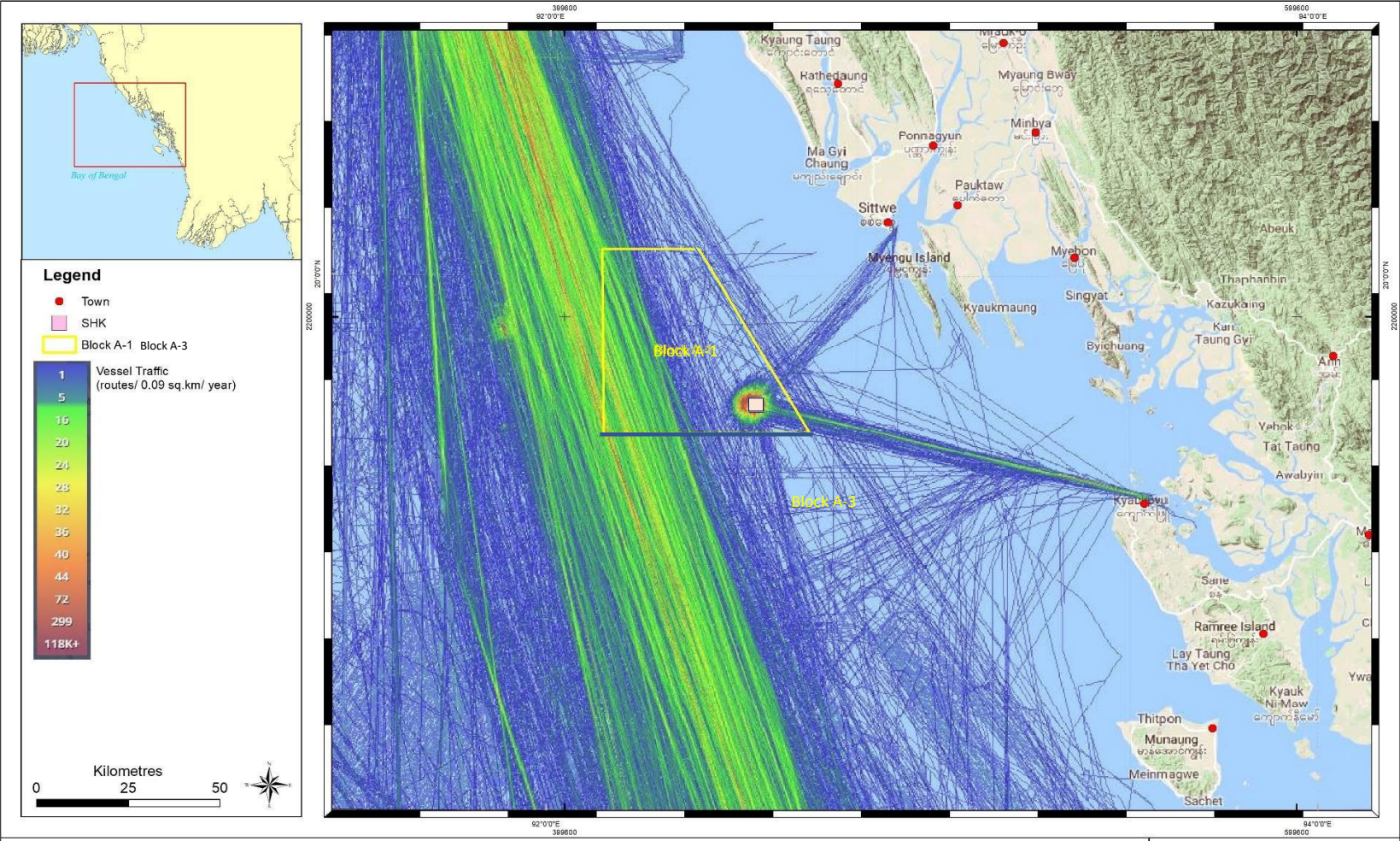


Figure 5-18 Shipping Lanes in Study Area

5.9 Public Health Components

Significant reductions in maternal and child mortality can be achieved through a few simple health interventions, including giving birth in a health facility, timely immunization against some of the main childhood illnesses, and adequate management of diarrhea including Oral Rehydration Therapy (ORT) etc. Children in the Study Area are much less likely than the average Myanmar child to be born in a health facility (only about 12 per cent are), where life- saving obstetric care would be available for mother and child in case of complications during birth. This also reflects the low level and quality of ante-natal care received by pregnant women in the State. The use of oral rehydration therapy (ORT), to prevent life-threatening dehydration associated with diarrhea among children, is employed in only 60 per cent of cases.

Table 5.18 summarizes the number of public health facilities within Townships in the Study Area and **Table 5.19** shows the health professional-to-patient ratios. According to the household survey result in Kyauk Phyu and Sittwe, cold is the most common illness in the Study Area, followed by Diabetics and TB (ERM, 2018 and 2019). **Figure 5.19** shows the township public health department in Sittwe and **Figure 5.20** shows a representative photo of Township hospital in Kyauk Phyu.

Table 5-18 Public Health Facilities within Townships in the Study Area

District	Township	Hospitals		Clinics	Rural Health Centers	Total
		Public	Private			
Kyauk Phyu	Ann	5	1	2	7	15
	Kyauk Phyu	3		2	8	13
	Manaung	3		11	8	22
	Ramree	6		2	9	17
Sittwe	Pauktaw	2			7	9
	Ponnagyun	3			5	8
	Rathedaung	4		8	7	19
	Sittwe	2	2	3	5	12

Source: Township GAD Data (2019)

Table 5-19 Health Professional-to-Patient Ratios within the Townships in the Study Area

District	Township	Medical doctors to total population	Nurses to total population	Rural Health Assistants to total population
Kyauk Pyu	Ann	1:9659	1:3219	1:19318
	Kyauk Pyu	1:7739	1:3611	1:27086
	Manaung	1:12174	1:1739	1:8696
	Ramree	1:12284	1:3510	1:14040
Sittwe	Pauktaw	1:46750	1:15583	1:31166
	Ponnagyun	1:22974	1:3282	1:27569
	Rathedaung	1:34179	1:9114	1:22786
	Sittwe	1:3277	1:1103	1:25486

Source: Township GAD Data (2019)



Source: ERM, 2019

Figure 5-19 Township Public Health Department in Sittwe



Source: ERM, 2019

Figure 5-20 Township Hospital in Kyauk Phyu

5.10 Hotel and Tourism Sector

Hotels and Tourism sector is emerging as the most prospective sector in Rakhine State since Myanmar has started its political and economic transition since 2010. Richness in natural resources, abundance in historical and cultural heritages and unique characteristic of different ethnic groups in Rakhine State are alluring factors for domestic and international tourists.

The major tourist destinations in Rakhine State include Mrauk-U, the ancient capital city of Rakhine Kingdom and Ngapali Beach. However, there are many untapped beaches and tourist attraction spots to develop along Rakhine Coast. It was reported that there were 53 hotels operating in Rakhine State. The majority of hotels are located in Thandwe District, especially in Ngapali Township. A representative photo of Ngapali Beach is shown in the following **Figure 5.21**.

There are 39 hotels along Ngapali beach, five (5) hotels in Sittwe and Mrauk-U, four (4) hotels in Kyauk Phyu. According to the Department of Hotel and Tourism, 64,727 international tourists visited Rakhine in 2017-18.



Figure 5-21 Ngapali Beach

5.11 Cultural Components

Mrauk-U, the ancient capital city of Rakhine State, is one of well-known archaeological sites in Myanmar. With century-old Buddhist temples, pagodas, city walls and some parts of remnants of Royal Palace, Mrauk-U is starting to change as the modes of transport and infrastructure have improved with a plan to develop Mrauk-U Airport.

5.12 Visual Components

There are three (3) major ports for interstate transportation, which include Sittwe, Kyauk Phyu and Thandwe Ports and three inter-state highways that connect with other main regions. These highways include:

- Sittway-Ann-Yangon Highway,
- Kyauk Phyu-Taungup-Yangon Highway and
- Thandwe-Gwa-Ngathaingchaung- Yangon Highway

Regarding air transport, airports exist in main cities such as Sittwe, Kyauk Phyu, Thandwe and Ann and Mann Aung. The government of Rakhine State has project plans to develop Mrauk-U Airport and Gwa Airport for better air transportation.

The Kyauk Phyu Special Economic Zone is located at the South of Kyauk Phyu town. The first phase of this project includes:

1. The development of 100 hectares of industrial park;
2. A deep-sea port – Multipurpose/ Container Handling Terminal; and
3. An integrated residential area.

Ponnagyun Industrial Zone is the second industrial zone project, which was earmarked to be constructed on 1,963.74 acres of land along the eastern part of Yangon- Sittwe Highway in Ponnagyun Township in Sittwe District.

Ka Nyin Chaung Economic Zone is being developed by the Maungdaw Border Merchants Association together with the Union of Myanmar Federation of Chambers of Commerce and Industry (UMFCCI). The total area of the Zone is about 100 acres of land, which is about 2 miles away from Maungdaw town and located on the bank of Naf River, the bordering river between Myanmar and Bangladesh. The zone has its own port with the capacity to handle 300 tons of seaborne cargo.

6. IMPACT ASSESSMENT AND MITIGATION MEASURES

6.1 Impact Assessment Methodology

The principal impact assessment steps are summarized in Figure 5.1 and comprise:

- **Impact prediction:** to determine what could potentially happen to resources/receptors as a consequence of the Project and its associated activities.
- **Impact evaluation:** to evaluate the significance of the predicted impacts by considering their magnitude or likelihood of occurrence (for unplanned events), and the sensitivity, value and/or importance of the affected resource/receptor.
- **Mitigation and enhancement:** to identify appropriate and justified measures to mitigate negative impacts and enhance positive impacts.
- **Residual impact evaluation:** to evaluate the significance of impacts assuming effective implementation of mitigation and enhancement measures.

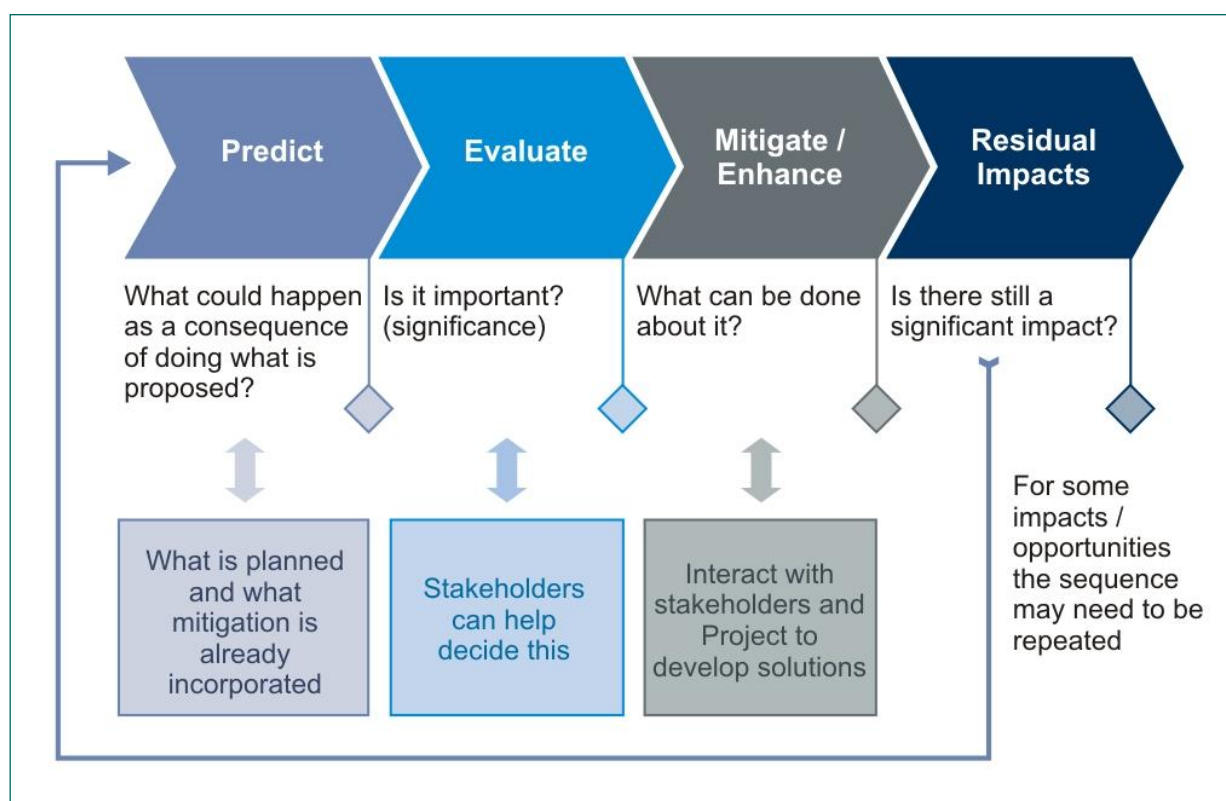


Figure 6-1 Impact Assessment Process

6.1.1 Prediction of Impacts

Prediction of impacts is an objective exercise to determine what could potentially happen to the sensitive receptors/resources as a consequence of the Project activities. From these potential interactions, the potential impacts to the various resources/receptors are identified and are elaborated to the extent possible. The assessment process typically utilizes a wide range of prediction methods including quantitative, semi-quantitative and qualitative techniques.

6.1.2 Evaluation of Impacts

Once the prediction of impacts is complete, each impact is described in terms of its relevant characteristics (e.g., type, scale, duration, frequency, extent). The terminology used to describe impact characteristics is shown in Table 6-1.

Table 6-1 Impact Characteristic Terminology

Characteristic	Definition	Designations
Type	A descriptor indicating the relationship of the impact to the Project (in terms of cause and effect).	Direct, Indirect, Induced
Extent	The “reach” of the impact (e.g., confined to a small area around the Project Footprint, projected for several kilometres, etc.).	Local, Regional, International
Duration	The time period over which a resource / receptor is affected.	Temporary, Short-term, Long-term, Permanent
Scale	The size of the impact (e.g., the size of the area damaged or impacted, the fraction of a resource that is lost or affected, etc.).	[no fixed designations; intended to be a numerical value]
Frequency	A measure of the constancy or periodicity of the impact.	[no fixed designations; intended to be a numerical value]

The definitions for the type designations are shown in **Table 6-2** and definitions for the other designations are resource/receptor-specific and are discussed in *Section 6.4*.

Table 6-2 Impact Type Definitions

Designations (Type, Extent, Duration)	Definition
Type	
Direct	Impacts that result from a direct interaction between the Project and a resource/receptor (e.g. sound from a seismic source such as a VSP leading to behavioral changes in marine fauna).
Indirect	Impacts that follow on from the direct interactions between the Project and its environment as a result of subsequent interactions within the environment (e.g. reduction in water quality from waste discharges potentially leading to effects in marine fauna).
Induced	Impacts that result from other activities (which are not part of the Project) that happen as a consequence of the Project (e.g., influx of camp followers resulting from the importation of a large Project workforce).
Extent	
Local	Impacts are experienced at a localized extent and limited to the vicinity of the well locations. These impacts will not be felt outside of the extent of Project Area.
Regional	Impacts are likely to be experienced within the wider region i.e. Rakhine State.
International	Impacts are may potentially extend across International boundaries.
Duration	
Temporary	Impacts that have effects that will occur for less than 1 month
Short-term	Impacts that have effects that will occur for 1-12 months
Long-term	Impacts that have effects that will occur for over a year 5 years
Permanent	Permanent, irreversible impact

The above characteristics and definitions apply to planned and unplanned events. An additional characteristic that pertains only to unplanned events is likelihood which is designated using a qualitative scale, as described in **Table 6-3**.

Table 6-3 Definitions for Likelihood Designations

Likelihood	Definition
Unlikely	The event is unlikely but may occur at some time during normal operating conditions.
Possible	The event is likely to occur at some time during normal operating conditions.
Likely	The event will occur during normal operating conditions (i.e., it is essentially inevitable).

6.1.3 Impact Magnitude, Receptor/Resource Sensitivity and Impact Significance

The next step is to assign each impact a 'magnitude' which is a function of a combination (depending on the resource/receptor in question) of the following impact characteristics: Extent; Duration; Scale; and Frequency.

Magnitude essentially describes the intensity of the change that is predicted to occur in the resource/receptor as a result of the impact. The magnitude designations are: Positive; Negligible; Small; Medium; and Large.

In the case of a positive impact, no magnitude designation (aside from 'positive') is assigned.

The definitions for these designations vary on a resource/ receptor basis. The impact magnitude for marine species, marine habitats and water quality impacts is provided in **Table 6-4**, **Table 6-5** and **Table 6-6** respectively. The impact magnitude criteria for the social impact assessment are provided in **Table 6-7**.

Table 6-4 Impact Magnitude for Marine Species

	Extent / Duration / Scale / Frequency
Large	May affect an entire population or species in sufficient magnitude to cause a decline in abundance and/ or change in distribution beyond which natural recruitment (reproduction, immigration from unaffected areas) would not return that population or species, or any population or species dependent upon it, to its former level within several generations.
Medium	May affect a portion of a population and may bring about a change in abundance and/ or distribution over one or more generations but does not threaten the integrity of that population or any population dependent on it.
Small	May affect specific group of localised individuals within a population over a short time period (one generation or less) but does not affect other trophic levels or the population itself.
Negligible	Immeasurable, undetectable or within the range of normal natural variation.

Table 6-5 Impact Magnitude for Marine Habitats

	Extent / Duration / Scale / Frequency
Large	May affect the integrity of an area or region, by substantially changing, in the long term, its ecological features, structures and functions, across its whole area, that enable it to sustain the habitat, complex of habitats and/or population levels of species that makes it important.
Medium	May affect some, if not all, of the area's ecological features, structures and functions in the short or medium term. The area or region may be able to recover through natural regeneration and restoration.
Small	May cause some minor impacts of limited extent, or to some elements of the area, are evident but easy to recover through natural regeneration.
Negligible	Immeasurable, undetectable or within the range of normal natural variation.

Table 6-6 Impact Magnitude for Water Quality

	Extent / Duration / Scale / Frequency
Large	Change in water quality over a large area that lasts over the course of several months with quality likely to cause secondary impacts on marine ecology; and/or routine exceedance of benchmark effluent discharge limits.
Medium	Temporary or localised change in water quality with water quality returning to background levels thereafter and/or occasional exceedance of benchmark effluent discharge limits.
Small	Slight change in water quality expected over a limited area with water quality returning to background levels within a few metres and/or discharges are well within benchmark effluent discharge limits.
Negligible	Immeasurable, undetectable or within the range of normal natural variation.

Table 6-7 Impact Magnitude for Local Communities, Fishermen and Other Marine Users

	Extent / Duration / Scale / Frequency
Large	Change dominates over baseline conditions. Affects the majority of the area or population in the area of influence and/or persists over many years. The impact may be experienced over a regional or national area.
Medium	Clearly evident difference from baseline conditions. Tendency is that impact affects a substantial area or number of people and/or is of medium duration. Frequency may be occasional, and impact may potentially be regional in scale.
Small	Perceptible difference from baseline conditions. Tendency is that impact is local, rare and affects a small proportion of receptors and is of a short duration.
Negligible	Change remains within the range commonly experienced within the household or community.

The other principal impact evaluation step is definition of the sensitivity (including vulnerability and importance) of the impacted resource/receptor. Other factors may also be considered, such as legal protection, government policy, stakeholder views and economic value.

As in the case of magnitude, the sensitivity designations themselves are universally consistent, however, the definitions for these designations vary on a resource/receptor basis. The universal sensitivity/ vulnerability/ importance designations are: Low; Medium; and High.

The receptor sensitivities for marine species, marine habitats and water quality are provided in **Table 6-8**, **Table 6-9** and **Table 6-10**, respectively. The receptor sensitivity criteria for the social assessment are provided in **Table 6-11**.

Table 6-8 Receptor Sensitivity for Marine Habitat

Category	Designation / Importance / Vulnerability
High	A habitat that has designated conservation status at an international scale (e.g., IUCN). Areas of particular biodiversity importance that may support populations of restricted range, endemic or endangered species, or is in itself unique or threatened.
Medium	A habitat that has designated conservation status at a national or regional scale. Areas composed of viable assemblages of plant and/or animal species of largely native origin, and/or where human activity has not essentially modified an area's primary ecological functions and species composition.
Low	A habitat not protected by law.

Category	Designation / Importance / Vulnerability
	Areas that may contain a large proportion of plant and/or animal species of non-native origin, and/or where human activity has substantially modified an area's primary ecological functions and species composition.

Table 6-9 Receptor Sensitivity for Marine Species

Category	Designation / Importance / Vulnerability
High	A species population that has designated conservation status at an international scale (e.g. IUCN). A species that is globally rare. A keystone species fundamental to the functioning of the ecosystem.
Medium	A species population that has designated conservation status at a national or regional scale. A species common globally but rare locally. Important to ecosystem functions or under threat or population in decline.
Low	A species not protected by law. Not critical to other ecosystem functions (e.g., as prey to other species or as predator to potential pest species) or common / abundant locally.

Table 6-10 Receptor Sensitivity for Marine Water Quality

Category	Designation / Importance / Vulnerability
High	Existing water quality is already under stress and/ or the ecological resources it supports are very sensitive to change (secondary ecological or health impacts are likely).
Medium	Existing water quality already shows some signs of stress and/ or supports ecological resources that could be sensitive to change in water quality.
Low	Existing water quality is good and the ecological resources that it supports are not sensitive to a change in water quality.

Table 6-11 Receptor Sensitivity for Local Communities, Fishermen and Other Marine Users

Category	Designation / Importance / Vulnerability
High	Profound or multiple levels of vulnerability that undermine the ability to adapt to changes brought by the Project.
Medium	Some but few areas of vulnerability; but still retaining an ability to at least in part adapt to change brought by the Project.
Low	Minimal vulnerability; consequently, with a high ability to adapt to changes brought by the Project and opportunities associated with it.

Once impact magnitude and resource/receptor sensitivity have been characterized, the significance can be assigned for each impact. Impact significance is designated using the matrix shown in **Table 6-12**.

Table 6-12 Impact Significance

		Resource/ Receptor Sensitivity		
		Low	Medium	High
Magnitude of Impact	Negligible	Negligible	Negligible	Negligible
	Small	Negligible	Minor	Moderate
	Medium	Minor	Moderate	Major
	Large	Moderate	Major	Major

The matrix applies universally to all resources/receptors as well as all impacts, as the resource/receptor-specific considerations are factored into the assignment of magnitude and sensitivity designations that enter into the matrix. **Box 6.1** provides context for what the impact significance ratings signify.

Box 6.1 Context of Impact Significances

An impact of **negligible** significance is one where a resource/receptor will essentially not be affected or the predicted effect is deemed to be 'imperceptible' or is indistinguishable from natural background variations.

An impact of **minor** significance is one where a resource/receptor will experience a noticeable effect, but the impact magnitude is sufficiently small and/or the resource/receptor is of low sensitivity. In either case, the magnitude should be well within applicable standards.

An impact of **moderate** significance has an impact magnitude that is within applicable standards, but falls somewhere in the range from a threshold below which the impact is minor, up to a level that might be just short of breaching a legal limit. Clearly, to design an activity so that its effects only just avoid breaking a law and/or cause a major impact is not best practice. These impacts are a priority for mitigation in order to avoid or reduce the significance of the impact. This does not necessarily mean that impacts of moderate significance have to be reduced to minor, but that moderate impacts are being managed effectively and efficiently.

An impact of **major** significance is one where an accepted limit or standard may be exceeded, or large magnitude impacts occur to highly sensitive resource/receptors. An aim of impact assessment is to get to a position where the Project does not have any major residual impacts, certainly not ones that would endure into the long-term or extend over a large area. However, for some aspects there may be major residual impacts after all practicable mitigation options have been exhausted. An example might be the visual impact of a facility. It is then the function of regulators and stakeholders to weigh such negative factors against the positive ones, such as employment, in coming to a decision on the Project.

It is important to note that impact prediction and evaluation consider any embedded controls (i.e., physical or procedural controls that are already planned as part of the Project design, regardless of the results of the impact assessment process). An example of an embedded control is a standard acoustic enclosure that is designed to be installed around a piece of major equipment. This avoids the situation where an impact is assigned a magnitude based on a hypothetical version of the Project that would not happen in a real-world situation.

6.1.4 Identification of Mitigation and Enhancement Measures

Once the significance of an impact has been characterized, the next step is to evaluate what control measures can be applied to eliminate, control or mitigate the risk and to determine if the risk level is acceptable.

The assessment process is intended to identify impacts and benefits associated with project activities and ways of dealing with them during the planning and design stage of the project. Planned mitigation measures will be described, and additional measures or controls will be recommended where impacts are still considered

to be unacceptable. These mitigation measures have been utilized to develop the EMP. Note that, in accordance with the EIA Procedures, the EMP for this Project is presented as a separate document.

Many mitigation or control measures will require a degree of management to ensure their success in reducing potential impacts to the residual level that is expected through the EIA process. Most of these residual outcomes are likely to require a degree of monitoring through project implementation to ensure that the mitigation management process is effective. It is these management and monitoring efforts that report to the EMP as part of the EIA process.

6.1.5 Residual Impact Evaluation

Once mitigation and enhancement measures are declared, the residual impact significance is identified (i.e., a repeat of the impact assessment steps discussed above). In some cases, it may only be possible to reduce the impact to a certain degree such as where an impact could not be completely avoided. All residual significant impacts are described in this report with commentary on why further mitigation is not feasible.

The degree of significance attributed to residual impacts is related to the weight that should be given to them in reaching a decision on the Project:

- Residual impacts of **Major** significance are considered to warrant substantial weight in the Project decision making process. Conditions should be imposed to ensure adverse impacts are strictly controlled and monitored;
- Residual impacts of **Moderate** significance are considered to be of reducing importance to decision-making, however, still warrant careful attention to ensure best available techniques are used to keep adverse impacts to as low as is technically and financially feasible;
- Residual impacts of **Minor** significance should be brought to the attention of the decision-maker but are identified as warranting little if any weight in the decision; and
- Not significant residual impacts are those that, after assessment, are found not to be significant to the decision making about the Project.

6.1.6 Management and Monitoring

The final stage in the impact assessment process is defining the management and monitoring measures that are needed to identify whether: a) impacts or their associated Project components remain in conformance with applicable standards; and b) mitigation measures are effectively addressing.

A summary of all actions which the Project Proponent has committed to are included in the separate EMP. The EMP includes mitigation measures, management and monitoring activities.

6.2 Residual Impact Assessment

The EMP's conducted for this Project assessed the potential impacts and mitigation to reduce the level of the impact. As this Project already exists, this section discusses the Operational Phase impacts only as the installation and construction related activities have already taken place.

The EMP's concluded that potential impacts would be expected to be typically short term and are well understood, with little or no evidence of adverse consequences on the majority of environmental or social receptors from previous experience in the industry.

6.3 Impacts and Mitigation measures

These potential impacts and the residual impacts are summarized in **Table 6-13**.

Table 6-13 Summary of Impacts from Operation Phase

Activity/ Source of Impact	Potential Impacts	Residual Impact Significance
OPERATION OF OFFSHORE FACILITIES		
SHP, support vessels and air transportation	<ul style="list-style-type: none"> Emissions from SHP, support vessels and air transportation (helicopter) may have the potential to elevate carbon dioxide (greenhouse gas) and other types of air pollutants to the atmosphere. 	Negligible
Discharge of Produced Water, Deck drains, bilge water discharges and sewage and greywater discharges	<ul style="list-style-type: none"> Small increase in concentration of organic content, nutrients, sediments, coliform bacteria in seawater and potential oil contamination. Impacts would be short term and low severity due to rapid dilution and dispersion in seawater. 	Minor
Disturbance effects on marine life of sewage, bilge water and oil contaminants	<ul style="list-style-type: none"> Sewage, bilge water, and oil contaminants from deck drain, platform, and vessels could result in disturbance effects on the marine life (e.g., fish, turtles, dolphins) in short term. Contaminants discharged into the sea will be dispersed and diluted rapidly. 	Minor
Disturbance on marine life from underwater noise of vessel movements	<ul style="list-style-type: none"> By altering the natural underwater acoustic environment for marine organism's particularly marine mammals. Vessel movements will likely be infrequent and over a short duration. 	Negligible
Non-hazardous wastes	<ul style="list-style-type: none"> Inappropriate handling, storage and disposal of non-hazardous wastes generated offshore have the potential to result in fouling/contamination of the marine and on-shore environments 	Negligible
Hazardous wastes	<ul style="list-style-type: none"> Inappropriate hazardous waste management have the potential to result in water pollution/fouling/ contamination of the sea/shoreline or on-shore environment (on-shore storage, transport and disposal activities) 	Negligible

Activity/ Source of Impact	Potential Impacts	Residual Impact Significance
Offshore facilities are a potential navigational hazard	<ul style="list-style-type: none"> Presence of offshore facilities during operation could potentially result in dangerous obstruction for navigation routes and fishing activities Exposure of workers to elevated noise, dust and heat with concomitant risk of hearing, impairment, respiratory problems and heat exhaustion 	Negligible
Risk of injury to facilities and support vessel personnel	<p>Exposure of workers to potentially hazardous materials (e.g. fuel, oils, chemicals etc.)</p> <p>Fire and explosion risks associated with natural gas/fuels etc.</p> <p>Risks associated with marine operations (e.g. drowning).</p> <p>Exposure of workers to potentially dangerous working conditions (e.g. risk of getting physical injury from machinery, dropped objects, working in elevated positions, electrocution etc.)</p> <p>Risk of having illness from communicable diseases</p>	Negligible
OPERATION OF MIDSTREAM, SUPPLY BASE AND JETTY FACILITIES		
Air Emissions	<ul style="list-style-type: none"> Emissions from onshore vehicles and equipment via fuel combustion may have the potential to elevate carbon dioxide (greenhouse gas) and other types of air pollutants to the atmosphere 	Minor
Airborne Noise	<ul style="list-style-type: none"> Noise impacts / disturbance through operational activities 	Negligible to Minor
Light Emissions from operational activities (coastal and onshore)	<ul style="list-style-type: none"> Alteration of light environment and light pollution by lights from vessels/ vehicles and project site 	Negligible to Minor
Operational discharges from operational vessels	<ul style="list-style-type: none"> Increase in concentration of organic content, nutrients, sediments, coliform bacteria in seawater and potential oil contamination 	Negligible to Minor
Run-off and discharge of sewage and greywater	<ul style="list-style-type: none"> Small increase in concentration of organic content, nutrients, sediments, coliform bacteria in surface water and potential oil contamination. 	Negligible to Minor
Run-off and discharge of sewage and greywater	<ul style="list-style-type: none"> Small increase in concentration of organic content, nutrients, sediments, coliform bacteria in surface water and potential oil contamination. 	Negligible to Minor

Activity/ Source of Impact	Potential Impacts	Residual Impact Significance
Disturbance effects on marine life of sewage and oil contaminants	<ul style="list-style-type: none"> Sewage and oil contaminants from run off and discharges could result in disturbance effects on the marine life (e.g., fish, turtles, dolphins) in short term. However, the contaminants discharged into the sea will be dispersed and diluted rapidly. 	Negligible to Minor
Physical Injury & Harassment	<ul style="list-style-type: none"> Vessel movement may potentially disturb marine mammals (e.g., vessel strike) 	Minor
Navigation management (notice to mariners)	<ul style="list-style-type: none"> Transportation of all facilities and equipment to the construction site may pose hazard to marine traffic or fishing (i.e., removal of fishing gears). 	Minor
Non-hazardous wastes	<ul style="list-style-type: none"> Inappropriate handling, storage and disposal of non-hazardous wastes the potential to result in fouling/contamination of the marine and on-shore environments 	Negligible
Hazardous wastes	<ul style="list-style-type: none"> Inappropriate hazardous waste management have the potential to result in water pollution/fouling/ contamination of the sea/shoreline or on-shore environment (on-shore storage, transport and disposal activities) 	Negligible
Storage of waste / fuel etc. onsite	<ul style="list-style-type: none"> Waste materials and other items such as fuel and lubricating oil may results in contamination of land depending on length of storage and storage receptacles. 	Negligible

Activity/ Source of Impact	Potential Impacts	Residual Impact Significance
Risk of injury to facilities personnel	<ul style="list-style-type: none"> Exposure of workers to elevated noise, dust and heat with concomitant risk of hearing, impairment, respiratory problems and heat exhaustion Exposure of workers to potentially hazardous materials (e.g., fuel, oils, chemicals etc.) Exposure of workers to potentially hazardous materials (e.g., fuel, oils, chemicals etc.) Exposure of workers to potentially dangerous working conditions (e.g., risk of getting physical injury from machinery, dropped objects, working in elevated positions, electro-caution etc.) Risks associated with marine operations (e.g., drowning) Risk of having illness from communicable diseases 	Negligible
SOCIAL IMPACT ASSESSMENT FROM OPERATION OF ONSHORE FACILITIES		
Social Cohesion	<ul style="list-style-type: none"> Resentment towards 'outsiders' occupying jobs Jealousy from those not benefiting from project Increased wealth causing family breakdown Breakdown of traditional authority and lore Social isolation 	Negligible
Demography and Culture	<ul style="list-style-type: none"> Beneficial ethnic and racial diversity Social tension from ethnic and racial diversity Depletion of labour from traditional industries Increased vulnerability of women 	Moderate - Minor

Activity/ Source of Impact	Potential Impacts	Residual Impact Significance
Cultural Heritage	<ul style="list-style-type: none"> • Disruption and destruction of cultural heritage • Isolation from culturally significant sites / materials • Improved knowledge and documentation of cultural materials and sites of significance 	<p>Minor (negative)</p> <p>Positive from improved knowledge of cultural materials</p>
Economy, Industry and Employment	<ul style="list-style-type: none"> • Dissemination of monetary benefits may be impeded • Procurement of goods and services required for the project from local providers not realized • Sustainability of industry and local employment post- closure of the project • Unmet community expectations – training and employment • Failure to build capacity amongst project impacted populations • Lack of availability of skilled workers resulting in a loss of local benefits • Depletion of labour/skill in traditional industries 	Moderate to Minor
Education	<ul style="list-style-type: none"> • Improved education facilities and standard • Improved proximity and access to education services • Increased pressure on educational infrastructure, facilities and services • Sustainability of facilities beyond project closure 	<p>Minor (negative)</p> <p>Positive from improved facilities</p>
Public Health	<ul style="list-style-type: none"> • Introduction and spread of disease • Project-related public health and safety • Boating safety • Military intervention and human rights • Improved access and quality of public health facilities • Increased pressure on existing health services 	<p>Minor (negative)</p> <p>Positive from improved facilities</p>

Activity/ Source of Impact	Potential Impacts	Residual Impact Significance
Infrastructure	<ul style="list-style-type: none"> Potential improvement in infrastructure Increased pressure on current infrastructure Loss of access to land and other facilities during construction, operations 	Minor (negative) Positive from improved facilities
Political Systems	<ul style="list-style-type: none"> Potential for political unrest to disrupt the project 	Minor
Human Rights	<ul style="list-style-type: none"> Perceived breaches of human rights Military intervention Forced and / or child labour Enforcement of exclusion zones International criticism 	Moderate – Minor
Resettlement and Compensation	<ul style="list-style-type: none"> Poor resettlement, restoration of livelihoods Damage or loss of access to land and crops Compensation unduly taxed or payment not distributed to land holders Fishing livelihoods 	Minor - Negligible
Environmental Values	<ul style="list-style-type: none"> Damage to agricultural land and fishing grounds Perceived damages to agricultural land and fishing grounds Decrease in available resources Detection of environmental damage by other sources (non-project related) 	Minor - Negligible
UNPLANNED EVENTS FOR OFFSHORE, MIDSTREAM, AND ONSHORE FACILITIES		
Dropped objects/lost equipment and vessel grounding/ collisions	<ul style="list-style-type: none"> Direct impact on personnel resulting in fatality Damage to a structural component Damage to equipment and piping causing release of hydrocarbons Loss of object to sea leading to potential environmental damage. 	Negligible to minor

Activity/ Source of Impact	Potential Impacts	Residual Impact Significance
Spills & Leaks from offshore platform SHP	<ul style="list-style-type: none"> Hazardous to the marine organisms and reduction of water quality but will spread rapidly to form a thin surface sheen and evaporate rapidly 	Negligible to minor
Chemical Spills	<ul style="list-style-type: none"> Potentially hazardous to marine/ terrestrial ecology and / or reduction of seawater or river quality 	Negligible
Blowout	<ul style="list-style-type: none"> Uncontrolled release of gaseous and liquid hydrocarbons to both the marine and atmospheric environments Damage to the benthic community Toxic to associated personnel 	Minor

6.4 Description of the Mitigation Measures

Through the Project development and the EIA process, PIC has made commitments to ensure appropriate environmental and social performance. A summary of the Project impacts and the committed measures designed to manage and mitigate those impacts is presented in **Table 6-14**. The schedule and responsibility for implementation of these mitigation measures are identified as necessary.

Table 6-14 Project Impacts and Mitigation Measures with Budget Allocation for Monitoring Sub plan

Environmental Issues	Activity/ Source of Impact	ID	Potential Impacts	Mitigation Measures/ Management Requirements	Residual Impact Significance	Actions	Responsibility	Frequency	Verification	Estimated Budget
OPERATION OF OFFSHORE FACILITIES										
Air quality	CPP, support vessels and air transportation	SS1	<ul style="list-style-type: none"> Emissions from CPP, support vessels and air transportation (helicopter) may have the potential to elevate carbon dioxide (greenhouse gas) and other types of air pollutants to the atmosphere 	<ul style="list-style-type: none"> Routine monitoring and maintenance of engines and all equipment for efficient and suitability for completed combustion Appropriately apply manuals and operation processes for each particular equipment operation and associated systems Optimize the installation schedule and supply and support operations/ logistics to reduce vessel operation time All contractors comply with PIC HSE management requirements and contractor operations audited for compliance with specified requirement Reducing unnecessary trips by improving route planning and implementing shared transportation where feasible Encourage the use of virtual meetings and remote collaboration tools to minimized business travel Ensuring regular tyre pressure checks and proper inflation to reduce rolling resistance and enhance fuel efficiency Implementing idle-reduction policies to prevent unnecessary fuel consumption and reduce carbon emissions 	Negligible	<ul style="list-style-type: none"> Ensure application of efficient equipment operations. Maintain records of all maintenance and application of appropriate operation processes. 	All contractors	Twice a year	Audit Reports	Average 15,000 USD per year

Environmental Issues	Activity/ Source of Impact	ID	Potential Impacts	Mitigation Measures/ Management Requirements	Residual Impact Significance	Actions	Responsibility	Frequency	Verification	Estimated Budget
	HVAC operation		<ul style="list-style-type: none"> Emission from refrigeration/ AC Equipment 	<ul style="list-style-type: none"> Install leak detection sensors to monitor refrigerant level and prevent excessive loss. Train HVAC technicians and facility staff on best practices for refrigerant management Promote strict refrigerant handling and disposal policies to ensure regulatory compliance. 						
Seawater Quality	Discharge of Produced Water Deck drains, bilge water discharges and sewage and greywater discharges	SS2	<ul style="list-style-type: none"> Small increase in concentration of organic content, nutrients, sediments, coliform bacteria in seawater and potential oil contamination. Impacts are, however, would be short term and low severity due to rapid dilution and dispersion in seawater 	<ul style="list-style-type: none"> All produced water will be treated offshore and discharged into the sea. Treated produced water will meet the Myanmar EQEG (discharge to sea maximum one day oil and grease should not exceed 42 mg/l; 30-day average should not exceed 29 mg/l). Chemical selection and use will be risk based so as to minimise the discharge of hazardous chemicals to sea. Platform utility system design standards and in-place operating philosophies to ensure discharged produced water achieves < 29 mg/l oil-in-water content (monthly average) 	Minor	<ul style="list-style-type: none"> OIW content to meet the required OIW specification described in section 4.3.4.2. Contractor's operations must be audited for compliance with specified requirements such as external Audit of ISO 14001 Conduct two Times Seawater Collection at 100 m and 500 m for Seawater Quality and report on compliance including results for eight parameters by SHP Lab 	Contractor and vessel operators	Twice a year	<ul style="list-style-type: none"> Environmental Audit Reports such as ISO 14001 EMS External Audit Report Vessel Logbook 	Average 10,000 USD per year

Environmental Issues	Activity/ Source of Impact	ID	Potential Impacts	Mitigation Measures/ Management Requirements	Residual Impact Significance	Actions	Responsibility	Frequency	Verification	Estimated Budget
				<ul style="list-style-type: none"> Compliance with requirements of MARPOL, Annexes I and IV for larger vessels All vessels, barges and rigs operate in compliance with MARPOL Annexes I: oil-in-water content of discharges should not exceed 15 ppm. All sewage and greywater discharges comply with MARPOL 73/78. Oil-water separators for deck drains in drilling platform and vessels Oil-water separators for bilge water discharges Collect used oil and oil-contaminated waste into slop tank for recycling or disposal by best available practice. 						
Marine organisms	Disturbance effects on marine life of sewage, bilge water and oil contaminants	SS3	<ul style="list-style-type: none"> Sewage, bilge water, and oil contaminants from deck drain, platform, and vessels could result in disturbance effects on the marine life (e.g. fish, turtles, dolphins) in short term. However, the contaminants discharged into the sea will be dispersed and diluted rapidly. 	<ul style="list-style-type: none"> Same measures as for <i>Seawater Quality</i> 	Minor	<ul style="list-style-type: none"> Conduct audit inspections and report on compliance including logbook records for all discharges 	Contractor and vessel's operators	Once in three years	<ul style="list-style-type: none"> Audit Reports Vessel Logbook 	No specific cost assigned as are part of standard operating procedures

Environmental Issues	Activity/ Source of Impact	ID	Potential Impacts	Mitigation Measures/ Management Requirements	Residual Impact Significance	Actions	Responsibility	Frequency	Verification	Estimated Budget
Marine organisms	Disturbance on marine life from underwater noise of vessel movements	SS4	<ul style="list-style-type: none"> By altering the natural underwater acoustic environment for marine organism's particularly marine mammals. However, vessel movements will likely be infrequent and over a short duration. 	<ul style="list-style-type: none"> Use only well-maintained vessels Service and inspect vessels regularly during operation Shut-down machines and equipment that are in intermittent use (or throttle down to minimum) 	Negligible	<ul style="list-style-type: none"> Advise contractors of all relevant mitigation measures Audit / inspect contractor operations Contractor to implement industry best practice on site 	Contractor and vessel's operators	During operation phase	<ul style="list-style-type: none"> Audit Reports Vessel Logbook 	No specific cost assigned as are part of standard operating procedures
Waste Management	Non-hazardous wastes	SS5	<ul style="list-style-type: none"> Inappropriate handling, storage and disposal of non-hazardous wastes generated offshore have the potential to result in fouling/contamination of the marine and on-shore environments 	<ul style="list-style-type: none"> Enforce all contractors to comply with Company HSE waste management requirements and relevant laws and monitor contractors' operations for their compliances Minimize waste generation Implement appropriate waste segregation and storage and transport waste by boats to onshore facility for disposal by best available practice Arrange training about appropriate wastes management and storage Establish guidelines for hazardous waste transportation 	Negligible	<ul style="list-style-type: none"> All contractors must comply with PIC HSE management requirements and contractor's operations must be audited for compliance with specified requirements. 	Contractor and vessel's operators	During operation phase	Audit Reports	Average 60,000 USD per year

Environmental Issues	Activity/ Source of Impact	ID	Potential Impacts	Mitigation Measures/ Management Requirements	Residual Impact Significance	Actions	Responsibility	Frequency	Verification	Estimated Budget
Waste Management	Hazardous wastes	SS6	<ul style="list-style-type: none"> Inappropriate hazardous waste management have the potential to result in water pollution / fouling/contamination of the sea/shoreline or on-shore environment (on-shore storage, transport and disposal activities) 	<ul style="list-style-type: none"> Enforce all contractors to comply with Company HSE waste management requirements and relevant laws and monitor contractors' operations for their compliances Minimize waste generation if practicable. Implement appropriate hazardous waste segregation and storage and transport all hazardous waste by boats to onshore facility for disposal by best available practice Arrange training about appropriate wastes management and storage Use waste manifest for all hazardous waste 	Negligible	<ul style="list-style-type: none"> All contractors must comply with PIC HSE management requirements and contractor's operations must be audited for compliance with specified requirements. 	Contractor and vessel's operators	During operation phase	Contractor Terms of Reference / Scope of Work	Average 60,000 USD per year
Fisheries and Navigation	Offshore facilities are a potential navigational hazard	SS7	<ul style="list-style-type: none"> Presence of offshore facilities during operation could potentially result in dangerous obstruction for navigation routes and fishing activities 	<ul style="list-style-type: none"> Assign 500 m radius exclusion zone (safety zone) around the platform to be closely monitored and actively enforced There would also be an Alert Area (5 nautical miles), where navigation is forbidden 	Negligible	<ul style="list-style-type: none"> Ensure relevant authorities are informed of the location of all installed facilities. Ensure establishment of the exclusion zone and all above water facilities install navigational warning devices 	Contractor and vessel's operators	During operation phase	<ul style="list-style-type: none"> Contractor Terms of Reference / Scope of Work Audit Reports Vessel Logbooks 	10,000 USD Per year

Environmental Issues	Activity/ Source of Impact	ID	Potential Impacts	Mitigation Measures/ Management Requirements	Residual Impact Significance	Actions	Responsibility	Frequency	Verification	Estimated Budget
				<ul style="list-style-type: none"> The platform will be provided with a range of navigation warning devices including navigation light, area lighting, communications equipment and radar reflectors Notices to mariners will be issued/posted to alert shipping to the infield presence of the installed facilities 		<ul style="list-style-type: none"> Ensure shipping alerts posted Conduct inspections/audits to check contractor compliance with requirements 				
Occupational Health and Safety	Risk of injury to facilities and support vessel personnel	SS8	<ul style="list-style-type: none"> Exposure of workers to elevated noise, dust and heat with concomitant risk of hearing, impairment, respiratory problems and heat exhaustion Exposure of workers to potentially hazardous materials (e.g. fuel, oils, chemicals etc.) Fire and explosion risks associated with natural gas/fuels etc. Risks associated with marine operations (e.g. drowning) 	<ul style="list-style-type: none"> Management controls and occupational health and safety management system. Operational controls including permitting system, management of changes, contractor management, monitoring, accident reporting and investigation, management plans, amendment, and protection, etc. Implementation according to health and safety implementation process and protection control measures such as safety procedures to use tools, safety operate, request working permit, PPE, etc. 	Negligible	<ul style="list-style-type: none"> All contractors must comply with PIC's occupational health and safety management system Contractor's operations must be audited for compliance with specified requirements 	PIC, Contractor	During operation phase	<ul style="list-style-type: none"> Contractor Terms of Reference / Scope of Work Audit Reports Vessel Logbooks 	No specific cost assigned as are part of standard operating procedures

Environmental Issues	Activity/ Source of Impact	ID	Potential Impacts	Mitigation Measures/ Management Requirements	Residual Impact Significance	Actions	Responsibility	Frequency	Verification	Estimated Budget
			<ul style="list-style-type: none"> Exposure of workers to potentially dangerous working conditions (e.g. risk of getting physical injury from machinery, dropped objects, working in elevated positions, electro-caution etc.) Risk of having illness from communicable diseases. 	<ul style="list-style-type: none"> Implementation based on restoration/ response measures such as first aid, plans to hire necessary licensed medic, emergency plans, and response plans in case of emergency. Implementation according to other measures such as health examination, information distribution, recommendation, training, and assigning health and safety/monitoring officers. 						
OPERATION OF MIDSTREAM, SUPPLY BASE AND JETTY FACILITIES										
Air quality	Air Emissions	SS9	Emissions from onshore vehicles and equipment via fuel combustion may have the potential to elevate carbon dioxide (greenhouse gas) and other types of air pollutants to the atmosphere	<ul style="list-style-type: none"> Emissions will comply with the Myanmar EQEG Routine monitoring and maintenance of engines/ vehicles and all equipment for efficient and suitability for completed combustion Vehicle / equipment air emissions should be controlled by simple good practice procedures (such as turning off equipment when not in use) 	Minor	<ul style="list-style-type: none"> Ensure application of efficient equipment operations. Maintain records of all maintenance and application of appropriate operation processes. 	PIC /Contractor (as appropriate)	6 th Monthly	Audit Reports	Average 15,000 USD per year

				<ul style="list-style-type: none"> • Vehicle / equipment exhausts observed to be emitting significant black smoke in their exhausts should be serviced • Appropriately apply manuals and operation processes for each particular equipment operation and associated systems • To effectively minimize unpleasant odors, periodic cleansing of the OGT interceptor pond is carried out as needed. Regular inspection and cleaning of the pond help maintain water quality and prevent potential environmental concerns. The process involves manual and mechanical cleaning techniques, such as high-pressure water jetting and removal of floated debris or sludge deposits. • Reducing unnecessary trips by improving route planning and implementing shared transportation where feasible • Encourage the use of virtual meetings and remote collaboration tools to minimized business travel • Ensuring regular tyre pressure checks and proper inflation to reduce rolling resistance and enhance fuel efficiency • Implementing idle-reduction policies to prevent unnecessary fuel consumption and reduce carbon emissions 						
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Environmental Issues	Activity/ Source of Impact	ID	Potential Impacts	Mitigation Measures/ Management Requirements	Residual Impact Significance	Actions	Responsibility	Frequency	Verification	Estimated Budget
Noise	Airborne Noise	SS10	Noise impacts / disturbance through operational activities	<ul style="list-style-type: none"> Conduct preventive maintenance to reduce noise level and to ensure efficiency of machinery from deterioration Orientate noise emitting equipment away from nearby receivers 	Negligible to Minor	<ul style="list-style-type: none"> Ensure application of efficient equipment operations. Maintain records of all maintenance and application of appropriate operation processes 	PIC /Contractor (as appropriate)	6 th monthly	Audit Reports	Average 5,000 USD per year
Light	Light Emissions from operational activities (coastal and onshore)	SS11	Alteration of light environment and light pollution by lights from vessels/ vehicles and project site	<ul style="list-style-type: none"> Minimising lighting to that which is absolutely necessary for the operation area Light dispersion should be limited/ mitigated by the design of the lighting equipment with the aim to minimise disturbance by avoiding intense illumination, white lights and night time lighting glare Lighting sources will be pointed inward and downwards where practicable to ensure the light rays travel downward and not horizontally or up to reduce light spill Avoid the use of diffuse lights as far as practicable and explore selection of lighting fixtures which allow shading of light only onto areas needed, and use lighting fixtures which are hooded and allow directing of light beam 	Negligible to Minor	Ensure application of mitigation measures	PIC /Contractor (as appropriate)	During operation phase	Audit Reports	No specific cost assigned as are part of standard operating procedures

Environmental Issues	Activity/ Source of Impact	ID	Potential Impacts	Mitigation Measures/ Management Requirements	Residual Impact Significance	Actions	Responsibility	Frequency	Verification	Estimated Budget
Seawater Quality	Operational discharges from operational vessels	SS12	Increase in concentration of organic content, nutrients, sediments, coliform bacteria in seawater and potential oil contamination	<ul style="list-style-type: none"> All contractors comply with PIC HSE management requirements and contractor operations audited for compliance with specified requirements Compliance with requirements of MARPOL, Annexes I and IV for larger vessels 	Negligible to Minor	<ul style="list-style-type: none"> Contractor's operations must be audited for compliance with specified requirements Report on audit inspections of compliance 	Contractor and vessel's operators	Once per year as Marine baseline sampling points mentioned in Baseline Survey in section 5.4, Figure 5.7	Audit Reports	Average 10,000 USD per year
Surface water Quality	Run-off and discharge of sewage and greywater	SS13	Small increase in concentration of organic content, nutrients, sediments, coliform bacteria in surface water and potential oil contamination.	<ul style="list-style-type: none"> Discharges will comply with the Myanmar EQEG All contractors comply with PIC HSE management requirements and contractor operations audited for compliance with specified requirements Permanent sewage treatment plant (e.g. septic tank) will be provided Sewage from toilets, kitchens and similar facilities will be discharged into a foul sewer. Wastewater collected from kitchens, including that from basins, sinks and floor drains, will be discharged into foul sewers via grease traps. The foul sewer will then lead to the permanent STW plant prior to effluent discharge to the watercourse 	Negligible to Minor	<ul style="list-style-type: none"> Maintain records of all maintenance and application of appropriate operation processes. 	PIC /Contractor (as appropriate)	Once per year as Marine baseline sampling points mentioned in Baseline Survey in section 5.4. and Figure 5.7	Audit Reports	Average 10,000 USD per year

Environmental Issues	Activity/ Source of Impact	ID	Potential Impacts	Mitigation Measures/ Management Requirements	Residual Impact Significance	Actions	Responsibility	Frequency	Verification	Estimated Budget
				<ul style="list-style-type: none"> Fuel tanks and chemical storage areas should be provided with locks and be sited on sealed areas. The storage areas of oil, fuel and chemicals should be surrounded by bunds to prevent spilled oil, fuel and chemicals from reaching the receiving waters Guidelines and procedures will be developed for immediate clean-up actions following any spillages of oil, fuel or chemicals Surface run-off from bunded areas should pass through oil/grease traps prior to discharge to the stormwater system Vehicle and plant servicing areas, vehicle wash bays and lubrication bays should, as far as possible, be located within roofed areas. The drainage in these covered areas should be connected to foul sewers via an oil / water separator. 		•				
Surface water Quality	Run-off and discharge of sewage and greywater	SS14	Small increase in concentration of organic content, nutrients, sediments, coliform bacteria in surface water and potential oil contamination.	<ul style="list-style-type: none"> Oil leakage or spillage should be contained and cleaned up immediately. Waste oil should be collected and stored for recycling or disposal 	Negligible to Minor	As above	As above	As above	As above	Average 10,000 USD per year

Environmental Issues	Activity/ Source of Impact	ID	Potential Impacts	Mitigation Measures/ Management Requirements	Residual Impact Significance	Actions	Responsibility	Frequency	Verification	Estimated Budget
Marine organisms	Disturbance effects on marine life of sewage and oil contaminants	SS15	Sewage and oil contaminants from run off and discharges could result in disturbance effects on the marine life (e.g. fish, turtles, dolphins) in short term. However, the contaminants discharged into the sea will be dispersed and diluted rapidly.	<ul style="list-style-type: none"> Same measures as for <i>Surface Water Quality</i> and <i>Seawater Quality</i> 	Negligible to Minor	<ul style="list-style-type: none"> Maintain records of all maintenance and application of appropriate operation processes. 	PIC /Contractor (as appropriate)	Once per year as Marine baseline sampling points mentioned in Baseline Survey in section 5.4. and Figure 5.7	Audit Reports	No specific cost assigned as are part of standard operating procedures
Marine Organisms	Physical Injury & Harassment	SS16	Vessel movement may potentially disturb marine mammals (e.g. vessel strike)	<ul style="list-style-type: none"> Same measures as for this issue in the Construction Phase 	Minor	<ul style="list-style-type: none"> Maintain records of vessel strike incidents 	PIC /Contractor (as appropriate)	Once per year as Marine baseline sampling points mentioned in Baseline Survey in section 5.4. and Figure 5.7	Vessel Log Books	No specific cost assigned as are part of standard operating procedures

Environmental Issues	Activity/ Source of Impact	ID	Potential Impacts	Mitigation Measures/ Management Requirements	Residual Impact Significance	Actions	Responsibility	Frequency	Verification	Estimated Budget
Fisheries, Navigation and Stakeholders	Navigation management (notice to mariners)	SS17	Transportation of all facilities and equipment to the construction site may pose hazard to marine traffic or fishing (i.e. removal of fishing gears).	<ul style="list-style-type: none"> All vessel operators related to the project will be required to comply with Myanmar Law, Port Authority regulations and PIC requirements with respect to vessel navigation practices Vessel movements should be discussed with Port Authority as appropriate to ensure minimal disturbance to ongoing operations and reduce the risk or marine accidents Jetty and vessels will be appropriately lit with good navigation warning devices, including navigation lights, area lighting, navigation/communications equipment and radar reflectors to provide sufficient warning to other vessels in the area 	Minor	<ul style="list-style-type: none"> Maintain records of notifications sent to relevant authorities Update and maintain communication with relevant authorities Report all incidences of encounters with marine traffic/fishing activities. 	PIC /Contractor (as appropriate)	During operation phase	Vessel Log Books	No specific cost assigned as are part of standard operating procedures
Waste Management	Non-hazardous wastes	SS18	Inappropriate handling, storage and disposal of non-hazardous wastes the potential to result in fouling/contamination of the marine and on-shore environments	<ul style="list-style-type: none"> Enforce all contractors to comply with Company HSE waste management requirements and relevant laws and monitor contractors' operations for their compliances Minimize waste generation Implement appropriate waste segregation and storage for disposal by best available practice Arrange training about appropriate wastes management and storage 	Negligible	<ul style="list-style-type: none"> Maintain records of all maintenance and application of appropriate operation processes. 	PIC /Contractor (as appropriate)	6 th Monthly	Audit Reports	Average 60,000 USD per year

Environmental Issues	Activity/ Source of Impact	ID	Potential Impacts	Mitigation Measures/ Management Requirements	Residual Impact Significance	Actions	Responsibility	Frequency	Verification	Estimated Budget
Waste Management	Hazardous wastes	SS19	Inappropriate hazardous waste management have the potential to result in water pollution/fouling/contamination of the sea/shoreline or on-shore environment (on-shore storage, transport and disposal activities)	<ul style="list-style-type: none"> Enforce all contractors to comply with Company HSE waste management requirements and relevant laws and monitor contractors' operations for their compliances Minimize waste generation Implement appropriate hazardous waste segregation and storage and transport all hazardous waste for disposal by best available practice Arrange training about appropriate wastes management and storage Use waste manifest for all hazardous waste 	Negligible	<ul style="list-style-type: none"> Maintain records of all maintenance and application of appropriate operation processes. 	PIC /Contractor (as appropriate)	6 th Monthly	Audit Reports	Average 60,000 USD per year

Environmental Issues	Activity/ Source of Impact	ID	Potential Impacts	Mitigation Measures/ Management Requirements	Residual Impact Significance	Actions	Responsibility	Frequency	Verification	Estimated Budget
Land Contamination Prevention	Storage of waste / fuel etc. onsite	SS20	Waste materials and other items such as fuel and lubricating oil may results in contamination of land depending on length of storage and storage receptacles.	<ul style="list-style-type: none"> Fuel, lubricating oil, chemical and chemical waste storage areas present on the site shall be provided with secondary containment Individual drainage from lines, pumps, compressors, vessels, heat exchangers and instruments shall be connected to an on-site oil water separator Stationary equipment that could release hydrocarbons and that are not located in containment areas will be installed on skids containing drain pans. An open drain system will collect spillage/leakage/contaminated storm water from these areas and will connect to the oil water separator. Spill containment and clean up equipment shall be provided in areas where oils, chemicals and chemical wastes are handled and stored Training shall be provided to relevant personnel on hazardous materials handling and spill control and clean up Contaminated materials and dispensed spill control and clean-up equipment shall be collected and disposed of in accordance with best available practice 	Negligible	<ul style="list-style-type: none"> Maintain records of all maintenance and application of appropriate operation processes. 	PIC /Contractor (as appropriate)	During operation phase	Audit Reports	No specific cost assigned as are part of standard operating procedures

Environmental Issues	Activity/ Source of Impact	ID	Potential Impacts	Mitigation Measures/ Management Requirements	Residual Impact Significance	Actions	Responsibility	Frequency	Verification	Estimated Budget
Occupational Health and Safety	Risk of injury to facilities personnel	SS21	<ul style="list-style-type: none"> Exposure of workers to elevated noise, dust and heat with concomitant risk of hearing, impairment, respiratory problems and heat exhaustion Exposure of workers to potentially hazardous materials (e.g. fuel, oils, chemicals etc.) 	<ul style="list-style-type: none"> Management controls and occupational health and safety management system Operational controls including permitting system, management of changes, contractor management, monitoring, accident reporting and investigation, management plans, amendment, and protection, etc. 	Negligible	<ul style="list-style-type: none"> Maintain records of all maintenance and application of appropriate operation processes. 	PIC /Contractor (as appropriate)	During operation phase	<ul style="list-style-type: none"> Contractor Terms of Reference / Scope of Work Audit Reports 	No specific cost assigned as are part of standard operating procedures
Occupational Health and Safety	Risk of injury to facilities personnel	SS21	<ul style="list-style-type: none"> Fire and explosion risks associated with natural gas/fuels etc. Risks associated with marine operations (e.g. drowning) Exposure of workers to potentially dangerous working conditions (e.g. risk of getting physical injury from machinery, dropped objects, working in elevated positions, electro-caution etc.) Risk of having illness from communicable diseases 	<ul style="list-style-type: none"> Implementation according to health and safety implementation process and protection control measures such as safety procedures to use tools, safety operate, request working permit, PPE, etc. Implementation based on restoration/ response measures such as first aid, plans to hire necessary licensed medic, emergency plans, and response plans in case of emergency Implementation according to other measures such as health examination, information distribution, recommendation, training, and assigning health and safety/monitoring officers 	Negligible	As above	As above	As above	As above	No specific cost assigned as are part of standard operating procedures

Environmental Issues	Activity/ Source of Impact	ID	Potential Impacts	Mitigation Measures/ Management Requirements	Residual Impact Significance	Actions	Responsibility	Frequency	Verification	Estimated Budget
SOCIAL IMPACT ASSESSMENT FROM OPERATION OF ONSHORE FACILITIES										
Stakeholder	Social Cohesion	SS22	<ul style="list-style-type: none"> Resentment towards 'outsiders' occupying jobs Jealousy from those not benefiting from project Increased wealth causing family breakdown Breakdown of traditional authority and lore Social isolation 	<ul style="list-style-type: none"> The provision of a variety of leisure and recreation activities and facilities. The development and implementation of employee and contractor behaviour policies and training. Strict prohibition of the excessive use of alcohol and drugs by all project and contractor personnel. Employment of local people resident in the project impact area. Development and implementation of a community and cultural awareness training program for Project employees and contractors. The development and implementation of a vulnerable person's policy. Establishment of appropriate partnerships with non-government organisations to collaborate on social support services for local and new residents experiencing transitional hardship due to Project development. 		<ul style="list-style-type: none"> Ensure the following are developed and implemented <ul style="list-style-type: none"> Vulnerable persons policy Employee and contractor behaviour policies and training community and cultural awareness training program for Project employees and contractors. Establish appropriate partnerships with non-government organisations to collaborate on social support services. Employ local people where possible. 	PIC	During operation phase	<ul style="list-style-type: none"> Vulnerable persons policy Training record 	No specific cost assigned as are part of standard operating procedures

Environmental Issues	Activity/ Source of Impact	ID	Potential Impacts	Mitigation Measures/ Management Requirements	Residual Impact Significance	Actions	Responsibility	Frequency	Verification	Estimated Budget
Stakeholder	Demography and Culture	SS23	<ul style="list-style-type: none"> Beneficial ethnic and racial diversity Social tension from ethnic and racial diversity Depletion of labour from traditional industries Increased vulnerability of women 	<ul style="list-style-type: none"> Development and implementation of employee and contractor behaviour policies and training. Employment of local people resident in the project impact area. Support traditional industries through the preferential local procurement of goods and services available in Kyaukpyu (particularly fresh produce) through the development and implementation of a preferential local procurement strategy. Development and implementation of a community and cultural awareness training program for Project employees and contractors. Support for local cultural events and festivals. Development and implementation of a vulnerable person's policy. 	Negligible to Moderate	<ul style="list-style-type: none"> Same as SS22 Provide support for local cultural festivals 	Same as SS22 PIC	Same as SS22 During Operation Phase	<ul style="list-style-type: none"> Same as SS22 	No specific cost assigned as are part of standard operating procedures

Environmental Issues	Activity/ Source of Impact	ID	Potential Impacts	Mitigation Measures/ Management Requirements	Residual Impact Significance	Actions	Responsibility	Frequency	Verification	Estimated Budget
Stakeholder	Cultural Heritage	SS24	<ul style="list-style-type: none"> Disruption and destruction of cultural heritage Isolation from culturally significant sites / materials Improved knowledge and documentation of cultural materials and sites of significance 	<ul style="list-style-type: none"> Facilitate and contribute to the funding of improving Myanmar cultural understanding and documentation, and/or investment in the preservation and restoration of sites of cultural and religious significance. 	Major (positive) from improved knowledge of cultural materials	<ul style="list-style-type: none"> Provide cultural documentation to local communities to improve understanding of cultural sites. 	PIC	Prior to Operation Phase	<ul style="list-style-type: none"> Cultural documentation 	No specific cost assigned as are part of standard operating procedures
Stakeholder	Economy, Industry and Employment	SS25	<ul style="list-style-type: none"> Dissemination of monetary benefits may be impeded Procurement of goods and services required for the project from local providers not realised Sustainability of industry and local employment post-closure of the project 	<ul style="list-style-type: none"> Development and implementation of a preferential local procurement policy. Extend any vocation and training programs established under the auspice of the socio-economic program to local community members not employed by the project. Prepare a project closure plan early in the project to ensure key decisions about infrastructure, employment and procurement on local communities are taken into consideration, developed collaboratively and articulated to stakeholders. 	Negligible to Moderate	<ul style="list-style-type: none"> Develop local procurement & local employment policy. Provide vocational training to local communities. Establish on-the-job training program of skill transfer from specialist expatriates to nationals. 	PIC	During Operation Phase	<ul style="list-style-type: none"> Local Employment and Procurement policy. CSR Records Training records 	Included in CSR budget

Environmental Issues	Activity/ Source of Impact	ID	Potential Impacts	Mitigation Measures/ Management Requirements	Residual Impact Significance	Actions	Responsibility	Frequency	Verification	Estimated Budget
			<ul style="list-style-type: none"> Unmet community expectations – training and employment Failure to build capacity amongst project impacted populations Lack of availability of skilled workers resulting in a loss of local benefits Depletion of labour/skill in traditional industries 	<ul style="list-style-type: none"> Development and implement a local employment policy for the preferential employment of project-impact communities. Women and youth from host communities should be positively discriminated for employment and participation in employment training programs. Vocational training of local personnel early in the project. Establish on-the-job training program of skill transfer from specialist expatriates to nationals. Carefully manage expectations among local communities in regards to employment. 						
Stakeholder	Education	SS26	<ul style="list-style-type: none"> Improved education facilities and standard Improved proximity and access to education services Increased pressure on educational infrastructure, facilities and services Sustainability of facilities beyond project closure 	<ul style="list-style-type: none"> Construction and renovation of educational facilities and provision of resources through socio-economic program. Provision and augmentation of education and health services through the collaboration with government and non-government organisations to ensure sustainability. Engage with the Government and appropriate non- 	Negligible to Minor (negative), Moderate (positive) from improved facilities and access to education.	<ul style="list-style-type: none"> Construct or renovate health and education services in local area. Consider funding a number of tertiary scholarships. 	PIC	During Operation Phase	CSR Records	Included in CSR budget

Environmental Issues	Activity/ Source of Impact	ID	Potential Impacts	Mitigation Measures/ Management Requirements	Residual Impact Significance	Actions	Responsibility	Frequency	Verification	Estimated Budget
				<p>government organisations for the planning of future education facilities and ensure arrangements for ongoing funding beyond project closure through completion of community-needs assessments in the project affected areas.</p> <ul style="list-style-type: none"> The socio-economic program should consider funding a number of tertiary scholarships for women and/or vulnerable minority groups within the project impact area. 						
Stakeholder	Public Health	SS27	<ul style="list-style-type: none"> Introduction and spread of disease Project-related public health and safety Boating safety Military intervention and human rights Improved access and quality of public health facilities 	<ul style="list-style-type: none"> Raise health awareness and development of education programs. Conduct a health baseline study. Design and implement a road safety awareness programme. Ensure the selection of transport route for heavy and light vehicles to prevent injury or illness to host communities. 	Negligible to Minor (negative) Positive, (Major) from improved facilities	<ul style="list-style-type: none"> Conduct Health baseline study. Provide education to local communities on health impacts. Develop traffic management strategy and road safety awareness. 	PIC / Contractors	During / prior to Operation Phase.	<ul style="list-style-type: none"> Health baseline study. Traffic management plan. Training record. Human rights policy. Grievance mechanism. 	\$30,000 USD

Environmental Issues	Activity/ Source of Impact	ID	Potential Impacts	Mitigation Measures/ Management Requirements	Residual Impact Significance	Actions	Responsibility	Frequency	Verification	Estimated Budget
			<ul style="list-style-type: none"> Increased pressure on existing health services 	<ul style="list-style-type: none"> Design and implement a traffic management strategy. Adopt environmental mitigation measures to manage construction dust and emissions. Design and implement a boating management strategy. Ensure appropriate HSSE training is provided to all employees. Ensure appropriate machine and vehicle operating training is provided to employees responsible for operating machine or driving vehicles. Ensure appropriate emergency evacuation procedures in place for employees and villagers. Engage private security and seek assurances from the Government. Develop and implement a human rights policy for the project and provide training and seek full compliance with the policy. <p>Develop and implement a grievance mechanism and provide training to staff on its use.</p>		<ul style="list-style-type: none"> Develop Human Rights policy. Develop a Grievance Mechanism. 				

Environmental Issues	Activity/ Source of Impact	ID	Potential Impacts	Mitigation Measures/ Management Requirements	Residual Impact Significance	Actions	Responsibility	Frequency	Verification	Estimated Budget
Stakeholder	Political Systems	SS28	<ul style="list-style-type: none"> Potential for political unrest to disrupt the project 	<ul style="list-style-type: none"> Develop and implement an ethical business policy to guide all business dealings across all levels of the organisation. Become signatory to the Extractive Industries Transparency Initiative (EITI) promoting revenue transparency and payments to the Government. When political unrest occurred in Myanmar and result in widespread turmoil, full communications with employees in affected areas should be maintained, have an evacuation strategy in place and minimise move into these and surrounding areas. 	Minor	<ul style="list-style-type: none"> Develop and implement an ethical business policy. Become signatory to the Extractive Industries Transparency Initiative (EITI). 	PIC	Prior to Operation Phase	<ul style="list-style-type: none"> Ethical Business Policy. EITI membership. 	No specific cost assigned as are part of standard operating procedures
Stakeholder	Human Rights	SS29	<ul style="list-style-type: none"> Perceived breaches of human rights Military intervention Forced and / or child labour Enforcement of exclusion zones International criticism 	<ul style="list-style-type: none"> Develop, implement and strictly monitor a human rights policy for all employees and contractors working directly or indirectly for the project, socio-economic program initiatives and any supporting activities. 	Minor to Moderate	<ul style="list-style-type: none"> Develop Human Rights policy. Contractor monitoring. Arrange security for site. Establish communication link with local villages. 	PIC	During Operation Phase	<ul style="list-style-type: none"> Human Rights policy. Monitoring Records / auditing of contractors. 	\$15,000 USD

Environmental Issues	Activity/ Source of Impact	ID	Potential Impacts	Mitigation Measures/ Management Requirements	Residual Impact Significance	Actions	Responsibility	Frequency	Verification	Estimated Budget
				<ul style="list-style-type: none"> Monitor all contractors to ensure adherence to international labour laws in respect of human rights and forced and child labour. Follow international standards for the acquisition of land required for the project. Respond expediently to any international criticism on the project specifically in regards to human rights impacts, forced labour and repression of ethnic minorities. Develop and implement community and cultural training for all staff and contractor throughout the project. Arrange private security for project facilities. Establish a communication link with the local villagers through the socio-economic program. 						
Fisheries and Stakeholder	Environmental Values	SS30	<ul style="list-style-type: none"> Decrease in available resources Detection of environmental damage by other sources (non-project related) 	<ul style="list-style-type: none"> Ensure appropriate environmental safeguards (outlined in the EMMPs) are in place during the operation phase. 	Negligible to minor	<ul style="list-style-type: none"> Provide results of environmental monitoring to local stakeholders. 	PIC	Prior to Operation Phase	<ul style="list-style-type: none"> Environmental Monitoring Report. Policy of resource use. 	No specific cost assigned as are part of standard operating procedures

Environmental Issues	Activity/ Source of Impact	ID	Potential Impacts	Mitigation Measures/ Management Requirements	Residual Impact Significance	Actions	Responsibility	Frequency	Verification	Estimated Budget
				<ul style="list-style-type: none"> Results of environmental monitoring should be delivered to local stakeholders and conduct themed information workshops for local residents on environmental issues. Development and implementation of a company policy preventing the use of community resources and/or assist in the establishment of sustainable sources of such resources. Consider establishing partnerships with community groups and /non-government organisations for the preservation/ conservation or sensitive impact areas. 		<ul style="list-style-type: none"> Development a company policy preventing the use of community resources and/or assist in the establishment of sustainable sources of such resources. Establish partnerships with community groups and /non-government organisations for the preservation/ conservation or sensitive impact areas. 				
UNPLANNED EVENTS FOR OFFSHORE, MIDSTREAM, AND ONSHORE FACILITIES										
Accidental/ Non-routine Events	Dropped objects/lost equipment and vessel grounding/collisions	SS31	<ul style="list-style-type: none"> Direct impact on personnel resulting in fatality Damage to a structural component Damage to equipment and piping causing release of hydrocarbons Loss of object to sea leading to potential environmental damage. 	<ul style="list-style-type: none"> To minimize impacts to benthic habitats Report all items dropped overboard 	Negligible to minor	<ul style="list-style-type: none"> Contractor's operations must be audited for compliance with specified requirements 	PIC /Contractor (as appropriate)	During all phases of the Project	<ul style="list-style-type: none"> Audit Reports Vessel Logbooks 	No specific cost assigned as are part of standard operating procedures

Environmental Issues	Activity/ Source of Impact	ID	Potential Impacts	Mitigation Measures/ Management Requirements	Residual Impact Significance	Actions	Responsibility	Frequency	Verification	Estimated Budget
Accidental/ Non-routine Events	Spills & Leaks from the Drilling Platform	SS32	<ul style="list-style-type: none"> Hazardous to the marine organisms and reduction of water quality but will spread rapidly to form a thin surface sheen and evaporate rapidly 	<ul style="list-style-type: none"> To ensure appropriate response/clean-up of oil spills at sea PIC Oil Spill Response and Incident Reporting system to be implemented All oil spills to be reported to PIC as well as the appropriate authorities Incident reports completed for all spills 	Negligible to minor	<ul style="list-style-type: none"> Ensure all contractors are aware and if necessary implement appropriate response/clean-up of oil spills at sea. Contractor's operations must be audited for compliance with specified requirements 	Contractor and vessel's operators	During all phases of the Project	<ul style="list-style-type: none"> PIC Incident Reporting system Audit Reports 	
Accidental/ Non-routine Events	Chemical Spills	SS33	<ul style="list-style-type: none"> Potentially hazardous to marine/ terrestrial ecology and / or reduction of seawater or river quality 	<ul style="list-style-type: none"> Standard Operating Procedures for handling / storage / transfer of hazardous materials Shipboard Oil Spill Emergency Plans (MARPOL requirement) for larger vessels To ensure appropriate response/clean-up of chemical spills at sea PIC Incident Reporting system to be implemented All chemical spills to be reported to PIC as well as the appropriate authorities Incident reports completed for all spills 	Negligible	<ul style="list-style-type: none"> Ensure all contractors are aware and if necessary implement appropriate response/clean-up of chemical spills. Contractor's operations must be audited for compliance with specified requirements 	PIC /Contractor (as appropriate)	During all phases of the Project	<ul style="list-style-type: none"> PIC Incident Reporting system Audit Reports 	

Environmental Issues	Activity/ Source of Impact	ID	Potential Impacts	Mitigation Measures/ Management Requirements	Residual Impact Significance	Actions	Responsibility	Frequency	Verification	Estimated Budget
Accidental/ Non-routine Events	Blowout	SS34	<ul style="list-style-type: none"> Uncontrolled release of gaseous and liquid hydrocarbons to both the marine and atmospheric environments Damage to the benthic community Toxic to associated personnel 	<ul style="list-style-type: none"> Installation of blowout preventer (BOP) 	Minor	<ul style="list-style-type: none"> Contractor's operations must be audited for compliance with specified requirements 	Contractor and vessel's operators	During drilling phase	Audit Reports	

7. CUMULATIVE IMPACT ASSESSMENT

Cumulative impacts refer to the additional impacts that may be generated by other developments and Shwe Project that when added to the impacts of the proposed Project combine to cause a greater impact. Such impacts may arise due to the temporal overlap of production activities in Shwe Development, as well as activities by other operators in the vicinity of the Shwe Project.

Block A-1 and A-3 are surrounded by other offshore oil and gas blocks: AD-7, A-4, AD-1 and A-2 (shown in Figure 7-1).

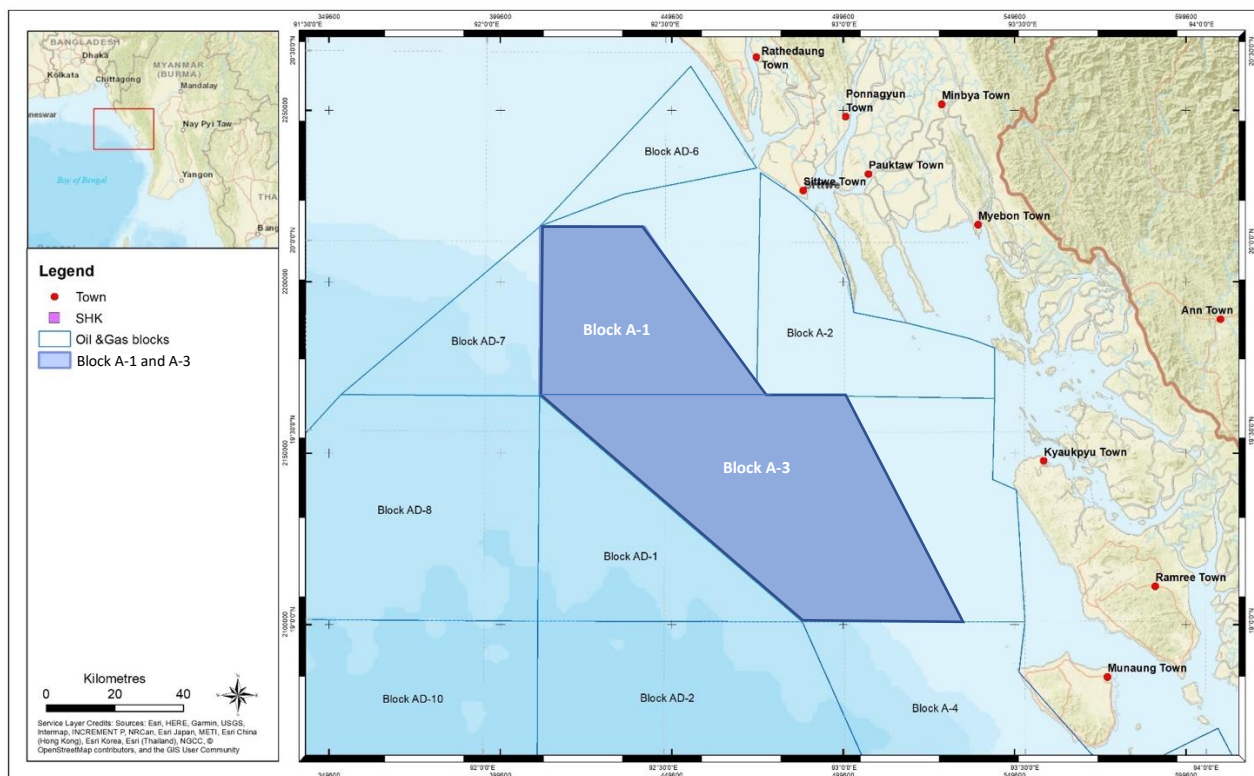


Figure 7-1 Oil and Gas Blocks around the project

It is understood that the offshore waters of Rakhine are expected to have a number of oil and gas exploration activities and these activities may overlap with other oil and gas operations such as seismic surveys and drilling, in neighboring Blocks although they are in different stages of exploration.

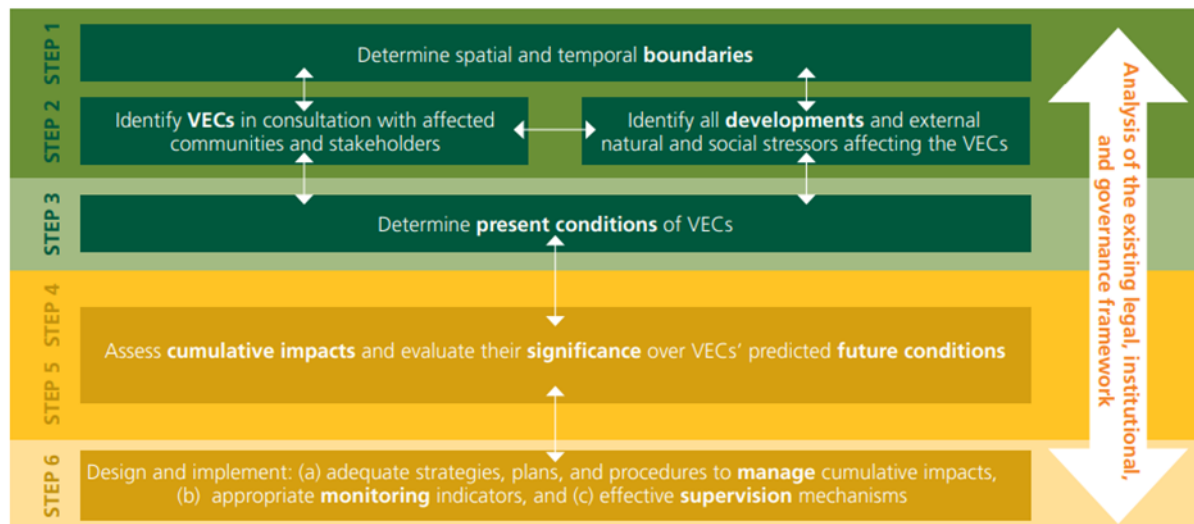
7.1 Objective of the Scope

The overall objective of this CIA is to identify and assess the contribution by the Project to cumulative impacts in the Project AOI. It is based on information presented throughout prior chapters of this EIA, information provided by the Project Proponent, and information available in the public domain. The specific objectives are to:

- Identify VECs that could be impacted cumulatively in areas potentially affected by the Project, considering input from stakeholders through the consultation process and the scientific community;
- Identify other existing and planned projects and external environmental and social drivers that could cumulatively impact VECs;
- Undertake a high-level assessment of potential cumulative impacts on VECs, considering the Project and the other identified existing and planned projects and external drivers in the area; and
- Recommend a management framework for the integrated management of potential cumulative impacts.

7.2 Methodology

This CIA follows the Handbook's six-step methodology (**Figure 7-2**). The process is iterative and flexible, with some steps having to be revisited in response to the results of others. For example, the VEC selection step usually needs to be adjusted after the potential impacts of the project are identified. The steps are described in detail below.



Source: IFC, 2013, VEC = Valued Environmental and Social Component

Figure 7-2 Summary of IFC's Cumulative Impact Assessment Methodology

7.2.1 Limitations

The limitations applicable to this CIA include: (1) incomplete information about other projects and activities (e.g., the information is not available in the public domain); (2) uncertainty with respect to the implementation of future projects; and (3) difficulty in establishing thresholds or limits of acceptable change for VECs, and therefore the significance of cumulative impacts.

7.2.2 Determination of Spatial and Temporal Boundaries

The following factors have been set within the methodology:

- Temporal boundaries have been set based on desktop review of available information pertaining to other proposed Projects within the area;
- ERM's understanding of Projects currently within and proposed to be developed within the local area; and
- Geographic boundaries are a composite of the location of the identified VEC, assessed impacts of the Project and the degree to which they may overlap with other external projects and stressors to impact upon an identified VEC.

7.2.3 Identification of VECs, Other Projects, and External Drivers

7.2.3.1 VECs

To be included in a CIA, a VEC must first be confirmed to be valued by some identifiable stakeholder group and/or the scientific community. Second, the VEC must be reasonably expected to be affected by both the Proposed Project under evaluation and some combination of other projects and/or external drivers.

Input from stakeholders has been collected as part of the EIA stakeholder engagement and consultation process. Engagement activities included interaction with governmental authorities, communities, population groups, and social organizations present in the AOI. The engagement and consultation strategy, a joint

knowledge building process, allowed for the progressive identification of risks and impacts, information sharing, and participation during the preparation of the EIA.

7.2.3.2 Other Projects

Through a thorough review of publicly available information, existing and reasonably foreseeable future planned projects and activities located within the spatial and temporal boundaries of the CIA, having the potential to result in cumulative impacts on identified VECs were identified. The outcomes of these considerations will be a simple binomial decision, i.e., yes the project is likely and therefore will be included within the CIA, or no, it is unlikely and therefore will not be included within the CIA.

The second step is to determine the extent of the various impacts of these projects. This allows for a decision to be made as to whether there is the potential for an overlap in Project impacts that could lead to a measurable cumulative impact. Key to this are the following elements:

- **Identification of appropriate geographical/spatial boundaries:** Where potentially interacting, projects are not located close enough, or sufficiently linked through various ecological and social processes, for relevant impacts to overlap, cumulative impacts are less likely;
- **Identification of temporal boundaries:** Where the schedules of various components of projects do not overlap in time, particularly with regards to the construction phase of large projects, cumulative impacts are less likely. Additionally, where projects are going to be short term, cumulative impacts will generally be of limited duration;
- **Consideration of impact type:** Whilst there may be no direct geographical overlap in project boundaries, there is the possibility that their offsite impacts may directly overlap elsewhere and cause offsite cumulative impacts. Examples are sediment discharges into river systems, air pollutant emissions, and social impacts associated with overall migration influx;
- **Determination of any “aggravating factors”:** that may be evident within a particular project identified for inclusion within the CIA. This includes elements such as the size of the project, environmental management performance, and the regulatory regime under which it operates; and
- **Identification of potential externalities:** that is a project ability to influence (either positively or negatively) the behaviors of other operations in the area.

Existing Shwe Project: Phase 1 of the Shwe Development was completed in 2013. Natural gas has been continuously produced from these fields and supplied for Myanmar domestic demand and China demand since July 2013. In Phase 2, the development is currently being undertaken to expand the production of raw gas to include the Shwe Subsea & Shwe Phyu fields.

7.2.3.3 External Drivers

External drivers are external natural and social stressors, which are not related to a single project or source. As these are ongoing stressors it has been assumed that they have already been captured as part of the Project baseline conditions (refer to Chapter 5) and the impact assessment. Specific additional identification and assessment of these is therefore not considered necessary as part of this CIA.

7.3 VEC Selection and Description

7.3.1 Selection of VECs

Potentially eligible VECs were analyzed against the following criteria: (1) confirmed to be valued by an identifiable stakeholder group (in the case of local communities, identified by a representative number of communities in the AOI) and/or the scientific community; (2) reasonably expected to be potentially impacted by the Project; and (3) reasonably expected to be potentially impacted by some combination of other projects and/or external drivers. Table 7-1 summarizes the VECs selected for this CIA.

Table 7-1 VECs Identified for the Project

VEC	Valued by Stakeholders or Scientific Community	Potentially Affected by the Project	Potentially Affected by One or More Other Projects	Potentially Affected by One or More External Drivers
Marine Water Quality	Yes	Yes	Yes	Yes
Marine Biodiversity	Yes	Yes	Yes	Yes
Socioeconomic Conditions	Yes	Yes	Yes	Yes

7.3.2 VEC Descriptions

7.3.2.1 Marine Water Quality

There are (3) major ports in Rakhine coastal areas, namely Sittwe, Than Dwe, and Kyauk Phyu. Ports and shipping operations are inherently hazardous to the marine environment. There has been no known significant pollution incident recorder at these major ports. Under normal operations, most cargo and oil/gas ports are not major sources of pollution. However, in fishing ports, where regulations on pollution control are difficult to implement on small boats, oil pollution from fuel/lubrication oil dumping and bilge water discharge has been observed. Marine accidents, although still low in frequency, could release significant amounts of oil into sea. However, no data are currently being collected to assess the impact of oil pollution on the marine and coastal environment and its living resources (BOBLME, undated).

Project specific marine water quality surveys were undertaken in 2007, 2017 and 2019 and the surveys indicate that the results of the parameters measured (Total Suspended Solids - TSS, Total Petroleum Hydrocarbon – TPH, Oil and Grease Concentration, Dissolved Oxygen – Do, Biological Oxygen Demand – BOD, Chemical Oxygen Demand – COD, Total Nitrogen and Ammonia, Metals (arsenic, copper, lead, zinc, chromium, cadmium, iron and mercury levels)) are well below the discharge standards of EQEG and ASEAN marine water quality criterion. This is typical of conditions in offshore environments away from the influence of coastal processes, with no evidence of detectable contamination in the water column at the surrounds of the proposed platform.

Potential impacts could arise from potential fuel spills occurring at the same time and the increased vessel presence. The potential for cumulative spills of fuel from the vessels is extremely unlikely to occur, and as vessels generally use light fuels which are readily diluted and dispersed and implement standard mitigation measures, impacts would be expected to be of **MINOR** significance to water quality by the place an Emergency Response Plan that includes a procedure for an effective reaction in case of spills events.

7.3.2.2 Marine Biodiversity

Baseline studies were undertaken in 2007 and 2017 in Block A-1 and A-3 and in 2019 at the Proposed SHK Platform location. The benthic habitat within the Study Area spanning open water environment of the continental shelf consists of bare, unconsolidated muddy sediments supporting a sparse assemblage of benthic organisms. Low abundance with low diversity of infauna is observed which are not of recognized conservation importance. Insufficient light limits the growth of primary producers such as seagrass, macroalgae or *zooxanthellate scleractinian* (reef building) corals which are absent from the seabed in the vicinity of the platform site.

The northern part of the Bay of Bengal (located offshore of the waters of Myanmar between Myanmar and India) was found to be the most productive area with high phytoplankton densities recorded, likely associated with nutrient-rich discharges from large rivers on the north coast. Given the limited scope to impact plankton

concentrations or abundance as well as high turnover rates, the plankton community in the Area of Influence is regarded as of low environmental sensitivity to the proposed Project activities.

Given the proposed offshore location of the SHK (70 km from the coast), open water species of marine mammal are of primary interest. Of the whale and dolphin species potentially present in Myanmar waters, most are oceanic, far-ranging, migratory species though there are several coastal species with closer affinities to shallow water habitat areas and estuarine areas.

Two cetacean species listed by the IUCN have a confirmed or probable occurrence in Myanmar oceanic waters: the blue whale (*Balaenoptera musculus*; Endangered) and sperm whale (*Physeter macrocephalus*; Vulnerable). Another Endangered cetacean, the fin whale (*Balaenoptera physalus*) has a possible occurrence in Myanmar waters (Holmes et al. 2014). The blue whale and the fin whale are also listed as endangered species recognized as of prime importance to the Region and deserving special attention under the ASEAN Agreement on the Conservation of Nature and Natural Resources (ASEAN, 1985). Other deep-water specialist species include Bryde's whale (*Balaenoptera edeni*), Longman's beaked whale (*Indopacetus pacificus*), strap-toothed whale (*Mesoplodon layardii*), Blainville's beaked whale (*Mesoplodon densirostris*), Risso's dolphin (*Grampus griseus*), dwarf sperm whale (*Kogia sima*), Fraser's dolphin (*Lagenodelphis hosei*), and rough-toothed dolphin (*Steno bredanensis*), however, these species are either listed as Data Deficient or Least Concern (IUCN, 2017).

Five species of marine turtles, all of which are IUCN-listed threatened species are reported for the Rakhine State waters. These are the olive ridley turtle (*Lepidochelys olivacea*) (Vulnerable), loggerhead turtle (*Caretta caretta*) (NE Indian Ocean subpopulation - Critically Endangered), green turtle (*Chelonia mydas*) (Endangered), hawksbill turtle (*Eretmochelys imbricata*) (Critically Endangered), and the leatherback turtle (*Dermochelys coriacea*) (Endangered). The hawksbill turtle and leatherback turtle have been occasionally reported by fishers from some parts of the Rakhine coastal area and the green turtle has been recorded in offshore waters.

Annual turtle nesting activity for coastal locations in Rakhine waters is reported to occur between September and March with the peak period of activity occurring from December to January. Given the location of Block A-1 in relation to known nesting beaches, there is a potential for marine turtles to be present within Block A-1 when foraging in or traversing open waters to and from seasonal nesting areas and adjacent mating areas.

Oyster Island is the closest KBA to Block A-1 at ~ 56 km. This area has been identified due to the presence of two marine turtle species listed as species of conservation concern on the IUCN Red List; green turtle and hawksbill turtle; which are listed as endangered and critically endangered respectively by the IUCN.

Only two species, the little tern (*Sterna albifrons*) and the brown booby (*Sula leucogaster*), are reported to have breeding colonies in Myanmar. Given there are no emergent features (islets or islands) within the Area of Influence, the operational area of existing and proposed Project activities is distant from breeding areas. Isolated islets in shallow coastal waters outside the Study Area, are expected to be potential suitable nesting sites for individuals of these species. No Important Bird and Biodiversity Areas are reported for the Area of Influence.

Disturbance of marine fauna due to the presence of SHK and vessels could occur, however the area of the impact is small and limited to 500 m around the SHK. In addition, there is an existing exclusion zone in place which overlaps this new zone. No fishers mentioned that they fish near the existing Shwe platform (and hence in the area of the proposed platform). Potential impacts would be expected to be of **MODERATE** significance to marine ecology.

7.3.2.3 Socioeconomic Condition

The fishery sector in Myanmar is the fourth largest exchange earner after agriculture, timber, and minerals. The fisheries resources of Myanmar can play a crucial role in the production of food, improvement of income and generating of employment. This industry creates direct benefit to over 2.0 million people.

The coastal waters of Myanmar have been heavily exploited. Several signs of over-fishing are visible and there is considerable concern, particularly because of demand for fish for local consumption and because the vast majority of fishers are artisanal; dependent on coastal waters for their livelihood. The trawl fisheries are

considered the most destructive. Environment degradation, especially in the estuarine regions, is also a concern. The need for managing the coastal fisheries has been recognized and several efforts have been undertaken. Licensing of vessels and banning trawl fishing within 5-mile in Rakhine and Tanintharyi Coastal Region and 10-mile in Ayeyarwady Delta Coastal Region have not been successful due to inadequate monitoring and enforcement (BOBLME, undated).

According to the survey conducted in the marine fisheries, it was noted about 1.0 million tons of pelagic fish and 0.75 million tons of demersal fish existed as biomass in Myanmar marine fishery waters. Out of the total biomass, 0.5 million tons of pelagic fish and 0.55 million tons of demersal fish (altogether 1.05 million tons) is marked as annual maximum sustainable yield (MSY) out of which 0.88 million tons were exploited during 1999-2000 (DoF, 2001).

It is expected that the social impacts from Project activities if properly mitigated, will be localized and the impact will be of **MODERATE** significance overall to shipping and fishing community activities.

7.4 Other Oil and Gas Developments in neighboring blocks

It is understood that the offshore waters of Rakhine are expected to have a number of oil and gas exploration activities over the next years. These activities may overlap with other oil and gas operations such as seismic surveys and drilling, in neighboring Blocks although they are in different stages of exploration.

Possible cumulative environmental impacts could therefore arise from the possible effects on water quality and sediments due to drilling activities in these Blocks. Disturbance of marine fauna could occur due to the physical presence of drilling rigs and other vessels. Potential spill leaks from the SHK and supply vessels also are considered as one of the factors that may generate cumulative impacts. Possible social impacts arise from the temporary displacement of fishing activity, due to the exclusion zone (500m) for SHK and other vessels for where the Project Area overlaps with potential commercial fishing grounds.

7.5 Cumulative Impact Assessment

Table 7-2 summarizes the assessment of cumulative impacts of the VECs identified for the CIA.

Table 7-2 Cumulative Impact Assessment

VEC	Potential Impacts from the Project	Potential Impacts from Other Projects	Potential Impacts from External Drivers	Cumulative Impact	Significance
Marine Water Quality	Potential impacts could arise from potential fuel spills occurring at the same time and the increased vessel presence.	The potential for cumulative spills of fuel from the vessels is extremely unlikely to occur, and as vessels generally use light fuels, which are readily, diluted and dispersed and implement standard mitigation measures, impacts would be expected to be of MINOR significance to water quality, sediment quality, fishing community, shipping and marine ecology.	Poor law enforcement in discharging waste at the sea and increase movement of vessels due to improve economic development may help degrade the marine water quality.	Degraded marine water quality due to increase discharge of pollutants in the waters.	Minor
Marine Biodiversity	Disturbance of marine fauna due to the presence of SHK and vessels could occur, however the area of the impact is small and limited to 500 m around the SHK.	Increases in vessel movement and project development in neighbouring blocks will likely to increase pressures on marine fauna. However, it is very much unlikely to develop projects in these blocks concurrently as they are at different stages of exploration.	Reducing marine water quality and increasing climate change will reduce marine biodiversity and resources when it combines with overfishing and illegal fishing practices.	Oil and Gas developments in Rakhine waters will increase pressure on marine resources when climate change and illegal fishing practices are collectively considered.	Moderate
Socioeconomic Conditions	Physical presence of SHK platform and support vessels and designation of exclusion zone (500 m) around the platform could limit the fishing ground available to the fishers.	Seismic survey and exploration of oil and gas in the neighbouring blocks will increase the presence of vessel movements in the waters. However, all these activities are likely to spread	Reducing fish resources due to overfishing and climate change will have impact on socioeconomic condition of the community in Rakhine.	Limiting access to the fishing ground for the fishers together with reduced marine resources will have fewer catch and cause problems to their livelihoods.	Moderate

VEC	Potential Impacts from the Project	Potential Impacts from Other Projects	Potential Impacts from External Drivers	Cumulative Impact	Significance
		during 2020-2025 and vessels are limit to the water only over a short period by issuing Notice to Mariner.			

7.6 Cumulative Impacts Management

Effective application of the mitigation hierarchy (avoid, reduce and remedy) to manage individual contributions of cumulative impacts is recommended as best practice. The project Proponent has incorporated Project design features that include physical or procedural controls to avoid and reduce possible impacts that are planned as part of the Project Description. These are considered from the very start of the impact assessment process as part of the Project, and are factored into the pre-mitigation impact significance ratings.

At the Project level, the measures listed in the EMP are considered sufficient to address the contributions of the Project to cumulative impacts.

8. OVERALL BUDGET FOR IMPLEMENTATION OF THE EMP

Through the Project development and the EIA process, PIC has made commitments to ensure appropriate environmental and social performance. A summary of the Project impacts and the committed measures designed to manage and mitigate those impacts is presented in *Table 5.14*. The schedule and responsibility for implementation of these mitigation measures are identified as necessary. The Shwe Field has been producing since 2013 and operations are expected to continue until 2045 for the next planned Phase (not included in this EMP).

The overall estimated budget for the implementation of the mitigation measures is around \$ 500,000 USD per year (including around US\$150,000 for environmental monitoring and US\$135,000 USD for implementing sub-plans).

The cost of implementing the EMP is difficult to quantify as many of the mitigation measures to be adopted for the EMP are linked to the overall operational cost of the Project.

For the annual budgeting purpose, apart from providing ball-pack figures for entire environmental management plan, it is not viable to allocate the budget for each sub plan as it can vary based on operational condition, thus may lead to over and underutilization of budget in practical.

9. ENVIRONMENTAL MANAGEMENT PLAN AND MONITORING PROGRAM-OPERATIONAL PHASE

9.1 Environmental and Social Management Organization

PIC is committed to providing resources essential to the implementation and control of the EMP. Resources include the appropriate human resources and specialized skills. The structure for the Organization responsible for environmental and social management and implementation of the EMP is depicted in **Table 9-1**.

Table 9-1 Environmental and Social Management Organization Roles and Responsibilities

Position	Responsibility
Office-based Personnel	
PIC Managing Director	<ul style="list-style-type: none"> Implement the stakeholder engagement plan (SEP). Report on stakeholder consultation. Ongoing liaison as required.
PIC O&M Director/O&M Manager	<ul style="list-style-type: none"> Ensure operations are undertaken as per this EMP. Provide sufficient resources to implement the management measures in this EMP. Ensure the mitigation measures as detailed in this EMP are actioned, as required.
PIC Head of HSE	<ul style="list-style-type: none"> Prepare environmental component of relevant Induction Package. Assist with the review, investigation and reporting of environmental incidents. Ensure environmental monitoring and inspections/audits are undertaken as per the requirements of this EMP. Liaise with relevant regulatory authorities as required. Assist in preparation of external regulatory reports required, in line with environmental approval requirements and PIC incident reporting procedures. Monitor and close out corrective actions identified during environmental monitoring or inspections.
Platform-based Personnel	
Platform Offshore Installation Manager/Onshore Gas Terminal Superintendent	<ul style="list-style-type: none"> Ensure that the Facilities management system and procedures are implemented. Ensure that personnel starting work on the facilities receive an environmental induction and are competent to undertake the work they have been assigned. Ensure that emergency drills are conducted as per the facility schedule. Ensure that the facilities Emergency Response Team has been given sufficient training to implement the platform's SOPEP.
PIC Production Supervisors	<ul style="list-style-type: none"> Ensure that the operations are undertaken as detailed in this EMP. Ensure that the management measures detailed in this EMP are implemented at the facilities. Ensure that Environmental incidents are reported and periodic environmental inspections are completed.

Position	Responsibility
PIC Safety Officers	<ul style="list-style-type: none"> Ensure that the activities are undertaken as outlined in this EMP. Ensure the monitoring requirements are met and the EMP is implemented at the facilities. Ensure environmental incidents are reported. Ensure periodic environmental inspections are completed
Vessel-based Personnel	
Vessel Masters	<ul style="list-style-type: none"> Ensure that the vessel management system and procedures are implemented. Ensure that personnel commencing work on the vessel receive an environmental induction and that personnel are competent to undertake the work they have been assigned. Ensure that SOPEP drills are conducted as per the vessel's schedule. Ensure that the vessel Emergency Response Team has been given sufficient training to implement the SOPEP. Ensure that any environmental incidents or breaches of this EMP are reported immediately to the PIDC Platform Offshore Installation Manager

PIC will work with and influence the contractors to ensure that all contractors are aware of and competent with respect to:

- Environmental and social impacts that could potentially arise from their activities.
- Necessity of conforming to the requirements of the EIA and EMP (i.e., implementing the control and mitigation measures) in order to avoid or reduce those impacts.
- Roles and responsibilities to achieve that conformity, including with regard to change management and emergency response.
- Documentation and reporting requirements and other EMP compliance requirements.

The Project will require that contractors have implemented training programmes for their personnel and each contractor is responsible for HSE awareness training for personnel working on the Project. The contractors are also responsible for identification of any additional training requirements to maintain required competency levels.

9.2 Waste Management Plan

A waste management plan has been developed for the project outlining the type and nature of waste arising from the project and means of managing the storage and handling of waste to minimize opportunities for accidental release. The production of waste will be minimized through good design (for instance, of use of pre-assembled units) and management procedures such as the pressure testing of equipment onshore, wherever practicable.

All waste is managed in accordance with the Waste Management Procedure (WMP) prepared for the Project. PIC Waste Management Procedure is illustrated in **Appendix G**.

All waste from onshore and offshore operations is temporarily stored at the OGT and collected by certified and licensed contractor for onward disposal. PIC has annually contracted with GOLDEN DOWA ECO-SYSTEM MYANMAR Co., Ltd for Hazardous and Non-Hazardous Waste Collection, treatment, and Disposal. The Golden DOWA Standard Operating Procedures is described in **Appendix H**.

Other returnable general wastes will be collected by MOGE for reuse.

Recommended monitoring requirements for waste generation include the following:

- A monthly inventory of waste types and volumes generated for disposal will be maintained; and
- Waste consignment notes for all wastes transferred to shore will be held.

Waste generation will be monitored through update of the waste inventory (including a specific hazardous waste inventory) produced during the installation phase. Waste Consignment Notes for all wastes transferred to shore will also be held.

Amount of Waste Generation from SHP/OGT were depended on project activities for increase or decrease such as Onshore and Offshore maintenance activities. However, PIC has carefully managed waste management collection and disposal plan to reduce negative environmental impact to the environment.

PIC has also successfully received ISO 14001 Certificate since 2019 for Compliance of PIC's Environmental Management System. The DNV GL ISO 14001 certificate for 3 years valid by periodical annual audit and LRQA ISO 14001 certificate for 3 years valid by periodical annual audit is shown in **Appendix L**.

9.3 Emergency Response Plans

PIC have developed plans and procedures to identify the potential for and response to environmental accidents and health and safety emergency situations and for preventing and mitigating any potentially adverse environmental and social impacts that may arise.

PIC has a number of Emergency Response Plans (ERP) in place, which detail the actions and resources available in the event of various emergency scenarios. These include; OGT Emergency Response Procedure, Shwe Platform Emergency Response, Emergency and Crisis Management Plan, and Oil Spill Contingency Plan. These plans and procedures are provided in **Appendix J**.

Emergency preparedness and response will be continually reviewed by PIC during the operations and after the occurrence of any accidents or emergency situations to ensure that lessons learnt inform continuous improvement. Emergency exercises will be undertaken on a regular basis to confirm adequacy of response strategies and investigations of accidents or incidents will follow formal documented procedures.

ERP budget is related to the oil spill incidents and PIC has applied annual membership to OSRL Singapore (Oil Spill Response Limited and link <https://www.oilspillresponse.com/about-osrl/>) as per MOGE's instruction.

The annual associated membership fee is 61,500 USD for the site coverage with total cumulative annual production of less than 40 thousand barrels per day for the Rig SHP (SHWE Platform) Block A-1 and A-3 in Myanmar.

9.4 Seawater Quality Management Plan

To minimize the discharge of hazardous chemicals into the sea, PIC is committed to adhering to all relevant national and international legislation, as outlined in **Section 3**. All produced water will undergo offshore treatment, as detailed in **Section 4.3.4.2 Produced water treatment system**, before being discharged into the marine environment. The treated produced water will comply with the Myanmar National Environmental Quality (Emission) Guidelines, ensuring that oil-in-water content remains below 29 mg/l on a monthly average in line with platform utility system design standards and operational procedures.

PIC also ensure compliance with MARPOL regulations, particularly Annexes I and IV, for large vessels, barges, and rigs operating in the area. According to MARPOL Annex, the oil-in-water content of discharged water must not exceed 15 ppm. Additionally, all sewage and greywater discharge are managed in full accordance with MARPOL 73/78 standards.

To further uphold environmental responsibility, contractor operations are subject to strict auditing processes, including system maintenance or operational disruptions, PIC will strictly adhere to established emergency response procedures. This includes the OGT Emergency Response Procedure, Shwe Platform Emergency Response Plan, Emergency and Crisis Management Plan and Oil Spill Contingency Plan (**Appendix J**), all of which are designed to mitigate potential impacts on seawater quality.

To support these initiatives, an estimated annual budget of \$10,000 has been allocated for the implementation and continuous improvement of the seawater quality Management plan.

9.5 Environmental Monitoring and Reporting

Monitoring will be required in order to demonstrate compliance with both regulatory and PIC's Project requirements (compliance monitoring), and will also provide verification of the overall design and effectiveness of the implemented control measures.

Compliance will be monitored to ensure that subcontractors meet contractual obligations with respect to work practices and design specifications (e.g., Project emission standards). This monitoring will be carried out by PIC and/or by an appointed third party.

In developing the monitoring measures, the following considerations and strategies have been applied:

- Consistency with internationally and locally acceptable practices.
- Logistically practical.
- Cost effectiveness.

Some potential environmental effects can be predicted with a degree of precision. A number of effects can, however, only be accurately evaluated once the activity commences (through impact monitoring). It is a requirement by PIC that environmental monitoring and reporting should be conducted throughout the field life of the Offshore Facilities in Block A-1 and Block A-3 in offshore Myanmar.

Monitoring will be required in order to demonstrate compliance with PIC's project commitments (compliance monitoring) and will also provide verification of the overall design and effectiveness of the implemented control measures. The key objectives of PIC's monitoring activities are as follows:

- To monitor discharges and emissions to ensure compliance with PIC's environmental commitments;
- To provide an early indication that any of the environmental control measures or practices are failing to achieve acceptable standards; and,
- To provide a basis for continuous review and improvements to the operational monitoring programme.

The following sections outline the recommended monitoring activities for key emissions, discharges and wastes during operational and decommissioning phases of the Project. PIC must make certain measurements and ensure that good and accurate records are maintained on any effluents discharged into the environment.

9.5.1 Air Emissions

Routine operational atmospheric emissions arise from flaring and normal process venting and from the power generation and gas compressors exhaust emissions. However, the CO₂ has a lesser environmental impact (i.e., Greenhouse Gas effect) than the venting of unburned hydrocarbons.

It is necessary to evaluate the quantity of gas flared, vented or burnt. The quantity of overall greenhouse gas emissions is calculated on a **monthly** basis. Action plans will be developed/ implemented as required to further reduce emissions should such plans be considered appropriate and practicable.

9.5.2 Surrounding Seawater Quality

The aqueous discharges of the operational phase of the project are limited to:

- Produced water (Compliance with Myanmar National Environmental Quality Emission Guidelines);
- Treated sewage at OGT and SHP Sewage (Complying with MARPOL 73/78, and Myanmar National Environmental Quality Emission Guidelines);
- Deck runoff water (Complying with MARPOL 73/78, and Myanmar National Environmental Quality Emission Guidelines);

- Domestic waters flow via a macerator prior to disposal at sea (Compliance with MARPOL 73/78); and
- The fire water system discharging directly into the sea (Compliance with MARPOL 73/78).

The overall impacts on the Project area's water quality are not considered to be significant, as dilution with the surrounding seawater leads to a very small impact area around the end of the disposal caisson.

The following monitoring should be conducted:

- Quantity of produced water discharged to the sea (tons/month) from Offshore; and
- Average hydrocarbon content in the produced water (mg/l averaged over a month) from Offshore.
- Offshore surrounding seawater quality results which shall be conducted by third party SHP BH Laboratory for 2 times per six months for 8 Parameters which are Chromium VI, Temperature, Dissolve O₂, Nitrate, Nitrite, Oil & Grease, Total Suspended Solids, Total Petroleum Hydrocarbon at 100 m (2 Locations), 150 m (1 Location) and 500 m (3 Locations). **Appendix Q** Proposed Seawater Monitoring Locations and **Appendix P** SHP BH Laboratory Profile and laboratory method of analysis.

9.5.3 Loss of Contaminant (Accidental Spills & Leaks)

A log of non-routine events, spills and accidents will be maintained throughout the operational phases of the Development and the necessary Root Cause Analysis will be undertaken. In addition, any spill incidents exceeding the reasonable size need to be recorded and reported via the PIC incident reporting system.

9.5.4 Seabed Sediments & Water Quality

Prior to the development of the Block A-1 and Block A-3 field, a Marine Environmental Baseline Survey was performed to measure the following parameters:

- Seawater quality;
- Particle size distribution;
- Organic matter and total organic carbon;
- Nutrients;
- Metals;
- Total petroleum hydrocarbons; and
- Macrobenthos.

The objective of the monitoring would be to track any environmental change, both temporally and spatially, and determine, if present, whether these changes are attributed to works. If detected, corrective action measures should be implemented to prevent any long-term adverse impacts to the surrounding environment through works. The existing environmental monitoring should be continued throughout the field-life of the facilities.

9.5.5 Waste Management

The waste generation will be monitored through an update of the waste inventory (including a specific hazardous waste inventory) produced during the operation phase. Waste consignment notes for all wastes transferred to shore will also be held.

9.6 Report Requirements

PIC will submit an Environmental Monitoring Report to MONREC every **6 months** after obtaining ECC. The report will include the following information collated during the Project:

- Environment Record.
- Waste Record.

A summary of the monitoring and record keeping is provided in **Table 9-2**.

Table 9-2 Summary of the Monitoring and Record-keeping for A1 and A3

Project Activity/ Environmental Aspect	Monitoring Measures	Criteria/ Standard	Reporting	Responsibility	Location	Frequency	Method	Budget
Waste Generation	Quantities of waste discharged (Sewage, food waste)	Compliance with MARPOL 73/78 ^b	Environmental Discharge Report	PIC	19°40'26.06"N 92°32'35.40"E	Waste recorded daily	Waste inventory log	65,000 USD per year
Surrounding Seawater Quality and Effluent	Quantities of any fluids discharged and hydrocarbon content if measured (Chromium VI, Temperature, Dissolved Oxygen, Nitrate, Nitrite, Oil & Grease, Total Suspended Solids, Total Petroleum Hydrocarbon)	ASEAN Marine Water Quality Guideline (2008), National Environmental Quality (Emission) Guidelines (2015)	Environmental Discharge Report	PIC	3 points within 100 m (19°67'32.29"N 92°54'21.60"E, 19°67'45.80"N 92°54'35.00"E, 19°67'48.80"N 92°54'18.20"E) 3 points within 500m (19°67'07.30"N 92°53'94.70"E, 19°67'71.20"N 92°53'94.50"E, 19°67'71.40"N 92°54'61.90"E)	Daily during discharge	Average hydrocarbon content in the discharge water (mg/l average over a month)	10,000 USD per year
Commercial Fishery Interaction	Recording of community grievances	N/A	Records of grievance in accordance with	PIC	Place of occurrence	If occurs	Grievance log	20,000 USD

Project Activity/ Environmental Aspect	Monitoring Measures	Criteria/ Standard	Reporting	Responsibility	Location	Frequency	Method	Budget
			the community grievance mechanism					
Training	Details of crew inductions	N/A	Induction record sheet	PIC	19°40'26.06"N 92°32'35.40"E	Training matrix	Recorded in the training record	20,000 USD
Incident reporting	Details of any environmental or social incidents	N/A	Inspection check sheets Environmental Discharge Report	PIC	19°40'26.06"N 92°32'35.40"E	If occurs	Recorded in the incident form	20,000 USD
Compliance Reporting	Compliance with EMP	EMP / Mitigation Measures	EMP/ Mitigation measures	PIC	19°40'26.06"N 92°32'35.40"E	Every 6-month	Inspection Checklist	10,000 USD per year
Accidental Releases and Leaks	Safety Record	N/A	N/A	PIC	Place of occurrence	If occur	PIC has a contract in place with independent oil spill response company	20,000 USD per year
Air emissions	Calculation of GHG emissions from gas flared	N/A	EMoP	PIC O&M	19°40'26.06"N 92°32'35.40"E (one Point)	Calculated monthly	Quantification based on flare volumes and vessel movements (fuel used)	20,000 USD

Project Activity/ Environmental Aspect	Monitoring Measures	Criteria/ Standard	Reporting	Responsibility	Location	Frequency	Method	Budget
Marine Organism	Sediment and Macrobenthos, Zooplankton, Phytoplankton, Marine Mammals	N/A	EMoP	PIC	Within the operation area	Once in three years	Sediment sampling and visual watching for marine mammals	20,000 USD for once
Vessel Traffic	Shipping lanes records	MARPOL, Annex I - VI for Vessel Traffic	EMoP	PIC	Within the operation area	Twice a year	Ship frequency tracking data	Include in operational cost

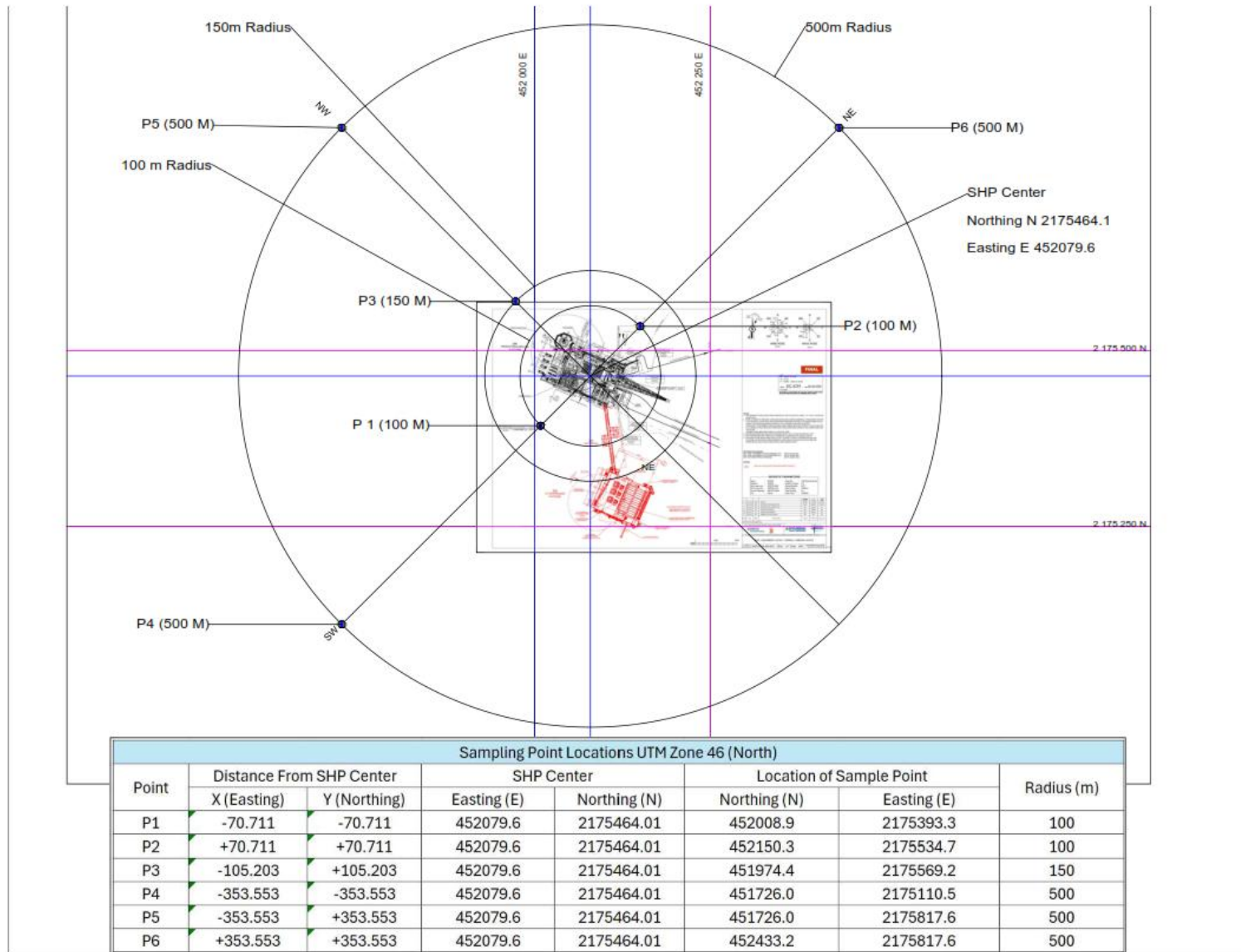


Figure 9-1 Proposed Seawater Quality Monitoring Points

Table 9-3 Summary of the Monitoring and Record-keeping for Midstream and Onshore Development

Project Activity/ Environmental Aspect	Monitoring Measures	Criteria/ Standard	Reporting	Responsibility	Location	Frequency	Method	Budget
Waste Generation	Quantities of waste discharged	N/A	Environmental Discharge Report	PIC	19°23'39.80"N 93°29'6.97"E	Waste recorded daily	Waste inventory log	65,000 USD per year
Effluent	Quantities of effluent discharged and measured parameters	NEQ(E)G	EMoP	PIC	19°23'23.40"N 93°29'0.30"E (Sewage)	Every 6-month	Lab analysis	10,000 USD per year
					19°23'21.57"N 93°29'0.67"E (Storm water drainage 1)			
					19°23'20.93"N 93°29'0.40"E (Storm water drainage 2)			
					19°23'22.12"N 93°28'58.07"E (Storm water drainage 3)			
Air emissions	Measured parameters and Calculation of GHG emissions	NEQ(E)G	EMoP	PIC O&M	19°23'37.69"N 93°29'12.81"E	Every 6-month	Air quality monitoring station, Quantification based on fuel usage of vehicles and machinery	20,000 USD

Project Activity/ Environmental Aspect	Monitoring Measures	Criteria/ Standard	Reporting	Responsibility	Location	Frequency	Method	Budget
Odour	Measured parameter	NEQ(E)G	EMoP	PIC	19°23'22.12"N 93°28'58.07"E 19°23'39.80"N 93°29'6.97"E	Every 6-month	Odour meter	2,000 USD per year
Noise Level	Measured parameters	NEQ(E)G	EMoP	PIC O&M	19°23'37.14"N 93°29'13.56"E	Every 6-month	Digital sound level meter	2,000 USD per year
Training	Details of staff inductions	N/A	Induction record sheet	PIC	19°23'21.94"N 93°28'57.80"E	Training matrix	Recorded in the training record	20,000 USD per year
Incident reporting	Details of any environmental or social incidents	N/A	Inspection check sheets Environmental Discharge Report	PIC	19°23'21.94"N 93°28'57.80"E	If occurs	Recorded in the incident form	20,000 USD Per year
Compliance Reporting	Compliance with EMP	EMP / Mitigation Measures	EMP/ Mitigation measures	PIC	19°23'21.94"N 93°28'57.80"E	Every 6-month	Inspection Checklist	10,000 USD per year



The Project will adopt MARPOL requirements and a SOPEP will be prepared and implemented. Should spills occur, they will be reported in the SOPEP Report.

9.7 PIC Onshore Gas Terminal (OGT) Emergency Response Plan

An Emergency Response Plan (ERP) has been prepared for the OGT which details the response for a number of different scenarios including:

- Gas Release, Fire, or Explosion.
- Accommodation Fire
- Chemical or diesel Oil spills.
- Medical emergencies including medevac procedures.
- Serious illness / injury.
- Bomb Threat
- Civil Unrest
- Sabotage/Pipeline ROW Sabotage
- Heavy weather/cyclone plan.
- Tsunamis etc.

The ERP also contains Action Plans that are required for the above scenarios.

The ERP contains the roles and responsibilities of PIC and any contractors as well as the Organization of the emergency management teams. It also lists the training requirements, and the drills and exercises to be carried out regularly to ensure compliance with the ERP.

The ERPs cover the platform and the onshore gas terminal and provided in full in **Appendix J**.

9.8 PIC Shwe Platform Emergency Response Plan

A Shwe Platform ERP has been prepared for the Project. The ERPs contain instructions for support relating to:

- Fire Inside LQ or Technical Building.
- Fire in Utilities, Process or DFR areas.
- Gas Release.
- Confined Space Rescue.
- Rescue from a Height.
- Dropped Object or Scaffold Collapse.
- Bomb Threat.
- Illegal Boarding.
- Chemical and diesel spills.
- Medical emergencies including medevac procedures.
- Search and rescue – include man-overboard procedures.
- Helicopter emergency (Precautionary Landing, Crash on Platform, Ditching)
- Methanol fires.
- Accommodation fire.
- Potential/Actual Vessel Collision.
- Radioactive Source Incident.
- Pipeline Rupture.
- Heavy weather/cyclone plan.
- Hazardous material spill response plans.

The ERP also contains Action Plans that are required for the above scenarios.

9.9 PIC's Oil Spill Contingency Plan

In the event of an unplanned hydrocarbon spill to the marine environment the Oil Spill Contingency Plan will be implemented to initiate a response. The PIC Oil Spill Contingency Plan details the operational tasks required to mobilize a first strike response. Oil Spill Contingency Plans are intended to be the first document used in a spill to provide guidance to the Incident Controller and the rest of the Incident Management Team. The PIC Oil Spill Contingency Plan details the roles and responsibilities, oil spill response techniques and containment / recovery of spilled hydrocarbons. Any spills which may lead to a serious impact will be reported to MONREC (as per the EIA Procedure):

"In respect of any breach which would have a serious impact or where the urgent attention of the Ministry is or may be required, within not later than twenty-four (24) hours, and in all other cases within seven (7) days of the Project Proponent becoming aware of such incident."

PIC's chartered vessels are complying with IOPP Certificate (International Oil Pollution Prevention Certificate) requirements and SOPEP. Foam Agent and Oil Dispersant have been provided by PIC to the safety standby vessel.

9.10 Community Grievance Mechanism

A grievance mechanism (**Figure 9-3**) is created by the Project Proponent so that stakeholders can raise questions or concerns with the Project and have the concerns addressed in a prompt and respectful manner. If a grievance or complaint is raised, it will be received by the Project through various channels, including submissions from volunteers, grievance boxes, face-to-face interactions with a grievance facilitator, and other communication methods. The grievance will be recorded and investigated and responded to. Should the complainant not accept the response, a review will be carried out. Once resolved, the grievance will be closed out and recorded in the grievance register, along with the settlement report signed by the claimant. If necessary, monitoring and/or evaluation will be conducted to prevent recurrence.

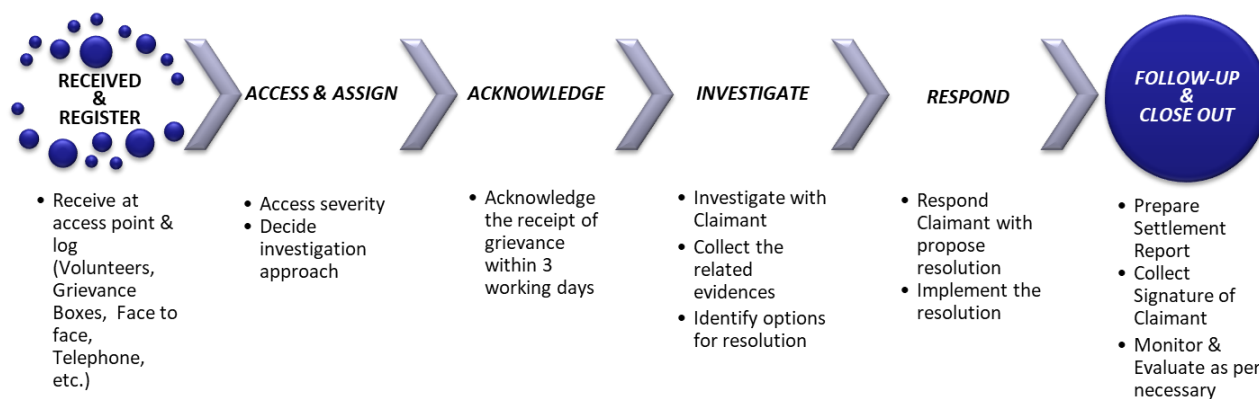


Figure 9-3 Procedure of Grievance Mechanism

9.11 Capacity Development and Training

Employee training includes awareness and competency with respect to:

- Environmental and social impacts that could potentially arise from their activities.
- Necessity of conforming to the requirements of the EIA and EMP, in order to avoid or reduce those impacts.
- Roles and responsibilities to achieve that conformity, including with regard to change management and emergency response.

The PIC O&M Manager is responsible for coordinating training, maintaining employee-training records, and ensuring that these are monitored and reviewed on a regular basis. PIC will be responsible for the management of contractors to ensure that training needs are met for personnel whose work may have a significant adverse impact upon the environment or social conditions. Training requirements are also listed in the Emergency Response Plans. In addition to the basic and refresher survival and safety training given to all personnel working onshore and offshore, all personnel nominated for emergency duties shall be provided with specific training, coaching and assessment by a certifying authority, commensurate with duties and responsibilities.

9.12 Mangrove Restoration Plan

To promote ecological restoration and enhance environmental sustainability, extensive afforestation and reforestation activities have been undertaken, focusing on mangrove forests and freshwater tree plantations. These efforts aim to improve biodiversity, mitigate climate change impacts and support local communities through sustainable forestry practices.

- A total of 2.19 million mangroves seedlings have been cultivated to support reforestation and afforestation projects.
- In 2011, a dedicated 28.3 ac was established for intensive mangrove plantation, serving as key restoration site for degraded coastal ecosystems.
- From fiscal year 2012 to 2023, a total of 2,472.34 acres of community-managed mangroves forests were established across 25 villages in Kyaukphyu Township.
- As of now, 1,160.24 ac of these community forests have been successfully certified, ensuring their sustainable management and long-term preservation.

Beside the mangrove restoration, freshwater tree plantation was carried out as follows:

- In 2017-2018, a total of 105,000 freshwater trees were planted along the Yangon-Sittwe Highway (238 miles) to enhance roadside greenery and environmental resilience
- In 2019, a 35-ac community freshwater plantation lot was established in Gwa Township, with the planting of 46,200 trees to support water conservation and local forestry programs

These initiatives not only restore degraded landscapes but also provide long-term ecological and socio-economic benefits, including carbon sequestration, disaster risk reduction and sustainable livelihoods for local communities.





Figure 9-4 Activities and Records of Mangrove Restoration Plan

9.13 Corporate Social Responsibility (CSR) program

PIC commences its Corporate Social Responsibility (CSR) program in project area shortly after the discovery of natural gas in Rakhine State, Myanmar. The CSR is defined as applying core values consistently and effectively, responding to the expectations of the community and continually improving our social, economic and environmental performance. The vision of sustainable development is to engage with local community ethically to have lasting achievements which benefit them in sectors of social, environmental, economic aspects. Through the CSR activities, PIC will tackle any socio-economic challenges facing the community and stand firmly as a constructive partner as well as a good citizen for the local populace.

9.13.1 Performed CSR Programs

Before monetization of the Project since 2006, CSR programs have been implemented annually, primarily targeting Rakhine State. These initiatives span diverse sectors, including education, health, water supply and infrastructure, social welfare, and environment. The total expenditure for these programs, including extraordinary CSR initiatives, has amounted to approximately USD 20.4 million. Examples of CSR programs conducted by PIC are illustrated in the following figures.

The Shwe Project CSR Program

Shwe Project, Myanmar

Objectives

- To conduct a business in a socially responsible and ethical manner
- To uplift the living conditions of the people in the project area
- To build a high level of trust and confidence with local communities

Principles

- Sustainability of the program
- Project Operated Areas
- Positive actions for the benefit of locals

Considerations

- Protecting the social structure
- Respecting the cultural and traditional values
- Encouraging local content for the development

Commencement : 2006

As of December 2024

Sector	Region (USD)		Total (USD)
	Rakhine State	Yangon & Others	
Education	4,325,766	46,094	4,371,860
Health	2,698,074	5,335,317	8,033,390
Water Supply & Infra	3,945,797	5,998	3,951,795
Social Welfare & Others	4,526,528	105,967	4,632,495
Environmental	3,096,071	-	3,096,071
TOTAL	18,592,236	5,493,375	24,085,611

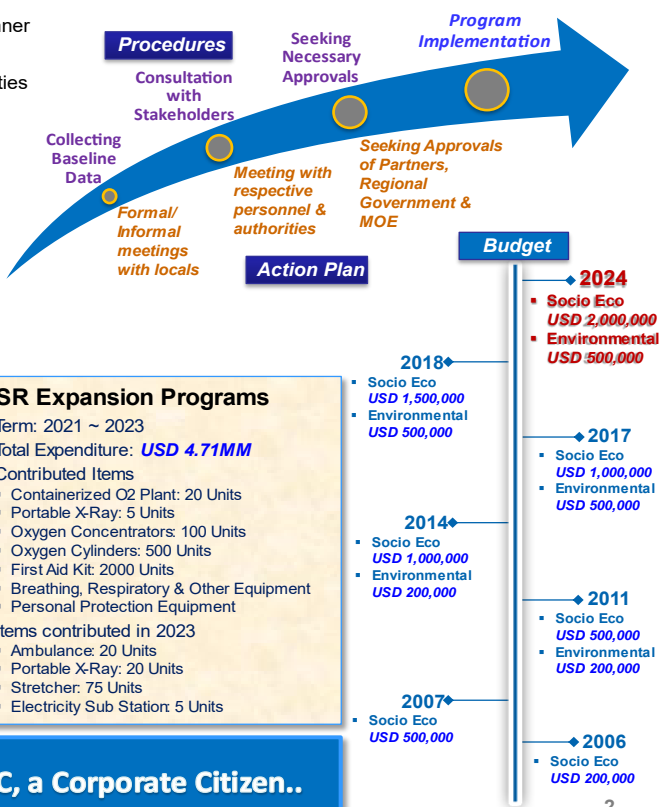
Manaung PV & ESS Project

- Term: 2018 ~ 2019
- Total Expenditure: **USD 2.37MM**
- Contributed Items
 - PV: 0.5 MGW
 - ESS: 2,000 MGWh
 - Generator: 500 KVA
 - Helipad: 2

CSR Expansion Programs

- Term: 2021 ~ 2023
- Total Expenditure: **USD 4.71MM**
- Contributed Items
 - Containerized O2 Plant: 20 Units
 - Portable X-Ray: 5 Units
 - Oxygen Concentrators: 100 Units
 - Oxygen Cylinders: 500 Units
 - First Aid Kit: 2000 Units
 - Breathing, Respiratory & Other Equipment
 - Personal Protection Equipment
- Items contributed in 2023
 - Ambulance: 20 Units
 - Portable X-Ray: 20 Units
 - Stretcher: 75 Units
 - Electricity Sub Station: 5 Units

PIC, a Corporate Citizen..



Performed CSR Programs 2006 ~ 2024

Shwe Project, Myanmar

Zayitaung Post Primary School

- School Buildings: **80 Units** / IT Classrooms / **Libraries**
- Teaching Aids & School Furniture
- Shwe **Scholarship** **54 students** / 16 graduated and 23 failed
- Vocational Trainings** 962 pax

Vocational Trainings

Scholarship Holders

Ambulance for Kyaukpyu

COVID 19 Test Kits Donation

Sub RHC (Sittwe)

EDUCATION
\$4.40 MM

HEALTH
\$8.03 MM

WATER SUPPLY & INFRA
\$3.95 MM

ENVIRONMENTAL CONSERVATION
\$3.10 MM

ECONOMY, SOCIAL WELFARE & OTHERS
\$4.63 MM

MANAGROVE FOREST
\$3.10 MM

FRESH WATER TREES
\$3.10 MM

WASTE MANAGEMENT
\$3.10 MM

Solar Power Plant (0.5 MGW)

Ethnic Houses Inndin

1000 KVA Generator

Mangrove Conservation

Garbage Collection Vehicles

Stakeholders Engagement

Shwe Project, Myanmar

Objectives

- Awareness on needs and concerns of community
- Build a sound relationship and mutual trust through engagements with community
- Ensure the theme of "Develop Together"

Focus Villages

- Seven (7) Villages from Gonechwein Village Tract
- Malakyun Village from Lakekhamaw Village Tract

Focus Discussions

- Socio-Economic
- Environment

Focus Groups

- Agriculture
- Fishery
- Grocery
- Others

Participants & Schedule

- Approximately twenty (20) Representatives from the Focus Villages
- Engagement with the Stakeholders once a month



Prioritizing the Stakeholders

Priority	Description	Engagement Strategy
First	Participants who have high impact and high interest	Key players
Second	Participants who have high interest but low impact	Meet their needs
Third	Participants who have high impact but low interest	Show concern
Fourth	Participants who have low impact and low interest	Spectators

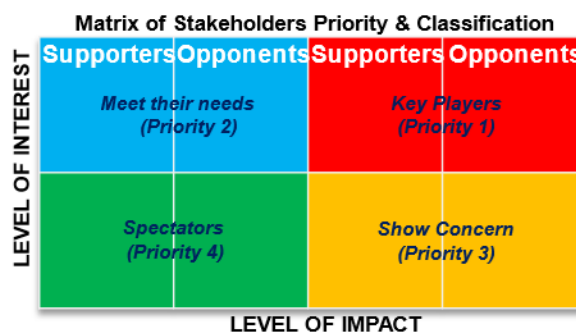


Figure 9-5 PIC CSR Programs

9.13.2 Procedures on Implementation of CSR Programs

In connection with procedures for implementation of CSR Programs illustrated in Figure 9-6, POSCO INTERNATIONAL Corporation conducts:

- collection of baseline data for selection of CSR Programs thru the meetings both formal and informal with the local community;
- based on the collected data, consultations with stakeholders including local authorities for prioritizing the programs as per level of necessity;
- according to the priority list, discussions with departments concerned, as instances, Education, Health, Rural Development and Public Works in order to avoid overlapping programs budgeted by respective departments;
- after selection of programs, presenting final proposed programs to Shwe Consortium Partners, Rakhine State Government and Ministry of Energy for necessary approvals on budget and CSR Programs being implemented in the prevailing financial year; and
- after procuring all necessary approvals, implementation of CSR Programs within such prevailing financial year.

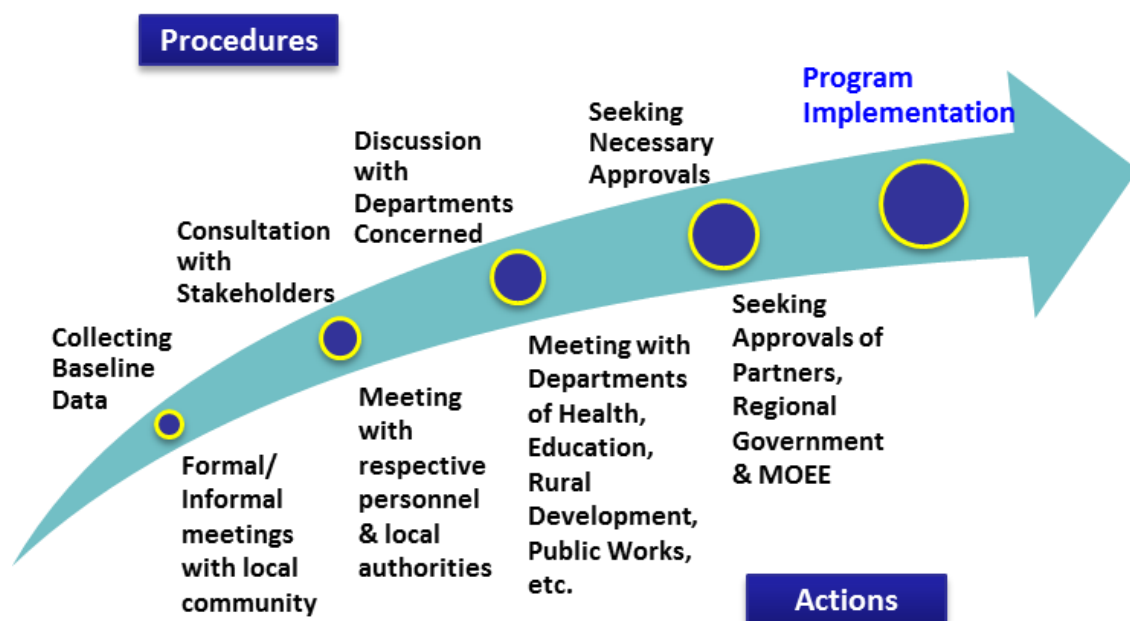


Figure 9-6 CSR Procedure

9.13.3 Salient Characteristics of CSR Programs by the Shwe Project

As outlined in Clause 10.2, the collection of baseline data and stakeholder consultations are crucial in selecting CSR programs implemented by the Project. These programs aim to contribute to the socio-economic and environmental development of local communities in Rakhine State, a commitment upheld since 2006.

In the same resolute spirit demonstrated during the combat against the COVID-19 pandemic, the Project, as a responsible and reputable corporate citizen, remains ever-prepared to contribute to emergency response efforts for natural disasters. Noteworthy instances of this commitment include the Project's proactive efforts in supporting victims affected by the aftermath of the Giri Cyclone in 2023 and the Yagi Typhoon in 2024.

Unlike CSR initiatives in other sectors across the country, the proposed CSR programs under the Project necessitate annual approvals from the Rakhine State Government and the Myanmar Oil and Gas Enterprise under the Ministry of Energy.

As illustrated in the Rakhine State Government recommends to implement some CSR Programs based on requirements of Rakhine State in neediest areas in addition to the proposed CSR Programs.

Table 9-4 Approved CSR Programs (April 2018 – March 2019)

Sector	Programs	Budget (US\$ 'K)
Education	Shwe Scholarship (Continuous Program)	372
	Construction of 1 Story-Buildings for Schools in Taunggup, Thandwe & Yanbye Townships <i>[Recommended by Rakhine State Govt.]</i>	
	Construction of School Building in Kyaukpyu Township	
	Provision of School Furniture for New Schools	
	Provision of Vocational Trainings at Kyaukpyu GTI	
	Computer Training Courses at Schools	
Health	Shwe Free Medicare Centers (Continuous Program)	70
	Provision of Medical Equipment	
Water Supply	Water Distribution Facilities at Lamuumaw Village (Phase II) <i>[Recommended by Rakhine State Govt.]</i>	56
	Rock Fill Dam <i>[Recommended by Rakhine State Govt.]</i>	
Infrastructure	Upgrading Interconnection Roads (Gonechwein - Phase V & Malakyun - Phase IV)	380
	Construction of Mawain Bridge	
Social	Village Development Project (Year III) <i>[with the cooperation of KOICA and Department of Agriculture]</i>	315
	Maungdaw Rehabilitation - Construction of Houses for Ethnic People <i>[Recommended by Rakhine State Govt.]</i>	
	Electricity Supply at Manaung Island (Feasibility Study for PV+ESS) <i>[Recommended by Ministry of Electricity & Energy]</i>	400
Environmental	1) Plantation of Fresh Water Trees along Maungdaw-Gwa High Way	393
	2) Construction of Access Road to Waste Disposal Area in Mrauk-U & Provision of a Backhoe Excavator to Mrauk-U	
	3) Provision of Garbage Bins & Garbage Collection Trucks (Compactor Type) <i>[All 3 Programs are recommended by Rakhine State Govt.]</i>	
	Mangrove Forest Conservation Program	
Others	Construction of Pit Latrines for Poor Households	14
	Green Kyaukpyu Campaign	
	Public Relations	
TOTAL		2,000

9.13.4 Future Plan & Budget



Figure 9-7 Milestones of CSR Budget

As illustrated in Figure 95, the Project has progressively augmented the CSR Budget from time to time. Commencing in 2024, the budget has been increased to 2.5 million per annum to sustain the implementation of approved CSR programs. These initiatives encompass a broad spectrum of focus areas, including **Education, Health, Infrastructure, Social Welfare, Economic Development, and Environment**, ensuring comprehensive support for the community's growth and well-being on **an annual basis**.

In addition to the aforementioned regular budget, the Project, embodying a sense of responsibility, has proactively allocated additional funds for extraordinary CSR initiatives. These include impactful programs such as the Manaung Electrification Project and efforts to combat the COVID-19 pandemic, demonstrating its solid commitment to addressing critical community needs.

Adhering to established industry best practices, the Project recognizes the crucial role of the regional government (Rakhine State Government) and Village Representative Groups from Gonechwein Village Tract and Malakyun Village in the Lakekamaw Village Tract in the implementation of CSR programs. This collaborative approach is designed to align initiatives with the development priorities of the local community while fostering a strong sense of ownership and engagement among community members to the greatest extent possible.

10. PUBLIC CONSULTATION AND INFORMATION DISCLOSURE

10.1 Summary of Consultation Conducted for the previous EIA and SIA Reports

For the Project, a separate Social Impact Assessment (SIA) was completed in June 2010. This SIA included public consultation at the national and regional (Rakhine State) level. The consultation helped the Project to gather information on potentially affected people and on potential data gaps and informed the impact assessment in the SIA Report.

Consultation involved face-to-face meetings with a range of stakeholders including the Department of Fisheries, the Chief Minister, and the General Administrative Department and a number of NGOs, CSOs and local committees.

Field interviews were conducted between 24 October and 5 November 2009. The household surveys were conducted in at least 1 in 4 households in all the villages of Gonechwein, Malakyun and Lakekhamaw. A summary of all stakeholders consulted, the dates and times of the meetings and the areas discussed is provided in **Table 10-1**.

Gonechwein, Lakekhamaw and Malakyun villages were also selected for Focus Group Discussions and these villages are located within 8 km of the onshore facilities. The focus groups who took part in discussions with MSR were:

- 20 farmers (10 male, 10 female) from Gonechwein village.
- 18 fishers (8 male, 10 female) from Lakekhamaw village.
- 8 landowners (6 male, 2 female) from Malakyun village.
- 10 landowners (5 male, 5 female) from Gonechwein village.
- 9 traders (2 male, 7 female) from Gonechwein village.

Table 10-1 October and November 2009 Stakeholder Engagement

Date	Organization and Representative	Areas of Discussion
26 October 2009, Peace and Development Council Office, Kyaukpyu	Kyaukpyu District Peace and Development Council - Chairman	<ul style="list-style-type: none"> • Kyaukpyu population statistics • Village and ward compositions • Local government authorities in Kyaukpyu township
26 October 2009, Bank office, Kyaukpyu	Kyaukpyu Township Myanmar Economic Bank - Bank manager	<ul style="list-style-type: none"> • Financial Services • Number of banks/financial institutions on Kyaukpyu • Use of banks • Availability of services • Loans and repayments
26 October 2009, Religious Affairs office, Kyaukpyu	Kyaukpyu District Religious Affairs Department - Head of Department	<ul style="list-style-type: none"> • Cultural heritage, religious and cultural practices • Location of culturally significant sites • Official records of significant sites • Surveys of significant sites • Social or religious organizations • Meeting places

Date	Organization and Representative	Areas of Discussion
28 October 2009, Department of Fisheries Office Kyaukpyu	Kyaukpyu District Department of Fisheries - Head of Department	<ul style="list-style-type: none"> • Role of Department • Activities and responsibilities Exclusion zones around project facilities • Enforcement • Awareness of zones • Location of prime fishing grounds Fishing industry profile and economic output Fishing boat numbers and status (commercial, private) • Types of fishing and locations • Catch sizes and type • Boat owners and cost of operations • Average earnings Seasonal influences • Perceptions of water and fish quality Project awareness and perceptions
28 October 2009, District Health office, Kyaukpyu	Kyaukpyu District Health - Head of Department	<ul style="list-style-type: none"> • Health statistics, services and facilities • Infection and disease rates for Kyaukpyu • Health facilities in Kyaukpyu • Number and type of health facilities and practitioners • Admission numbers • Reasons for admission • Health funding • Access to health care • Environmental health risks • Potential project impacts on health and services.
29 October 2009, Port Authority office, Kyaukpyu	Kyaukpyu District Port Authority - Head of Department	<ul style="list-style-type: none"> • Current and future use of jetty facilities in Kyaukpyu • Jetty facilities • Vessel traffic numbers • Capacity and capacity for growth • Vessel size capacity
29 October 2009, District Education office, Kyaukpyu	Kyaukpyu District Education - Officer	<ul style="list-style-type: none"> • Baseline information about the level of education and educational facilities in Sittwe and Kyaukpyu. • Number and type of schools and post-school education facilities in Kyaukpyu (Primary, secondary and tertiary) • Attendance numbers and gender spread • Teachers – numbers, salary • School capacity • Cost of schooling

Date	Organization and Representative	Areas of Discussion
		<ul style="list-style-type: none"> • Education funding
29 October 2009, Police Force Office, Kyaukpyu	Kyaukpyu Township People's Police Force - Members	<ul style="list-style-type: none"> • Law and order
30 October 2009, Motor Transport office, Kyaukpyu	Motor Transport Supervision Committee - Members	<ul style="list-style-type: none"> • Transportation and mobility • Local travel • Public transport • Road condition and maintenance
30 October 2009, Chairman's fish depot, Kyaukpyu	Kyaukpyu Township Fishermen's Association - Chairman and Secretary	<ul style="list-style-type: none"> • Role of the fishing authority • Activities • Communications • Interactions with other authorities
2 November 2009, personal household, Kyaukpyu	Kyaukpyu elders	<ul style="list-style-type: none"> • General economy and livelihoods of Kyaukpyu • Jobs and availability • Industry and economy • Small-scale mining • Local business capacity to support Shwe Project • Existing programs to assist in business expansion and growth • Micro-financing
2 November 2009, Port Authority office, Sittwe*	Port Authority in Sittwe - Head	<ul style="list-style-type: none"> • Sittwe Port facilities • Shwe Project's impact on vessel traffic • Jetty facility upgrade plans • Vessel traffic and safety

10.2 Summary of Consultation Activities Undertaken for the Environment Management Plan (EMP) in 2018

The EMP consultation meetings were held with various relevant stakeholders at the regional (Rakhine) level in Sittwe and township level in Kyaukpyu Township. The consultation helped the Project to gather information on potentially affected people, and on potential data gaps and stakeholder's concerns and suggestions, and how these can be closed out in the EMP.

The meetings were conducted with various stakeholders, including Rakhine State Minister of Electric Power, Industry, Transportation and Development Affair, Rakhine State Minister for Agriculture, Livestock, Forestry and Mines; and other regional level government officers (such as Township GADs, township government departments, village tract leaders, and local communities). The date, time, location, stakeholder and purpose of each meeting is provided in the following **Table 10-2**.

Table 10-2 EMP Stakeholder Engagement in October and November 2018

Date, Time and Location	Stakeholder	Response of Engagement
30 th October 2018 (Chief Minister Meeting Hall)	Rakhine State Government	<ul style="list-style-type: none"> • Present information on the Project • Get approval for township / village level meeting • Gathers concerns and suggestion from stakeholders
31 st October 2018 (Kyaukpyu GAD Meeting Hall)	Local government Department, village tract leaders, CSOs and other interested parties	<ul style="list-style-type: none"> • Present Project information to local government, village tract leaders and other interested parties • Gather concerns and suggestions from stakeholders
1 st November 2018 (Lakekhamaw Village Tract)	Local community of Lakekhamaw Village Tract	<ul style="list-style-type: none"> • Present Project information to local government and local community members • Undertake social-baseline data collection • Gather concerns and suggestions from stakeholders
1 st November 2018 (Gonechwein Village Tract)	Local community of Gonechwein village Tract	<ul style="list-style-type: none"> • Present Project information to local government and local community members • Undertake social-baseline data collection • Gather concerns and suggestions from stakeholders

The public consultation meetings were conducted in Kyaukpyu Township and the villages of Gonechwein and Malakyun to present about the Project and collect concerns and suggestions from relevant stakeholders (such as local government and communities).

The minutes of the meetings and photos from the consultation are provided in **Appendix K**; some photos of the meeting are also provided in **Figure 10-1**.



Meeting with Rakhine State Minister of Electric Power,
Industry and Transportation, Sittwe



Meeting with local government and CSOs in
Kyaukpyu GAD Office, Kyaukpyu



Meeting with local community in
Gonechwein Village, Kyaukpyu



Meeting with local community in Malakyun village,
Lakekhamaw Village Tract, Kyaukpyu

Figure 10-1 Photos from the EMP Consultation Meetings

10.2.1 Key Questions Raised during Public Consultation

The following section summarizes the key issues raised and presents in **Table 10-3** information on how these comments have been addressed in this EMP Study.

Table 10-3 Summary of Comments and EMP Study Considerations

Comments Received	Response to Comments in Meeting	EMP Study Considerations
<u>Job Opportunity</u>		
The local people in Kyaukpyu are rarely hired by PIC. Could the management level of PIC consider this?	Your comment will submit to PIC's management team.	Job opportunity will consider in EMP report.
<u>Social Benefits</u>		
PIC's CSR program is provided in Gonechwein village. Could PIC consider to provide CSR program in Ohn Taw village etc?	PIC's CSR program just start. PIC will provide later on.	CSR program will consider in EMP report
<u>Impacts to Environment</u>		
The wastewater discharge from Onshore Gas Terminal is very dirty and have bad odour. How PIC manage and control the issue?	PIC will manage to control the waste as soon as possible.	The wastewater will consider in EMP report
<u>Waste Management</u>		
People are complaining the water pollution recently. How does PIC's supply vessel manage the waste?	PIC hired the vessel that is certificated by MARPOL. The vessel complies with MARPOL guidelines and documented all of their activities to avoid the pollution.	The waste management will consider in EMP report.

10.2.2 Disclosure

Information disclosure is one of the most important aspects of any engagement process. The process of disclosure involves the provision of information in an accessible manner (a manner which allows for easy understanding, such as in the local language) to the stakeholders. This disclosure not only allows for trust to be built amongst the stakeholders through the sharing of information but also allows for more constructive participation in the other processes of consultation and resolution of grievances due to availability of accurate and timely information.

The EMP Report will also disclose on PIC's website (<https://www.poscointl.com/eng/esg/myanmarReport.do>) as well as the executive summary of the EMP Report in Myanmar and English. Hard copies will be provided upon request at PIC's office in Yangon as well as in Sittwe, Kyaukpyu GAD offices.

11. APPENDICES

Appendix A commitment letter of PIC and PIC Company Registration

Date: 26th November, 2024

To: Director General
Environmental Conservation Department
Ministry of Natural Resources and Environmental Conservation
Office No. (58), Ottrathiri Township
Nay Pyi Taw, Myanmar

Page(s): 1 (including this cover)

**SUBJECT: RE-SUBMISSION OF ENVIRONMENTAL MANAGEMENT PLAN (EMP) FOR
SHWE PROJECT DEVELOPMENT PHASE (1) – COMMITMENT LETTER**

Reference: ECD's Letter No. EIA-2/2 (898/2018) Dated on 14th August, 2018

Dear Sirs,

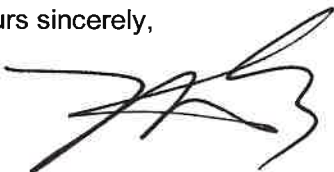
We refer to the captioned updated EMP, POSCO INTERNATIONAL Corporation (PIC) would like to re-submit herewith revised EMP which was updated and finalized by PIC in accordance with the Environmental Conservation Law (2012), Rules (2014) and Environmental Impact Assessment Procedures under the instructions of Ministry of Natural Resources and Environmental Conservation (MONREC) dated on February 27, 2015.

In this regard, PIC endorses and confirms to Ministry of Natural Resources and Environmental Conservation that:

- a) The Project's EMP is accurate and complete.
- b) EMP is written in align with Myanmar EIA procedure and related laws.
- c) The project will always be followed the commitments of EMP and the environmental mitigation plan.

The issuance of this confirmation and undertaking has been duly authorized by PIC who has signed below.

Yours sincerely,



For Managing Director

Byeong Seok Cho / Director – O&M

POSCO INTERNATIONAL Corporation (Myanmar E&P)

CC – MOGE: Directors (Planning/Offshore/Administration)



ပြည်ပကော်ပိုရေးရှင်း မှတ်ပုံတင်လက်မှတ်
Certificate of Registration for Overseas Corporation

POSCO INTERNATIONAL CORPORATION (MYANMAR E&P OFFICE)
Company Registration No. 114730092

မြန်မာနိုင်ငံကုမ္ပဏီများအက်ဥပဒေ ၁၉၁၄ အရ

POSCO INTERNATIONAL CORPORATION (MYANMAR E&P OFFICE)

အား ၂၀၀၂ ခုနှစ် ဇွန်လ ၁၇ ရက်နေ့တွင် မှတ်ပုံတင်ခွင့်ပြုလိုက်သည်။

This is to certify that
POSCO INTERNATIONAL CORPORATION (MYANMAR E&P OFFICE)
was registered under the Myanmar Companies Act 1914 on 17 June 2002.

ကုမ္ပဏီမှတ်ပုံတင်အရာရှိ

Registrar of Companies

ရင်းနှီးမြှုပ်နှံမှုနှင့်ကုမ္ပဏီများညွှန်ကြားမှုဦးစီးဌာန

Directorate of Investment and Company Administration



Former Registration No. 1FC/2002-2003

Appendix B CVs of PIC's Experts

Personal Profile



Name	Mr. Phore Kyaw
Nationality	Myanmar
Date of Birth	28 th January 1974
Contact	+95 9448012480
Email	Phore.kayw@poscointl-enp.com
Years of Experience in HSE	More than 15 Years

Educational Qualification

University	Period	Qualification
Yangon Technological University	2001 Bachelor of Engineering	(Mechanical)

Other Courses and Trainings

Sr	Course/Training	Year
1	SME Criteria and Productivity Awareness	2007
2	Process Safety Management (PETRONAS)	2008
3	Environmental Management System (PETRONAS)	2008
4	Safety and Health Officer (NIOSH)	2008
5	HAZMAT Handling (HG Solution)	2009
6	Basic First Aid Training (MRCS)	2010
7	Value of Integrity (PETRONAS)	2010
8	PTW (Permit To Work) Train The Trainer (PETRONAS)	2011
9	NEBOSH IGC (International General Certificate)	2011
10	Damaged Control Team with Helicopter Familiarization (TSTC)	2011
11	Confined Space Entry with Breathing Apparatus (TSTC)	2011
12	PASR(Pre-activity Safety Review) Leadership Training (DNV)	2012
13	Helicopter Landing Officer (TSTC)	2012
14	Authorized Gas Tester (MSTS Falck Nutec)	2012
15	AGT Train The Trainer (MSTS Falck Nutec)	2012
16	Appointment of PTW Trainer (PETRONAS)	2013
17	HSE Tier-3 Assurance (PETRONAS)	2014
18	ICS (Incident Command System) HSE Specific Role (Petrofac)	2014
19	ICS 100 (Incident Command System) (Petrofac)	2014
20	NEBOSH ITC (International Technical Certificate in Oil and Gas Operational Safety)	2014
21	Lead in Style Program	2014
22	Management of Change	2014
23	Think On Your Feet (MFQ Asia)	2014
24	BOSIET (UNITEAM)	2014
25	Incident Investigation Training for Executives (Tripod Beta)	2015
26	Recommendation (CHMC – China National Heavy Machinery Corporation)	2005

27	Foundation of Leadership (PLC)	2015
28	Technical Membership of Institution of Occupational Safety and Health (Tech IOSH)	2015
29	OHSAS 18001:2007 Lead Auditor	2016
30	Fire Risk Assessment: PETRONAS	2017
31	Leadership Gold (John C Maxwell)	2017
32	Incident Investigation Bronze Level (Energy Institute)	2017
33	Incident Investigation Silver Level (Energy Institute)	2018
34	3 Month Job Attachments at PETRONAS Head Quarter in Kuala Lumpur	2016
35	ISO 14001:2015 Internal Auditor Training	2018
36	ISO 31000 Risk Management Training	2022
37	ISO 45001:2018 Internal Auditor Training	2022

Work Experience

	Company	POSCO International Corporation (Myanmar E&P)
	Period	October 2018 - Present
	Position Title	Head of HSE
	Location	Head Office, Yangon, Myanmar
	Roles and Responsibilities <ul style="list-style-type: none"> - Developing Annual HSSE Plan, KPI and Objectives - Maintain PIC's HSSE Procedures, Guidelines and Standards - Preparation and submission of Monthly HSSE Performance Report to Management. - Provide guidance to support the Leadership Team in achieving incident free workplace. - Support / Advise Leadership Team, and Health, Safety, Security & Environment (HSS&E) Team in areas of safety / health and emergency preparedness. - Develop site level plans and programs / procedures as required by the HSS&E-MS. Ensure establishment of adequate control processes and implementation per the HSS&E-MS. - Lead Annual HSSE Audit and follow up correction and corrective actions to the findings and recommendations. - Advise site Management on analysis of incident using Tripod Beta Methodology. - Conduct HSSE Awareness Training on ISO 14001, 45001 and PIC HSSE MS to Management and Staffs. - Review and monitor HSE CAR (Corrective Action Register) online and follow up with respective responsible person and action owner. - Organize HSE Steering Committee Meeting with committee member bi-annually. - Organize and participate in investigation and follow-up of incidents, including development of remedial action plans. Provide root cause analysis expertise to support these efforts and review reports. Share safety-related Lessons Learned between sites. - Organize ISO 14001 and ISO 45001 Certification and Surveillance audit as per audit timeline. - Chair quarterly Contractor HSE Coordination Meetings with active contractors. - Monitor and steward HSSE Team to meet goals and set KPI's. - Organize Safety Cultural Improvement Program for staffs and contractors at sites. - Strategize COVID-19 Prevention Plan based on MOH Guidance to prevent infection at sites. - Monitor compliance to PIC's Life Saving Rules as adopted from IOGP 	
1	Company	PETRONAS Carigali Myanmar (HK) Limited
	Period	Jan 2018 – Sept 2018
	Position Title	Sr. Executive Occupational Safety and Assurance

	Location	Head Quarter, Yangon, Myanmar
	<p>Roles and Responsibilities</p> <ul style="list-style-type: none"> - Route Hazards Assessment for Onshore Block IOR-7 - Overall HSE in charge of Civil Work for Drilling Campaign at IOR-7 - Leading Tier-1 Audits for offshore and onshore facilities - Contract HSE Evaluation for Drilling Rigs and associated service - Leading Risk Assessment for MOC (Engineering) - Leading and liaising with Third Parties for Onshore and Offshore EIA - Leading PRA (Project Risk Assessment) for Civil Work at Onshore Block IOR-7 - Contractor HSE Management - Feasibility Study for Transportation of Drilling Tubulars from Yangon to Myan Aung by Train. 	
2	Company	Petronas Carigali Myanmar (HK) Limited
	Period	May 2014 – Dec 2017
	Position Title	Sr. Executive Occupational, Process and Technical Safety
	Location	Head Quarter, Yangon, Myanmar
	<p>Roles and Responsibilities</p> <ul style="list-style-type: none"> -Implementing Process Safety Management to ensure safety of people, to prevent damage to environment, to prevent damage to assets and to maintain good reputation of the company. -Implementation of company's HSEMS and monitoring to ensure continual improvement. -Maintaining PSI (Process Safety Information), Identification of HSE Training requirement of workforce, review and update of all HSE Related documents. -Implementation of company's Mandatory Control Framework to ensure the company's activities are in comply with all applicable HSE standards and Industrial best practices at all time. -Leading in contract evaluation to ensure HSE Competency of contractors before they are awarded. -Monitoring contractors' HSE performance to ensure contractors comply with contractual requirements -Training to workforce on Permit To Work system, Authorized Gas Tester and Job Hazard Analysis and other HSE tools. -Development of Emergency Response Plan for Offshore Platform and Onshore Gas Terminal, review of the document on regular basic, conducting emergency exercises and drills to ensure readiness of Emergency Response Team. -Leading Risk Assessment for various activities for project, modification and planned shutdown at Offshore and Onshore -Lead development of MOPO,SISO for SIMOP. Monitoring SIMOP activities. - Involved in developing Yetagun HSE Case and HER together with service providers - Conducted various Occupational Safety and Health trainings to MOGE Staffs - Lead incident investigation by using Tripod Beta tools - Coordination with third party service providers for safety study such as Safety Case, QRA, HAZOP and Formal Safety Studies - Lead in updating HER (Hazards and Effect Registers) for company facilities. 	
3	Company	Petronas Carigali Myanmar (HK) Limited
	Period	April 2011-May 2014
	Position Title	Health, Safety and Environment Officer
	Location	Yetagun Offshore Platform, Myanmar


	<p>Roles and Responsibilities</p> <ol style="list-style-type: none"> 1. Provide advice to line management, including contractors on occupational safety matters, to ensure that the conducted activities are in full compliance to regulatory and Company requirements, e.g. Permit To Work system, Confined Space Entry and ZETO Rules 2. Carry out work site inspections to ensure that occupational safety risks associated with the work activities as well as risks posed by machinery, plant, equipment, substance and appliances are managed to a level as low as reasonably practicable (ALARP). 3. Participate in incident investigation, ensuring the incident investigation process is carried out in accordance to PETRONAS structured incident investigation and accurate identification of incident causation. Compile appropriate documentation and paperwork and keeping of records. Attended Tripod Beta training and worked as a tripodian. 4. Coordinated monthly HSE Meeting for Yangon Office to update HSE Performance of the company. 5. Development of IAP (Incident Action Plan) and ERP (Emergency Response Plan) for offshore platform and onshore terminal. Review of ERPs on regular basis. 6. Implementation of Company's Process Safety Management System elements to prevent happening of major process incidents. 7. Leading Risk Assessments for MOC (Management of Change), Plant Turnaround, JHA for normal PMR activities, Major Modification and SIPROD (Simultaneous Production and Drilling) 8. Training of AGT (Authorized Gas Tester) and PTW (Permit To Work) to all company and contractor personnel to ensure all work activities are carried out in safe and efficient manner. 10. Implementation of MCF (Mandatory Control Framework) to ensure the company's activities comply with PETRONAS Technical Standards and Industrial Best Practices. 11. HSE Evaluation of contractors in contract bidding process. 12. Providing necessary advice to the drilling and exploration activities. 13. Review of bridging documents for project activities at offshore 	
4	Company	Petronas Carigali Myanmar (HK) Limited
	Period	Dec 2007-Apr 2011
	Position Title	Health, Safety and Environment Officer
	Location	Pipeline Operating Centre (Gas Terminal), Myanmar
	<p>Roles and Responsibilities</p> <ol style="list-style-type: none"> 1. Responsible for implementation of Company's HSE Policies 2. Lead in inspection safety equipment at sites 3. Involved in HSE Management System Assurance Process 4. Lead in Risk Assessment for routine and non-routine activities 5. Hazardous Waste Management (waste from pipeline pigging) 6. Lead in HSE Committee Meeting on regular basis 7. Implementation of company's Hazard Hunt Program 8. Development and regular review of ERP (Emergency Response Plan) 9. Conducting Emergency Response Exercise and Drill on regular basis 10. Monitoring of Safety Training completion of plant personnel 11. Training on PTW System and Authorized Gas Tester to plant personnel 	
5	Company	PMG Distillery and Drinking Water Factory
	Period	May 2006 – Nov 2007
	Position Title	Assistant Maintenance Engineer


	Location	Shwe Pyi Thar Industrial Zone, Yangon, Myanmar
	Roles and Responsibilities 1. Inspection and maintenance of steam boiler and process piping 2. Coordinating with contractors for major maintenance and plant shutdown. 3. Risk Assessment for all planned activities	
6	Company	CHMC (China National Heavy Machinery Corporation)
	Period	June 2003- May 2005
	Position	Title Fabrication and Installation Engineer
	Location	Tigyit, Shan State, Myanmar
	Roles and Responsibilities 1. Installation of two sets of 240tph steam boilers 2. Fabrication and installation of hot air and cold air ducts Installation steel structures for two sets of boilers 3. Economizers, superheater, waterwall and furnace, pulverized coal burner 4. Commissioning of the steam boiler to MEPE (Myanma Electric Power Enterprise)	
7	Company	Contractor of EDEN Group Company Limited
	Period	Dec 2001- May 2003
	Position Title	Fabrication and Installation Engineer
	Location	Yangon, Myanmar
	Roles and Responsibilities 1. Fabrication and installation of warehouse and steel structures for factories and workshops.	

Notes: Some of the certificate copies are intentionally left in order to minimize the file size.

Certificate of Degree

1. Bachelor of Engineering (Mechanical)





ရန်ကုန်နည်းပညာတက္ကသိုလ် YANGON TECHNOLOGICAL UNIVERSITY


အင်ဂျင်နီယာဘွဲ့
Bachelor of Engineering


ဦးရန်ငြိမ်းစောကုန်း၏ သား/သမီး စောကုန်းစိုးကျော်၏ အား
အင်ဂျင်နီယာဘွဲ့ (..... ခက်ဖြူ.....)
ကို အပ်နှံခြင်းဖြင့်လိုက်သည်။


JUL 2007

The degree of Bachelor of Engineering (..... Mechanical.....)
is awarded to
Maung Phote Kyaw, son/daughter of U Yan Kyi Aung.

အမျိုးသားမှတ်ပုံတင်အမှတ် (National Registration Number) 12/Maung Kyaw (Maung) 040114
ဘွဲ့ရမှတ်ပုံတင်အမှတ် (Graduate Registration Number) 18967


မော်ကွန်းထိန်း
ရန်ကုန်နည်းပညာတက္ကသိုလ်
Registrar
Yangon Technological University




ပါမောက္ခချုပ်
ရန်ကုန်နည်းပညာတက္ကသိုလ်
Rector
Yangon Technological University

ရန်ကုန်မြို့ ၂၀၀၁ ခု နိုဝင်ဘာ လ ရက်
Yangon, 17 NOV 2001,

Other Qualifications

1. NEBOSH (National Examination Board of Occupational Safety and Health) IGC (UK)



2. Damage Control Team



SIRIM
MS ISO 9001 : 2008
Reg. No. : AR 2727



SIRIM
ISO 14001 : 2004
Reg. No. : CR 0366



Serial No:
T 20648



TERENGGANU SAFETY TRAINING
CENTRE SDN. BHD.
(Co. No: 312447-M)

THIS IS TO CERTIFY THAT
PHORE KYAW
SN NE30131

HAS SUCCESSFULLY PARTICIPATED
DAMAGE CONTROL TEAM
WITH
HELICOPTER FAMILIARIZATION

FROM : 13TH OCTOBER 2011
TO : 14TH OCTOBER 2011

NAME : Y.BHG. DATO' HAJI MOKHTAR BIN NONG
DESIGNATION : CHAIRMAN



SIGNATURE :

NAME : MOHD ROSNI BIN SALIM
DESIGNATION : GENERAL MANAGER

SIGNATURE :

14TH OCTOBER 2011

3. PASR (DNV)

	<i>Cert No. DNVKI/Aca-Kw 1323</i>
<hr/>	
DET NORSKE VERITAS	
<hr/>	
CERTIFICATE OF TRAINING	
<hr/>	
<p>This is to certify that</p>	
<p><i>PHORE KYAW</i></p>	
<p>has successfully completed the DNV training course</p>	
<p>PRE-ACTIVITY SAFETY REVIEW (PASR) LEADERSHIP COURSE</p>	
<p>held at</p>	
<p>KERTEH, TERENGGANU 19 - 20 FEBRUARY 2012</p>	
<p></p>	
<hr/>	
<p>ALEX TAN <i>Head of Section TISE Risk Management</i></p>	

4. Incident Command System (Role Specific Training for HSE) Petrofac



This is to certify that

Phore Kyaw

Attended

**ICS Role Specific Training for
HSE**

18 March 2014

conducted by

Chemical Process Technology Centre

A handwritten signature in black ink, appearing to read "Paul Groves", with a long horizontal flourish extending to the right.

Paul Groves
Managing Director
Petrofac Training Services
Chemical Process Technology Centre
Singapore

5. Incident Command System 100 (ICS 100) Petrofac



This is to certify that

Phore Kyaw

Attended

Incident Command System 100 (ICS 100)

17 to 18 March 2014

conducted by

Chemical Process Technology Centre

A handwritten signature in black ink, appearing to read "Paul Groves", is positioned above the printed name.

Paul Groves
Managing Director
Petrofac Training Services
Chemical Process Technology Centre
Singapore

6. NEBOSH (National Examination Board of Occupational Safety and Health) ITC (UK)



7. Technical Membership of IOSH (UK)



Institution of Occupational Safety and Health

Incorporated by Royal Charter 2003

This is to certify that

**Phore
Kyaw**

was admitted as a

Technical Member

on

11 October 2015

Signed on behalf of the Council

[Signature]

Chief Executive

Karen McDermott

President

MR. YE HLAING WIN

No 21/A, 1st Floor, Yadana Lan Thwe Street, District Number (12),
South Okkalapa Township, Yangon

Myanmar

Mobile: +95 09 762 071 991

ye.hlaing@poscointl-enp.com

**Summary of Experiences and Skills:**

- Air-conditioning HVAC Duct Design, AutoCAD (Civil and M&E drawings),
Researcher on Swirling Fluidized Bed Combustor Boiler Prototype (using Biomass fuel
such as Burning rice husk for energy) and Ex-Situ Anaerobic Bioreactor for TPH
contaminated soils, Heat Exchanger Design for Boilers, Batch by Batch Mass
Production for electronic manufacturing Industry (Soseki SHARP tablet and SHARP
Fax and Telephone).
- Office Administration and Documentation, Research on Migrated Education for
Myanmar in Thailand,
- Over 11 + years of Oil and Gas HSE sectors in environmental Management System:
 - Coordinated General HSE (Health, Safety, and Environment) Meetings,
 - Initial Review on ESIA reports being developed by third party for Company
projects for each phase,
 - Cooperated with environmental third-party service provider for public
consultation meetings,
 - GHG Emission Data Submission for management, Submission of Monthly and
Weekly HSSE reports to Management,
 - Develop Material Safety Data Sheet for Natural Gas Quality for company
 - Action on HSE related KPI to achieve company environmental objectives,
Incident Records/Registration for office/offshore/onshore, coordinated to
arrange Annual Offshore and Onshore Life Saving Equipment Services for
certification,
 - Follow up Corrective action register for closure of HSE Open items,
 - Develop Hazardous and Non-Hazardous Waste Management Reports,
 - Conducting HSE Awareness Trainings, and Environmental Waste Awareness
Trainings,
 - Annual HSSE Audits to Yangon Office, offshore, and onshore sites, and
organize to conduct periodical ISO 14001 and ISO 45001 External Audits by
certification body,
 - Coordinate to arrange Internal Cross Audits for HSE MS and EMS,
 - Organize to conduct Contractor's HSSE Audit,
 - Conducting office HSE Drills and Emergency Response Exercises, Conducting
and Coordinating of General HSE meeting,
 - Participating, Coordinating, and presenting to update HSE action items to
HSSE Steering Committee Meeting,
 - Coordinate Management Site Visit Audit as per HSE plan,

- Organize to establish Groupware HSE Plan & Statistics, and Corrective Action Register with internal IT team for HSE,
- Organize to conduct Environmental Impact Assessment/Initial Environmental Examination/Environmental Management Plan for reports to Myanmar Environmental Conservation Department, and Establishment of Annual Environmental Aspect and Impact Register/Assessment for Yangon office/Offshore/Onshore sites for ISO EMS requirement,
- Organize Public Consultation Meetings with contracted environmental service provider for IEE/EIA/EMP,
- Establish to conduct Annual Review on HSE Legal Register for Management for compliance,
- Schedule review and update of Waste Management Procedure/related HSE procedures for company,
- Scheduled Environmental Monitoring Service/ Management Review etc.

Training Certificates:

- ISO/IEC: 27001: 2002 Information Security Management System Awareness Training (May 2023)
- ISO/IEC: 27001: 2002 Internal Auditor Training (May 2023)
- NEBOSH International General Certificate in Occupational Health & Safety IGC (14 May 2020)
- Tripod Beta Bronze & Silver Level
- Stop2Think (KCA Deutag)
- ISO 14001:2015 Internal Auditor Course (2018)
- ISO 45001:2018 Internal Auditor Course (2022)
- Safety Integrity Level (2017)
- Process Safety Management & Auditing (2018), (Energy Institute)
- ICS/IMS 300 Applied Incident Management System Training (2019, OSRL Singapore)
- Major Emergency Management-Initial Response Training, OPITO Standard, (2018, PVD Technical Training and Certification J.S.C)
- Dangerous Goods Process Course, IATA DG Manual, (2013, AMS Global Flight)
- "HSE" Engineering Course (2017, TPA Total Professeurs Associes)
- National Seminar on Oil Pollution Preparedness, Response and Cooperation (2017, Department of Marine Administration, Ministry of Transport and Communications, Myanmar)

EDUCATION:**Bachelor of Engineering (Mechanical Engineering),**

Sirindhorn International Institute of Technology, Thammasat University, Thailand (www.siiit.tu.ac.th)

Master of Engineering (Environmental Engineering),

Kasetsart University Graduate International Program, Bangkok, Thailand, (www.ku.ac.th)

ESIA WORK EXPERIENCES:

1 March 2018 – Current

Position: Environmental Engineer

Company: POSCO INTERNATIONAL CORPORATION
(Myanmar E&P)

<https://www.poscointl.com/eng/>

- Provide advice and lead on the development of environmental management systems and developed environmental management system procedures on support of operation and production activities for environmental related regulatory compliances.
- Arrange to manage IEE, ESIA and EMP processes for each phase for company
- Monitor and take action for compliance of Environmental Management Plans
- Cooperate of the project based environmental planning and support as a focal point.
- Develop, execute, monitor, and evaluate the environmental monitoring plan reports with environmental service provider
- Ensure to manage and handle the ESIA development, compilation and submission, and any subsequent public consultation processes for public complaints with authority and service provider
- Arrange the implementation of Environmental Management Plan/Mitigation (EMP) component for ESIA to ensure compliance with laws/rules/standard parameters as well as resulting company commitments from the approved ESIA report.
- Implement on environmental objectives and targets that may be required by either company environmental management systems and by legislation
- Liaise with Myanmar O&G operators and Government Department for environmental issues and activities
- Develop and over-see the environmental audit plan.
- Ensure Industry Best Available Techniques and Practices are adopted in company environmental management system for ongoing operations such as EMPs, Hazardous and Non-

Hazardous Waste treatment & disposal, monitoring on compliance of SANGA GHG Emission Calculation and Reports.

- Organize ISO 14001 Internal and External Audit for continual certification for company and followed up action items from audit findings to close within targeted date
- Organize to Conduct Annual Health & Safety Management System Review and Environmental Management System Review, and follow up action items for closure of open items by Company Group Ware Corrective Action Register

1 March 2013 – 1 March 2018

Position: HSE Coordinator

Company: POSCO DAEWOO CORPORATION (Myanmar E&P)
<https://www.poscointl.com/eng/>

- Collaborate with HSS&E team members to ensure alignment of site safety strategies / plans.
- Work with site management and HSS&E team to implement the site safety, health, security, and environmental programs.
- Facilitate implementation of systematic Safety processes to assure compliance with the company HSS&E-MS requirements.
- Advise Sites for Company's Safety requirements, expectations, and best practices and appropriate compliance monitoring.
- Communicate and coordinate guidelines for safety awareness, recognition, and incentive programs.
- Provide to support for risk assessments and studies. Ensure results are addressed as relevant field work is executed.
- Collect, analyze, and report data on leading indicators, safety performance and safety initiatives to HSS&E team, working with site and administrative support staff.
- Facilitate to organize and arrange regular Safety inspections, assessments, and audits at the various sites in accordance with established Company processes or as requested by HSE Manager.
- Develop site Safety Audit Schedule, conduct site Safety audits and assist site Management in responding to site audits.
- Ensure effective safety communications across the site Team, Contractors, Management Support and other key stakeholders.
- Organize and participate in investigation and follow-up of incidents, including development of remedial action plans.

- Provide root cause analysis to support these efforts and review reports. Share safety-related Lessons Learned between sites.
- Facilitate / encourage heightened HSS&E awareness and behavior.
- Develop Safety / Health / Emergency Preparedness and Response-related training plan and support implementation.
- Facilitate coordination / oversight for training, drills, and other matters related to Emergency Preparedness and Response.
- Monitor, investigate, identify and resolve Safety issues, evaluate Safety Metrics/HSE Statistics, and provide reports to responsible line management and HSS&E Function, as required.



nebosh

NEBOSH International General Certificate in Occupational Health and Safety

This is to certify that

Ye Hlaing Win

was awarded this qualification on

14 May 2020

William Nixon
Chair

David Morgan
Chief Executive

Master log certificate No: 00483656/1185333

SQA Ref: R368 04



**The National Examination Board in
Occupational Safety and Health**

Registered in England & Wales No. 2698100
A Charitable Company Charity No. 1010444

มหาวิทยาลัยธรรมศาสตร์

สภามหาวิทยาลัยขอประกาศให้ทราบทั่วกันว่า

นายเย ไส วิน

ได้สำเร็จการศึกษาตามหลักสูตรชั้นปริญญาแห่งมหาวิทยาลัยนี้เมื่อ ปีการศึกษา ๒๕๕๐
จึงให้ปริญญาบัตรนี้ไว้เพื่อแสดงว่าเป็น

วิศวกรรมศาสตรบัณฑิต (วิศวกรรมเครื่องกล)



ขอจงมีความสุขสวัสดิ์เจริญเทอญ

ให้ไว้ตามมติสภามหาวิทยาลัย

เมื่อ วันที่ ๒๖ เดือน มีนาคม พ.ศ. ๒๕๕๑

นายกสภามหาวิทยาลัย

อธิการบดี

ผู้อำนวยการสถาบันเทคโนโลยีนานาชาติสิรินธร

(Official Translation)

Thammasat University

The University Council hereby proclaims that

Mr Ye hlaing Win

has completed the studies and satisfied the requirements in the academic year 2007

for the degree of

Bachelor of Engineering (Mechanical Engineering)



May the recipient of this degree be blessed with happiness and prosperity
Granted with the University Council's approval
on the 26th day of March, 2008

(Sd/) Sumet Tantivejkul

Chairperson of the University Council

(Sd/) Surapon Nitikraipot

Rector of the University

(Sd/) Sawasd Tantaratana

Director, Sirindhorn International Institute of Technology

Certified correct translation

A handwritten signature in black ink, appearing to read 'Akekarin Y.', is written over a faint circular background.

Asst. Prof. Akekarin Yolrabil

Registrar

August 14, 2008

NOT VALID WITHOUT SEAL

4722796987



**SIRINDHORN INTERNATIONAL INSTITUTE OF TECHNOLOGY
THAMMASAT UNIVERSITY**

RANGSIT : P.O.BOX 22, Thammasat-Rangsit Post Office
Thammasat University Rangsit Center
Pathumthani 12121 THAILAND
Tel. : (66 2) 564-3221-8, 986-9103-9
Fax : (66 2) 986-9112-3

BANGKADI : 160 Moo 5, Tivanond Road
Bangkadi Industrial Park, Bangkadi
Mueang, Pathumthani 12000, THAILAND
Tel. : (66 2) 501-3505-20
Fax : (66 2) 501-3524

Our Ref. SIIT: 08/08 6046

Date: 3 April 2008

To Whom It May Concern:

This is to certify that Mr. Ye Hlaing Win graduated with the degree of Bachelor of Engineering from the Mechanical Engineering Program of the Sirindhorn International Institute of Technology, Thammasat University on 26 March 2008.

Sincerely,

Asst. Prof. Dr. Alice Sharp

Acting Chief of Registration Division

Registration Division

Telephone: (662) 986-9009 Ext. 1432

Fax: (662) 986-9009 Ext. 1434

Form SRR 019: B-Status (Graduated)-RS



Thammasat University
(Formerly : University of Moral and Political Sciences)
Bangkok, Thailand.

July 11, 2008

TO WHOM IT MAY CONCERN :

This is to certify that MR YE HLAING WIN
has completed all the requirements for the Bachelor of Engineering (Mechanical
Engineering), an international program taught entirely in English.

The degree was officially conferred on March 26, 2008.

A handwritten signature in black ink, appearing to read 'Akekarin Y.', is written over a faint, circular embossed seal of Thammasat University.

Asst.Prof. Akekarin Yolrabil

Registrar

NOT VALID WITHOUT SEAL

Admission no. 4722796987

KASETSART UNIVERSITY

THE UNIVERSITY COUNCIL

confers the degree

Master of Engineering (Environmental Engineering)
(International Program)

Upon

Mr.Ye Hlaing Win

who has completed all the requirements of the curriculum
with all the rights and privileges thereto pertaining
given on this sixteenth day of May
in the year two thousand and twelve



A handwritten signature in black ink, appearing to read "Kanghol Adulairadong", written over a horizontal line.

Chairman of the Council

A handwritten signature in black ink, appearing to read "V. K.", written over a horizontal line.

President

A handwritten signature in black ink, appearing to read "Gunjana Thueagol", written over a horizontal line.

Dean



KASETSART UNIVERSITY

THE GRADUATE SCHOOL BANGKOK 10900, THAILAND.



Student ID. : 51657393

Name : Mr. Ye Hlaing WIN

Date of Birth : July 17, 1974

Place of Birth : Mandalay, Myanmar

Date of Admission : November 3, 2008

Faculty : Graduate School

Field of Study : Environmental Engineering

Degree Conferred : M.Eng. (Environmental Engineering)

Date of Graduation : May 16, 2012



	Degree	University	Date
1	B.Eng.(Mechanical Engineering)	Thammasat University	March 26, 2008
2	Kasetsart University 1943	Kasetsart University 1943	Kasetsart University 1943

Course Code	Course Title	GR	CR	Course Code	Course Title	GR	CR
<u>Second Semester 2008</u>				<u>First Semester 2011</u>			
210521	Design of Air Pollution Control Systems	A	3	Maintain Student Status			
210591	Research Methods in Environmental Eng.	A	1	sem. G.P.A. = CR. 0			
210597	Seminar	A	1	cum. G.P.A. = 3.75 CR. 36			
sem. G.P.A. = 4.00 CR. 5				<u>Second Semester 2011</u>			
cum. G.P.A. = 4.00 CR. 5				Maintain Student Status			
<u>First Semester 2009</u>				sem. G.P.A. = CR. 0			
01210511	Environmental Engineering Chemistry	A	3	cum. G.P.A. = 3.75 CR. 36			
01210512	Advanced Water Treatment Process Design	A	3	Thesis: Ex-Situ Anaerobic Bioremediation for Soil Contaminated with Total Petroleum Hydrocarbons			
01210596	Selected Topics in Environmental Engineering	B	3	End of Transcript			
01210597	Seminar	A	1				
01216541	Environmental Risk Assessment	A	3				
sem. G.P.A. = 3.77 CR. 13							
cum. G.P.A. = 3.83 CR. 18							
<u>Second Semester 2009</u>							
01210599	Thesis	S	6				
sem. G.P.A. = CR. 6							
cum. G.P.A. = 3.83 CR. 24							
<u>First Semester 2010</u>							
01210513	Wastewater Treatment Process Design	A	3				
01210599	Thesis	S	6				
01216542	Hazardous Wastes Management & Minimization	B	3				
sem. G.P.A. = 3.50 CR. 12							
cum. G.P.A. = 3.75 CR. 36							
<u>Second Semester 2010</u>							
Maintain Student Status							
sem. G.P.A. = CR. 0							
cum. G.P.A. = 3.75 CR. 36							

NOTES :

1 A credit is defined as one lecture, recitation or quiz one hour per week during a regular semester or 2-3 hours a week of practice during a regular semester.

2 Grading system:

A = 4.0	F = 0
B+ = 3.5	I = Incomplete
B = 3.0	S = Satisfactory
C+ = 2.5	U = Unsatisfactory
C = 2.0 (graduate passing grade)	N = Grade not reported
D+ = 1.5	P = Pass
D = 1.0	

3 Pre-requisite and audit subject (in brackets) are not counted towards graduate credit.

4 This transcript is not valid without the official university seal.



ABDUL HADE USENG
Assistant Registrar

Given On May 17, 2012 Checked by



KASETSART UNIVERSITY
THE GRADUATE SCHOOL
BANGKOK 10903, THAILAND

No. 0513.11501/1088

This is to certify that

Mr. Ye Hlaing WIN

has completed all the requirements for the degree of Master of Engineering (Environmental Engineering) with a major in Environmental Engineering. The Kasetsart University Council conferred the degree on May 16, 2012.

Given on May 18, 2012

(Associate Professor Dr. Gunjana Theeragool)

Dean of The Graduate School



Photograph of Mr. Ye Hlaing WIN



PVD Training

presents this Certificate to

Ye Hlaing Win

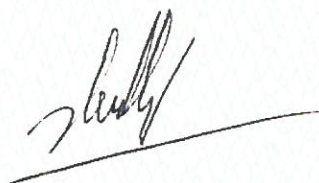
Date of Birth: **17-Jul-1974** Nationality: **Myanmar** PP/ID No: **9/MAYATA(N)003241**

for successful completion of the training course

**MAJOR EMERGENCY MANAGEMENT - INITIAL
RESPONSE TRAINING**

(toward OPITO standard)

Course date: From **04-Jun-2018** to **05-Jun-2018**



Hoang Thanh Liem
Training Department Manager



BUI THANH VAN
Managing Director

PVD Training's Authorized Personnel

Certificate No.: **S5070406201806**

Issued Date: **05-Jun-2018**

Expiry Date: **05-Jun-2021**



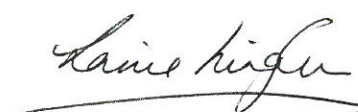
This is to certify that

Ye Hlaing Win

successfully completed the Energy Institute training course:

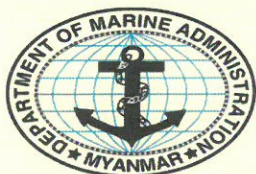
Process Safety Management & Auditing

22 June 2018

A handwritten signature in black ink, appearing to read "Louise Kingham".

Louise Kingham
Chief Executive
Energy Institute





Republic of the Union of Myanmar
Ministry of Transport and Communications
Department of Marine Administration



CERTIFICATE

This is to certify that

YE HLAING WIN

has participated in the

**National Seminar on
Oil Pollution Preparedness, Response and Cooperation**

held in Yangon, Republic of the Union of Myanmar,
from 29 to 30 March 2017

organized by the
Department of Marine Administration

Maung Maung Oo
Director General
Department of Marine Administration



INTERNATIONAL
MARITIME
ORGANIZATION

KYSTVERKE.



Oil Spill Response



IPIECA

Global Initiative for Southeast Asia



This certificate is hereby issued to

U Ye Hlaing Win

From Oil & Gas, Partner & Contractor Companies

for having successfully completed the

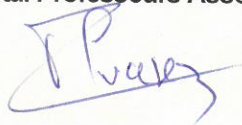
“HSE Engineering” course

*The programme’s primary objective is to provide participants with
practical knowledge complementing their theoretical fundamentals.*

organised by

Total Professeurs Associés from 24 to 28 of July, 2017

José Alvarez
Professor
Total Professeurs Associés



Philippe Persillon
Chairman
Total Professeurs Associés





Certificate of Attendance

This certificate is awarded to

Ye' Hlaing Win

for successfully completing the training on

ISO14001:2015 Awareness Course

conducted on 1-2 October 2018

8 October 2018

Date of issue

Grace Cheah
Managing Director & Lead Trainer



Certificate of Attendance

This certificate is awarded to

Ye' Hlaing Win

for successfully completing the training on

ISO14001:2015 Internal Auditor Course

conducted on 3 October 2018

8 October 2018

Date of issue

Grace Cheah
Managing Director & Lead Trainer

CERTIFICATE OF PARTICIPATION

is hereby presented to:

YE HLAING WIN (MR)

HSE COORDINATOR

POSCO DAEWOO CORPORATION (MYANMAR E&P)

To certify that he/she has successful completion of

SAFETY INTEGRITY LEVEL

6TH – 7TH JULY 2017

CONCORDE HOTEL KUALA LUMPUR, MALAYSIA



WE SOLVE YOUR PUZZLE

A handwritten signature in black ink, appearing to read 'Khalil Elhadaoui', is written over a horizontal line.

MR. KHALIL ELHADAUI

P.ENG, LSSBB, SME, CRMP, UE-1, CDA, MMP

SR. CONSULTANT & PRINCIPAL

Appendix C PERMITS of PIC



ခ ရိုင် အ ထွေ ထွေ အုပ်ချုပ်ရေး ဦးစီးဌာန
 ကျောက်ဖြူခရိုင်၊ ကျောက်ဖြူမြို့
 စာအမှတ်၊ ၁၇၁၆ / ၄ / ၁ - ၈ / ဦး ၁ (အထည)
 ရက်စွဲ၊ ၂၀၁၆ ခုနှစ်၊ ဧပြီလ ၈ ရက်

သို့

✓ ကိုယ်စားလှယ်အရာရှိ
 မြန်မာ့ရေနံနှင့်သဘာဝဓါတ်ငွေ့လုပ်ငန်း
 ရွှေစီမံကိန်း၊ ကျောက်ဖြူမြို့

အကြောင်းအရာ။ ဌာနပိုင်မြေအားလက်ရောက်လွှဲပြောင်းပေးခြင်း
 ရည်ညွှန်းချက်။ ပြည်ထဲရေးဝန်ကြီးဌာန၏ (၁၇ . ၃ . ၂၀၁၆)ရက်စွဲပါ အမိန့်ကြော်ငြာစာ
 (၇၇၄/၂၀၁၆)

ကျောက်ဖြူမြို့နယ်၊ လိပ်ခမော်အုပ်စု၊ ကွင်းပေါင်း(၂)ကွင်း၊ မြေဧရိယာ(၁၀၅.၃၅)ဧကအား
 စွမ်းအင်ဝန်ကြီးဌာန၊ မြန်မာ့ရေနံနှင့်သဘာဝဓါတ်ငွေ့လုပ်ငန်း၊ ရွှေစီမံကိန်း၊ ကျောက်ဖြူမြို့မြေအဖြစ်
 အသုံးပြုရန်ရည်ညွှန်းအမိန့်ကြော်ငြာစာဖြင့်အခမဲ့လွှဲပြောင်းပေးသည့် မြေလွှဲအမိန့်ထုတ်ပြန်ပြီးဖြစ်ပါ
 သဖြင့် စက်မှု/စီးပွားမြေငှားဂရန်ရရှိရေး လုပ်ထုံးလုပ်နည်းနှင့်အညီ ဆက်လက်ဆောင်ရွက်သွားရန်
 နှင့် အမိန့်ကြော်ငြာစာ၊ မြေစာရင်းပုံစံ(၁၀၅)၊ (၁၀၆)တို့အား ပူးတွဲလျှက်မြေလက်ရောက်လွှဲပေး
 လိုက်ကြောင်းအကြောင်းကြားပါသည်။

ပူးတွဲပါ - အမိန့်ကြော်ငြာစာ(၁)စောင်
 - မြေစာရင်းပုံစံ(၁၀၅) (၁)စောင်
 - မြေစာရင်းပုံစံ(၁၀၆) (၁)စောင်

အုပ်ချုပ်ရေးမှူး
 (စိုးသိန်း၊ ၁ / ၃၅၆၃)

မိတ္တူကို

မြို့နယ်အထွေထွေအုပ်ချုပ်ရေးဦးစီးဌာန၊ ကျောက်ဖြူမြို့
 မြို့နယ်လယ်ယာမြေစီမံခန့်ခွဲရေးနှင့်စာရင်းအင်းဦးစီးဌာန၊ ကျောက်ဖြူမြို့
 လှည့်လည်စာတွဲ
 ရုံးလက်ခံ



ပြည်ထောင်စုသမ္မတမြန်မာနိုင်ငံတော်

ပြည်ထဲရေးဝန်ကြီးဌာန

အမိန့်ကြော်ငြာစာ (၇၇၄ / ၂၀၁၆)

၁၃၇၂
၂၆-၄-၂၀၁၆
၁၀-၇-၂၀

နေပြည်တော်၊ ၁၃၇၇ ခုနှစ်၊ တပေါင်းလဆန်း ၉ ရက်

(၂၀၁၆ ခုနှစ်၊ မတ်လ ၁၇ ရက်)

အမှတ်။ ရခိုင်ပြည်နယ်၊ ကျောက်ဖြူခရိုင်၊ ကျောက်ဖြူမြို့နယ်အတွင်းရှိ အောက်ဖော်ပြပါ မြေဧရိယာ (၂၆၈.၈၈)ဧကအား မြန်မာ့ရေနံနှင့်သဘာဝဓာတ်ငွေ့လုပ်ငန်း၊ အရှေ့တောင်အာရှရေနံနှင့် သဘာဝဓာတ်ငွေ့ပိုက်လိုင်းစီမံကိန်း၊ ရွှေစီမံကိန်း မြေနေရာများအဖြစ် အသုံးပြုရန်အတွက် ပြည်ထောင်စုအမိန့်ဆင့်ဆိုချက် ၃၃၂ အရ စွမ်းအင်ဝန်ကြီးဌာန သို့ အမဲလွှဲပြောင်းပေးလိုက်သည်။

မြို့နယ်	ကျေးရွာအုပ်စုအမည်	ကွင်းအမှတ်/ အမည်	မြေကွက်အမှတ်ပေါင်း	မြေဧရိယာ (ဧက)	မှတ်ချက်
ကျောက်ဖြူ	လိပ်ခမော်	၄၅၄/လောကုန်ဘောင်ကွင်း၊ ၄၅၇/မရကျွန်းမြောက်ကွင်း၊	၁၆ ခု	၁၀၅.၃၅	ရွှေစီမံကိန်းမြေ အဖြစ်အသုံးပြုရန်
		၄၅၇/မရကျွန်းမြောက်ကွင်း၊ ၄၅၈/မရကျွန်းမြောက်ကွင်း၊	၃ ခု	၄.၂၇	
ကျောက်ဖြူ	ရတန	၃၃၉/ကျောက်ခမောက်ကွင်း၊ ၃၆၂/ကပိုင်ချောင်းတောင်ကွင်း၊ ၃၃၈/ရတနကွင်း၊ ၃၆၂/ ကပိုင်ချောင်းတောင်ကွင်း၊ ၃၃၁/ကဲပြန်ကွင်း၊ ၃၃၉/ကျောက်ခမောက်ကွင်း၊ OSS/ကြေးတိုင်ပြင်ကွင်း၊	၅ ခု	၂.၈၄	အရှေ့တောင်အာရှ ရေနံနှင့်သဘာဝ ဓာတ်ငွေ့ပိုက်လိုင်း စီမံကိန်းမြေအဖြစ် အသုံးပြုရန်
ကျောက်ဖြူ	ကြာအိန်	၄၉၉/သဖန်းခါးမြောက်ကွင်း၊ ၂၀၁/သပြေတောင်အရှေ့ကွင်း၊ ၅၀၂/ကြာအိန်ကွင်း၊	၁၁ ခု	၉.၅၃	
ကျောက်ဖြူ	ဦးကင်း	၅၁၃/ကျောက်ကျင်ချောင်း ကွင်း	၂ ခု	၄.၅၀	
ကျောက်ဖြူ	အုန်းတော	၄၆၆ / ပြိုင်းစိက္ကောတောကွင်း	၄ ခု	၉.၂၄	

မြို့နယ်	ကျေးရွာအုပ်စု အမည်	ကွင်းအမှတ်/ အမည်	မြေကွက် အမှတ်ပေါင်း	မြေဧရိယာ (ဧက)	မှတ်ချက်
ကျောက်ဖြူ	ကန္တီး	၄၆၉ / နမ်းတဲတိန်ကွင်း၊ ၄၇၂ / ကန္တီးတောင်ကွင်း၊ ၄၇၃/မီးကျောင်းတက်ကွင်း၊ OSS/ကြေးတိုင်ပြင်ကွင်း၊	၇ ခု	၅.၃၇	အရှေ့တောင်အာရှ ရေနံနှင့်သဘာဝ ဓာတ်ငွေ့ပိုက်လိုင်း စီမံကိန်းပြေအဖြစ် အသုံးပြုရန်
ကျောက်ဖြူ	ပြင်ကြီး	၃၆၁/ကပိုင်ချောင်းအရှေ့ကွင်း၊ ၃၆၂/ကပိုင်ချောင်းတောင်ကွင်း၊ ၃၆၀ / ပြင်ကြီးတောင်ကွင်း၊ ၃၆၁/ကပိုင်ချောင်းအရှေ့ကွင်း၊ OSS/ကြေးတိုင်ပြင်ကွင်း၊	၃ ခု	၉.၆၈	
ကျောက်ဖြူ	စစ်တော	၅၀၃ / စည်မော်ကွင်း	၂ ခု	၃.၈၇	
ကျောက်ဖြူ	မဒေးကျွန်း	၅၀၇/တောက်တလူကွင်း၊ ၅၀၈/ရွာမကွင်း၊ ၅၀၉ / ကျောက်တန်းကွင်း၊	၁၇ ခု	၁၁၄.၂၃	
စုစုပေါင်း	ကျေးရွာ အုပ်စု (၉)အုပ်စု	ကွင်းပေါင်း (၂၄) ကွင်း	၇၀ ခု	မွန်စီမံကိန်းဥပဒေ - (၁၁၅.၃၅)ဧက အရှေ့တောင်အာရှ - (၁၆၃.၇၃)ဧက ရေနံနှင့်သဘာဝဓာတ်ငွေ့ ပိုက်လိုင်းစီမံကိန်းဥပဒေ စုစုပေါင်းမြေဧရိယာ (၂၆၈.၈၈) ဧက	

အခမဲ့လွှဲပြောင်းပေးသည့်မြေသည် အမှုတွဲပါစစ်ဆေးအတည်ပြုထားသည့် မြေပုံအတိုင်း ဖြစ်ပြီး စွမ်းအင်ဝန်ကြီးဌာနက အသုံးမပြုသောနေ့တွင် နိုင်ငံတော်သို့ ပြန်လည်အပ်နှံရမည်။

ဒုတိယဗိုလ်ချုပ်ကြီးကိုကို
ပြည်ထောင်စုဝန်ကြီး

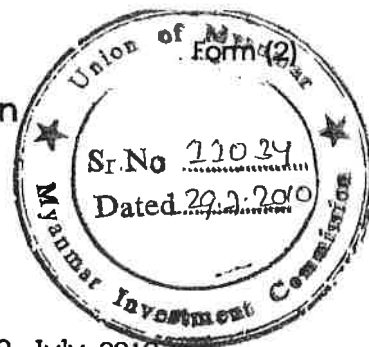
စာအမှတ်၊ ပထမ / ၂ - ၃ (၇၇၄) / ထောက် ၂

ရက်စွဲ၊ ၂၀၁၆ ခုနှစ်၊ မတ်လ ၁၇ ရက်



The Myanmar Investment Commission

PERMIT



Permit No. 444/2010

Date 29, July, 2010

The Myanmar Investment Commission issues this Permit under Section 10 of the Union of Myanmar Foreign Investment Law-

- (a) Name of Promoter DIRECTOR GENERAL,
ENERGY PLANNING DEPARTMENT
- (b) Citizenship MYANMAR
- (c) Address BUILDING NO.(6), NAY PYI TAW, MYANMAR
- (d) Name and Address of principal or organization MINISTRY OF ENERGY,
BUILDING NO.(6), NAY PYI TAW.
- (e) Place of incorporation REPUBLIC OF KOREA
- (f) Type of business in which investment is to be made EXPLORATION,
APPRAISAL, DEVELOPMENT AND SALE OF NATURAL GAS
- (g) Place(s) at which investment is permitted BLOCK A-1 & A-3,
RAKHINE OFFSHORE AREA
- (h) Amount of foreign capital US \$ 1975.401 MILLION
- (i) Period for bringing in foreign capital 2010 TO 2014
- (j) Total amount of capital (Kyat) EQUIVALENT IN KYAT OF
US\$ 1975.401 MILLION
- (k) Permitted duration of investment 30 YEARS OF COMMERCIAL OPERATION
- (l) Name of the economic organization to be formed in Myanmar DAEWOO INTERNATIONAL CORPORATION, ONGC VIDESH LIMITED,
GAIL(INDIA) LIMITED, KOREA GAS CORPORATION

Chairman

The Myanmar Investment Commission

မြန်မာနိုင်ငံ ရင်းနှီးမြှုပ်နှံမှု ကော်မရှင်
ခွင့်ပြုမိန့်



ခွင့်ပြုမိန့်အမှတ် ၄၄၄/၂၀၁၀

၂၀၁၀ ခုနှစ်၊ ဧပြီလ၊ ၁၁ ရက်နေ့

ပြည်ထောင်စု မြန်မာနိုင်ငံတော် နိုင်ငံခြား ရင်းနှီးမြှုပ်နှံမှု ဥပဒေ ပုဒ်မ (၁၀) အရ ဤခွင့်ပြုမိန့်ကို မြန်မာနိုင်ငံ ရင်းနှီးမြှုပ်နှံမှု ကော်မရှင်က ထုတ်ပေးလိုက်သည်-

- (က) ကမကထပြုသူ၏အမည် ညွှန်ကြားရေးမှူးချုပ်၊ စွမ်းအင်စီမံရေးဦးစီးဌာန
- (ခ) မည်သည့် နိုင်ငံသား မြန်မာ
- (ဂ) နေရပ်လိပ်စာ ရုံးအမှတ် (၆)၊ နေပြည်တော်
- (ဃ) ပင်မအဖွဲ့အစည်းအမည်နှင့် လိပ်စာ စွမ်းအင်ဝန်ကြီးဌာန၊ ရုံးအမှတ်(၆) နေပြည်တော်၊
- (င) ဖွဲ့စည်းရာအရပ် ကိုရီးယားသမ္မတနိုင်ငံ
- (စ) ရင်းနှီးမြှုပ်နှံမှုပြုလုပ်မည့်လုပ်ငန်းအမျိုးအစား သဘာဝဓါတ်ငွေ့ ထုတ်လုပ် ရောင်းချခြင်း လုပ်ငန်း
- (ဆ) ရင်းနှီးမြှုပ်နှံမှုပြုလုပ်ခွင့်ပြုသည့်အရပ်ဒေသ(များ) ရခိုင်ကမ်းလွန်ဒေသ လုပ်ကွက် A-1 နှင့် A-3
- (ဇ) နိုင်ငံခြားမတည်ငွေရင်း အမေရိကန်ဒေါ်လာ ၁၉၇၅.၄၀၀ သန်း
- (ဈ) နိုင်ငံခြားမတည်ငွေရင်းယူဆောင်လာရမည့်ကာလ ၂၀၁၀ ခုနှစ်မှ ၂၀၁၄ ခုနှစ်ထိ
- (ည) စုစုပေါင်း မတည်ငွေရင်းပမာဏ(ကျပ်) အမေရိကန်ဒေါ်လာ ၁၉၇၅.၄၀၀ သန်း နှင့် ညီမျှသော မြန်မာကျပ်ငွေ
- (ဋ) ရင်းနှီးမြှုပ်နှံခွင့်ပြုသည့် သက်တမ်း သဘာဝဓါတ်ငွေ့ စတင်ရောင်းချသည့် နေ့မှ နှစ်ပေါင်း (၃၀)
- (ဌ) မြန်မာနိုင်ငံတွင် ဖွဲ့စည်းမည့် စီးပွားရေး အဖွဲ့အစည်းအမည်

DAEWOO INTERNATIONAL CORPORATION, ONGC VIDESH LIMITED, GAIL(INDIA) LIMITED, KOREA GAS CORPORATION


ဥက္ကဋ္ဌ

မြန်မာနိုင်ငံရင်းနှီးမြှုပ်နှံမှု ကော်မရှင်



Form (2)

Annex-1

THE REPUBLIC OF THE UNION OF MYANMAR
MYANMAR INVESTMENT COMMISSION

Amendment on Permit No. 444/2010, dated 29th July, 2010

The Myanmar Investment Commission, at its meeting(19/2016)held on dated 7th October 2016 had approved to change the company's name from "Daewoo International Corporation" to "POSCO Daewoo Corporation". Hence, the name of the company may be amended as "POSCO Daewoo Corporation, ONGC Videsh Limited, Gail(India) Limited, Korea Gas Corporation".

(n) **Name of Company incorporated in Myanmar** POSCO
DAEWOO CORPORATION, ONGC VIDESH LIMITED, GAIL(INDIA)
LIMITED, KOREA GAS CORPORATION

Date: 8th November, 2016
Location: Yangon


(Mya Thuza)
Joint Secretary




စုံစံပြု
ဖူးတွဲ - ၁

ပြည်ထောင်စုသမ္မတမြန်မာနိုင်ငံတော်
မြန်မာနိုင်ငံရင်းနှီးမြှုပ်နှံမှုကော်မရှင်

၂၀၁၀ ခုနှစ် ဇူလိုင်လ ၂၉ ရက်နေ့ ရက်စွဲပါခွင့်ပြုမိန့်အမှတ် ၄၄၄/၂၀၁၀တွင် ပြင်ဆင်ချက်

၂၀၁၆ ခုနှစ် အောက်တိုဘာလ ၇ ရက်နေ့တွင် ကျင်းပပြုလုပ်သော မြန်မာနိုင်ငံရင်းနှီးမြှုပ်နှံမှုကော်မရှင်၏ ၁၉/၂၀၁၆ အစည်းအဝေး ဆုံးဖြတ်ချက်အရ “Daewoo International Corporation” အမည်မှ “POSCO Daewoo Corporation” အမည်သို့ ပြောင်းလဲခွင့် ရရှိပြီးဖြစ်သဖြင့် ကုမ္ပဏီအမည်အား “POSCO Daewoo Corporation, ONGC Videsh Limited, Gail(India) Limited, Korea Gas Corporation” သို့ ပြင်ဆင်ပြောင်းလဲလိုက်သည်။

(ပ) မြန်မာနိုင်ငံတွင် ဖွဲ့စည်းမည့် ကုမ္ပဏီအမည် POSCO DAEWOO
CORPORATION, ONGC VIDESH LIMITED, GAIL(INDIA) LIMITED, KOREA
GAS CORPORATION


(မြသုဇာ)
တွဲဖက်အတွင်းရေးမှူး

ရက်စွဲ၊ ၂၀၁၆ ခုနှစ် နိုဝင်ဘာလ ၈ ရက်
နေရာ၊ ရန်ကုန်မြို့

Confidential



THE REPUBLIC OF THE UNION OF MYANMAR
MYANMAR INVESTMENT COMMISSION
No.(1), Thitsar Road, Yankin Township, Yangon

Tel: 95-01-658130
Fax: 95-01-658142

Our ref: DICA-5(E)/006/2016(511)

Date : 8th November 2016

**Subject : Decision of the Myanmar Investment Commission for the
Change of the Name of Company**

Reference: Ministry of Electric Power and Energy Letter, dated (14-9-2016)

1. The Myanmar Investment Commission, at its meeting 19/2016 held on dated 7th October 2016 had approved that the name of the company be amended from "Daewoo International Corporation, ONGC Videsh Limited, Gail(India) Limited, Korea Gas Corporation" to "POSCO Daewoo Corporation, ONGC Videsh Limited, Gail(India) Limited, Korea Gas Corporation"
2. Hence, the name of the company be amended as POSCO Daewoo Corporation, ONGC Videsh Limited, Gail(India) Limited, Korea Gas Corporation, accordingly on the permit No. 444/2010 dated 29-7-2010.
3. It is also here by notified that POSCO Daewoo Corporation, ONGC Videsh Limited, Gail(India) Limited, Korea Gas Corporation., shall have to abide by all terms and conditions stated in the Commission's letter No. Ya Ka-1/Na-623/2010 (11034) dated 29th July 2010.


for Chairman

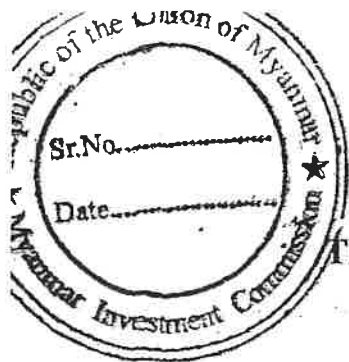
(Mya Thuza, Joint Secretary)

**Managing Director
Myanma Oil and Gas Enterprise**

- cc: 1. Office of the Government of the Republic of the Union of Myanmar
2. Ministry of Home Affairs
3. Ministry of Natural Resources and Environmental Conservation
4. Ministry of Electric Power and Energy
5. Ministry of Labour, Immigration and Population
6. Ministry of Commerce

Confidential

7. Ministry of Planning and Finance
8. Central Bank of Myanmar
9. Office of the Rakhine State Government
10. Director General, Environmental Conservation Department
11. Director General, Directorate of Labour
12. Director General, Department of Trade
13. Director General, Directorate of Investment and Company Administration
14. Director General, National Archives Department
15. Director General, Internal Revenue Department
16. Director General, Customs Department
17. Daewoo International Corporation
18. ONGC Videsh Limited
19. Gail(India) Limited
20. Korea Gas Corporation
21. POSCO Daewoo Corporation



Form (2)

Annex-1

THE REPUBLIC OF THE UNION OF MYANMAR
MYANMAR INVESTMENT COMMISSION

Amendment on Permit No. 444/2010, dated 29th July, 2010

The Myanmar Investment Commission, at its meeting(19/2016)held on dated 7th October 2016 had approved the transfer of Participating Interest (PI) "Daewoo International Corporation" to "POSCO Daewoo Corporation". Hence, the name of the company may be amended as "POSCO Daewoo Corporation, ONGC Videsh Limited, Gail(India) Limited, Korea Gas Corporation".

(n) Name of Company incorporated in Myanmar POSCO
DAEWOO CORPORATION, ONGC VIDESH LIMITED, GAIL(INDIA)
LIMITED, KOREA GAS CORPORATION

(Mya Thuza)
Joint Secretary

Date: 8th November, 2016
Location: Yangon



ပုံစံ (၂)
ပူးတွဲ - ၁

ပြည်ထောင်စုသမ္မတမြန်မာနိုင်ငံတော်
မြန်မာနိုင်ငံရင်းနှီးမြှုပ်နှံမှုကော်မရှင်

၂၀၁၀ ခုနှစ် ဇူလိုင်လ ၂၉ ရက်နေ့ ရက်စွဲပါခွင့်ပြုမိန့်အမှတ် ၄၄၄/၂၀၁၀တွင် ပြင်ဆင်ချက်

၂၀၁၆ ခုနှစ် အောက်တိုဘာလ ၇ ရက်နေ့တွင် ကျင်းပပြုလုပ်သော မြန်မာနိုင်ငံရင်းနှီးမြှုပ်နှံမှုကော်မရှင်၏ ၁၉/၂၀၁၆ အစည်းအဝေးဆုံးဖြတ်ချက်အရ “Daewoo International Corporation ၏ Participating Interest(PI) များအား “POSCO Daewoo Corporation” သို့ လွှဲပြောင်းခွင့် ရရှိပြီးဖြစ်သဖြင့် ကုမ္ပဏီအမည်အား “POSCO Daewoo Corporation, ONGC Videsh Limited, Gail(India) Limited, Korea Gas Corporation” သို့ ပြင်ဆင်ပြောင်းလဲလိုက်သည်။

(ပ) မြန်မာနိုင်ငံတွင် ဖွဲ့စည်းမည့် ကုမ္ပဏီအမည်

POSCO DAEWOO

CORPORATION, ONGC VIDESH LIMITED, GAIL(INDIA) LIMITED, KOREA
GAS CORPORATION

(မြို့သူဇာ)

တွဲဖက်အတွင်းရေးမှူး

ရက်စွဲ၊ ၂၀၁၆ ခုနှစ် နိုဝင်ဘာလ ၈ ရက်
နေရာ၊ ရန်ကုန်မြို့

Confidential



THE REPUBLIC OF THE UNION OF MYANMAR
MYANMAR INVESTMENT COMMISSION
No.(1), Thitsar Road, Yankin Township, Yangon

Our ref: DICA-5(E)/006/2016(၅၈)

Date : ၈th November 2016

**Subject : Decision of the Myanmar Investment Commission for the
Change of the Name of Company**

Reference: Ministry of Electric Power and Energy Letter, dated (14-9-2016)

1. The Myanmar Investment Commission, at its meeting 19/2016 held on dated 7th October 2016 had approved that the name of the company be amended from "Daewoo International Corporation, ONGC Videsh Limited, Gail(India) Limited, Korea Gas Corporation" to "POSCO Daewoo Corporation, ONGC Videsh Limited, Gail(India) Limited, Korea Gas Corporation"
2. Hence, the name of the company be amended as POSCO Daewoo Corporation, ONGC Videsh Limited, Gail(India) Limited, Korea Gas Corporation, accordingly on the permit No. 444/2010 dated 29-7-2010.
3. It is also here by notified that POSCO Daewoo Corporation, ONGC Videsh Limited, Gail(India) Limited, Korea Gas Corporation., shall have to abide by all terms and conditions stated in the Commission's letter No. Ya Ka-1/Na-623/2010 (11034) dated 29th July 2010.

for Chairman

(Mya Thuza, Joint Secretary)

Managing Director

Myanma Oil and Gas Enterprise

- cc: 1. Office of the Government of the Republic of the Union of Myanmar
2. Ministry of Home Affairs
3. Ministry of Natural Resources and Environmental Conservation
4. Ministry of Electric Power and Energy
5. Ministry of Labour, Immigration and Population
6. Ministry of Commerce

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7. Ministry of Planning and Finance
8. Central Bank of Myanmar
9. Office of the Rakhine State Government
10. Director General, Environmental Conservation Department
11. Director General, Directorate of Labour
12. Director General, Department of Trade
13. Director General, Directorate of Investment and Company Administration
14. Director General, National Archives Department
15. Director General, Internal Revenue Department
16. Director General, Customs Department
17. Daewoo International Corporation
18. ONGC Videsh Limited
19. Gail(India) Limited
20. Korea Gas Corporation
21. POSCO Daewoo Corporation



THE REPUBLIC OF THE UNION OF MYANMAR

Myanmar Investment Commission

Amendment on Permit No. 444/2010 dated 29th July 2010

The Myanmar Investment Commission, at its meeting 6/2020 held on dated 28th April 2020 approved the name of POSCO Daewoo Corporation be changed to POSCO International Corporation.(Block A-1 & A-3)

(n) Name of Company Incorporated in Myanmar POSCO INTERNATIONAL CORPORATION, ONGC VIDESH LIMITED, GAIL (INDIA) LIMITED, KOREA GAS CORPORATION

Date : 2nd June 2020

Location: Yangon

Thant Sin Lwin

for Chairman

(Thant Sin Lwin, Secretary)





Confidential

THE REPUBLIC OF THE UNION OF MYANMAR

MYANMAR INVESTMENT COMMISSION

No.(1), Thitsar Road, Yankin Township, Yangon.

Our ref: MIC-5(E)/006/2020(234)

Date : 28 June 2020

Subject: Decision of the Myanmar Investment Commission for amendment of the name of company incorporated in Myanmar of POSCO Daewoo Corporation, ONGC Videsh Limited, Gail (India) Limited, Korea Gas Corporation

Reference: Ministry of Electric and Energy's Letter No. MOEE-2/(15)/(Kha)/(POSCO-2)(8022)/2020 dated 19-5-2020.

- 1. The Myanmar Investment Commission, at its meeting 6/2020 held on dated 28th April 2020 had approved the name of POSCO Daewoo Corporation be changed to POSCO International Corporation.**
- 2. Hence, the name of company incorporated in Myanmar which is carrying out exploration, appraisal, development and sale of natural gas is hereby amended to POSCO International Corporation, ONGC Videsh Limited, Gail (India) Limited, Korea Gas Corporation on the Permit No. 444/2010 dated 29-7-2010.(Block A-1 & A-3)**
- 3. It is also hereby notified that POSCO International Corporation, ONGC Videsh Limited, Gail (India) Limited, Korea Gas Corporation shall have to abide by all terms and conditions stated in the Commission's Letter No. Ya Ka-1/Na-623/2010(11034) dated 29-7-2010 and MIC-5(E)/006/2016(511) dated 8-11-2016.**

**for Chairman
(Thant Sin Lwin, Secretary)**

Managing Director

Myanma Oil and Gas Enterprise

- cc:**
- 1. The Office of the Union Government**
 - 2. Ministry of Office of the Union Government**
 - 3. Ministry of Home Affairs**
 - 4. Ministry of Planning, Finance and Industry**

Confidential

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5. Ministry of Investment and Foreign Economic Relations
6. Ministry of Natural Resources and Environmental Conservation
7. Ministry of Electric and Energy
8. Ministry of Labour, Immigration and Population
9. Ministry of Commerce
10. Rakhine State Investment Committee
11. Office of the Rakhine State Government
12. Director General, Fire Services Department
13. Director General, National Archives Department
14. Director General, Customs Department
15. Director General, Internal Revenue Department
16. Director General, Directorate of Investment and Company Administration
17. Director General, Department of Environmental Conservation
18. Director General, Directorate of Labour
19. Director General, Immigration and National Registration Department
20. Director General, Department of Trade
21. Rakhine State Office, Directorate of Investment and Company Administration
22. POSCO International Corporation
23. ONGC Videsh Limited
24. Gail (India) Limited
25. Korea Gas Corporation

Confidential



The Myanmar Investment Commission

PERMIT



Permit No. 445/2010

Date 29, JULY, 2010

The Myanmar Investment Commission issues this Permit under Section 10 of the Union of Myanmar Foreign Investment Law-

- (a) Name of Promoter DIRECTOR GENERAL,
ENERGY PLANNING DEPARTMENT
- (b) Citizenship MYANMAR
- (c) Address BUILDING NO.(6), NAY PYI TAW, MYANMAR
- (d) Name and Address of principal organization MINISTRY OF ENERGY,
BUILDING NO.(6), NAY PYI TAW,
- (e) Place of incorporation REPUBLIC OF KOREA
- (f) Type of business in which investment is to be made CONSTRUCTION
OF OFFSHORE NATURAL GAS PIPELINE
- (g) Place(s) at which investment is permitted BLOCK A-1 & A-3,
RAKHINE OFFSHORE AREA
- (h) Amount of foreign capital US\$ 443.087 MILLION
- (i) Period for bringing in foreign capital 2010 TO 2013
- (j) Total amount of capital (Kyat) EQUIVALENT IN KYAT OF
US\$ 443.087 MILLION
- (k) Permitted duration of investment 30 YEARS OF COMMERCIAL OPERATION
- (l) Name of the economic organization to be formed in Myanmar DAEWOO INTERNATIONAL CORPORATION, ONGC VIDESH LIMITED,
GAIL(INDIA) LIMITED, KOREA GAS CORPORATION

Chairman

The Myanmar Investment Commission

မြန်မာနိုင်ငံ ရင်းနှီးမြှုပ်နှံမှု ကော်မရှင်
ခွင့်ပြုမိန့်



ခွင့်ပြုမိန့်အမှတ် ၄၄၅/၂၀၁၀

၂၀၁၀ ခုနှစ်၊ ဇူလိုင်လ (၂၉) ရက်

ပြည်ထောင်စု မြန်မာနိုင်ငံတော် နိုင်ငံခြား ရင်းနှီးမြှုပ်နှံမှု ဥပဒေ ပုဒ်မ (၁၀) အရ ဤခွင့်ပြုမိန့်ကို မြန်မာနိုင်ငံ ရင်းနှီးမြှုပ်နှံမှု ကော်မရှင်က ထုတ်ပေးလိုက်သည်။

- (က) ကမကထပြုသူ၏အမည် ညွှန်ကြားရေးမှူးချုပ်၊ စွမ်းအင်စီမံရေးဦးစီးဌာန
- (ခ) မည်သည့် နိုင်ငံသား မြန်မာ
- (ဂ) နေရပ်လိပ်စာ ရုံးအမှတ် (၆) ၊ နေပြည်တော်
- (ဃ) ပင်မအဖွဲ့အစည်းအမည်နှင့် လိပ်စာ စွမ်းအင်ဝန်ကြီးဌာန၊ ရုံးအမှတ်(၆)
နေပြည်တော်၊
- (င) ဖွဲ့စည်းရာအရပ် ကိုရီးယားသမ္မတနိုင်ငံ
- (စ) ရင်းနှီးမြှုပ်နှံမှုပြုလုပ်မည့်လုပ်ငန်းအမျိုးအစား ကမ်းလွန်သဘာဝဓါတ်ငွေ့
ပိုက်လိုင်း တည်ဆောက်ခြင်း လုပ်ငန်း
- (ဆ) ရင်းနှီးမြှုပ်နှံမှုပြုလုပ်ခွင့်ပြုသည့်အရပ်ဒေသ(များ) ရခိုင်ကမ်းလွန်ဒေသ
လုပ်ကွက် A-1 နှင့် A-3
- (ဇ) နိုင်ငံခြားမတည်ငွေရင်း အမေရိကန်ဒေါ်လာ ၄၄၃.၀၈၇ သန်း
- (ဈ) နိုင်ငံခြားမတည်ငွေရင်းယူဆောင်လာရမည့်ကာလ ၂၀၁၀ ခုနှစ် မှ ၂၀၁၃ ခုနှစ် အထိ
- (ည) စုစုပေါင်း မတည်ငွေရင်းပမာဏ(ကျပ်) အမေရိကန်ဒေါ်လာ ၄၄၃.၀၈၇ သန်း
နှင့် ညီမျှသော မြန်မာကျပ်ငွေ
- (ဋ) ရင်းနှီးမြှုပ်နှံခွင့်ပြုသည့် သက်တမ်း သဘာဝဓါတ်ငွေ့ စတင်ပို့လွှတ်သည့်နေ့မှ
နှစ်ပေါင်း ၃၀
- (ဌ) မြန်မာနိုင်ငံတွင် ဖွဲ့စည်းမည့် စီးပွားရေး အဖွဲ့အစည်းအမည်

DAEWOO INTERNATIONAL CORPORATION, ONGC VIDESH LIMITED,
GAIL(INDIA) LIMITED, KOREA GAS CORPORATION

ဥက္ကဋ္ဌ

မြန်မာနိုင်ငံရင်းနှီးမြှုပ်နှံမှု ကော်မရှင်



The Myanmar Investment Commission

PERMIT



Permit No. 445 /2010

Date 29 July, 2010

The Myanmar Investment Commission issues this Permit under Section 10 of the Union of Myanmar Foreign Investment Law-

- (a) Name of Promoter DIRECTOR GENERAL
ENERGY PLANNING DEPARTMENT
- (b) Citizenship MYANMAR
- (c) Address BUILDING NO.(6), NAY PYI TAW, MYANMAR
- (d) Name and Address of principal organization MINISTRY OF ENERGY,
BUILDING NO.(6), NAY PYI TAW.
- (e) Place of incorporation REPUBLIC OF KOREA
- (f) Type of business in which investment is to be made CONSTRUCTION OF
OFFSHORE NATURAL GAS PIPELINE FACILITIES AND TRANSPORTATION OF
NATURAL GAS
- (g) Place(s) at which investment is permitted BLOCK A-1 & A-3,
RAKHINE OFFSHORE AREA
- (h) Amount of foreign capital US \$ 443.087 MILLION
- (i) Period for bringing in foreign capital 2010 TO 2013
- (j) Total amount of capital (Kyat) EQUIVALENT IN KYAT OF
US\$ 443.087 MILLION
- (k) Permitted duration of investment 30 YEARS OF COMMERCIAL OPERATION
- (l) Name of the economic organization to be formed in Myanmar
DAEWOO INTERNATIONAL CORPORATION, ONGC VIDESH LIMITED,
GAIL(INDIA) LIMITED, KOREA GAS CORPORATION


Chairman

The Myanmar Investment Commission



Form (2)

Annex-1

THE REPUBLIC OF THE UNION OF MYANMAR
MYANMAR INVESTMENT COMMISSION

Amendment on Permit No. 445 /2010, dated 29th July, 2010

The Myanmar Investment Commission, at its meeting (22/2016) held on dated 1st December 2016 had approved to change the company's name from "Daewoo International Corporation" to "POSCO Daewoo Corporation". Hence, the name of the company may be amended as "POSCO Daewoo Corporation, ONGC Videsh Limited, Gail (India) Limited, Korea Gas Corporation". (Block A-1 & A-3)

(n) Name of Company incorporated in Myanmar POSCO
DAEWOO CORPORATION, ONGC VIDESH LIMITED, GAIL(INDIA)
LIMITED, KOREA GAS CORPORATION

Date: 15th December, 2016

Location: Yangon


(Aung Naing Oo)
Secretary




ပုံစံ(၂)
ပူးတွဲ - ၁

ပြည်ထောင်စုသမ္မတမြန်မာနိုင်ငံတော်
မြန်မာနိုင်ငံရင်းနှီးမြှုပ်နှံမှုကော်မရှင်

၂၀၁၀ ခုနှစ် ဇူလိုင်လ ၂၉ ရက်နေ့ ရက်စွဲပါခွင့်ပြုမိန့်အမှတ် ၄၄၅/၂၀၁၀တွင် ပြင်ဆင်ချက်

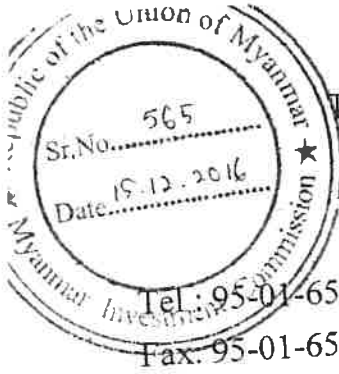
၂၀၁၆ ခုနှစ် ဒီဇင်ဘာလ ၁ ရက်နေ့တွင် ကျင်းပပြုလုပ်သော မြန်မာနိုင်ငံရင်းနှီး မြှုပ်နှံမှု ကော်မရှင်၏ ၂၂/၂၀၁၆ အစည်းအဝေး ဆုံးဖြတ်ချက်အရ “Daewoo International Corporation” အမည်မှ “POSCO Daewoo Corporation” အမည်သို့ ပြောင်းလဲခွင့် ရရှိပြီးဖြစ်သဖြင့် ကုမ္ပဏီအမည်အား “POSCO Daewoo Corporation, ONGC Videsh Limited, Gail (India) Limited, Korea Gas Corporation” သို့ ပြောင်းလဲပြင်ဆင်လိုက်သည်။
(Block A-1 & A-3)

(ပ) မြန်မာနိုင်ငံတွင် ဖွဲ့စည်းမည့် ကုမ္ပဏီအမည် POSCO DAEWOO
CORPORATION, ONGC VIDESH LIMITED, GAIL (INDIA) LIMITED,
KOREA GAS CORPORATION


(အောင်နိုင်ဦး)
အတွင်းရေးမှူး

ရက်စွဲ၊ ၂၀၁၆ ခုနှစ် ဒီဇင်ဘာလ ၁၅ ရက်
နေရာ၊ ရန်ကုန်မြို့

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THE REPUBLIC OF THE UNION OF MYANMAR
MYANMAR INVESTMENT COMMISSION
No.(1), Thitsar Road, Yankin Township, Yangon


Our ref : MIC-5(E)/445/2016(565)

Date : 15 December 2016

**Subject : Decision of the Myanmar Investment Commission for the
Change of the Name of Company**

Reference: Ministry of Electric Power and Energy Letter No. Policy- Legal-
Inspection / 04 (266/ 2016) dated (18-10-2016)

1. The Myanmar Investment Commission, at its meeting 22/2016 held on dated 1st December 2016 had approved that the name of the company be amended from "Daewoo International Corporation, ONGC Videsh Limited, Gail (India) Limited, Korea Gas Corporation" to "POSCO Daewoo Corporation, ONGC Videsh Limited, Gail (India) Limited, Korea Gas Corporation".
2. Hence, the name of the company be amended as POSCO Daewoo Corporation, ONGC Videsh Limited, Gail(India) Limited, Korea Gas Corporation, accordingly on the permit No. 445/2010 dated 29-7-2010. (Block A-1 & A-3)
3. It is also hereby notified that POSCO Daewoo Corporation, ONGC Videsh Limited, Gail(India) Limited, Korea Gas Corporation., shall have to abide by all terms and conditions stated in the Commission's letter No. Ya Ka-1/Na-624/2010 (11035) dated 29th July 2010.


for Chairman
(Aung Naing Oo, Secretary)

**Managing Director
Myanma Oil and Gas Enterprise**

- cc: 1. Office of the Government of the Republic of the Union of Myanmar
2. Ministry of Home Affairs
3. Ministry of Natural Resources and Environmental Conservation
4. Ministry of Electricity and Energy
5. Ministry of Labour, Immigration and Population

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6. Ministry of Commerce
7. Ministry of Planning and Finance
8. Central Bank of Myanmar
9. Office of the Rakhine State Government
10. Director General, Environmental Conservation Department
11. Director General, Directorate of Labour
12. Director General, Department of Trade
13. Director General, Directorate of Investment and Company Administration
14. Director General, National Archives Department
15. Director General, Internal Revenue Department
16. Director General, Customs Department
17. Daewoo International Corporation
18. ONGC Videsh Limited
19. Gail(India) Limited
20. Korea Gas Corporation
21. POSCO Daewoo Corporation



THE REPUBLIC OF THE UNION OF MYANMAR

Myanmar Investment Commission

Amendment on Permit No. 445/2010 dated 29th July 2010

The Myanmar Investment Commission, at its meeting 6/2020 held on dated 28th April 2020 approved the name of POSCO Daewoo Corporation be changed to POSCO International Corporation.(Block A-1 & A-3)

(n) Name of Company Incorporated in Myanmar POSCO INTERNATIONAL CORPORATION, ONGC VIDESH LIMITED, GAIL (INDIA) LIMITED, KOREA GAS CORPORATION

Date : 2nd June 2020

Location: Yangon

Thant Sin Lwin

for Chairman

(Thant Sin Lwin, Secretary)





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THE REPUBLIC OF THE UNION OF MYANMAR
MYANMAR INVESTMENT COMMISSION
No.(1), Thitsar Road, Yankin Township, Yangon.

Our ref: MIC-5(E)/445/2020(235)

Date : 2nd June 2020

Subject: Decision of the Myanmar Investment Commission for amendment of the name of company incorporated in Myanmar of POSCO Daewoo Corporation, ONGC Videsh Limited, Gail (India) Limited, Korea Gas Corporation

Reference: Ministry of Electric and Energy's Letter No. MOEE-2/(15)/(Kha)/(POSCO-2)(8022)/2020 dated 19-5-2020.

1. The Myanmar Investment Commission, at its meeting 6/2020 held on dated 28th April 2020 had approved the name of POSCO Daewoo Corporation be changed to POSCO International Corporation.
2. Hence, the name of company incorporated in Myanmar which is carrying out construction of offshore natural gas pipeline facilities and transportation of natural gas is hereby amended to POSCO International Corporation, ONGC Videsh Limited, Gail (India) Limited, Korea Gas Corporation on the Permit No. 445/2010 dated 29-7-2010.(Block A-1 & A-3)
3. It is also hereby notified that POSCO International Corporation, ONGC Videsh Limited, Gail (India) Limited, Korea Gas Corporation shall have to abide by all terms and conditions stated in the Commission's Letter No. Ya Ka-1/Na-624/2010(11035) dated 29-7-2010 and MIC-5(E)/445/2016(565) dated 15-12-2016.

Managing Director

Myanma Oil and Gas Enterprise

- cc: 1. The Office of the Union Government
2. Ministry of Office of the Union Government
3. Ministry of Home Affairs

Thant Sin Lwin
for Chairman
(Thant Sin Lwin, Secretary)

Confidential

Confidential

- 2 -

4. Ministry of Planning, Finance and Industry
5. Ministry of Investment and Foreign Economic Relations
6. Ministry of Natural Resources and Environmental Conservation
7. Ministry of Electric and Energy
8. Ministry of Labour, Immigration and Population
9. Ministry of Commerce
10. Rakhine State Investment Committee
11. Office of the Rakhine State Government
12. Director General, Fire Services Department
13. Director General, National Archives Department
14. Director General, Customs Department
15. Director General, Internal Revenue Department
16. Director General, Directorate of Investment and Company Administration
17. Director General, Department of Environmental Conservation
18. Director General, Directorate of Labour
19. Director General, Immigration and National Registration Department
20. Director General, Department of Trade
21. Rakhine State Office, Directorate of Investment and Company Administration
22. POSCO International Corporation
23. ONGC Videsh Limited
24. Gail (India) Limited
25. Korea Gas Corporation

Confidential



ပြည်ထောင်စုသမ္မတမြန်မာနိုင်ငံတော်အစိုးရ

လျှပ်စစ်နှင့်စွမ်းအင်ဝန်ကြီးဌာန

ရေနံနှင့်သဘာဝဓာတ်ငွေ့စီမံရေးဦးစီးဌာန

စာအမှတ်၊ စီမံ-စီးပွား/ ၀၂/ ၅-၁(၁၂၂၉)၂၀၂၁

ရက်စွဲ၊ ၂၀၂၁ ခုနှစ်၊ ဒီဇင်ဘာလ ၂၇ ရက်

သို့

ညွှန်ကြားရေးမှူးချုပ်

အကောက်ခွန်ဦးစီးဌာန

အကြောင်းအရာ။ လျှပ်စစ်နှင့်စွမ်းအင်ဝန်ကြီးဌာန၊ မြန်မာ့ရေနံနှင့်သဘာဝဓာတ်ငွေ့လုပ်ငန်း အမည်ဖြင့် ပြည်ပမှ Foreign Capital စနစ်ဖြင့် တင်သွင်းလာမည့် လုပ်ငန်းသုံးပစ္စည်းများအတွက် အကောက်ခွန်ဆိုင်ရာရှင်းလင်းခွင့်ပြု ပါရန်ကိစ္စ

ရည်ညွှန်းချက်။ (၁) စီးပွားရေးနှင့်ကူးသန်းရောင်းဝယ်ရေးဝန်ကြီးဌာန၏ ၁၅-၃-၂၀၁၃ ရက်စွဲပါ အမိန့်ကြော်ငြာစာအမှတ်၊ ၂၃/၂၀၁၃
(၂) မြန်မာနိုင်ငံရင်းနှီးမြှုပ်နှံမှုကော်မရှင်၏ ၉-၄-၂၀၂၁ ရက်စွဲပါ စာအမှတ်၊ မရက-၉/န-ထွေ/၂၀၂၁(၁၃၀၂)

၁။ လျှပ်စစ်နှင့်စွမ်းအင်ဝန်ကြီးဌာန၊ မြန်မာ့ရေနံနှင့်သဘာဝဓာတ်ငွေ့လုပ်ငန်းနှင့် ထုတ်လုပ်မှုအပေါ်ခွဲဝေခံစားရေးစာချုပ်ချုပ်ဆို၍ ရေနံနှင့်သဘာဝဓာတ်ငွေ့ရှာဖွေတူးဖော် ထုတ်လုပ်ရေးလုပ်ငန်းများဆောင်ရွက်လျက်ရှိသည့် Posco International Corporation (Myanmar E & P)(Shwe Project) မှ မြန်မာ့ရေနံနှင့်သဘာဝဓာတ်ငွေ့လုပ်ငန်းအမည်ဖြင့် နောက်ဆက်တွဲဇယားပါ လုပ်ငန်းသုံးပစ္စည်းများကိုစုစုပေါင်းတန်ဖိုး US\$ 2,131,240.00 (အမေရိကန်ဒေါ်လာနှစ်သန်းတစ်သိန်းသုံးသောင်းတစ်ထောင်နှစ်ရာလေးဆယ်တိတိ) ဖြင့် ပြည်ပမှ တင်သွင်းလာမည်ဖြစ်ပါသည်။

၂။ ရေနံနှင့်သဘာဝဓာတ်ငွေ့လုပ်ငန်းသုံးပစ္စည်းကိရိယာများကို ပြည်ပမှတင်သွင်းခြင်း၊ လုပ်ငန်းပြီးဆုံး၍ ပြန်လည်တင်ပို့ခြင်းများအတွက် စီးပွားရေးနှင့်ကူးသန်းရောင်းဝယ်ရေး ဝန်ကြီးဌာန၏ ရည်ညွှန်း(၁)ပါစာအရ ပို့ကုန်/သွင်းကုန်လိုင်စင်လျှောက်ထားခြင်းမှ ကင်းလွတ် ခွင့်ရရှိခဲ့ပြီး၊ မြန်မာနိုင်ငံရင်းနှီးမြှုပ်နှံမှုကော်မရှင်၏ ရည်ညွှန်း(၂)ပါစာအရ ထုတ်လုပ်ရေးကာလ အတွင်း ရောက်ရှိနေသော ရင်းနှီးမြှုပ်နှံမှုလုပ်ငန်းများမှ လုပ်ငန်းလိုအပ်ချက်အရ ကျသင့်သည့် အခွန်အကောက်ပေးဆောင်၍ ပြည်ပမှတင်သွင်းမည့် လုပ်ငန်းသုံးပစ္စည်းများအတွက် ကော်မရှင်၏ သီးခြားထောက်ခံချက်ရယူရန် မလိုအပ်ကြောင်း ခွင့်ပြုထားပြီးဖြစ်ပါသဖြင့် လျှပ်စစ် နှင့်စွမ်းအင်ဝန်ကြီးဌာနမှ ဖော်ပြပါ လုပ်ငန်းသုံးပစ္စည်းများအား တင်သွင်းခွင့်ပြုခဲ့ပါသည်။

၃။ သို့ဖြစ်ပါ၍ မြန်မာ့ရေနံနှင့်သဘာဝဓာတ်ငွေ့လုပ်ငန်းအမည်ဖြင့် Posco International Corporation (Myanmar E & P)(Shwe Project) မှ နောက်ဆက်တွဲဇယားပါ လုပ်ငန်းသုံးပစ္စည်းများ တင်သွင်းလာရာတွင် အကောက်ခွန်ဆိုင်ရာရှင်းလင်းရေးကိစ္စများအား လုပ်ထုံးလုပ်နည်းနှင့်အညီ ဆောင်ရွက်ခွင့်ပြုပါရန် မေတ္တာရပ်ခံအပ်ပါသည်။



ဝင်းမော်

ညွှန်ကြားရေးမှူးချုပ်
✓ ✕ ✓

မိတ္တူကို

မြန်မာနိုင်ငံရင်းနှီးမြှုပ်နှံမှုကော်မရှင်

ဦးဆောင်ညွှန်ကြားရေးမှူး

မြန်မာ့ရေနံနှင့်သဘာဝဓာတ်ငွေ့လုပ်ငန်း

လျှပ်စစ်နှင့်စွမ်းအင်ဝန်ကြီးဌာန၊ မြန်မာ့ရေနံနှင့်သဘာဝဓာတ်ငွေ့လုပ်ငန်းအမည်ဖြင့် Foreign Capital (Consumable) အဖြစ်
တင်သွင်းလာမည့် လုပ်ငန်းသုံးပစ္စည်းများစာရင်း

Foreign Capital (Consumable)

Sr No	Company	Letter No.	Block No.	Amount(US\$)		Description	Remarks
				(C.I.F Yangon/ Sittwe/Kyaukpkyu			
1	Posco International	202111 200042	Shwe Project	2,117,800.00		Oil Well Chemicals under Provision of Chemicals and Lab Services (KHI (Kinetic Hydrate Inhibitor) and etc.,)	အခွန်ပေးဆောင်ပြီး တင်သွင်းခွင့်ပြုပါရန်
2	Posco International	202112 200003	Shwe Project	13,440.00		Oil Well Equipment / Tools and Equipment for Campaign 2 Execution (Gas - Diving Oxygen @ 200Bar)	အခွန်ပေးဆောင်ပြီး တင်သွင်းခွင့်ပြုပါရန်
Total (US\$)				2,131,240.00			



Date: 26th November 2021

Ref. No: 202111-200042

To: U Aung Min / Managing Director/ MOGE

SUBJECT: Request for Import Permit / Investment

Dear Sirs,

We always appreciate your continuous support and cooperation to the SHWE Project.

With regards to the above subject, we are planning to import **Oil Well Chemicals under Provision of Chemicals and Lab Services for SHWE Project** in block A1 as per enclosed Proforma Invoice.

The following material lists is the property of **POSCO INTERNATIONAL Corp. (Myanmar E&P)** and as such, may be categorized as 'Investment (Consumable)'.

Invoice	Date	Description	Total USD
SHWE-ASTD-502/2021	26.11.2021	Oil Well Chemicals under Provision of Chemicals and Lab Services for SHWE Project in block A1.	2,117,800.00
Total Amount USD CIF			2,117,800.00

We would be very grateful if you would be kind enough to permit the importation in respect of the said items.

Thanking you in advance of your kind cooperation.

Yours sincerely,



Hyun Hyung Moon (Director –Procurement & Logistics)

For Managing Director

POSCO INTERNATIONAL Corporation (Myanmar E&P)

CC: Director (Offshore /Materials Planning)– MOGE



SR.	DESCRIPTION	Ref No in MOGE Chemical 419 Items
1	MEG (Mono Ethylene Glycol)	358
2	KHI (Kinetic Hydrate Inhibitor)	353
3	Water Clarifier / Reverse Demulsifier /Aluminum Salt(Mixtures)	360
4	Anti -foam/ Defoamer	352
5	Sodium Hypochlorite	359
6	Methanol	56

POSCO INTERNATIONAL Corporation

165, Convensia-daero, Yeonsu-gu, Incheon, 21998, Korea

Tel: 82-2-759-2114 Fax: 82-2-753-9489

www.poscointl.com

POSCO INTERNATIONAL Corporation (Myanmar E&P)

Room #301, Maha Land, No. 56, Kabar Aye Pagoda Road, Yankin Township (11081), Yangon, Myanmar

Tel: 951-653-239 Fax: 951-651-638



JOS Logistics Pte Ltd

Loyang Offshore Supply Base, Box No. 5138, Building No. 201

Loyang Crescent, Singapore 508988

Tel: (65) 6542 4788 Fax: (65) 6542 4818

Co. Reg. No: 200721395H

Email: logistics@joslog.com.sg

PROFORMA INVOICE

SHIPPER: JOS LOGISTICS PTE LTD. Loyang Offshore Supply Base 25 Loyang Crescent Box No. 5138, Building No. 201 Singapore 508988 For POSCO INTL Corporation(Myanmar E & P)		INVESTMENT				
CONSIGNEE: The Managing Director Myanmar Oil and Gas Enterprise (M . O . G . E) #44, Nay Pyi Taw, Myanmar For POSCO INTL Corporation(Myanmar E & P) Shwe Project		CARRIER NOTIFY: POSCO INTERNATIONAL Corporation(Myanmar E & P) Maha Land ,No-56,Kabar Aye Pagoda Road,Yankin Township,Yangon Tel: (95 - 1) 653 239 Fax: (95- 1) 651858 Invoice No. (Packing No.): SHWE-ASTD-502/2021 Date: 26. Nov .2021 Country of Origin: Singapore/USA/Canada/UK/Germany/Italy/ Norway/ Frence/ Korea/ India/ Malaysia/Thailand/ Spain Mode of Transport: By Air / Sea Port of Shipment: Singapore Port of Discharge: Yangon / Sittwe / Kyauk Phyu				
	HS CODE	DESCRIPTION	QTY		UNIT PRICE (US \$)	AMOUNT (US \$)
1	29053100	MEG (Mono Ethylene Glycol)	L	300,000	1.90	570,000.00
2	38140010	KHI (Kinetic Hydrate Inhibitor)	L	250,000	5.60	1,400,000.00
3	38249026	Water Clarifier / Reverse Demulsifier /Aluminum Salt(Mixtures)	L	8000	4.30	34,400.00
4	38249090	Anti -foam/ Defoamer	L	8000	3.00	24,000.00
5	39269099	Sodium Hypochlorite	L	5000	1.88	9,400.00
6	29051100	Methanol	L	100,000	0.80	80,000.00
TOTAL CIF YANGON US\$						2,117,800.00

We hereby certified that the above information is true and Correct

FOREIGN INVESTMENT COMMISSION

PERMIT NO.444/2010

NO COMMERCIAL VALUE ,THE VALUE DECLARED IS ONLY FOR CUSTOMS PURPOSE ONLY

NO TRANSFER OF FOREIGN EXCHANGE INVOLVED

PRODUCTION SHARING CONTRACT FOR

PETROLEUM EXPLORATION AND DEVELOPMENT

ALL PRICES ARE CIF YANGON

Authorized Signature

မြန်မာ့ရေနံနှင့်သဘာဝဓာတ်ငွေ့လုပ်ငန်း
MYANMA OIL AND GAS ENTERPRISE

FAX 95-67-411125
PHONE 95-67-411055/ 95-67-411056



MINISTRY OF ELECTRICITY AND ENERGY
COMPLEX 44, NAY PYI TAW, MYANMAR

Our Ref: MD(15P)-3/6 (128) 2019

Dated: March 8 , 2019

POSCO Daewoo Corporation (Myanmar E&P)
Maha Land, No. 56, Kabar Aye Pagoda Road,
Yankin Township, Yangon.

Fax: 01-651638

Attention: Mr. Heung Bum Yi, Managing Director and Senior Vice President

Subject: Approval for Provision of Chemicals and Lab Services for Shwe Project

Reference: 1. POSCO Daewoo Letter No. 201901-200033 dated February 5, 2019
2. The Steering Committee Meeting 3/2019 held on March 6, 2019

Dear Mr. Heung Bum Yi,

Regarding the above subject and references, please be informed that your recommendation to award Provision of Chemicals and Lab Services for Shwe Project contract to Baker Hughes GE with total estimated contract value of US\$ 5,961,211 (Inclusive of 2.5% Myanmar Withholding Tax) for three years is hereby approved.

Sincerely yours,

For Managing Director
(Aung Win, Dy Director "Planning")
Myanma Oil and Gas Enterprise
Nay Pyi Taw

cc: Director General, Oil and Gas Planning Department
Director (Planning)/(Drilling)/(Offshore)/(Finance)/DD(Planning), MOGE



ပြည်ထောင်စုသမ္မတမြန်မာနိုင်ငံတော်

ပြည်ထဲရေးဝန်ကြီးဌာန

အမိန့်ကြော်ငြာစာ (၇၇၄ / ၂၀၁၆)

၂၃၇၂
၂၆-၄-၂၀၁၆
၁၀-၃၁

နေပြည်တော်၊ ၁၃၇၇ ခုနှစ်၊ တပေါင်းလဆန်း ၉ ရက်

(၂၀၁၆ ခုနှစ်၊ မတ်လ ၁၇ ရက်)

အမှတ်။ ရခိုင်ပြည်နယ်၊ ကျောက်ဖြူခရိုင်၊ ကျောက်ဖြူမြို့နယ်အတွင်းရှိ အောက်ဖော်ပြပါ မြေဧရိယာ (၂၆၈.၈၈)ဧကအား မြန်မာ့ရေနံနှင့်သဘာဝဓာတ်ငွေ့လုပ်ငန်း၊ အရှေ့တောင်အာရှရေနံနှင့် သဘာဝဓာတ်ငွေ့ပိုက်လိုင်းစီမံကိန်း၊ ရွှေစီမံကိန်း မြေနေရာများအဖြစ် အသုံးပြုရန်အတွက် မြေနှင့်အခွန်အမိန့်ဆင့်ဆိုချက် ၃၃၂ အရ စွမ်းအင်ဝန်ကြီးဌာန သို့ အခမဲ့လွှဲပြောင်းပေးလိုက်သည်။

မြို့နယ်	ကျေးရွာအုပ်စု အမည်	ကွင်းအမှတ်/ အမည်	မြေကွက် အမှတ်ပေါင်း	မြေဧရိယာ (ဧက)	မှတ်ချက်
ကျောက်ဖြူ	လိပ်ခဲမော်	၄၅၄/လောကုန်ဘောင်ကွင်း၊ ၄၅၇/မရကျွန်းမြောက်ကွင်း၊	၁၆ ခု	၁၀၅.၃၅	ရွှေစီမံကိန်းမြေ အဖြစ်အသုံးပြုရန်
	အ	၄၅၇/မရကျွန်းမြောက်ကွင်း၊ ၄၅၈/မရကျွန်းမြောက်ကွင်း၊	၃ ခု	၄.၂၇	
ကျောက်ဖြူ	ရတန	၃၃၉/ကျောက်ခမောက်ကွင်း၊ ၃၆၂/ကပိုင်ချောင်းတောင်ကွင်း၊ ၃၃၈/ရတနကွင်း၊ ၃၆၂/ ကပိုင်ချောင်းတောင်ကွင်း၊ ၃၃၁/ငကဲပြိန်ကွင်း၊ ၃၃၉/ကျောက်ခမောက်ကွင်း၊ OSS/ကြေးတိုင်ပြင်ကွင်း၊	၅ ခု	၂.၈၄	အရှေ့တောင်အာရှ ရေနံနှင့်သဘာဝ ဓာတ်ငွေ့ပိုက်လိုင်း စီမံကိန်းမြေအဖြစ် အသုံးပြုရန်
ကျောက်ဖြူ	ကြတ္တိန်	၄၉၉/သဖန်းခါးမြောက်ကွင်း၊ ၅၀၁/သပြေတောင်အရှေ့ကွင်း၊ ၅၀၂ / ကြတ္တိန်ကွင်း၊	၁၁ ခု	၉.၅၃	
ကျောက်ဖြူ	ဦးကင်း	၅၁၃/ကျောက်ကျင်ချောင်း ကွင်း	၂ ခု	၄.၅၀	
ကျောက်ဖြူ	အုန်းတော	၄၆၆ / ပြိုင်းစိက္ကောတောကွင်း	၄ ခု	၉.၂၄	

ဖြန့်ဝေခြင်း

- ၁။ ပြည်ထောင်စုအစိုးရအဖွဲ့ရုံး၊
- ၂။ ပြည်ထောင်စုဝန်ကြီး၊ စွမ်းအင်ဝန်ကြီးဌာန၊
- ၃။ ပြည်ထောင်စုဝန်ကြီး၊ လယ်ယာစိုက်ပျိုးရေးနှင့် ဆည်မြောင်းဝန်ကြီးဌာန၊
- ၄။ ဝန်ကြီးချုပ်၊ ရခိုင်ပြည်နယ်အစိုးရအဖွဲ့၊
- ၅။ ညွှန်ကြားရေးမှူးချုပ်၊ အထွေထွေအုပ်ချုပ်ရေးဦးစီးဌာန၊
(အမှုတွဲနှင့်အတူ ပူးတွဲပေးပို့ပါသည်)
- ၆။ ညွှန်ကြားရေးမှူးချုပ်၊ လယ်ယာမြေစီမံခန့်ခွဲရေးနှင့် စာရင်းအင်းဦးစီးဌာန၊
- ၇။ ဦးဆောင်ညွှန်ကြားရေးမှူး၊ မြန်မာ့ရေနံနှင့် သဘာဝဓာတ်ငွေ့လုပ်ငန်း၊
- ၈။ ဦးဆောင်ညွှန်ကြားရေးမှူး၊ ပုံနှိပ်ရေးနှင့်စာအုပ်ထုတ်ဝေရေးလုပ်ငန်း၊ (ပြည်ထောင်စုသမ္မတ
မြန်မာနိုင်ငံတော်ပြန်တမ်းတွင် ထည့်သွင်းကြေညာပေးပါရန်)
- ၉။ အုပ်ချုပ်ရေးမှူး၊ ရခိုင်ပြည်နယ်အထွေထွေအုပ်ချုပ်ရေးဦးစီးဌာန၊
- ၁၀။ ဦးစီးဌာနမှူး၊ ရခိုင်ပြည်နယ်လယ်ယာမြေစီမံခန့်ခွဲရေးနှင့် စာရင်းအင်းဦးစီးဌာန၊
- ၁၁။ အုပ်ချုပ်ရေးမှူး၊ ကျောက်ဖြူခရိုင်အထွေထွေအုပ်ချုပ်ရေးဦးစီးဌာန၊
- ၁၂။ အုပ်ချုပ်ရေးမှူး၊ ကျောက်ဖြူမြို့နယ်အထွေထွေအုပ်ချုပ်ရေးဦးစီးဌာန၊
- ၁၃။ ဦးစီးဌာနမှူး၊ ကျောက်ဖြူမြို့နယ်လယ်ယာမြေစီမံခန့်ခွဲရေးနှင့် စာရင်းအင်းဦးစီးဌာန၊
- ၁၄။ တာဝန်ခံအရာရှိ၊ မြန်မာ့ရေနံနှင့် သဘာဝဓာတ်ငွေ့လုပ်ငန်း၊ အရှေ့တောင်အာရှ၊ ရေနံနှင့်
သဘာဝဓာတ်ငွေ့ပိုက်လိုင်းစီမံကိန်း၊ ကျောက်ဖြူမြို့၊
- ၁၅။ လှည့်လည်စာတွဲ၊
- ၁၆။ ရုံးလက်ခံ။

အမိန့်အရ



ဝေတွဲအမြဲတမ်းအတွင်းဝန်



2015 - 0433877

သော လက်ရှိမြေပုံတွင် ယခုနှစ်အသုံးပြုသော ဦးပိုင်ခြေပုံ
လက်ခံရေးကူးချုပ်မှန်



ဦးပိုင်အမှတ်/ မြေကွက်အမှတ်
၁၆၁၆၅၂၁၉၀၂၁၆၀၀၀
၁၅၂၁

မြန်မာ့အလင်းစာတိုက်အုပ်ချုပ်ရေးဦးစီးဌာန
ကျောက်ပြင်

— ୫:୩୦ ଖୁବ୍ ଧୀର —

ခရိုင်အတွေးထွေအုပ်ချုပ်ရေးဦးစီးဌာန၊
ကျောက်မြို့မြို့

(အထက်ဖော်ပြပါအကြောင်းအရာကတစ်ဆင့် အသုံးပြုနိုင်ပါသည်။)

ਸ੍ਰੀ ਗੁਰੂ ਗ੍ਰੰਥ ਸਾਹਿਬ

[illegible]

သတ်မှတ်ချက်များ (စစ်ဆေးရန်)



DDA

ပြည်ထောင်စုသမ္မတမြန်မာနိုင်ငံတော်

ပြည်ထဲရေးဝန်ကြီးဌာန

အမိန့်ကြော်ငြာစာ (၁၇၁၁ / ၂၀၁၅)

UTMS

NAP/622

နေပြည်တော်၊ ၁၃၇၇ ခုနှစ်၊ တန်ဆောင်မုန်းလပြည့်ကျော် ၁၂ ရက်

(၂၀၁၅ ခုနှစ်၊ ဒီဇင်ဘာလ ၈ ရက်)

အမှတ်။ ၁၈၉၄ ခုနှစ်၊ မြေသိမ်းအက်ဥပဒေပုဒ်မ ၄၊ ပုဒ်မခွဲ (၁)အရ အောက်ဖော်ပြပါမြေများကို အများပြည်သူအကျိုးငှာ မြန်မာ့ရေနံနှင့် သဘာဝဓာတ်ငွေ့လုပ်ငန်း၊ အရှေ့တောင်အာရှ၊ ရေနံနှင့် သဘာဝဓာတ်ငွေ့ပိုက်လိုင်းစီမံကိန်း မြေအဖြစ် အသုံးပြုရန်အတွက် စွမ်းအင်ဝန်ကြီးဌာနမှ အလိုရှိကြောင်း ကြေညာလိုက်သည်-

မြေတည်ရှိရာဒေသ

ပြည်နယ်	မြို့နယ်	ကျေးရွာအုပ်စု အမည်	ကွင်းအမှတ်/ အမည်	ဦးပိုင် ပေါင်း	မြေဧရိယာ(ဧက)
ရခိုင်	ကျောက်ဖြူ	ဝုံးချွန်	၄၃၉ / ငသံခဲကွင်း ၄၅၀ / အောက်ပြိန်ကွင်း ၄၅၁ / လယ်ခါကွင်း ၄၅၂ / ဝုံးချွန်ကွင်း ၄၅၃ / ကံတီကွင်း	၇၄ ခု	လယ်မြေ ၁၇.၆၈ ဥယျာဉ်မြေ ၆.၈၆
ရခိုင်	ကျောက်ဖြူ	လိပ်ခမော်	၄၅၄ / ငလာကုန်တောင်ကွင်း ၄၅၇ / မရက္ခန်းမြောက်ကွင်း	၁၂၂ ခု	လယ်မြေ ၆၅.၆၅ ဥယျာဉ်မြေ ၁၅.၀၃ ကိုင်းမြေ ၁.၁၂ ဧနီမြေ ၀.၀၅
စုစုပေါင်း			၇ ကွင်း	၁၉၆ ခု	လယ်မြေ ၈၃.၃၃ ဥယျာဉ်မြေ ၂၁.၈၉ ကိုင်းမြေ ၁.၁၂ ဧနီမြေ ၀.၀၅
			စုစုပေါင်းမြေဧရိယာ		၁၀၆.၃၉

မြေသိမ်းအက်ဥပဒေပုဒ်မ ၃၊ အပိုဒ်ခွဲ (ဂ)တွင် အပ်နှင်းထားသော လုပ်ပိုင်ခွင့်များအရ ကျောက်ဖြူခရိုင်အထွေထွေအုပ်ချုပ်ရေးဦးစီးဌာန၊ အုပ်ချုပ်ရေးမှူးအား အထက်ဖော်ပြပါဒေသရှိ မြေသိမ်းယူခြင်းကိစ္စအဝဝကို အရေးယူဆောင်ရွက်ရန် ကော်လံထွော်အရာရှိအဖြစ် ခန့်ထားလိုက်သည်။

သိမ်းယူမည့်မြေနှင့်စပ်လျဉ်း၍ မြေသိမ်းအက်ဥပဒေပုဒ်မ ၄၊ ပုဒ်မခွဲ (၂)တွင် ပြဋ္ဌာန်းထားသည့် အတိုင်း ဆောင်ရွက်ရန် ကျောက်ဖြူခရိုင်အထွေထွေအုပ်ချုပ်ရေးဦးစီးဌာန၊ အုပ်ချုပ်ရေးမှူးသို့ လုပ်ပိုင်ခွင့်အပ်နှင်းလိုက်သည်။

မြေသိမ်းအက်ဥပဒေပုဒ်မ ၆ အရ အောက်ဖော်ပြပါမြေများကို အများပြည်သူအကျိုးငှာ စွမ်းအင်ဝန်ကြီးဌာန၊ မြန်မာ့ရေနံနှင့် သဘာဝဓာတ်ငွေ့လုပ်ငန်း၊ အရှေ့တောင်အာရှ၊ ရေနံနှင့် သဘာဝဓာတ်ငွေ့ပိုက်လိုင်းစီမံကိန်းအတွက် သိမ်းဆည်းရန် ရည်ရွယ်ကြောင်း ကြေညာလိုက်သည်။

မြေအကြောင်းအရာဖော်ပြချက်။ တိုင်းတာသတ်မှတ်ထားသောမြေ၏ ကွင်းအမှတ် / အမည်၊ ဦးပိုင်အမှတ်၊ မြေဧရိယာနှင့် ပိုင်ရှင်အမည်များကို နောက်ဆက်တွဲဖြင့် ဖော်ပြအပ်ပါသည်။

ဖော်ပြပါမြေကွက်များ၏ အလား(၄)ရပ်မှာ အောက်ပါအတိုင်းဖြစ်ပါသည်-

- | | |
|---------------|--|
| အရှေ့လားသော် | - ဂုံးချိန်ကျေးရွာအုပ်စု ဦးငြိမ်းချမ်းမောင်၊ မဆွေဇင်ဦးတို့၏ ဂရန်မြေ၊ ဦးမင်းကြည်၊ ဦးဝင်းမြင့်နှင့် ဦးဖြူသီးပါ (၂၅)ဦး၏ ဥယျာဉ်ခြံမြေများ၊ ဦးလှဖြူသံပါ (၄၀)ဦး၏ လယ်မြေများ နှင့် လိပ်ခမော်ကျေးရွာအုပ်စု ဦးကျော်အေးပါ(၁၇)ဦး၏ ဥယျာဉ်ခြံမြေများနှင့် ဦးမောင်ထွန်းဖြူပါ (၃၈)ဦး၏ လယ်မြေများ၊ |
| အနောက်လားသော် | - ဂုံးချိန်ကျေးရွာအုပ်စု ဦးငြိမ်းချမ်းမောင်၏ ဂရန်မြေ၊ ဦးထွန်းသောင်းနှင့် ဦးအေးမင်းပါ (၁၂)ဦးတို့၏ ဥယျာဉ်ခြံမြေနှင့် ဦးမောင်ကောက်ပါ (၁၁)ဦး၏ လယ်မြေများနှင့် လိပ်ခမော်ကျေးရွာအုပ်စု ခလရ(၃၄)၏ စက်ပစ်ကွင်းမြေ၊ နေရာနှင့် ဦးလှဖြူသံပါ (၅၈)ဦး၏ လယ်မြေများ၊ |
| တောင်လားသော် | - ဂုံးချိန်ကျေးရွာအုပ်စု ဦးငယောင်းပါ (၁၁)ဦး၏ ဥယျာဉ်ခြံမြေများ၊ ဦးမောင်ပါးပါ (၁၈)ဦး၏ လယ်မြေများနှင့် လိပ်ခမော်ကျေးရွာအုပ်စု ဒေါ်မေငယ်မပါ(၃၆)ဦး၏ ဥယျာဉ်ခြံမြေများ၊ ဦးဘဟန်ပါ (၂၈)ဦး၏ လယ်မြေများ၊ |

မြောက်လားသော်

- ဘင်္ဂလားပင်လယ်၊ စေပုတ်ကောရွာ၊ ဦးမောင်ဝေပါ (၁၃)ဦး၏ ဥယျာဉ်ခြံမြေများ၊ ဦးလှဖြူသံပါ (၆)ဦး၏လယ်မြေများနှင့် ဂုံးချိန်-လိပ်ခမော်ကျေးရွာအုပ်စုရွာချင်းဆက်လမ်း၊

မှတ်ချက်။ စာရင်းတွင် ဖော်ပြပါမြေကွက်များနှင့် ဧရိယာများသည် ၂၀၁၂-၂၀၁၃ ခုနှစ်အတွက် အသုံးပြုသော မြေပုံအရဖြစ်၍ အထက်ဖော်ပြပါမြေပုံများကို ကျောက်ဖြူခရိုင်အထွေထွေအုပ်ချုပ်ရေး ဦးစီးဌာနရုံးတွင် ကြည့်ရှုစစ်ဆေးနိုင်ပါသည်။

မြေသိမ်းအက်ဥပဒေပုဒ်မ ၁၇၊ ပုဒ်မခွဲ (၁)အရ မြေသိမ်းအက်ဥပဒေပုဒ်မ ၉၊ ပုဒ်မခွဲ (၁)နှင့် (၃)တို့တွင် ဖော်ပြထားသည့်အတိုင်း အမိန့်ကြော်ငြာစာထုတ်ဆင့်ပြီးနောက် (၁၅)ရက်ကုန်ဆုံးသော အခါ အဆိုပါမြေကိုသိမ်းယူပြီးလျှင် မြန်မာ့ရေနံနှင့် သဘာဝဓာတ်ငွေ့လုပ်ငန်း၊ အရှေ့တောင်အာရှ၊ ရေနံနှင့်သဘာဝဓာတ်ငွေ့ပိုက်လိုင်းစီမံကိန်း မြေအဖြစ် အသုံးပြုရန်အတွက် စွမ်းအင်ဝန်ကြီးဌာန အမည်ဖြင့် စက်မှုမြေငှားဂရန်ထုတ်ပေးနိုင်ရေး လုပ်ထုံးလုပ်နည်းနှင့်အညီ ဆောင်ရွက်ရန် မြေသိမ်း ကော်လံထွော်အရာရှိအား ညွှန်ကြားလိုက်သည်။

ဒုတိယဗိုလ်ချုပ်ကြီးကိုကို
ပြည်ထောင်စုဝန်ကြီး

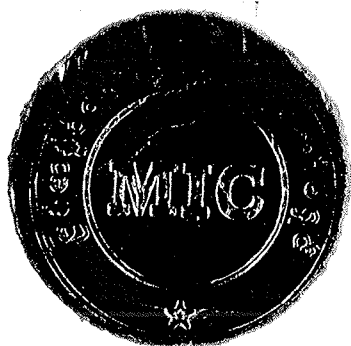
စာအမှတ်၊ ပထရ / ၂ - ၃ (၁၇၁၁) / ထောက် ၂

ရက်စွဲ၊ ၂၀၁၅ ခုနှစ်၊ ဒီဇင်ဘာလ ၈ ရက်

ဖြန့်ဝေခြင်း

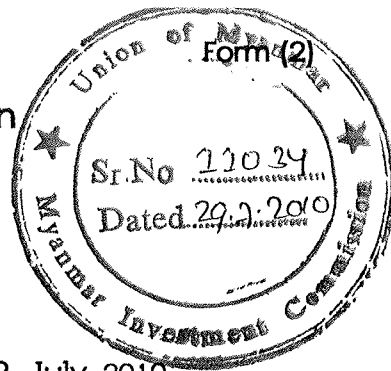
- ၁။ ပြည်ထောင်စုဝန်ကြီး၊ စွမ်းအင်ဝန်ကြီးဌာန၊
- ၂။ ပြည်ထောင်စုဝန်ကြီး၊ လယ်ယာစိုက်ပျိုးရေးနှင့် ဆည်မြောင်းဝန်ကြီးဌာန၊
- ၃။ ဝန်ကြီးချုပ်၊ ရခိုင်ပြည်နယ်အစိုးရအဖွဲ့၊
- ၄။ ညွှန်ကြားရေးမှူးချုပ်၊ အထွေထွေအုပ်ချုပ်ရေးဦးစီးဌာန၊
(အမှုတွဲနှင့်အတူ ပူးတွဲပေးပို့ပါသည်)
- ၅။ ညွှန်ကြားရေးမှူးချုပ်၊ လယ်ယာမြေစီမံခန့်ခွဲရေးနှင့် စာရင်းအင်းဦးစီးဌာန၊
- ၆။ ဦးဆောင်ညွှန်ကြားရေးမှူး၊ မြန်မာ့ရေနံနှင့် သဘာဝဓာတ်ငွေ့လုပ်ငန်း၊
- ၇။ ဦးဆောင်ညွှန်ကြားရေးမှူး၊ ပုံနှိပ်ရေးနှင့်စာအုပ်ထုတ်ဝေရေးလုပ်ငန်း၊ (ပြည်ထောင်စုသမ္မတ မြန်မာနိုင်ငံတော်ပြန်တမ်းတွင် ထည့်သွင်းကြေညာပေးပါရန်)

၁၇၁၁ / ၂၀၁၅



The Myanmar Investment Commission

PERMIT



Permit No. 444/2010

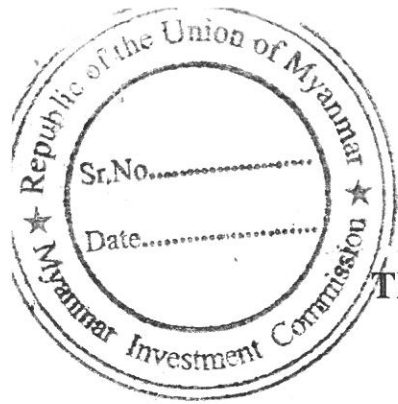
Date 29, July, 2010

The Myanmar Investment Commission issues this Permit under Section 10 of the Union of Myanmar Foreign Investment Law-

- (a) Name of Promoter DIRECTOR GENERAL,
ENERGY PLANNING DEPARTMENT
- (b) Citizenship MYANMAR
- (c) Address BUILDING NO.(6), NAY PYI TAW, MYANMAR
- (d) Name and Address of principal organization MINISTRY OF ENERGY,
BUILDING NO.(6), NAY PYI TAW.
- (e) Place of incorporation REPUBLIC OF KOREA
- (f) Type of business in which investment is to be made EXPLORATION,
APPRAISAL, DEVELOPMENT AND SALE OF NATURAL GAS
- (g) Place(s) at which investment is permitted BLOCK A-1 & A-3,
RAKHINE OFFSHORE AREA
- (h) Amount of foreign capital US \$ 1975.401 MILLION
- (i) Period for bringing in foreign capital 2010 TO 2014
- (j) Total amount of capital (Kyat) EQUIVALENT IN KYAT OF
US\$ 1975.401 MILLION
- (k) Permitted duration of investment 30 YEARS OF COMMERCIAL OPERATION
- (l) Name of the economic organization to be formed in Myanmar
DAEWOO INTERNATIONAL CORPORATION, ONGC VIDESH LIMITED,
GAIL(INDIA) LIMITED, KOREA GAS CORPORATION


Chairman

The Myanmar Investment Commission



Form (2)

Annex-1


THE REPUBLIC OF THE UNION OF MYANMAR
MYANMAR INVESTMENT COMMISSION

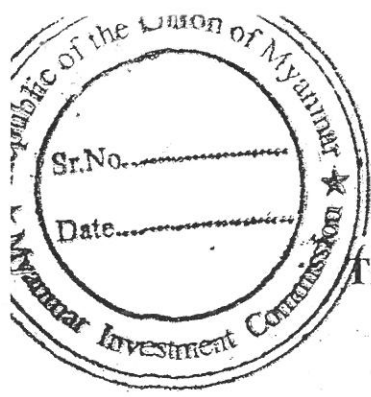
Amendment on Permit No. 444/2010, dated 29th July, 2010

The Myanmar Investment Commission, at its meeting(19/2016)held on dated 7th October 2016 had approved to change the company's name from "Daewoo International Corporation" to "POSCO Daewoo Corporation". Hence, the name of the company may be amended as "POSCO Daewoo Corporation, ONGC Videsh Limited, Gail(India) Limited, Korea Gas Corporation".

(n) **Name of Company incorporated in Myanmar** POSCO
DAEWOO CORPORATION, ONGC VIDESH LIMITED, GAIL(INDIA)
LIMITED, KOREA GAS CORPORATION

Date: 8th November, 2016
Location: Yangon


(Mya Thuza)
Joint Secretary



Form (2)

Annex-1

THE REPUBLIC OF THE UNION OF MYANMAR
MYANMAR INVESTMENT COMMISSION

Amendment on Permit No. 444/2010, dated 29th July, 2010

The Myanmar Investment Commission, at its meeting(19/2016)held on dated 7th October 2016 had approved the transfer of Participating Interest (PI) "Daewoo International Corporation" to "POSCO Daewoo Corporation". Hence, the name of the company may be amended as "POSCO Daewoo Corporation, ONGC Videsh Limited, Gail(India) Limited, Korea Gas Corporation".

(n) Name of Company incorporated in Myanmar POSCO
DAEWOO CORPORATION, ONGC VIDESH LIMITED, GAIL(INDIA)
LIMITED, KOREA GAS CORPORATION

(Mya Thuza)
Joint Secretary

Date: 8 November, 2016
Location: Yangon



THE REPUBLIC OF THE UNION OF MYANMAR

Myanmar Investment Commission

Amendment on Permit No. 444/2010 dated 29th July 2010

The Myanmar Investment Commission, at its meeting 6/2020 held on dated 28th April 2020 approved the name of POSCO Daewoo Corporation be changed to POSCO International Corporation.(Block A-1 & A-3)

(n) Name of Company Incorporated in Myanmar POSCO INTERNATIONAL CORPORATION, ONGC VIDESH LIMITED, GAIL (INDIA) LIMITED, KOREA GAS CORPORATION

Date : 2nd June 2020

Location: Yangon

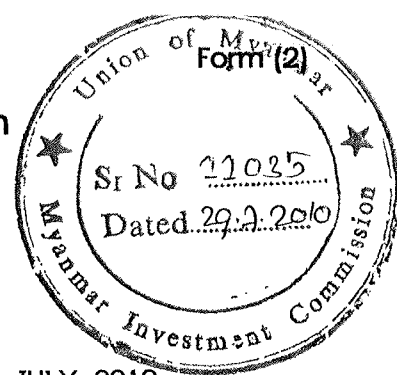
Thant Sin Lwin
for Chairman
(Thant Sin Lwin, Secretary)





The Myanmar Investment Commission

PERMIT



Permit No. 445/2010

Date 29, JULY, 2010

The Myanmar Investment Commission issues this Permit under Section 10 of the Union of Myanmar Foreign Investment Law-

- (a) Name of Promoter DIRECTOR GENERAL,
ENERGY PLANNING DEPARTMENT
- (b) Citizenship MYANMAR
- (c) Address BUILDING NO.(6), NAY PYI TAW, MYANMAR
- (d) Name and Address of principal organization MINISTRY OF ENERGY,
BUILDING NO.(6), NAY PYI TAW.
- (e) Place of incorporation REPUBLIC OF KOREA
- (f) Type of business in which investment is to be made CONSTRUCTION
OF OFFSHORE NATURAL GAS PIPELINE
- (g) Place(s) at which investment is permitted BLOCK A-1 & A-3,
RAKHINE OFFSHORE AREA
- (h) Amount of foreign capital US\$ 443.087 MILLION
- (i) Period for bringing in foreign capital 2010 TO 2013
- (j) Total amount of capital (Kyat) EQUIVALENT IN KYAT OF
US\$ 443.087 MILLION
- (k) Permitted duration of investment 30 YEARS OF COMMERCIAL OPERATION
- (l) Name of the economic organization to be formed in Myanmar
DAEWOO INTERNATIONAL CORPORATION, ONGC VIDESH LIMITED,
GAIL(INDIA) LIMITED, KOREA GAS CORPORATION

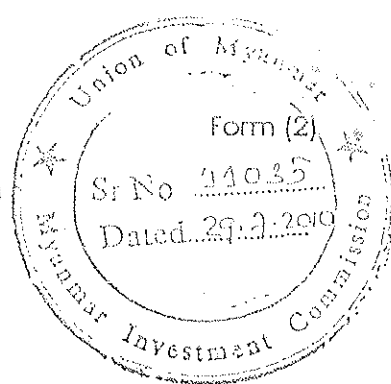
Chairman

The Myanmar Investment Commission



The Myanmar Investment Commission

PERMIT



Permit No. 445 /2010

Date 29 July, 2010

The Myanmar Investment Commission issues this Permit under Section 10 of the Union of Myanmar Foreign Investment Law-

- (a) Name of Promoter DIRECTOR GENERAL
ENERGY PLANNING DEPARTMENT
- (b) Citizenship MYANMAR
- (c) Address BUILDING NO.(6), NAY PYI TAW, MYANMAR
- (d) Name and Address of principal or ganization MINISTRY OF ENERGY,
BUILDING NO.(6), NAY PYI TAW.
- (e) Place of incorporation REPUBLIC OF KOREA
- (f) Type of business in which investment is to be made CONSTRUCTION OF
OFFSHORE NATURAL GAS PIPELINE FACILITIES AND TRANSPORTATION OF
NATURAL GAS
- (g) Place(s) at which investment is permitted BLOCK A-1 & A-3,
RAKHINE OFFSHORE AREA
- (h) Amount of foreign capital US \$ 443.087 MILLION
- (i) Period for bringing in foreign capital 2010 TO 2013
- (j) Total amount of capital (Kyat) EQUIVALENT IN KYAT OF
US\$ 443.087 MILLION
- (k) Permitted duration of investment 30 YEARS OF COMMERCIAL OPERATION
- (l) Name of the economic or ganization to be formed in Myanmar
DAEWOO INTERNATIONAL CORPORATION, ONGC VIDESH LIMITED,
GAIL(INDIA) LIMITED, KOREA GAS CORPORATION

Chairman

The Myanmar Investment Commission



Form (2)

Annex-1

THE REPUBLIC OF THE UNION OF MYANMAR
MYANMAR INVESTMENT COMMISSION

Amendment on Permit No. 445 /2010, dated 29th July, 2010

The Myanmar Investment Commission, at its meeting (22/2016) held on dated 1st December 2016 had approved to change the company's name from "Daewoo International Corporation" to "POSCO Daewoo Corporation". Hence, the name of the company may be amended as "POSCO Daewoo Corporation, ONGC Videsh Limited, Gail (India) Limited, Korea Gas Corporation". (Block A-1 & A-3)

(n) Name of Company incorporated in Myanmar _____ POSCO

DAEWOO CORPORATION, ONGC VIDESH LIMITED, GAIL(INDIA)

LIMITED, KOREA GAS CORPORATION

(Aung Naing Oo)

Secretary

Date: 15th December, 2016

Location: Yangon



THE REPUBLIC OF THE UNION OF MYANMAR

Myanmar Investment Commission

Amendment on Permit No. 445/2010 dated 29th July 2010

The Myanmar Investment Commission, at its meeting 6/2020 held on dated 28th April 2020 approved the name of POSCO Daewoo Corporation be changed to POSCO International Corporation.(Block A-1 & A-3)

(n) Name of Company Incorporated in Myanmar POSCO INTERNATIONAL CORPORATION, ONGC VIDESH LIMITED, GAIL (INDIA) LIMITED, KOREA GAS CORPORATION

Date : 2nd June 2020

Location: Yangon

Thant Sin Lwin

for Chairman

(Thant Sin Lwin, Secretary)



Appendix D Progress Status of Phase 1 EMP

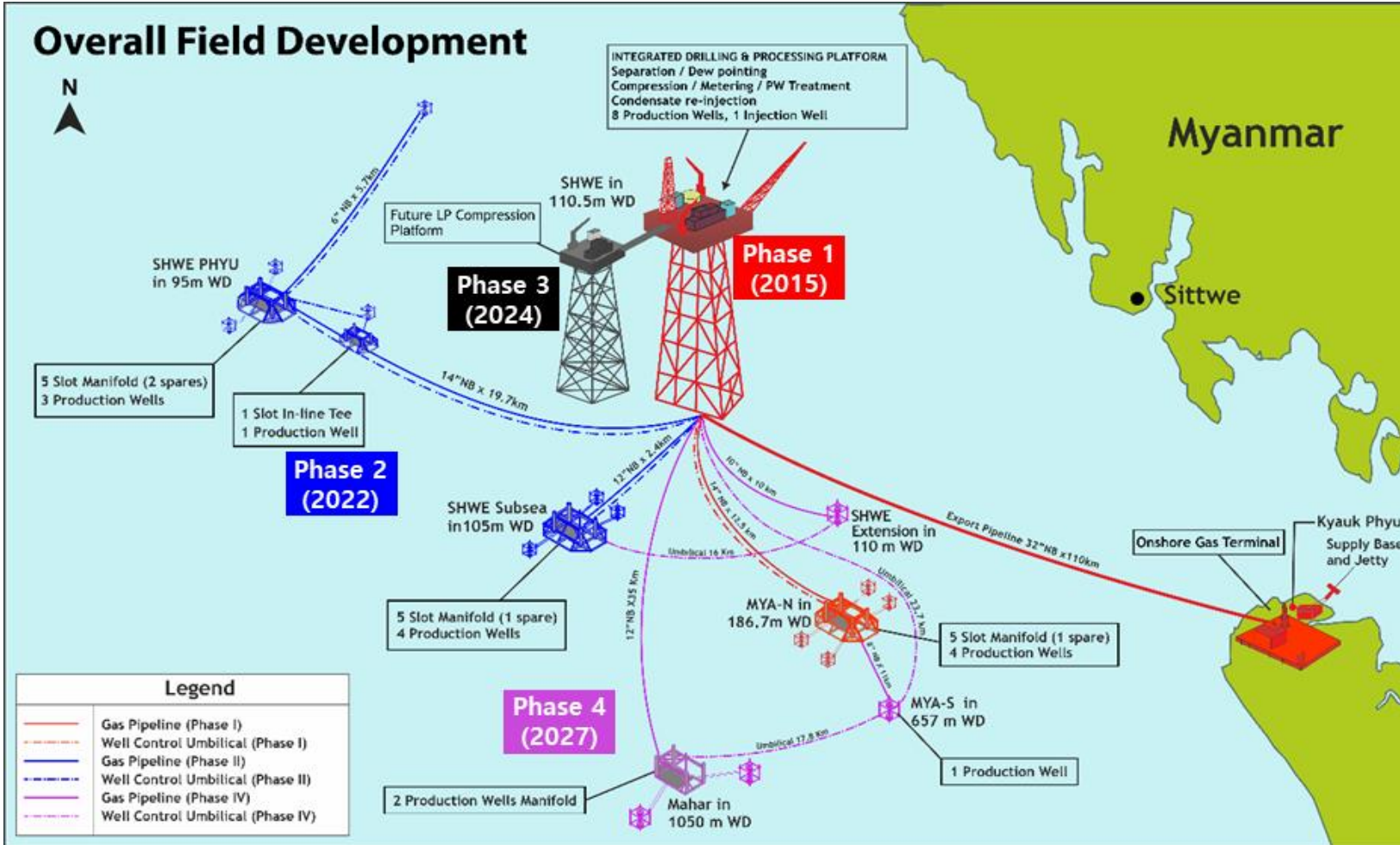
Progress Status of Phase 1 EMP For SHWE Offshore

10th May 2024

Meeting Agenda

Time Allocated	Agenda	Presented by
10:00 – 10:10	1. Opening Remarks by ECD	ECD
10:10 – 10:40	2. Introduction	MOGE
10:40 – 11:00	3. PIC's Presentation on EMP	PIC
11:00 – 11:15	4. CSR Update	MOGE
11:15 – 11:30	5. E Guard's Discussion	E-Guard
11:30 – 12:00	6. ECD Guidance and Discussion on Way Forward	All
12:00	End of Meeting	

SHWE Project



- **SHWE Project:**

A multiple gas-condensate field integrated development within Blocks A-1 and A-3

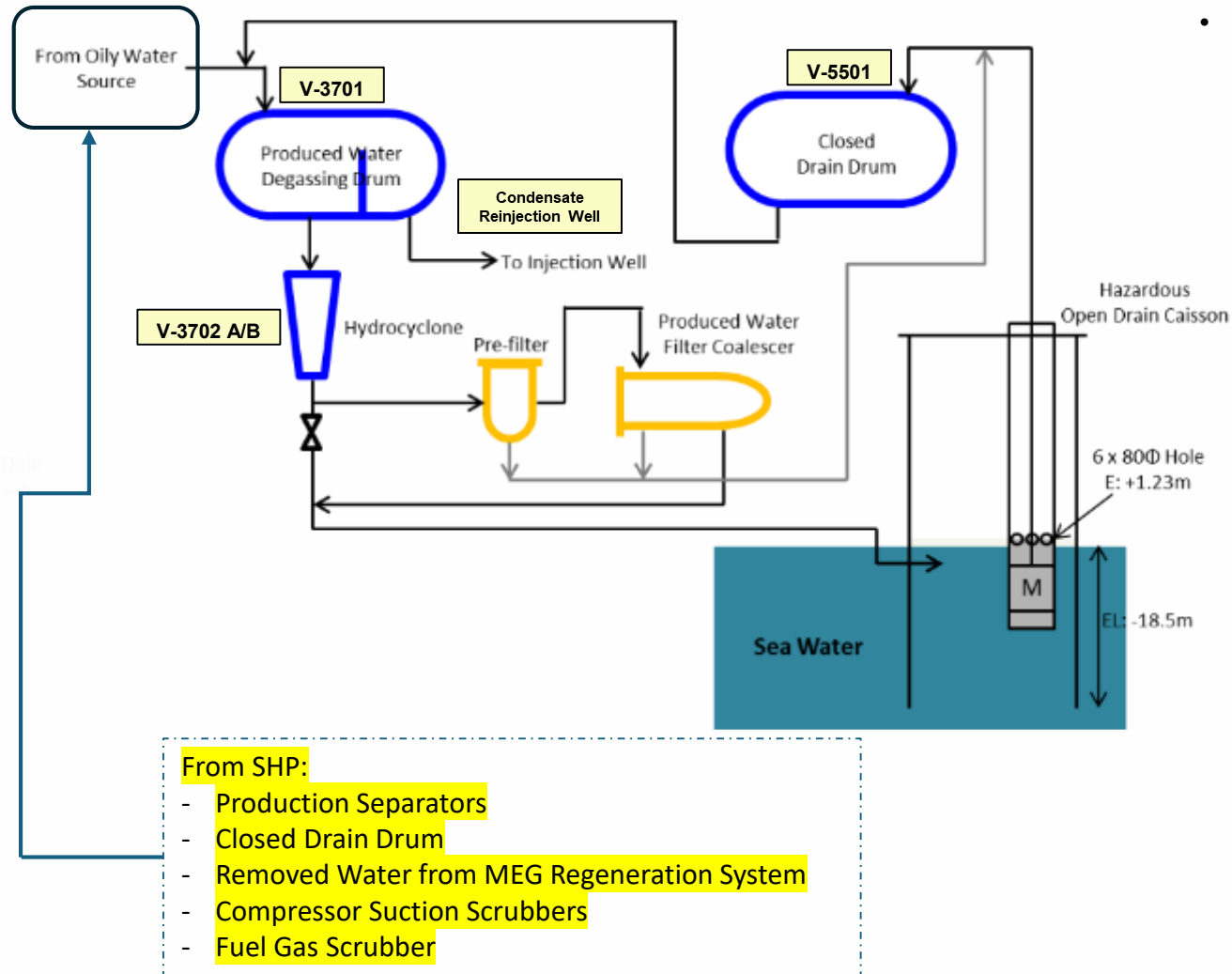
- **Phase 4 Development:**

- Mahar: (2) Subsea Wells
- Mya South: (1) Subsea Well
- Shwe Extension: (1) Subsea Well

- **Consortium of 5 Companies:**

- (1) POSCO INTERNATIONAL Corporation (PIC)(51%);
- (2) Myanmar Oil and Gas Enterprise (MOGE)(15%);
- (3) Oil and Natural Gas Corporation Videsh Limited (OVL)(17%);
- (4) Gas Authority of India (GAIL)(8.5%) ; and
- (5) Korea Gas Corporation (KOGAS) (8.5%).

Produced Water Treatment System



• Degassing Drum V-3701, Hydrocyclone V-3702A/B, Coalescing Filter Package A-3703:

- The produced water degassing drum V-3701 is operated at a controlled pressure (about 7 barg) with blanketing by fuel gas. The oil/water separation is carried out by gravity inside the drum which includes two compartments, one oil compartment recovering the oil layer formed at the surface of the liquid in the 1st compartment which flows over a separation baffle (weir).
- Oily water is sent to the hydrocyclone packages V-3702 A/B (2 x 100%) under normal liquid level control and then to the Produced Water Coalescer Filter for further polishing. Hydrocyclone reject stream is sent to the closed drain drum V-5501, and will be pumped back to the produced water degassing drum for re-treatment. Treated water is sent to the hazardous open drain caisson where any oil layer can be pumped back to the process (via the closed drain drum) with a dedicated submerged lift pump.
- The OIW measurement for the Produced Water is at downstream of the Hydrocyclones before disposal to sea through the Hazardous Open Drain Caisson.
- Therefore, the actual OIW at the caisson bottom is expected to be on-spec as the oil will be separated inside the caisson and recovered to the Closed Drain Drum.
- **Main Caisson External Diameter (965 mm), Internal Caisson Diameter (468 mm), Main Caisson Length (40.760 m), and Internal Caisson Length (30.560 m)**
- **Seawater Elevation (Min and Max)**

Produced Water Treatment System (Cont.)



Degassing Drum V-3701

Produced Water Treatment System (Cont.)



Closed Drain Drum V-5501

Produced Water Treatment System (Cont.)



Hydrocyclone (V-3702 A&B)

Produced Water Treatment System (Cont.)



Produced Water Pre-Filter & Filter Coalescer Package (A-3703)

Produced Water Treatment System (Cont.)



Produced Water Pre-Filter & Filter Coalescer Package (A-3703)

Produced Water Treatment System (Cont.)



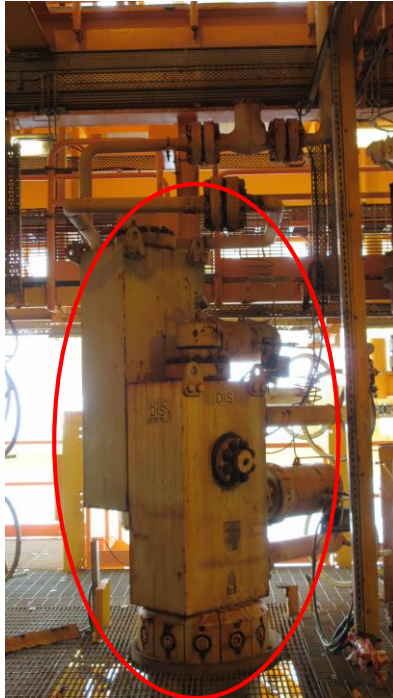
Open Drain Caisson
(M-5601)



Open Drain Caisson
Pump (P-5601)



Produced Water Treatment System (Cont.)



Condensate Reinjection Well



Condensate Booster Pumps (P-3401 A&B)

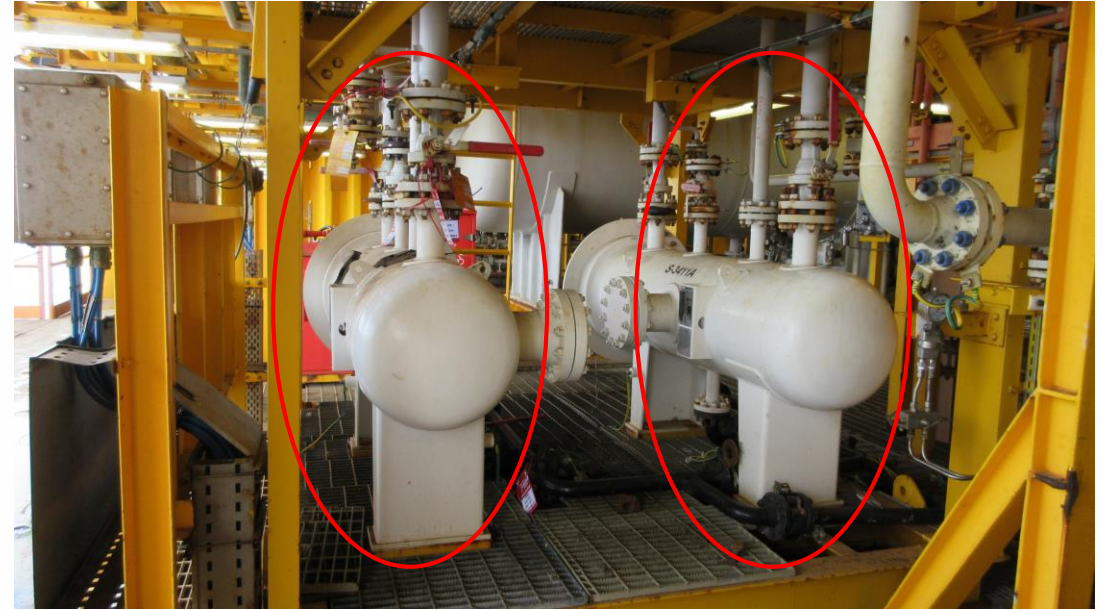


**Liquid Re-injection Pumps
(P-3402 A&B)**

Produced Water Treatment System (Cont.)




**Condensate Filters
(S-3403 A&B)**




**Post Condensate Filters
(S-3411 A&B)**

PIC Waste Management Workflow





SHP-OGT Waste Management Work Flow for Storage and Disposal



1. Classification	Non-Hazardous Waste					Hazardous Waste			
	Food Kitchen Waste	Kitchen Wastes (Cooking Oils)	General Waste (Plastic/Glass bottles, Cans, Used Paper, Paper cup, Rubber, Tyres, Hoses, Non-Contaminated Clothes etc.)	Scrap woods*	Scrap Metal*	Used Lube Oil	Waste Oil	Paints / Other Chemicals / Used Toner Cartridges/Produced Sand/Used MEG/Used Batteries/Expired Chemicals/Fluorescent Tubes/Contaminated Oily Rags & Clothes/Lab Wastes	Biomedical Waste* (Clinical Wastes)
2. Storage	Waste Bin	Clip top drums (To Buy)	Waste Bin/Jumbo Bags	Waste Bin/Jumbo Bags	Waste Skid (To Rent)	Clip top drum (To Buy)		No-Cut IBC/Metal Closed Container	SHP/OGT Clinic
3. Transportation	Asteroid	POSCO INTERNATIONAL CORPORATION (MARINE TRANSPORTATION TO MOGE THAKETA JETTY)							LEO
4. Disposal		DOWA (Recognised Hazardous Waste Treatment Facility in Yangon)							
Total Amount (Year, Kg)									

* Scrap Metal: Recyclable steel mixed with the filters, used ring joint gaskets, empty steel cans containers and cables, which are normally Collected by MOGE for reusable Non-Hazardous Wastes after PIC official Letter request for visit and check at OGT for collection. Remained Non-Hazardous Wastes are being arranged by DOWA local contractor for proper disposal.

Scrap Woods to donate local monastery by CSR Rep in KPU.

* Biomedical Waste is keep in a sealed container by Medical Doctor. This is kept in the Clinic, and sending the Biomedical Wastes to Yangon Medical Clinic for proper disposal and Biomedical Waste Disposal Certificate.



Environmental Management Plan (Phase 1)

Monitoring Report Requirements

PIC will submit an Environmental Monitoring Report to MONREC every 6 months. The report will include the following information collated during the Project:

- Environment Record.
- Waste Record.

A summary of the monitoring and record keeping is provided in below Table.

Project Activity/ Environmental Aspect	Monitoring Measures	Reporting	Responsibility
Waste Generation	Quantities of waste discharged Quantities of any fluids discharged and hydrocarbon content if measured	Environmental Discharge Report	PIC
Commercial Fishery Interaction	Recording of community grievances	Records of grievance in accordance with the community grievance mechanism	PIC
Training	Details of crew inductions	Induction record sheet	PIC
Incident reporting	Details of any environmental or social incidents	Incident report forms	PIC
Compliance Reporting	Compliance with EMP	Inspection check sheets Final Environmental Discharge Report	PIC
Accidental Releases and Leaks	Safety Record	Safety record included in Project Environmental Monitoring report	PIC
Air emissions	Calculation of GHG emissions from gas flared	Environmental Monitoring Report	PIC

Summary of the Monitoring and Record-keeping for A-1 and A-3

ISO 14001 Certificates (2019 – 2023)

DNV-GL

MANAGEMENT SYSTEM
CERTIFICATE

Certificate No:
264165-2018-AE-SGP-UKAS

Initial certification date:
10, July, 2019

Valid:
10, July, 2019 - 10, July, 2022

This is to certify that the management system of

POSCO INTERNATIONAL Corporation
#301 Maha Land Center No 56, Kabar Aye Pagoda Road, 11081, Yankin Township, Yangon, Myanmar.

and the sites as mentioned in the appendix accompanying this certificate

has been found to conform to the Environmental Management System standard:
ISO 14001:2015

This certificate is valid for the following scope:
Management and Operator of Shwe Project, Exploration and Production of Gas at Shwe and Mya North Fields including Operation of Shwe Offshore Platform, and Onshore Gas Terminal (OGT) Plant on Ramree Island, Rakhine State, Myanmar.

Place and date:
Singapore, 10, July, 2019



For the issuing office:
DNV GL – Business Assurance
16 Science Park Drive, DNV GL
Technology Centre, Singapore 118327


Woe Kah Boon
Management Representative



Lack of fulfillment of conditions as set out in the Certification Agreement may render this Certificate invalid.
ACCREDITED UNIT: DNV GL Business Assurance UK Limited, 4th Floor, One Building, 30 Stamford Street, London, SE1 9QJ, United Kingdom.
TEL: +4420 393 816 4000. www.dnvgl.co.uk

Lack of fulfillment of conditions as set out in the Certification Agreement may render this Certificate invalid.
ACCREDITED UNIT: DNV GL Business Assurance UK Limited, 4th Floor, One Building, 30 Stamford Street, London, SE1 9QJ, United Kingdom.
TEL: +4420 393 816 4000. www.dnvgl.co.uk

Page 1 of 1

DNV-GL

Certificate No: 264165-2018-AE-SGP-UKAS
Place and date: Singapore, 10, July, 2019

Appendix to Certificate

POSCO INTERNATIONAL Corporation
Locations included in the certification are as follows:

Site Name	Site Address	Site Scope
POSCO INTERNATIONAL Corporation	#301 Maha Land Center No 56, Kabar Aye Pagoda Road, 11081, Yankin Township, Yangon, Myanmar.	Management and Operator of Shwe Project, Exploration and Production of Gas at Shwe and Mya North Fields including Operation of Shwe Offshore Platform, and Onshore Gas Terminal (OGT) Plant on Ramree Island, Rakhine State, Myanmar.
Onshore Gas Terminal Plant	Malagayan st, Leik-Khamaw Village, 07121, Kyauk Phyu Township, Rakhine State, Myanmar	Gas Distribution Terminal at Shwe and Mya North Fields
Shwe Offshore Platform	Shwe Offshore Platform, Latitude (N) 19°40'26.06", Longitude (E) 92°32'35.40", Myanmar	Production of Gas at Shwe and Mya North Fields

Lack of fulfillment of conditions as set out in the Certification Agreement may render this Certificate invalid.
ACCREDITED UNIT: DNV GL Business Assurance UK Limited, 4th Floor, One Building, 30 Stamford Street, London, SE1 9QJ, United Kingdom.
TEL: +4420 393 816 4000. www.dnvgl.co.uk

Page 1 of 1

LRQA

Current issue date:
15 September 2023
Expiry date:
10 July 2025
Certificate identity number:
10002054

Original approval(s):
ISO 14001 - 10 June 2022

Certificate of Approval

This is to certify that the Management System of:

POSCO International Corporation

Level-3, No. 623, Vantage Tower, Pyay Road, Kamayut Township, 11041, Yangon, Myanmar

has been approved by LRQA to the following standards:
ISO 14001:2015

Approval number(s): ISO 14001 – 00055968

This certificate is valid only in association with the certificate schedule bearing the same number on which the locations applicable to this approval are listed.

The scope of this approval is applicable to:
Management and Operator of SHWE Project and Production of Gas, including the operation of SHWE Offshore Platform and its Facilities in Bay of Bengal, and Onshore Gas Terminal on Ramree Island, Rakhine State, Myanmar.

This certificate is a continuation of a previous approval from another certification body as follows:
Previous original ISO 14001 approval on 10-Jul-2019, DNV GL certificate number 264165-2018-AE-SGP-UKAS


Luis Cunha

Aves Operations Manager - North Asia & SAMEA
Issued by: LRQA Limited



LRQA Group Limited, its affiliates and subsidiaries and their respective officers, employees or agents are, individually and collectively, referred to in this clause as 'LRQA'. LRQA assumes no responsibility and shall not be liable to any person for any loss, damage or expense caused by reliance on the information or advice in this document or for any other reason, unless that person has signed a contract with the relevant LRQA entity for the provision of this information or advice and in that case any responsibility or liability is exclusively on the terms and conditions set out in that contract.
Issued by: LRQA Limited, 1 Trinity Park, Bickenhill Lane, Birmingham B37 7YU, United Kingdom

Page 1 of 2

LRQA

Certificate identity number: 10002054

Certificate Schedule

Location	Activities
POSCO International Corporation (Myanmar E & P) Level-3, No. 623, Vantage Tower, Pyay Road, Kamayut Township, 11041, Yangon, Myanmar	ISO 14001:2015 Management and Operator of SHWE Project and Production of Gas, including the operation of SHWE Offshore Platform and its Facilities in Bay of Bengal, and Onshore Gas Terminal on Ramree Island, Rakhine State, Myanmar.
Onshore Gas Terminal Malagayan st, Leik-Khamaw Village, Kyauk Phyu Township, Rakhine State, 07121, Myanmar	ISO 14001:2015 Onshore Gas Terminal on Ramree Island.
Shwe Offshore Platform Latitude (N) 19°40'26.06", Longitude (E) 92°32'35.40", Myanmar	ISO 14001:2015 Gas Production and Facility Operation in Bay of Bengal.

Lack of fulfillment of conditions as set out in the Certification Agreement may render this Certificate invalid.
ACCREDITED UNIT: DNV GL Business Assurance UK Limited, 4th Floor, One Building, 30 Stamford Street, London, SE1 9QJ, United Kingdom.
TEL: +4420 393 816 4000. www.dnvgl.co.uk

Page 2 of 2

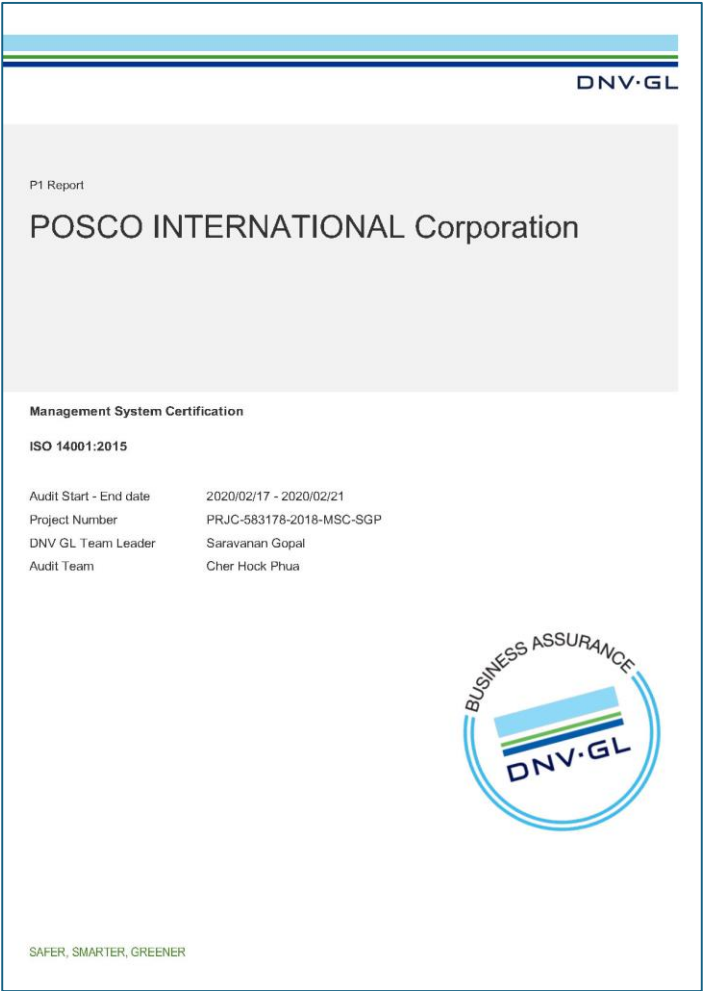
Valid: 10th July 2019 to 10th July 2022

Valid: 15th September 2023 to 10th July 2025

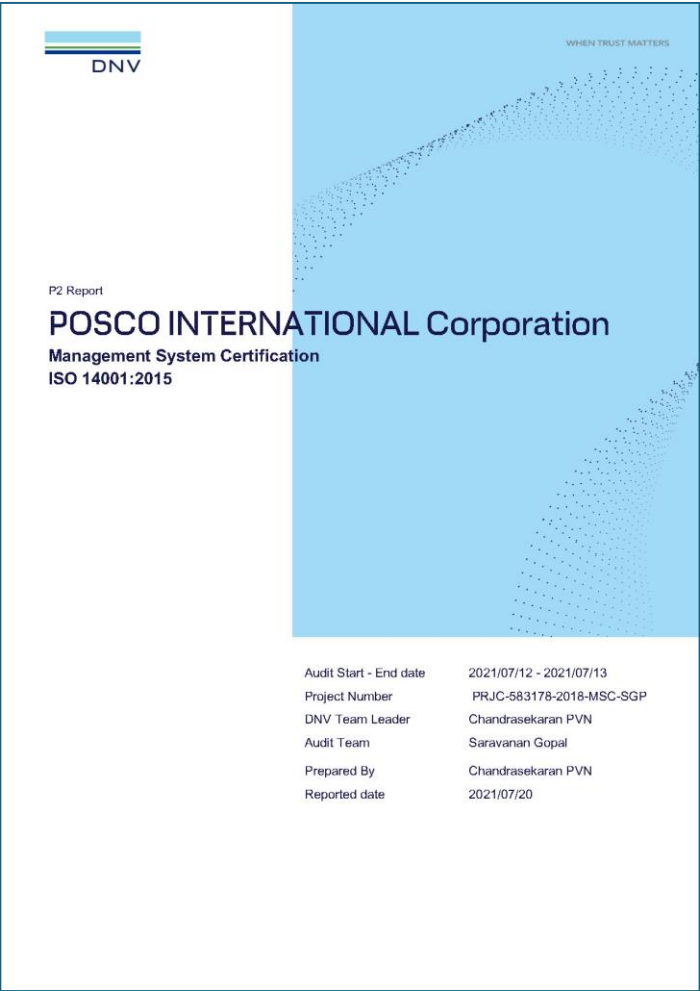
ISO 14001 Audit Reports (2019 - 2023)



Certification Audit - 2019



Surveillance Audit 1 - 2020



Surveillance Audit 2 - 2021

ISO 14001 Audit Reports (2019 - 2023)



Certificate Renewal

Report for:

POSCO International Corporation

LRQA reference: BGK00000791 / 5268958
Assessment dates: 27-June-2022 - 01-July-2022
Reporting date: 05-July-2022
Client address: #301 Maha Land Center No 56 Kabar Aye Pagoda Road, Yankin Township Yangon 11081, MM
Assessment criteria: ISO 14001:2015
Assessment team: Wera Kiettikul
Visit Bowsirikuldech; Wichai Hanthornrongwit; Phornsuang Markmanee; Kamiga Sukkeaw; Nuuntie Thaninnuthawit
LRQA client facing office: BGK Thailand OU

LRQA Group Limited, its affiliates and subsidiaries and their respective officers, employees or agents are, individually and collectively, referred to in this clause as 'LRQA'. LRQA assumes no responsibility and shall not be liable to any person for any loss, damage or expense caused by reliance on the information or advice in this document or howsoever provided, unless that person has signed a contract with the relevant LRQA entity for the provision of this information or advice and in that case any responsibility or liability is exclusively on the terms and conditions set out in that contract.

Re-Certification Audit - 2022



Change to Approval, Surveillance 1

Report for:

POSCO International Corporation

LRQA reference: BGK00000791 / 5268968
Audit dates: 20-July-2023 - 30-August-2023
Reporting date: 14-September-2023
Client address: Level-3, No. 623, Vantage Tower, Pyay Road, Kamayut Township, Yangon 11041, MM
Audit criteria: ISO 14001:2015
Audit team: Wera Kiettikul
Wichai Hanthornrongwit; Nuuntie Thaninnuthawit
LRQA client facing office: BGK Thailand OU

LRQA Group Limited, its affiliates and subsidiaries and their respective officers, employees or agents are, individually and collectively, referred to in this clause as 'LRQA'. LRQA assumes no responsibility and shall not be liable to any person for any loss, damage or expense caused by reliance on the information or advice in this document or howsoever provided, unless that person has signed a contract with the relevant LRQA entity for the provision of this information or advice and in that case any responsibility or liability is exclusively on the terms and conditions set out in that contract.

Surveillance Audit 1 - 2023

Appendix E MOEE' Notification No (103/2017)

“ရွှေသဘာဝဓာတ်ငွေ့ရေနံမြေ” အဖြစ်သတ်မှတ်ခြင်း
[၁၇.၁၁.၂၀၁၇] [၁၇.၁၁.၂၀၁၇] [အမိန့်ကြော်ငြာစာအမှတ်၊ (၁၀၃/ ၂၀၁၇)]

ပြည်ထောင်စုသမ္မတမြန်မာနိုင်ငံတော်အစိုးရ
လျှပ်စစ်နှင့်စွမ်းအင်ဝန်ကြီးဌာန
“ရွှေသဘာဝဓာတ်ငွေ့ရေနံမြေ” အဖြစ်သတ်မှတ်ခြင်း
အမိန့်ကြော်ငြာစာအမှတ်၊ (၁၀၃/ ၂၀၁၇)
၁၃၇၉ ခုနှစ်၊ တန်ဆောင်မုန်းလပြည့်ကျော် ၁၄ ရက်
(၂၀၁၇ ခုနှစ်၊ နိုဝင်ဘာလ ၁၇ ရက်)

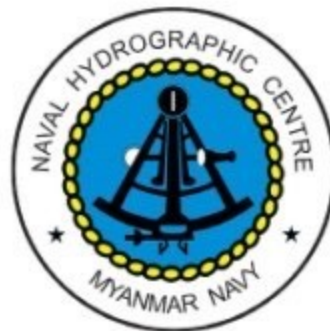
- ☐ ၁။ လျှပ်စစ်နှင့်စွမ်းအင်ဝန်ကြီးဌာနသည် ၁၉၁၈ ခုနှစ်၊ ရေနံမြေများအက်ဥပဒေပုဒ်မ ၃ ပြဋ္ဌာန်းချက်ပါ လုပ်ပိုင်ခွင့်ကိုကျင့်သုံး၍ နိုင်ငံတော်၏ ကမ်းလွန်စီမံကိန်းဖြစ်သော အောက်ဖော်ပြပါကမ်းလွန် ရွှေသဘာဝဓာတ်ငွေ့စီမံကိန်း၏ ဖွံ့ဖြိုးတိုးတက်မှုနှင့် ထုတ်လုပ်မှုဧရိယာနယ်နိမိတ် ကို “ရွှေသဘာဝ ဓာတ်ငွေ့ရေနံမြေ” အဖြစ်သတ်မှတ်ကြေညာလိုက်သည်-
- (က) စစ်တွေမြို့၏ အနောက်တောင်ဘက် ၄၅ မိုင်နှင့် ကျောက်ဖြူမြို့၏ အနောက်မြောက်ဘက် ၇၇ မိုင် အကွာရှိ ရခိုင်ကမ်းလွန်လုပ်ကွက် အမှတ် A-1/ A-3 အတွင်း ရွှေသဘာဝဓာတ်ငွေ့စီမံကိန်းဖွံ့ဖြိုး တိုးတက်မှုနှင့် ထုတ်လုပ်မှုဧရိယာ (Development and Production area)

Point	Latitude			Longitude		
	Degree	Minute	Second	Degree	Minute	Second
A	20	4	0.00	92	9	0.00
B	20	4	0.00	92	24	0.00
C	19	36	0.00	92	41	0.00
D	19	36	0.00	93	1	50.00
E	19	15	30.00	93	17	40.00
F	19	0	0.00	93	17	40.00
G	19	0	0.00	92	53	0.00
H	19	36	0.00	92	9	0.00

- ☐ ၂။ အထက်ဖော်ပြပါကြော်ငြာပြီးသော သဘာဝဓာတ်ငွေ့ရေနံမြေဒေသအတွင်းရှိ ရေနံနှင့်သဘာဝ ဓာတ်ငွေ့ ရှာဖွေတူးဖော်ခြင်း၊ ထုတ်လုပ် ခြင်း၊ သယ်ယူရွှေ့ပြောင်းခြင်း၊ သိုလှောင်ခြင်း စသည်များကို ဆောင်ရွက်နေသော လုပ်ငန်းခွင်ဧရိယာအတွင်း လျှပ်စစ်နှင့်စွမ်းအင် ဝန်ကြီးဌာန၏ ခွင့်ပြုချက်မရှိဘဲ လုပ်ငန်းဆောင်ရွက်ခြင်း၊ ခိုးယူခြင်း၊ အကျိုးဖျက်ဆီးခြင်းပြုပါက ရေနံမြေအက်ဥပဒေအရ လည်းကောင်း၊ တည်ဆဲဥပဒေများအရလည်းကောင်း ထိရောက်စွာအရေးယူ ဆောင်ရွက်မည် ဖြစ်ပါသည်။

ဝင်းခိုင်
ပြည်ထောင်စုဝန်ကြီး

Appendix F Notice to mariners



NOTICE TO MARINERS

NO. 24/ 2022

DECLARATION MARINE EXCLUSIVE ZONE FOR SHWE PHYU GAS FIELD

General : Myanmar, Rakhine Coast.

Positions : Untill further notice, during development of the Shwe Phyu gas field, unauthorized navigating, anchoring, fishing, trawling and other under water operation are prohibited at the following area.

(I) Mariners are warned not to approach within a radius of (5) nautical miles from the Points given by the following coordinates-

Point	Latitude (N)	Longitude (E)
SHS Manifold	19° 41' 44".478	92° 32' 28".294
SPS ILT	19° 48' 02".511	92° 27' 46".657
SPS Manifold	19° 48' 50".557	92° 26' 38".894
PLET- D1	19° 51' 14".671	92° 24' 37".941

(II) Mariners are warned not to approach within (500) m from both side of gas pipeline connecting between From **SHS Manifold to SHWE Platform (12" Pipeline)** given by the following coordinates-

Location	Latitude (N)	Longitude (E)
SHS Manifold	19° 41' 44".599	92° 32' 29".845
TP-1	19° 41' 27".731	92° 32' 37".406
IP-1	19° 41' 07".869	92° 32' 46".308
TP-2	19° 40' 46".904	92° 32' 40".915
CR-1	19° 40' 34".456	92° 32' 37".713
SHP	19° 40' 28".142	92° 32' 36".089

(III) Mariners are warned not to approach within (500) m from both side of gas pipeline connecting between From **PLET- D1 to SPS Manifold (6" Pipeline)** given by the following coordinates-

Location	Latitude (N)	Longitude (E)
PLET- D1	19° 51' 14".337	92° 24' 38".931
TP-1	19° 50' 57".880	92° 24' 46".207
IP-1	19° 50' 44".152	92° 24' 52".275
TP-2	19° 50' 34".285	92° 25' 04".046
TP-3	19° 49' 49".553	92° 25' 57".402
IP-2	19° 49' 43".719	92° 26' 04".36
TP-4	19° 49' 36".345	92° 26' 09".431
PLET- D2	19° 48' 52".552	92° 26' 39".544

- (IV) Mariners are warned not to approach within (500) m from both side of gas pipe line connecting between **From SPS Manifold to SPS ILT(14" Pipeline)** given by the following coordinates-

Location	Latitude (N)	Longitude (E)
Tie- in point / SPS Manifold	19° 48' 51".221	92° 26' 40".459
TP-1	19° 48' 36".157	92° 26' 50".186
IP-1	19° 48' 19".544	92° 27' 02".237
TP-2	19° 48' 11".778	92° 27' 21".504
CR-2	19° 48' 03".298	92° 27' 42".543
Tie- in 1/ SPS ILT	19° 48' 02".027	92° 27' 45".695

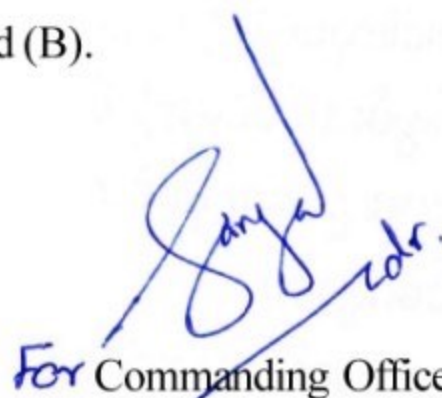
- (V) Mariners are warned not to approach within (500) m from both side of gas pipe line connecting between **From SPS ILT to SHWE Platform (14" Pipeline)** given by the following coordinates-

Location	Latitude (N)	Longitude (E)
Tie- in 2 / SPS ILT	19° 48' 01".517	92° 27' 46".961
TP-3	19° 47' 52".116	92° 28' 10".279
IP-2	19° 47' 42".844	92° 28' 33".276
TP-4	19° 47' 21".756	92° 28' 44".608
TP-5	19° 46' 23".995	92° 29' 15".640
IP-3	19° 46' 19".545	92° 29' 18".030
TP-6	19° 46' 15".492	92° 29' 21".110
TP-7	19° 41' 53".900	92° 32' 39".772
IP-4	19° 41' 23".278	92° 33' 03".013
TP-8	19° 40' 48".957	92° 32' 46".511
START- UP/TIE- IN POINT/ SHP	19° 40' 27".938	92° 32' 36".406

Charts affected: Admiralty Chart No. 817 and INT 4706

Source : Ministry of Electrical Power and Energy, dated 29th September, 2022.

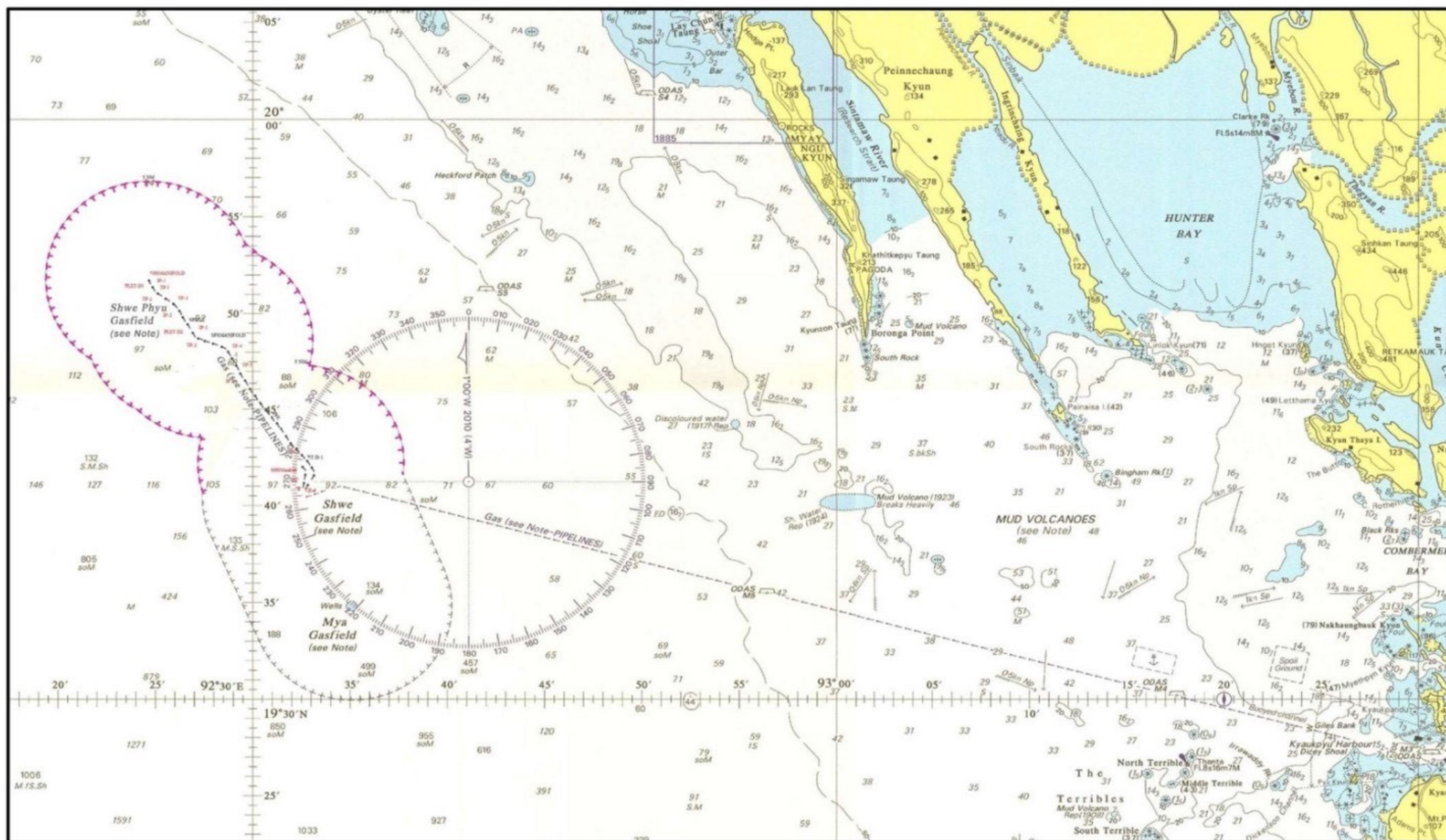
Remak : The rough locations of gas field's centre points and pipe lines are depicted on Admiralty Chart No. 817 and attached as Annex(A) and (B).

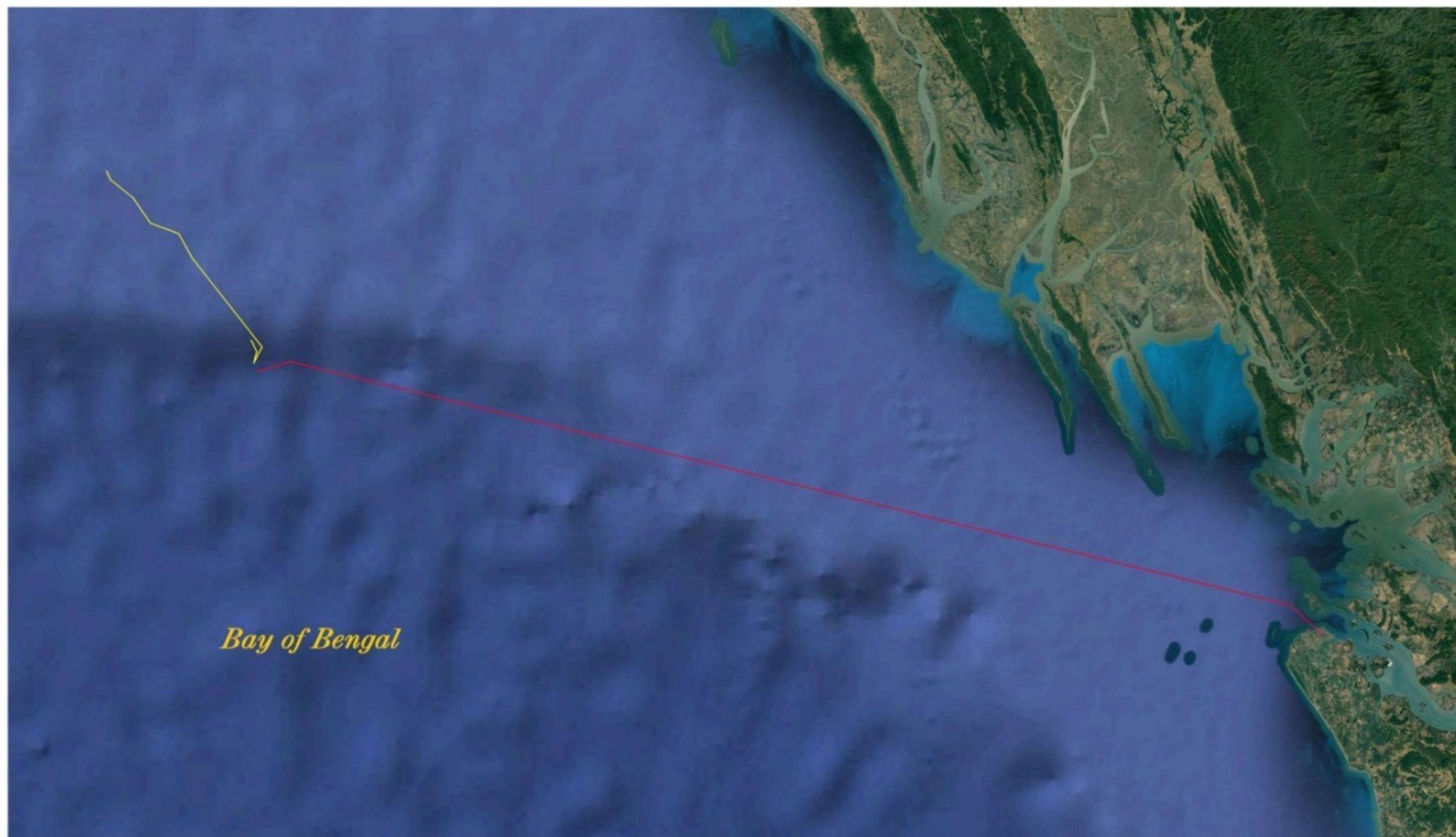

For Commanding Officer

Date, 18th October, 2022

Myanmar Naval Hydrographic Centre
Myanmar Navy.

ANNEX A







NOTICE TO MARINERS

NO. 15/ 2012

DECLARATION MARRINE EXCLUSIVE ZONE FOR SHWE AND MYA GAS FIELDS

(A) Positions : Untill further notice,during development of the Shwe and Mya gas fields, unauthorized navigation,anchoring, trawling and other under water operation are prohibited at the following areas as follow-

(1) Affecting within 5 miles radius of Shwe Centre Point.

Point	Latitude (N)	Longitude (E)
SHP	19° 40' 26.063"	92° 32' 35.404"

(2) Affecting within 5 miles radius of Mya North Centre Point.

Point	Latitude (N)	Longitude (E)
MNM	19° 34' 47.247"	92° 35' 4.507"

(3) Affecting within (500)m on both side of gas pipe line. Connecting from MNM to SHP given by the following Coordinates:

Point	Latitude (N)	Longitude (E)
MNM	19° 34' 47.247"	92° 35' 4.507"
SHP	19° 34' 48.95"	92° 35' 4.230"
CP 1	19° 35' 7.9"	92° 35' 18.484"
IP 1	19° 36' 34.016"	92° 35' 38.131"
TP 1	19° 39' 4.69"	92° 34' 28.239"
CP 2	19° 39' 8.546"	92° 34' 28.927"
IP 2	19° 39' 45.347"	92° 33' 17.05"
TP 2	19° 40' 59.983"	92° 32' 39.48"
EP	19° 40' 24.652"	92° 32' 36.138"
SHP	19° 40' 26.063"	92° 32' 35.404"

(4) Affecting within (500) m on both side of gas pipe line. Connecting from SHP to Land Fall point given by the following Coordinates:

Point	Latitude (N)	Longitude (E)
SHP	19° 40' 26.063"	92° 32' 35.404"
SP	19° 40' 50.474"	92° 34' 3.337"
IP 1	19° 40' 58.121"	92° 34' 30.833"
TP 1	19° 40' 51.221"	92° 34' 58.548"
CP 2	19° 27' 28.369"	93° 28' 7.499"
IP 2	19° 27' 21.8"	93° 28' 33.3"

TP 2	19° 27' 4.155"	93° 28' 52.473"
LFP	19° 25' 35.131"	93° 30' 29.177"

(B) Charts Affected : Admiralty Charts No.817,821,829.

(Reported from Ministry of Energy, dated 6th August, 2012)

(C) Remark : The rough locations of gas field's centre points and pipe lines are depicted on google image and attached as Annex (A)

Date, 28th August, 2012

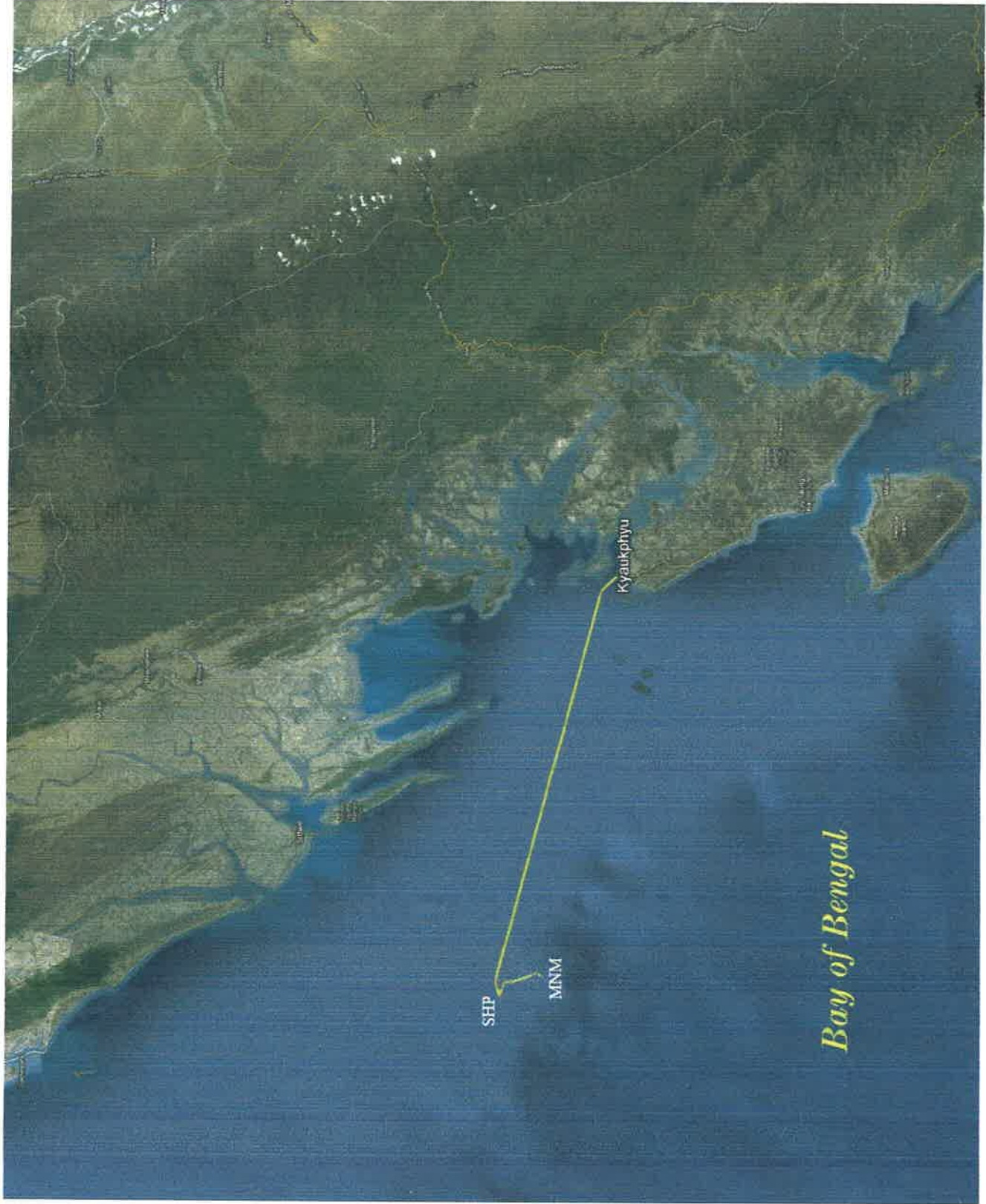


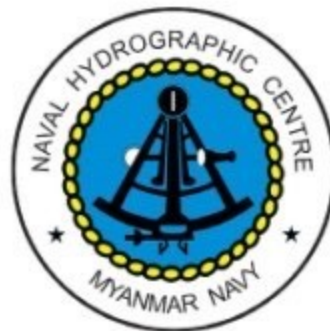
Commanding Officer

Myanmar Naval Hydrographic Centre

Myanmar Navy.

Annex- A





NOTICE TO MARINERS

NO. 24/ 2022

DECLARATION MARINE EXCLUSIVE ZONE FOR SHWE PHYU GAS FIELD

General : Myanmar, Rakhine Coast.

Positions : Untill further notice, during development of the Shwe Phyu gas field, unauthorized navigating, anchoring, fishing, trawling and other under water operation are prohibited at the following area.

(I) Mariners are warned not to approach within a radius of (5) nautical miles from the Points given by the following coordinates-

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SHS Manifold	19° 41' 44".478	92° 32' 28".294
SPS ILT	19° 48' 02".511	92° 27' 46".657
SPS Manifold	19° 48' 50".557	92° 26' 38".894
PLET- D1	19° 51' 14".671	92° 24' 37".941

(II) Mariners are warned not to approach within (500) m from both side of gas pipeline connecting between From **SHS Manifold to SHWE Platform (12" Pipeline)** given by the following coordinates-

Location	Latitude (N)	Longitude (E)
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SHP	19° 40' 28".142	92° 32' 36".089

(III) Mariners are warned not to approach within (500) m from both side of gas pipeline connecting between From **PLET- D1 to SPS Manifold (6" Pipeline)** given by the following coordinates-

Location	Latitude (N)	Longitude (E)
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- (IV) Mariners are warned not to approach within (500) m from both side of gas pipe line connecting between **From SPS Manifold to SPS ILT(14" Pipeline)** given by the following coordinates-

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TP-1	19° 48' 36".157	92° 26' 50".186
IP-1	19° 48' 19".544	92° 27' 02".237
TP-2	19° 48' 11".778	92° 27' 21".504
CR-2	19° 48' 03".298	92° 27' 42".543
Tie- in 1/ SPS ILT	19° 48' 02".027	92° 27' 45".695

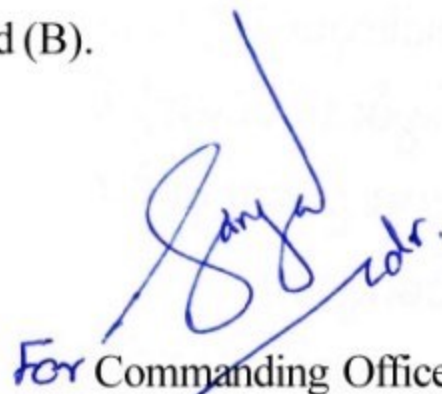
- (V) Mariners are warned not to approach within (500) m from both side of gas pipe line connecting between **From SPS ILT to SHWE Platform (14" Pipeline)** given by the following coordinates-

Location	Latitude (N)	Longitude (E)
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TP-3	19° 47' 52".116	92° 28' 10".279
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START- UP/TIE- IN POINT/ SHP	19° 40' 27".938	92° 32' 36".406

Charts affected: Admiralty Chart No. 817 and INT 4706

Source : Ministry of Electrical Power and Energy, dated 29th September, 2022.

Remak : The rough locations of gas field's centre points and pipe lines are depicted on Admiralty Chart No. 817 and attached as Annex(A) and (B).

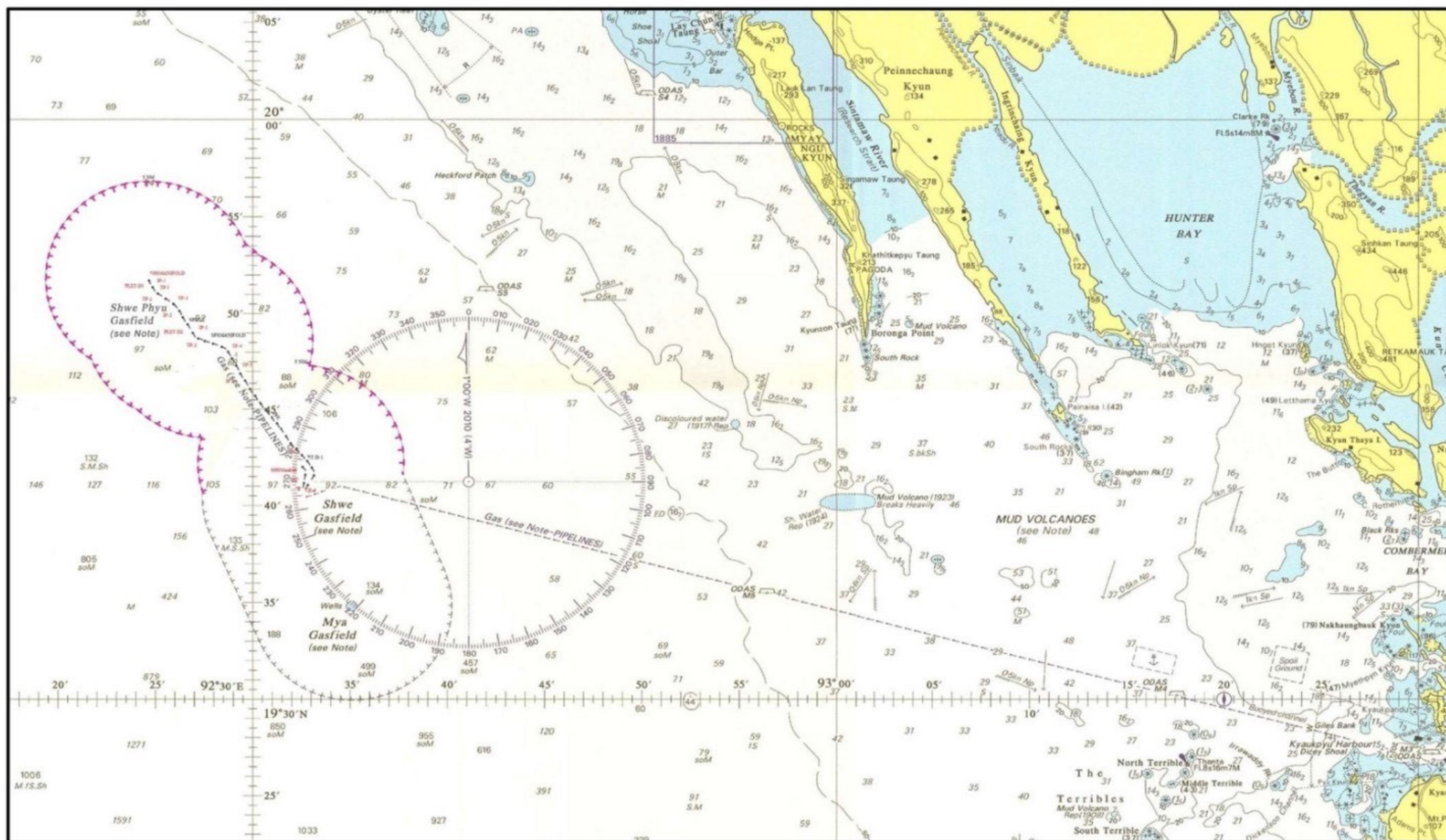

For Commanding Officer

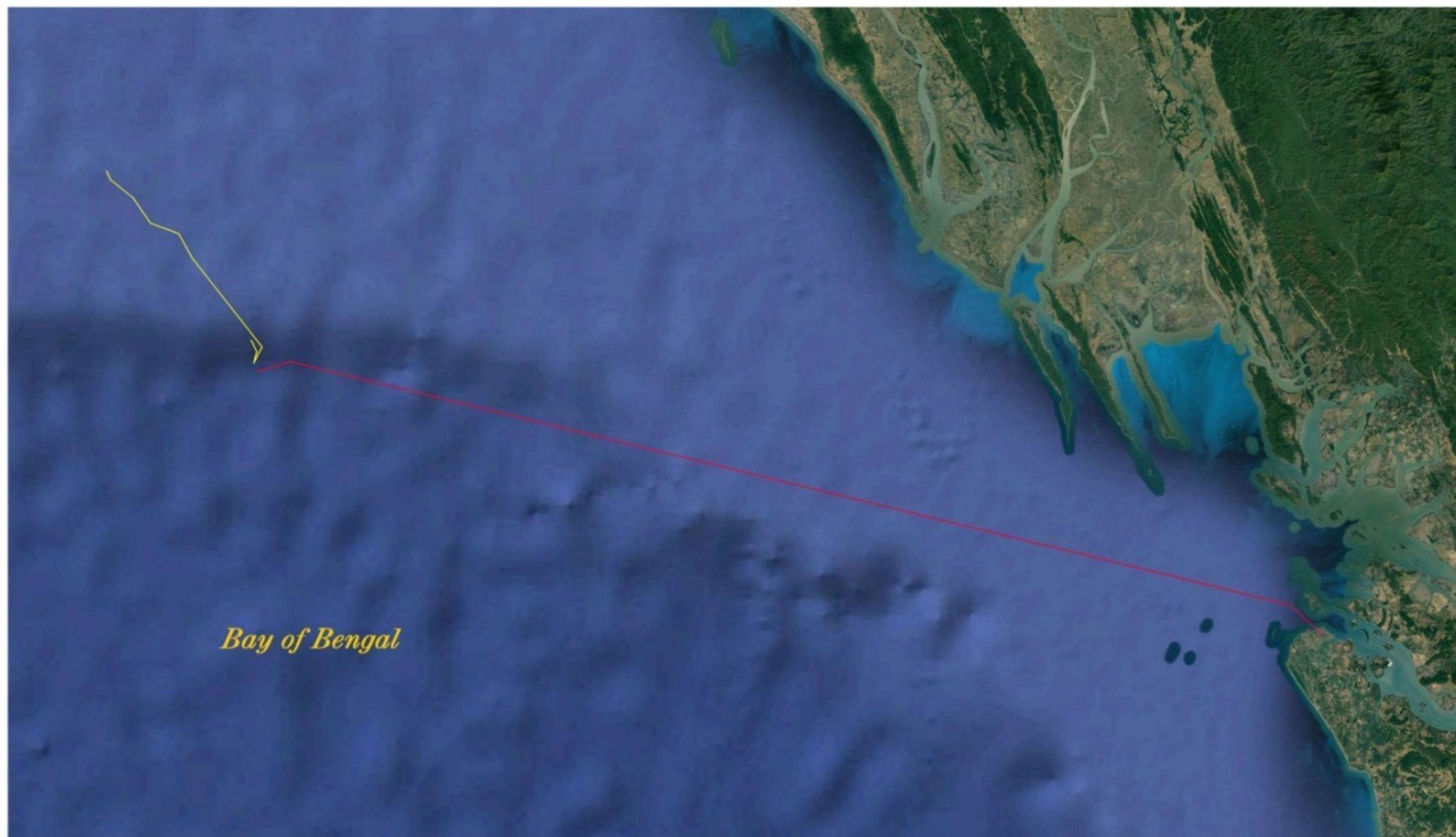
Myanmar Naval Hydrographic Centre

Myanmar Navy.

Date, 18th October, 2022

ANNEX A



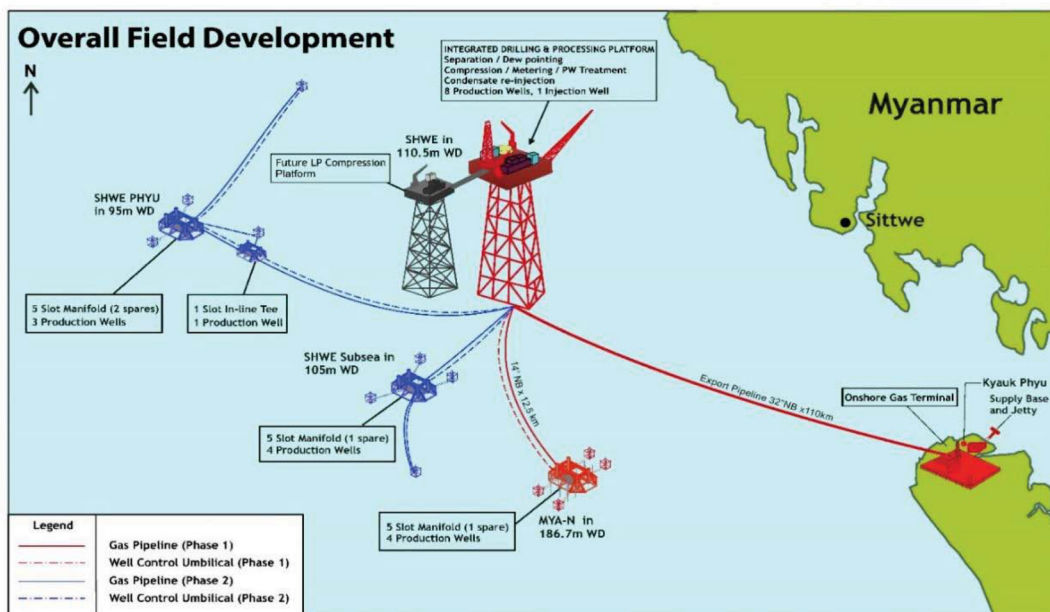


Appendix G PIC's waste management procedure

PROJECT / JOB TITLE: SHWE PROJECT

DOCUMENT TITLE: WASTE MANAGEMENT PROCEDURE

DOCUMENT NUMBER: YGG-SF-MP-02-02-0002



		YHW	PK	PS	BSC
5	Re-Issued for Use	Digitally signed by Ye Hlaing Win DN: cn=Ye Hlaing Win, o=HSE, ou=PIC, email=ye.hlaingwin@poscointl-enp.com, c=MM Date: 2022.06.07 15:15:47 +06'30'	Digitally signed by Phore Kyaw DN: cn=Phore Kyaw, o=Head of HSE, ou=POSCO International Corporation, email=phore.kyaw@poscointl-enp.com, c=MM Date: 2022.06.07 15:12:45 +06'30'	Digitally signed by Paolo Scalea DN: cn=Paolo Scalea, o=ou, email=Paolo.Scalea@poscointl-enp.com, c=MM Date: 2022.06.08 22:29:51 -03'00'	Digitally signed by BS Cho Date: 2022.06.09 09:11:39 +06'30'
Revision Number	Description	Prepared	Checked	Checked	Approved

Revision History

Revision Number	Date	Section(s)	Page(s)	Brief Description of Change	Author of Change
Rev 0	1-Mar17	5, 6 & 7	7 to 14	Change Doc. No and updated as per current practice of waste handling, storage & disposal including various forms in the procedure	MM/JL
Rev 1	17-Jul-18	OFD Picture	Cover Page	Change to Latest Overall Field Development Picture	YHW
Rev 1	17-Jul-18	6.4	13 to 14	Revised of reusable non-hazardous waste collection and hazardous waste collection by MOGE and Certified 3 rd party service provider for hazardous waste treatment.	YHW
Rev 2	05-Sep-18	6.3	12 to 26	Revised of SHP and OGT Waste Transfer, Storage, Disposal, Effluent Treatment, and System to better reflect EMP contents.	YHW
Rev 3	15-May-19	Appendix		Deleted Waste Inventory Log as Per ISO 14001 Audit requirement	YHW
Rev 4	30-Sep-19	4.2, 5.6 5.7 and Appendix	Various	Revised Reference Documents, GHS Pictograms to be applied and Referred DG procedures, Title of Non-hazardous and Hazardous Waste Drum Audit Worksheet, and adding new appendices	YHW
Rev 5	7-Jun-22	6.2.3 6.3.2 All Sections and Appendix 3	Page7, Page 11 Page 17, Page 23, and Page 25 & 26	Updated Revision Number, added Laboratory Wastes etc. Scheduled Revision and edit Revision Number 6 on all pages Added reference for YGG-SF-EP-04-02-0002 HSSE Audit Inspection and Review Procedure_Rev4 Added Section 9.0 Annual HSSE Audit Revised to add Dangerous Goods & Combustible Liquids Storage Compatibility Chart	YHW

HOLD Record

Hold Number	Date	Section(s)	Page(s)	Brief Description of Hold	Cleared

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1.0 PURPOSE

This waste management procedure is developed to ensure correct and safe handling and disposal of non-hazardous and hazardous waste generated from Company controlled facilities.

The purpose of this document is to:

- Ensure that classification of wastes and waste disposal are done properly.
- To provide clear directions on waste management.
- To ensure that all personnel involved with waste perform their roles and responsibilities as outlined in this document.
- Ensure proper implementation and compliance, including segregation.
- Provide direction so as to comply with applicable Myanmar environmental law and international acceptable standard.

2.0 SCOPE

This procedure applies to all sites managed by Company and to all personnel including Contractors. This procedure deals with waste classification, segregation, temporary site waste transfer, storage, disposal, recording and reporting of non-hazardous and hazardous waste produced by Company's controlled operations in Myanmar.

This is intended to be compliant with relevant Myanmar environmental legislations as well as international standards and accepted best practice.

3.0 OBJECTIVE

The waste management procedure is intended as a practical guidance document for use by all personnel to ensure a common approach in all phases of waste handling, from identification at the point of generation through disposal. The procedure identifies each type of waste currently generated and provides clear guidelines for handling and disposal practices within Company controlled facilities.

The basic principles for waste management procedure will include the following;

- Means of waste reduction re-use, recycling and recovery shall be identified and implemented where practicable.
- All wastes must be identified, segregated, stored, transported and disposed on the basis of an assessment of the hazards/risks to health, safety and environment.
- An auditable waste control system shall be established.
- Facilities for waste handling, storage and disposal shall be reviewed at regular intervals.
- Regular evaluations of current and alternative waste management practice in accordance with local and international regulations in compliance with Myanmar Environmental Legislation.
- Provides information and appropriate training for personnel.

4.0 REFERENCE DOCUMENTS AND ABBREVIATIONS

4.1 Abbreviations

CSR	Corporate & Social Responsibility
Company	POSCO INTERNATIONAL Corporation Myanmar E & P
ECD	Environmental Conservation Department
HSSE	Health, Safety, Security and Environment
HSSEMS	Health, Safety, Security and Environment Management System
IMO	International Maritime Organization
MARPOL	International Convention for the Prevention of Pollution from Ship
MOGE	Myanma Oil & Gas Enterprise
MONREC	Ministry of Natural Resources and Environmental Conservation
MSDS	Material Safety Data Sheet
OD	Open Drains
OGT	Onshore Gas Terminal
OIM	Offshore Installation Manager
O & M	Operation and Maintenance
PPE	Personal Protective Equipment
RMDF	Returned Materials & Disposal Form
SHP	SHWE Offshore Production Platform
TBT	Toolbox Talk

4.2 Reference Documents

This procedure is based on appropriate international guidelines and Myanmar Environmental Legislations;

YGG-SF-MS-01-01-0001	HSSE Management System
YGG-OM-MP-03-07-0020	Dangerous Goods Handling Procedures
YGG-OM-MP-03-07-0026	Chemical Handling Procedure
YGG-SF-EP-04-02-0002	HSSE Audit Inspection and Review Procedure_Rev4

MARPOL 73/78 Annex V	IMO Regulations and Prevention of Pollution from Ship
MONREC Law No. 9/2012	Myanmar Environmental Conservation Law
MONREC Rules 2014	Myanmar Conservation Rules
Myanmar Law No. 8/2006	Myanmar Conservation of Waters and Rivers Law
Myanmar Law No. 28/2013	Prevention from Danger of Chemicals and Associated Materials Law
Myanmar Rules No. 85/2015-2016	Prevention of Hazard from Chemical and Related Substances Rules

5.0 ROLES AND RESPONSIBILITIES

5.1 O & M Director

- Ensure that each operating site implements this waste management procedure.
- Provide and allocate resources required to ensure appropriate implementation and compliance with this procedure.
- Authorize expenditures to allow the various waste streams to be processed and disposed, as per this document.
- Overall approval of this document and any future amendment as deemed necessary.

5.2 O & M Manager

- Ensure that these procedures are implemented in all sites in his area of responsibility.
- Organize and communicate to management the status of the implementation and compliance with this procedure, to relevant domestic and international standards and applicable laws.
- Review and determine which materials and equipment are classified as scrap or partners property.
- Review this procedure as required.

5.3 Head of HSE and/or his designee

- Functional 'owner' of this procedure while obtaining input from the operational groups.
- Review recommendations from site management on waste management implementation, compliance, and reporting.

- Provide guidelines and support on compliance with applicable local and international laws.
- Responsible for monitoring new developments and regulations and advising on their adoption, where appropriate to Company's waste management practices.
- Ensure that waste management training is implemented at site.
- Handle waste management collection and arrangements by liaising with MOGE.
- Review and revise as required, this procedure on a biennial basis. *(At two yearly intervals.)*

5.4 OIM and/or OGT Superintendent

- Ensures that all waste handling procedures are implemented and followed by site personnel and contractors.
- Responsible for waste identification and classification.
- Ensures that all involved personnel have had appropriate training in this procedure.
- Provide input related to collection and removal of waste at site.
- Ensure all waste materials removed from site are verified, manifested/ documented and approved by site management.

5.5 Site HSSE Representative

- Check implementation and verify compliance with this procedure.
- Conduct site inspection and audit on waste handling and collection by MOGE.
- Enforce that appropriate documentation and approvals are in place before waste movement takes place.
- Report non-compliance with this procedure.
- Provide recommendations for improvement of this procedure.
- Provide appropriate training for site personnel that handle waste segregation, storage and disposal.
- Enforce all MSDS are compiled and available for all hazardous waste

5.6 OGT Warehouse Supervisor

- Responsible for the proper receipt, recording and storage of all waste materials received from SHP and/or collected in OGT. Originator of waste must put a label and segregate in accordance to section 6.2 of this procedure for each type of packaging ex. jumbo bags, drums, IBC's, skips, bins etc.
- Responsible for the hazardous waste inventory and storage area in compliance with these procedures.
- Ensure that waste stored in hazardous waste storage areas is accompanied by applicable MSDS, and make to apply Dangerous Goods labelling for transportation

(Appendix 8) referring to YGG-OM-MP-03-07-0020_ Dangerous _Goods _Handling.

- Ensure proper segregation of waste and that appropriate PPE is used during handling of waste.
- Provide recommendations for improvement of waste management practice and this procedure.
- Correctly manifest and record all waste being removed from site, and check/update inventory log as per Appendix 3, & 4.

5.7 SHP Services Supervisor

- Supervise workforce responsible for segregation of waste and labelling of wastes.
- Ensure implementation and compliance with this procedure by site personnel.
- Adhere to correct labelling protocols relating to all waste before shipment to OGT as describe in Appendix 1 & 2, and 8 (GHS Labels).
- Ensure that hazardous wastes are stored in sealed waste containers to prevent leakage or spill during transport. Ensure proper segregation of waste and that appropriate PPE is used during handling of hazardous waste.
- Ensure that appropriate MSDS are displayed relating to different types of hazardous waste and dangerous goods. Any shipment of hazardous waste or dangerous good shall be manifested as per Appendix 5.
- Correctly manifest and record all waste being removed from site as per Appendix 6 & 7.
- Ensure to make GHS labels applying on Hazardous Wastes drums or Boxes as per Appendix 8, and refer to YGG-OM-MP-03-07-0020_ Dangerous _Goods _Handling.

5.8 SHP Warehouse man/Storekeeper

- Responsible for listing/recording on the waste inventory each type of waste being shipped as per Appendix 6 & 7.
- Maintain/Update hazardous waste inventory sheet and provide this information to Services Supervisor and Site HSE Representative.

6.0 PROCEDURE

6.1 Waste classification

The classification of Company waste generated shall be categorized in two (2) main groups according to criteria of risk, as non-hazardous and hazardous waste.

6.1.1 Non-Hazardous Waste

Defined as any waste which is not harmless but presents a low risk to human health and the environment. Examples are;

- Non-biodegradable waste considered as junk or scrap (e.g. metal, plastic, rubber, glass, tires, hoses,)
- General or Recyclable waste (e.g. paper, cartoons, metal cans, wood, plastic drinking bottles, glass bottles, non-contaminated cloth)
- Biodegradable waste (e.g. food waste from site galley and mess room)
- Gardening waste
- Inert waste (e.g. non-contaminated blasting grit, crushed glass or sand)

6.1.2 Hazardous Waste

Defined as any waste which may cause danger or is likely to be harmful to health or the environment by reasons of their chemical activity, toxicity, flammability, explosive, corrosive or other characteristics whether alone or in contact with other wastes. Hazardous wastes can comprise of solid, liquid or containerized liquid or gas waste.

- General Hazardous Waste (e.g. chemicals, acid, paints, thinner, used oil, contaminated packing material, containers/drums or bags, oily gloves or rags, spill absorbent pads, oily filters, printer cartridge, florescent tubes or bulbs, medical waste and batteries)
- Waste contaminated with hazardous substances in a concentration which exceeds the standard limit as described by Myanmar Environmental Law. (e.g. drilling mud, contaminated blasting grit, crushed glass or sand)

6.2 Waste Segregation and Handling

6.2.1 Segregation

Waste shall be handled and stored in a manner that reduces risk to the environment. Waste either at the source or after collection which requires different treatment or disposal methods shall be segregated as much as possible at source for collection, storage, transportation, and disposal, in accordance with the waste classification. In addition, it will reduce the risk of contamination of non-hazardous wastes with hazardous wastes.

Waste should be segregated into the following groups;

- General non-hazardous waste
(E.g. Food, Wet Paper, RO water Filters, Air Filters & Cooking Oil)
- Recyclable waste
(E.g. Paper, Plastic, Bottles, Cans, Scrap Woods or Timber, Metal & Carton)
- Biodegradable waste (food waste from kitchen and mess room). At SHP, food waste is disposed of after macerating, direct to the sea, in accordance with MARPOL rules.
- Hazardous waste

Medical or clinical waste accumulated from OGT and SHP are of very small quantities and shall be stored in dedicated sealed waste bins, marked with universal warning signs and/or the words “Medical Waste” or “Bio-Hazard” as appropriate. These wastes are disposed of through a contract service agreement with the Company health care provider.

6.2.2 Container

Housekeeping is essential and all wastes must be collected and disposed of in appropriate containers, bins, skips or bags. All waste containers must;

- Have clear identification or labelling to assist in sorting and dispatching of the waste containers in line with colour coding system or waste grouping.
- Be provided in adequate numbers and at the correct locations including the working area, accommodation and offices.
- Be made from durable materials compatible with the waste to be collected, leak proof, sturdy, stable and easily handled.
- Be colour coded to ensure separation of non-hazardous waste from hazardous waste.
- Be accompanied with MSDS if they are being transported and MSDS must be available at site for all relevant wastes generated.

6.2.3 Colour Coding and Labelling

Implementation of colour coding of every waste container should be coherent and consistent from one Company facility to another. The number of waste categories to be collected must not be excessive to avoid getting site personnel confused or discouraged. Education of site personnel of the principle of waste management in particular relating to the colour coding process shall be discussed in TBT, safety meetings and included in site HSSE induction. Non-compliance with waste management procedures is to be viewed seriously.

General principle of waste groupings are as follows;

Colour	Waste Categories
Red	Hazardous Waste (contaminated gloves, rags, absorbent pads & Laboratory Wastes etc.)
Blue	Metal scraps included steel, slings, drums lids & etc.
White **	Biodegradable waste (food waste from mess room & kitchen)
Green	Non-Hazardous waste/Recyclable or Non-Biodegradable waste
Black	Used oil or chemicals
Yellow	Medical/Clinical waste

** Note that there is no biodegradable waste ‘stored’ at SHP. The white colored bins are therefore not required. (Stainless steel bins are used for very short-term storage, during meal times, the food waste is then ground in the approved macerator to the correct size and discharged to the sea sub surface via the discharge caisson.

Waste containers shall be clearly marked both in English and Myanmar language as to their contents or waste classifications. Also, special attention should be paid to waste that may be reused and recycled that needs to be segregated and clearly marked, such as Aluminum drinks cans.

6.3 Waste Transfer, Storage, Disposal, Effluent Treatment, and System

6.3.1 SHP

Waste generated in SHP shall be properly contained, secured and transported to OGT for handling, storage and disposal. General waste sent to OGT shall be enclosed inside sturdy 1 tonne or 500Ltr Bulk Waste Bags, (commonly referred to as “Jumbo Bags” by SHP crew).

Spent oils or chemicals in drums or containers are placed on a spill containment pallet(s) and temporarily kept at designated hazardous storage areas until the scheduled transfer or shipment to OGT. Spill control equipment is provided and shall be readily available at all times. Inventory log, record and update of hazardous waste at site. Waste oil or chemical containers must be approximately 80% full. Half full containers should not be shipped for disposal.

Food waste generated from kitchen and mess room are treated in line with MARPOL 78/73 Annex V IMO Regulations and Prevention of Pollution from Ship. Food wastes are macerated or ground up into not greater than 25mm cubes, before dumping overboard.

Sewage generated from SHP is disposed of in accordance with the spirit of MARPOL 78/73, and PIC (Myanmar E&P) has complied with Myanmar National Environmental Quality (Emission) Guidelines, 2015. SHP offshore platform is also in excess of 12 nautical miles from shore. There are no batch disposals of sewage, from holding tanks etc. from SHP.

De-sander System

The produced liquids and sand (if any) are drawn-off from the gas separators bottom and sent to the desanding packages (A-0811) for separator (V-1001A), (A-0821) for separator (V-1001B). The desanding package consists of 2 x 100% sand Hydrocyclones (V-0811A/B for Train 1 and V-0821A/B for Train 2) where sand is separated from the liquid by centrifugation and then discharged into 2x100% sand accumulator vessels (V-0812A/B for Train 1 and V-0822A/B for Train 2) installed underneath the Hydrocyclones. The operating sand accumulator is then taken offline and unloaded by flushing the slurry with fresh water into the sand collection bin, where the liquids are drained and sand collected. The accumulated sand is then sent for disposal.

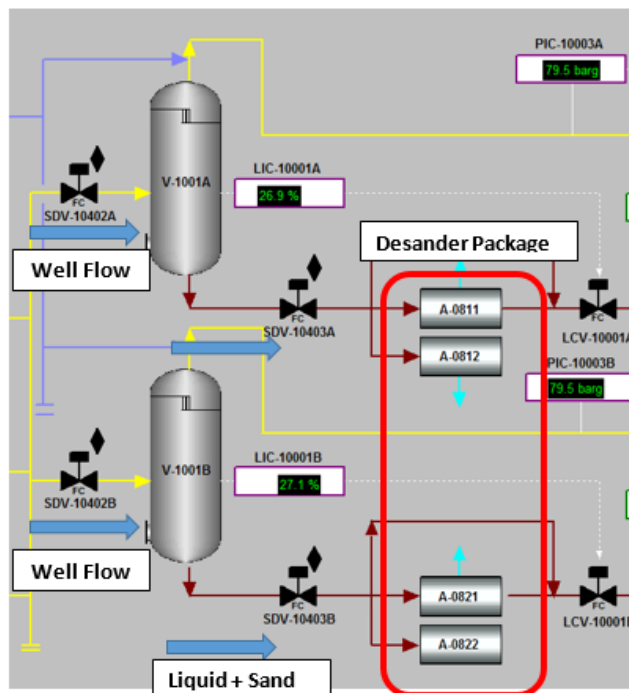


Figure 6.1: Production Separators and Desander Package

Hydro test water and cooling water system

Hydro testing is not normally carried out as part of platform regular activities. In the event of a pipe spool being fabricated and/or repaired at site, Hydro test is carried out with fresh water and the water is disposed of via hazardous open drain system. Special activities which involve larger volumes of Hydro test water are to be treated on a case by case situation. Spent engine coolant is properly segregated and sent for disposal to shore.

Produced Water System

The Produced Water Treatment system comprises of the following equipment:

- 1 x 100% Produced Water Degassing Drum V-3701
- 2 x 100 % Produced Water Hydrocyclones V-3702 A/B
- 1 x 100 % Produced Water Coalescing Filter Package A-3703

The different sources of oily water effluents are collected and sent to the produced water degassing drum V-3701.

It receives:

- The liquid condensates streams coming from the continuous bottom liquid outlet of the production separators V-1001A & V-1001B.
- The water effluent streams coming from the MEG regeneration packages A-1201 / A-1401.
- The liquid outlet streams from the export compressor suction KO drums, V-2401 / V-2501 / V-2601.
- The liquid outlet stream from the HP Fuel gas scrubber V-4001.
- The liquids from the closed drain drum V-5501 pumped with P-5501A/B and sent under on/off level control to the produced water degassing drum V-3701.

The produced water degassing drum V-3701 is operated at a controlled pressure (about 7 barg) with blanketing by fuel gas. The oil/water separation is carried out by gravity inside the drum which includes two compartments, one oil compartment recovering the oil layer formed at the surface of the liquid in the 1st compartment which flows over a separation baffle (weir).

Oily water is sent to the hydrocyclone packages A-3702 (2 x 100%) under normal liquid level control and then to the Produced Water Coalescer Filter for further polishing. Hydrocyclone reject stream is sent to the closed drain drum V-5501, and will be pumped back to the produced water degassing drum for re-treatment. Treated water is sent to the hazardous open drain caisson where any oil layer can be pumped back to the process (via the closed drain drum) with a dedicated submerged lift pump.

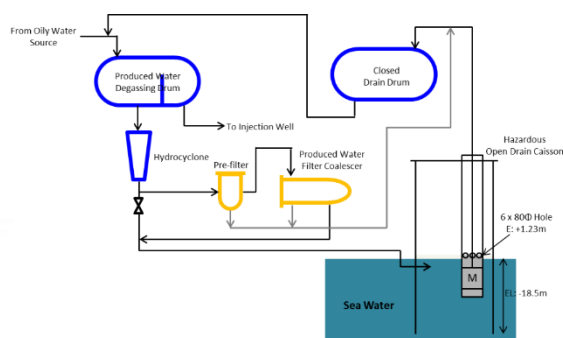


Figure 6.2: Produced Water System Schematic

Open Drain System

On Shwe platform, the open drain system is designed to collect and route to an appropriate disposal system, the effluent drained from equipment and/or systems.

The open drain network is segregated into 3 systems for collecting:

- Non-hazardous open drains: it concerns the areas located in non-hazardous areas.
- Hazardous open drains: it concerns the areas where hazardous products such as hydrocarbons or methanol are present. This hazardous open drain is foreseen to collect any leakage recovered into the drip pans, any product sprayed on the floor during maintenance and cleaned with washing water, water from deluge which may be polluted, etc.
- Chemical drains: this concerns the areas where chemicals are stored and handled (tote tank lay down area, chemical injection skids). Dedicated drip pans are provided on these areas to contain any possible leakage which can then be transferred into dedicated containers for disposal and/or further treatment.

Non-hazardous drains and hazardous drains are collected in two different networks and routed independently to the hazardous open drain caisson M-5601 for disposal into the sea.

Inside the hazardous open drain caisson M-5601, an oil skimming pump – hazardous open drain caisson pump P-5601, is installed to remove any oil accumulated inside the caisson.

The hazardous open drain caisson pump P-5601 is located inside a closed barrel with six holes equally-spaced on the circumference and located in between the sea levels corresponding to LAT and HAT (low and high astronomical tide). These holes allow recovery of the floating oil which overflows through them, into the pump barrel. The oil recovery is an intermittent and manual operation which is managed locally by an operator. Pump is started manually and stopped automatically. Pumped oil is then routed to the closed drain drum V-5501.

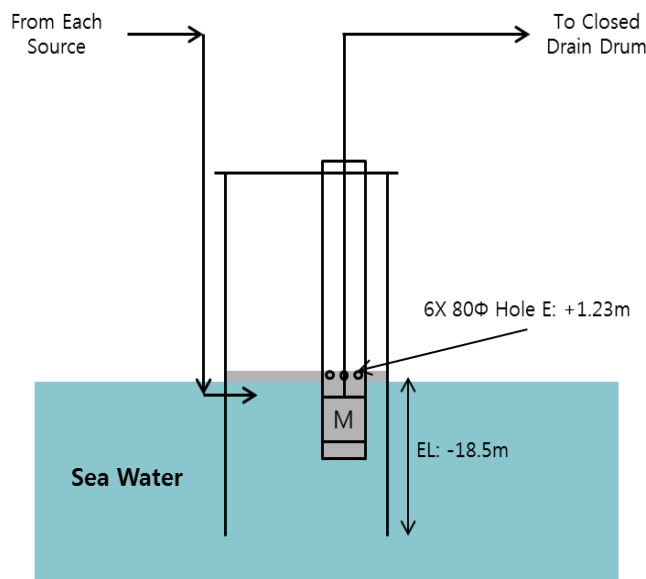


Figure 6.3: Open Drain System Schematic

Condensate System

The condensate system comprises the following equipment:

- 1 x 100% Condensate buffer drum V-3402
- 2 x 100 % Condensate booster Pumps P-3401 A/B
- 2 x 100 % Condensate Filters S-3403A/B
- 2 x 100 % Liquid reinjection Pumps P-3402 A/B
- 2 x 100% Liquid Burners A-3405 / A-3406

Condensate from the condensate buffer drum is disposed to the condensate disposal well SHD-DIS via two sets of pumps in series, condensate booster pumps P-3401A/B (1 in duty, 1 stand by) and liquid re-injection pumps P-3402 A/B (1 in duty, 1 stand by). The function of the Booster Pump is to ensure minimum required suction pressure is available for the high pressure Reinjection Pumps. The Reinjection Pumps then increase condensate pressure to the required level to ensure reinjection into the dedicated reservoir zone.

When the disposal well SHD-DIS is not available, liquid from condensate buffer drum may be routed to the liquid burner packages A-3405 / A-3406 via the condensate booster pumps. The liquid burners can dispose of the condensate by means of flaring.

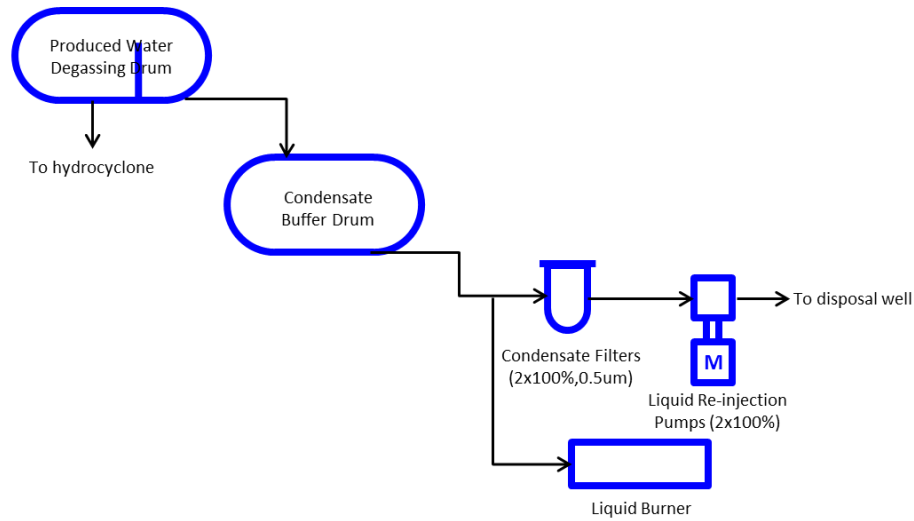


Figure 6.4: Condensate Disposal System Schematic

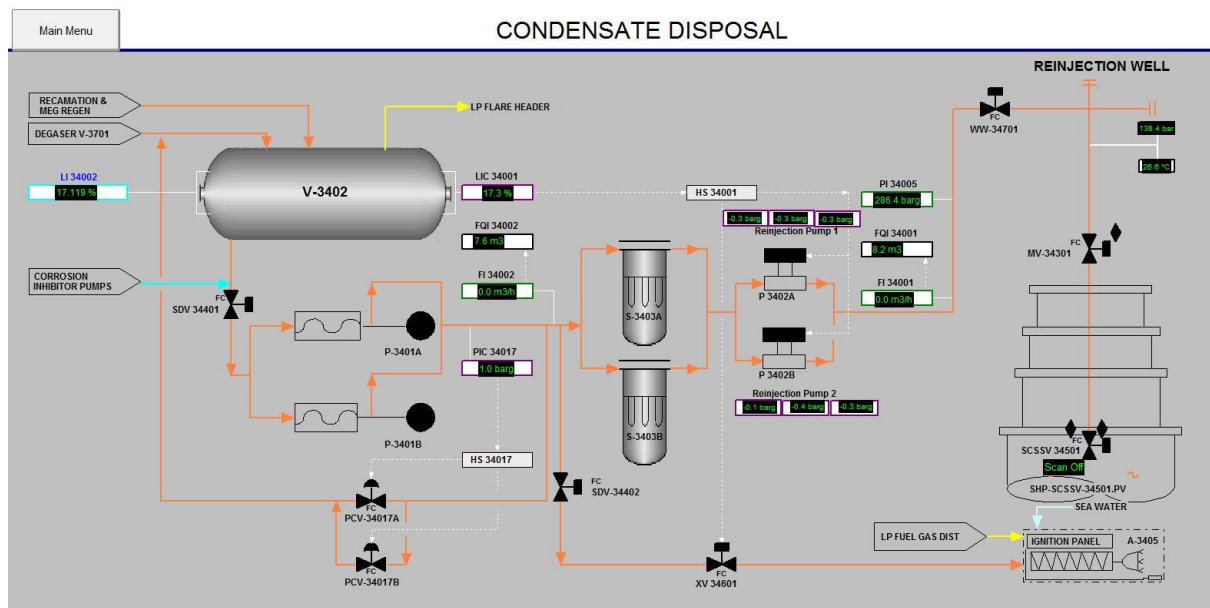


Figure 6.5: Condensate Disposal System

Well work-over fluids system

Shwe well completions comprise of gravel packs and single string tubing, with downhole pressure/temperature gauge and safety valve. During the Shwe platform drilling phase filtered completion brine was used as base fluid for completions with a number of chemical additives to meet functional requirements.

Sodium bromide / potassium chloride brine was used as completion brine in Shwe completion operations. The preparing process of the fluid was to mix brine with fresh water to adjust weight and salinity and filtered it through Diatomaceous Earth (DE) and cartridge filters.

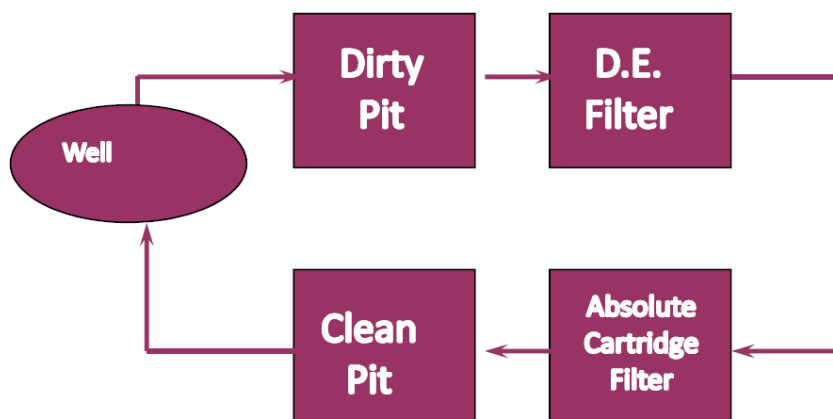


Figure 6.6 Completion Fluid Circulation System

Completion brine was kept in a closed loop system without disposal during the operation. Once completion brine was returned to surface it was transferred back to a mud pit, filtered again through DE and cartridge filters and used again. The solids returned in completion brine were minimal and those were sent onshore for disposal with DE material and cartridges.

When operation was completed, well and pits were filled with completion brine. The brine inside production casing/tubing annulus was maintained there and shall be kept there for the life of a well. The fluid inside production tubing was produced back during well clean up stage and transferred through separators via process lines and all of the liquid through produced water treatment system and discharged into open drain caisson. Lastly, the remaining completion fluid in pits was transferred to supply vessel tanks and returned back to onshore.

A number of chemical additives were used to meet functional requirements for completion fluid. For example gelling agent was used to make viscous fluid to carry gravel down to formation. This fluid lost its viscosity on dilution with brine and became part of completion brine. Furthermore weak acid fluids were used to dissolve calcium carbonate mud filter cake and remove polymer type loss circulation material. Weak acid systems of mixtures of acetic acid and hydrochloric acid were used for the purpose. The acid fluids were not circulated back to surface but all were injected into formation.

The drilling program is complete and any future Well intervention works will be planned to follow similar procedures to prevent waste entering the environment.

6.3.2 OGT

Handling and storage of waste at OGT site, includes waste from SHP. A dedicated storage area for hazardous and non-hazardous waste is provided at site and the disposal process is as follows;

All scrap material that has an intrinsic value must be handed over to MOGE and disposed of only with approval from the O & M Director. A complete list of the scrap that will be disposed must be clearly documented by manifest, recorded by gate pass for leaving the site and a

relevant photograph must be attached to the form stipulating description of the scrap material. The Gate pass and relevant documentation for the waste exiting OGT site must be verified and approved by OGT Superintendent.

All scrap materials are contractually required to be taken by MOGE and examples of scrap descriptions include;

- Cable & wire of all sizes and types.
- Hoses 3 inches diameters and above.
- Clean containers, of sizes 20 litres or greater, whether of plastic or metal.
- Discarded equipment and materials made from metal (steel, stainless steel, aluminium)
- Gas cylinders, including Freon, and fire extinguishers.
- Broken or un-repairable equipment (valves, flanges, pipe, supports, instruments, appliances)
- Filters (air, water, oil) made completely or partially from metal

General or domestic waste must be non-hazardous, this category is removed from site daily by a waste disposal Contractor furnishing a documented manifest and gate pass duly approved by OGT Superintendent. The waste generated at SHP will be transported to OGT via periodic supply boat and contained in sturdy “big bags” within waste skips, or suitable containers and follows the same process of waste collection by waste disposal Contractor.

The term domestic waste is any non-putrescible waste consisting of materials, such as paper, cardboard, packing materials, plastic bags or containers, glass or metal containers of small (<20 liter) size, cooking oil, wood in small quantities, or similar materials generated from a dwelling.

Burning of dry grass and vegetation waste at OGT is permitted to comply Myanmar’s Environmental Law. Such wastes are collected through waste disposal Contractor or an organic waste composting method is applied.

Scrap wood or timber such as shipping crates and pallets, either broken or in quantities greater than can be used by Company controlled operations. These waste materials accumulated either at OGT or SHP are to be donated to two (2) local monasteries and/or other identified local communities and also require a documented manifest and gate pass duly approved by OGT Superintendent with an endorsement by CSR on a Donation Form as shown in Appendix 11.

No other materials are to be donated to the local Kyauk Phyu monasteries due to a potential for repercussions from other local communities.

All hazardous wastes are kept in designated storage areas and disposal shall be arranged by ECD certified (or) registered local Service Company, to its hazardous waste treatment facility in Myanmar and to which all collected Company hazardous waste is disposed. Hazardous waste will be handled through ECD certified (or) registered local Service Company.

Examples of Hazardous Waste are:

- Paint & thinners.
- Batteries
- Used oils & fuel
- Contaminated blasting grit, crushed glass and sand

- Aerosols
- Printer Cartridges
- Acids / bases
- Chemicals
- Laboratory Wastes
- Oil contaminated filters
- Oil & chemical contaminated rags & gloves
- Contaminated chemical sacks & drums
- Electrical waste (lighting fixtures, tubes, lamps, bulbs, & computer equipment)
- Radioactive sources & scale

POSCO INTERNATIONAL CORPORATION (Myanmar E&P) will comply with Myanmar National Environmental Quality (Emission) Guidelines, 2015, for all waste effluent levels.

Waste Water

All waste water from buildings are collected and sent to a biological treatment package A-6610.

This Package includes:

- 2 x 100% sewage macerators
- One partitioned sewage holding tank (with 3 compartments for aeration/clarification/chlorination & disinfection).
- 2 x 100% air blowers
- One chlorine tank
- 2 x 100% chlorine injection pumps
- Local control panel

Open Drain System

The open drain system is divided into three networks:

- An entirely non-polluted water drainage system going to a rainwater interceptor pond, OD1
- An accidentally oil-contaminated drainage system: hazardous and non-hazardous open drain header going to the open drain tank T-5610, OD2
- A sewer system (grey & black waters from buildings) going to sewage package, OD3

The hazardous and non-hazardous open drain headers first flow in an open pit which is located upstream of the open drain tank. This pit has two functions:

- The first one is to exclusively send draining effluent (from OGT process equipment) to the open drain tank for oil/water separation.
- The second one is to send first flush of rainwater to the open drain for oil/water separation and then (after sending this first flush), to automatically send excess of rainwater to the interceptor pond (by bypassing the open drain tank).

The open drain tank is equipped with a level interface transmitter to inform the operator when oil volume is accumulated inside the tank T-5610. Oil floating at the surface is then pumped out with portable pump.

Decanted water from open drain tank is then sent to the rain water interceptor pond T-5901 by overflowing from the tank T-5610.

Decanted water from interceptor pond T-5901 is sent directly to sea by overflow after mud and debris separation.

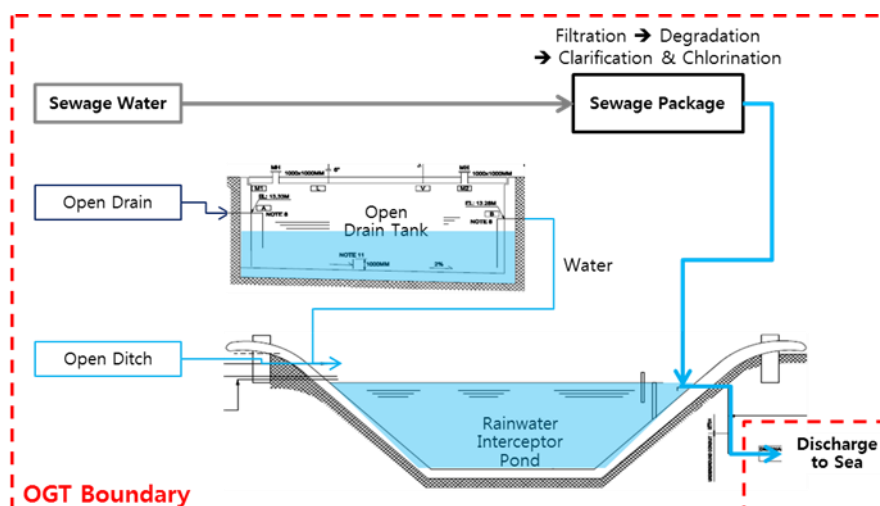


Figure 6.7: OGT Effluent Treatment Schematic

6.3.3 Yangon Headquarter Office

Office general waste is collected and disposed through the management of building administrator while the disposal of waste generated from the staff canteen is managed by Company's catering service provider. Used furnishings etc. from Yangon office are sent direct to the MOGE reception facilities at Thaketa, for correct disposal.

6.3.4 Contractor's Generated Waste

Waste and scrap generated by Contractors as a result of their work activities in OGT shall be properly disposed at Contractor's own cost, however when waste is being removed from OGT site it shall be documented with manifest and gate pass duly approved by OGT Superintendent.

Contractor's waste generated in SHP shall be handled in accordance with contractual agreement usually resulting in transportation onshore for proper disposal.

6.4 Schedule of MOGE's Reusable Non-Hazardous Waste collection and Schedule of Hazardous Waste Collection at OGT

In the context of this document, Reusable Non-hazardous waste from OGT for collection must be offered to and collected by MOGE. This shall be arranged by Company's Yangon HSSE Team with the approval of O & M Director. Upon confirmation of the date of scheduled waste collection, OGT Superintendent to provide assistance for MOGE's reusable non-hazardous

waste collection/handling activity at OGT site. All exiting Non-Hazardous waste and Hazardous waste from site is documented, manifested and gate pass approved by OGT Superintendent.

Company is responsible for all expenditures and cost generated on MOGE waste collection activities at OGT site such as MOGE's personnel mobilization, accommodation and waste transportation to MOGE's Thaketa Supply Base facility in Yangon, Myanmar. After MOGE's collection, the remaining non-hazardous wastes must be arranged for collection by third party service provider with approval of O&M Director.

All Hazardous Waste Collection must be conducted by Registered Hazardous waste treatment service providers of Myanmar Environmental Conservation Department. Certified Hazardous Waste Treatment Service Provider's Schedule for the collection must be arranged by Yangon HSE team with approval of O&M Director.

7.0 ON-SITE MANAGEMENT

Bulk solid wastes will be stored in containers with lids or covers to prevent rainwater infiltration and to minimize the release of vapors or odors. Containers will remain closed unless waste is being added or removed for shipment. On SHP cleaned empty 1 Tonne IBC's with tops cut off and drainage holes and up to 3 placed inside half height cargo basket, are being used for scrap metal collection. Each waste container will be identified and clearly marked with a waste label (hazardous or non-hazardous).

7.1 Manifest and Record Keeping

Records of all stored and transported waste under hazardous and non-hazardous categories will be maintained at each facility.

For waste generated in SHP and transported to OGT, SHP manifest shipments based on category and waste identification. All manifests and waste records will be maintained by both the sending and receiving locations as per Appendix 7.

7.2 Security Check

Security personnel will check waste in the same manner as all materials and as per details in the OGT Site Access Procedure. Besides manifesting of scrap material collected by MOGE, in general a Gate Pass is required for General / Domestic waste to leave OGT facilities and in addition a wood donation form, Appendix 11, for scrap wood donated to local monasteries and/or other approved local communities, is required.

7.3 Hazardous Waste Storage at OGT

Company's generated hazardous waste is placed at a designated storage area located at Warehouse "L" in OGT and control measures shall be maintained until the scheduled MOGE waste collection. General access to this area shall be controlled.

Control measures include;

- Hazardous waste shall be stored securely in totally enclosed and locked units wherever practical. Where this is not practical, a secure area with strict entry control shall be designated.

- Separate areas within the secure storage will be required to segregate incompatible and reactive waste types as per Appendix 3.
- Storage area shall include provision for spillage containment and/or placement into a spill containment pallet.
- Appropriate spill clean-up materials shall be available and ready for use, these include appropriate absorbent pads, spills containment rolls etc.
- Appropriate PPE shall be available at site and ready for use. (Chemical gloves, respirator/mask, boiler suit (disposable), eye protection & etc.)
- Appropriate warning signs and emergency shower/eye wash station shall be maintained at the area.
- Suitable Fire Extinguishers shall be provided in close proximity to the storage area.
- MSDS of the stored chemicals and waste oils shall be maintained available at site.
- Inventory log/list to be maintained and update record/movement of waste.
- No combustible materials such as wood/timber or papers to be stored at the area.

8.0 EMPLOYEE TRAINING

Site HSSE Representative and SHP Services Supervisors will coordinate programs to train site personnel in the proper identification and handling of waste. The primary purpose of the training is to ensure that personnel have the knowledge and skills to perform their duties in a manner that protects themselves, other employees and contractors, and the environment.

Awareness training should include the following topics:

- Individuals responsibilities and accountabilities
- Generation/Accumulation
- Waste Segregation and colour coding
- Manifest System
- Documentation/Record keeping
- Emergency Response

All personnel, whose duties involve any aspect of waste generation, handling, storage, documentation, disposal, or potential exposure, should receive training. Personnel to be trained include employees and contractors who are involved in some capacity with the waste management procedures.

9.0 ANNUAL HSSE AUDIT

Annual HSSE audit has been carried out to OGT, SHP, and Yangon office to ensure compliance of waste management standard and ISO 14001 Standard.

10.0 CONTINUOUS PROCEDURAL REVIEW AND UPDATE

This Waste Management Procedure will be updated as changes in operations, waste regulations, and waste characteristics occur.

Appendix 1. HAZARDOUS WASTE LABEL

HAZARDOUS WASTE	
POSCO INTERNATIONAL Corporation Myanmar E & P	
Shipping Name:	
Hazard Class:	
ID Number:	
Waste Description:	%
1	
2	
3	
4	
Accumulation Dates:	
Facility of Generation:	
Physical State <input type="checkbox"/> Gas <input type="checkbox"/> Liquid <input type="checkbox"/> Solid	
Hazard Category <input type="checkbox"/> Flammable <input type="checkbox"/> Corrosive <input type="checkbox"/> Toxic <input type="checkbox"/> Air/Water Reactive <input type="checkbox"/> Oxidizer <input type="checkbox"/> Explosive	
Handle with Care	

Appendix 2. NON-HAZARDOUS WASTE LABEL
























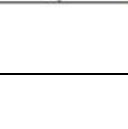
Non-Hazardous Waste POSCO INTERNATIONAL Corporation Myanmar E & P		
Waste Description:		
Accumulation Dates:		
Facility of Generation:		
Physical State <div style="display: flex; justify-content: space-around; align-items: center;"> <div><input type="checkbox"/> Gas</div> <div><input type="checkbox"/> Liquid</div> <div><input type="checkbox"/> Solid</div> </div>		

Appendix 3. HAZARDOUS WASTE SEGREGATION

Restricted Waste Segregation:

All restricted waste must be segregated into categories to prevent incompatible mixtures. The table (Chart) provided below may be used when separating incompatible chemicals.

Dangerous Goods & Combustible Liquids Storage Compatibility Chart

DANGEROUS GOODS & COMBUSTIBLE LIQUIDS STORAGE COMPATIBILITY CHART													
Class or Subsidiary Risk													
FLAMMABLE GASES		OK TO STORE TOGETHER	OK TO STORE TOGETHER	SEGREGATE At least 3m	SEGREGATE At least 3m	SEGREGATE At least 5m	SEGREGATE At least 5m	SEGREGATE At least 5m	SEGREGATE At least 5m	SEGREGATE At least 3m	ISOLATE	SEGREGATE At least 3m	SEGREGATE At least 5m
NON TOXIC NON FLAMMABLE GASES		OK TO STORE TOGETHER	OK TO STORE TOGETHER	OK TO STORE TOGETHER	OK TO STORE TOGETHER	SEGREGATE At least 5m	SEGREGATE At least 5m	SEGREGATE At least 5m	SEGREGATE At least 5m	SEGREGATE At least 3m	ISOLATE	SEGREGATE At least 3m	SEGREGATE At least 5m
TOXIC GAS		SEGREGATE At least 3m	OK TO STORE TOGETHER	MAY NOT BE COMPATIBLE CHECK MSDS AND NOTES	SEGREGATE At least 3m	SEGREGATE At least 5m	SEGREGATE At least 5m	SEGREGATE At least 5m	SEGREGATE At least 5m	SEGREGATE At least 3m	ISOLATE	SEGREGATE At least 3m	SEGREGATE At least 5m
OXIDIZING GAS		SEGREGATE At least 3m	OK TO STORE TOGETHER	SEGREGATE At least 3m	OK TO STORE TOGETHER	SEGREGATE At least 5m	SEGREGATE At least 5m	SEGREGATE At least 5m	SEGREGATE At least 5m	SEGREGATE At least 3m	ISOLATE	SEGREGATE At least 3m	SEGREGATE At least 5m
FLAMMABLE LIQUIDS + COMBUSTIBLE LIQUIDS		SEGREGATE At least 5m	SEGREGATE At least 5m	SEGREGATE At least 5m	SEGREGATE At least 5m	OK TO STORE TOGETHER	SEGREGATE At least 3m	SEGREGATE At least 5m	SEGREGATE At least 5m	SEGREGATE At least 5m	ISOLATE	SEGREGATE At least 5m	SEGREGATE At least 3m
FLAMMABLE SOLID		SEGREGATE At least 5m	SEGREGATE At least 5m	SEGREGATE At least 5m	SEGREGATE At least 5m	SEGREGATE At least 3m	OK TO STORE TOGETHER	SEGREGATE At least 3m	SEGREGATE At least 5m	SEGREGATE At least 3m	ISOLATE	SEGREGATE At least 3m	MAY NOT BE COMPATIBLE CHECK MSDS AND NOTES
SPONTANEOUSLY COMBUSTIBLE		SEGREGATE At least 5m	SEGREGATE At least 5m	SEGREGATE At least 5m	SEGREGATE At least 5m	SEGREGATE At least 5m	SEGREGATE At least 3m	OK TO STORE TOGETHER	SEGREGATE At least 5m	SEGREGATE At least 5m	ISOLATE	SEGREGATE At least 3m	SEGREGATE At least 3m
DANGEROUS WHEN WET		SEGREGATE At least 5m	SEGREGATE At least 5m	SEGREGATE At least 5m	SEGREGATE At least 5m	SEGREGATE At least 5m	SEGREGATE At least 5m	SEGREGATE At least 5m	OK TO STORE TOGETHER	SEGREGATE At least 5m	ISOLATE	SEGREGATE At least 3m	SEGREGATE At least 5m
OXIDIZING AGENT		SEGREGATE At least 3m	SEGREGATE At least 3m	SEGREGATE At least 3m	SEGREGATE At least 3m	SEGREGATE At least 5m	KEEP APART	SEGREGATE At least 5m	SEGREGATE At least 5m	MAY NOT BE COMPATIBLE CHECK MSDS AND NOTES	ISOLATE	SEGREGATE At least 3m	SEGREGATE At least 3m
ORGANIC PEROXIDE		ISOLATE	ISOLATE	ISOLATE	ISOLATE	ISOLATE	ISOLATE	ISOLATE	ISOLATE	ISOLATE	OK TO STORE TOGETHER	ISOLATE	SEGREGATE At least 3m
TOXIC SUBSTANCES		SEGREGATE At least 3m	SEGREGATE At least 3m	SEGREGATE At least 3m	SEGREGATE At least 3m	SEGREGATE At least 5m	SEGREGATE At least 3m	SEGREGATE At least 3m	SEGREGATE At least 3m	SEGREGATE At least 3m	ISOLATE	OK TO STORE TOGETHER	SEGREGATE At least 5m
CORROSIVE		SEGREGATE At least 5m	SEGREGATE At least 5m	SEGREGATE At least 5m	SEGREGATE At least 5m	SEGREGATE At least 3m	MAY NOT BE COMPATIBLE CHECK MSDS AND NOTES	SEGREGATE At least 3m	SEGREGATE At least 5m	SEGREGATE At least 3m	SEGREGATE At least 3m	SEGREGATE At least 5m	MAY NOT BE COMPATIBLE CHECK MSDS AND NOTES

Appendix 4. NON-HARZARDOUS AND HAZARDOUS WASTE DRUM AUDIT WORKSHEET

INSTRUCTIONS:

For each one confirm that:

- Label is intact and meets the requirements of Waste name and hazard warning.
- Copy of MSDS is included.
- Waste is listed in the waste inventory log.

Date: _____

Facility/Contact: _____

Waste Drum Location	Adequate Label?				MSDS Available?	Listed On Waste Inventory?
	Waste Label?	Non-Hazardous Warning?	Hazard Warning?	Label Legible?		
1.						
2.						
3.						
4.						
5.						
6.						
7.						
8.						
9.						
10.						

Item #	Equip #	Corrective Action (task)	Comments	WO #

SHIPPER'S DECLARATION FOR DANGEROUS GOODS

Appendix 6. RETURN MATERIALS & DISPOSAL FORM (RMDF)

<div style="display: flex; justify-content: space-between; align-items: center;"> <div>posco INTERNATIONAL</div> <div>Returned Materials and Disposal Form</div> </div>							
Point of Origin (please check appropriate box) <input type="checkbox"/> SHP <input type="checkbox"/> OGT <input type="checkbox"/> YANGON <input type="checkbox"/> SINGAPORE <input type="checkbox"/> OTHERS _____				Mode of Transport (please check appropriate box) <input type="checkbox"/> Air _____ <input type="checkbox"/> Land _____ <input type="checkbox"/> Sea _____ <input type="checkbox"/> Hand Carry _____ <input type="checkbox"/> Others _____			
Item No	PO, WO, Reservation, SIR or other reference	Quantity Returned	SAP code	Description	Serial/ Part Number	Original Documents	Return Code (See Index)
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
Comments / Remarks 							
Return Code Index 1 - Return into SAP inventory 2 - For Repair, Calibration & Refurbishment 3 - For Scrap / Disposal <i>Note: For return code 1 and 2 material number or SAP code must be obtained prior returning to OGT Warehouse whether the item has been used or unused.</i>							
Name Position Signature Date	Originator	Approval (Line Supervisor)		Approval (SHP-OIM / OGT SUPT)		(To be filled up by the Warehouse Personnel) Received by SAP Posting by	

[illegible]

Appendix 8. GLOBALLY HARMONIZED SYSTEM (GHS) PICTOGRAMS

GHS Pictograms

Physical Hazards



- Being flammable
- Self Reactivity
- Pyrophorics
- Releasing Self-Heat
- Emitting Flammable Gases



- Gases under Pressure



- Oxidization



- Explosion
- Self Reactivity
- Organic Peroxide

Health Hazards



- Irritation
- Dermal Sensitizer
- Acute Toxicity (harmful)



- Corrosion



- Acute Toxicity (Severe)



- Carcinogenicity
- Respiratory Sensitizer
- Reproductive Toxicity
- Target Organ Toxicity
- Germcell Mutagenicity

Environmental Hazards



- Environmental Toxicity

**United Nation Recommendation of
Transport and Dangerous Goods(UNRTDG)**

CLASS 1: EXPLOSIVES



Division (1.1,1.2 and 1.3
Severely Explosives



Division 1.4
Explosives and
Hazardous Substances



Division 1.5
Explosives



Division 1.6
Not Severely
Explosives

CLASS 2: GASES



Division 2.1
Flammable Gases



Division 2.2
Non-flammable, Non-toxic Gases



Division 2.3
Toxic Gases

CLASS 3: FLAMMABLE LIQUIDS



Flammable Liquids

CLASS 4: FLAMMABLE SOLIDS



Division 4.1
Flammable Solids



Division 4.2
Substance liable to
spontaneous combustion



Division 4.3
Substances which in contact
with water emit
flammable gases

CLASS 5: OXIDIZING SUBSTANCES AND ORGANIC PEROXIDES



Division 5.1
Oxidizing substances



Division 5.2
Organic peroxides

CLASS 6: TOXIC AND INFECTIOUS SUBSTANCES



Division 6.1
Toxic substances



Division 6.2
Infectious substances

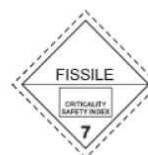
CLASS 7: RADIOACTIVE MATERIALS



Radioactive materials



Radioactive materials



CLASS 8: CORROSIVE SUBSTANCES






Corrosive substances

CLASS 9: MISCELLANEOUS DANGEROUS SUBSTANCES AND ARTICLES



Miscellaneous Dangerous
substances and articles

Appendix 9. UNITED NATIONS' GHS OF CLASSIFICATION AND LABELLING OF CHEMICALS AND DANGEROUS GOODS (VOLUME 1 AND 2)

<p>Copyright@United Nations, 2011. All rights reserved.</p> <p>ST/SG/AC.10/30/Rev.4</p> <p>GLOBALLY HARMONIZED SYSTEM OF CLASSIFICATION AND LABELLING OF CHEMICALS (GHS)</p> <p><i>Fourth revised edition</i></p> <p> UNITED NATIONS New York and Geneva, 2011</p>	<p>Copyright@United Nations, 2011. All rights reserved.</p> <p>Recommendations on the</p> <p>TRANSPORT OF DANGEROUS GOODS</p> <p>Model Regulations</p> <p>Volume I</p> <p><i>Seventeenth revised edition</i></p> <p> UNITED NATIONS</p>	<p>Copyright@United Nations, 2011. All rights reserved.</p> <p>Recommendations on the</p> <p>TRANSPORT OF DANGEROUS GOODS</p> <p>Model Regulations</p> <p>Volume II</p> <p><i>Seventeenth revised edition</i></p> <p> UNITED NATIONS</p>
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EDMS's Folder > HSE > UN GHS Labelling for Chemicals / UN DG (Volume 1) / UN DG (Volume 2)

Appendix 10. PREVENTION OF HAZARD FROM CHEMICAL AND RELATED SUBSTANCES LAW AND RULES

Prevention of Hazard from Chemical and Related Substances Law
(2013, Pyidaungsu Hluttaw Law No, 28)
The 5th Waning of Wagaung 1375 M.E
(26th August, 2013)

The Pyidaungsu Hluttaw hereby enacts this Law.

Chapter I

Title and Definition

1. This Law shall be called the Prevention of Hazard from Chemical and Related Substances Law.
2. The following expressions contained in this Law shall have the meanings given here under:-
 - (a) **Chemical** means the chemical element, compound and mixture which appeared from men made or by natural to be hazardous to Human Being and Animals' health or life, be disadvantages on the environment. This expression also includes smoke and gas, liquid, oil and grease and solid wastes which are obtained from chemical reaction of element, compound and mixture by technique;

producing, selling or exporting the chemical and related substances;

- (n) **Labelling** means the Material Safety Data Sheet with hazard statement warning that is stuck on the box, bottle, cardboard, empty boxes and packages which is put chemical or related substances, the storehouses which are stored them, the vehicles which are transported them in accordance with the stipulations;
- (o) **Primary Laboratory** means a laboratory prescribed by the Central Leading Board by notification to analyze samples of the chemical and related substances;
- (p) **Appellate Laboratory** means a laboratory specified separately by the Central Leading Board when if require to examine again and to make a final and conclusive decision, in respect of the report of analysis remark of the Primary Laboratory.



The Republic of the Union of Myanmar
Ministry of Industry

Notification No. (85/ 2015-2016)

The 3rd Waxing of Pyatho, 1377 M.E.
(12th January, 2016)

The Ministry of Industry, in exercising the power conferred under sub-section (a) of Section 47 of the Prevention of Hazard from Chemical and Related Substances Law, hereby issues the following rules with the approval of the Union Government.

Chapter I

Title and Definition

1. These rules shall be called the Prevention of Hazard from Chemical and Related Substances Rules.
2. The expressions contained in these rules shall have the same meanings as defined in the Prevention of Hazard from Chemical and Related Substances Law. Moreover, the following expressions shall have the meanings given hereunder:
 - (a) **Law** means the Prevention of Hazard from Chemical and Related Substances Law;
 - (b) **Conditional Chemical** means the chemical and related substances which are prescribed for ordinary use of public;
 - (c) **Restricted Chemical** means the hazardous chemical and related substances which are specially controlled for health and safety of the human beings;
 - (d) **Prohibited Chemical** means the chemical and related substances which are produced, used and imported only by the State for the cases of doing the scientific research and eradicating the contagious disease;

EDMS's Folder > HSE > Prevention of hazard from chemical and related substances law /rules

Appendix 11. SCRAP WOOD DONATION FORM

SCRAP WOOD DONATION FORM

Date:		Time:	
Type of Waste:		Origin:	
Quantity:			
Detailed Description of Waste:			
Receiving Institution:			
Name: _____			
Location: _____			
Receiving Institution receipt: I declare and acknowledge that I received Scrap Wood, as described above, from PIC. Received by: Name and Signature: _____ Date: _____ Time: _____			
Transported by Driver Name and Signature:		Vehicle Type & Vehicle Reg. No: _____ 5 Ton Truck _____ 25 Ton Truck _____	
Requested by:	Acknowledged by HSSE Supervisor	Approved by OGT CSR REP	Approved by OGT Superintendent
Name and Signature:	Name and Signature:	Name and Signature:	Name and Signature:

Appendix H Golden Dowa standard operation procedures

Reporting Period		July
Sr. No	Kind	Disposal System
1	Chemicals <ul style="list-style-type: none"> • Unused • Spent Chemicals • Residues 	Firstly, necessary to check MSDS. Normally, for the liquid chemical waste, do neutralize and treated by water treatment facility. For the solid chemical waste do pre-treatment and dispose to hazardous landfill. (GEM-FA-S063E00, GEM-FA-S004E00, GEM-FA-S009E00)
2	Acid / Alkali	Do neutralization and treat in waste water treatment facility. (GEM-FA-S063E00)
3	Paint / Thinner	Separation of solid and liquid content. In case of solid pretreatment with absorbent material (sand) and send to hazardous landfill. In case of liquid do the blending test with waste oil and send to cement factory. (GEM-FA-S093E00)
4	Used Oil / Waste Oil	Send to cement factory (burning as fuel) (GEM-FA-S016E00)
5	Contaminated Packing Materials	Solidification and send to hazardous landfill (GEM-FA-S004E00, GEM-FA-S009E00)
6	Contaminated Container/ Drum /Bag	Check the actual condition and remove the residual. Wash the container and dismantle into cap and body. Cut the body to about 30 cm pieces and then dispose to non-hazardous landfill, in case of hazardous residue contains, send to hazardous landfill. (GEM-FA-S017E00)
7	Contaminated Cloths	Do pre-treatment (mixing with sand, 1:1) and dispose to hazardous landfill (GEM-FA-S092E00)
8	Contaminated Soil	Do pre-treatment (solidification) and dispose to Hazardous landfill (GEM-FA-S004E00, GEM-FA-S009E00)
9	Contaminated Blasting Grit	Do pre-treatment (solidification) and dispose to Hazardous landfill (GEM-FA-S004E00, GEM-FA-S009E00)
10	Contaminated Sand	Do pre-treatment and dispose to Hazardous landfill (GEM-FA-S004E00, GEM-FA-S009E00)
11	Oily Gloves or Rags	Do pre-treatment (mixing with sand, 1:1) and dispose to hazardous landfill (GEM-FA-S092E00)
12	Spill Absorbent Pads	Do pre-treatment (mixing with sand, 1:1) and dispose to Hazardous landfill (GEM-FA-S092E00)
13	Oily Filters	Do pre-treatment and dispose to hazardous landfill (GEM-FA-S004E00, GEM-FA-S009E00)
14	Oily Sludge	Pre-treatment and send to hazardous landfill (GEM-FA-S004E00, GEM-FA-S009E00)
15	Produced Sand	Pre-treatment and send to hazardous landfill (GEM-FA-S004E00, GEM-FA-S009E00)

16	Printer Cartridge	Dismantling, pre-treatment and dispose to hazardous landfill (GEM-FA-S001E00)
17	Fluorescent Tubes / Bulbs	Crush the waste using crusher and keep in proper container for exportation.
18	Medical Waste	Liquid waste: 1) in case of being possibility to treat in water treatment facility destroy the waste and send to water treatment facility (GEM-FA-S012E00), 2) in case of being impossibility of treating in water treatment facility destroy the waste and send to hazardous landfill (GEM-FA-S014E00) Solid waste: Destroy the waste and send to hazardous landfill (GEM-FA-S013E00)
19	Biohazards Waste	Unacceptable waste
20	Batteries	Do dismantling, stabilization (cementation) and dispose to hazardous landfill. (GEM-FA-S006E00)
21	Drilling Waste • Cutting • Mud	Mix waste with cement and soil (normally 10:3 (waste: cement), the ratio rate depends on actual waste state) and then dispose to hazardous landfill in case of SBM and to non-hazardous landfill in case of WBM. (Treatment SOP for SBM and WBM)
22	NORM Containing Waste	Unacceptable waste
23	High Salinity Wastes	Do treatment by waste water treatment facility. (GEM-FA-S034E00)
24	Electronic Waste	Do dismantling, sorting, recycling, cementation and dispose to non-hazardous landfill or hazardous landfill. (GEM-FA-S007E00)
25	Other	




Standard Operating Procedure	DOC NO:	GEM-FA-S066E/00
Subject: SOP; Pretreatment of Nonhazardous Waste by Shredding Machine	Issued/Revised Date: 1 Oct 2018	Page 1 of 4

Standard Operating Procedure; Pretreatment of Nonhazardous Waste by Shredding Machine (ISO 14001:2015)

Address : Lot No. E1, Thilawa SEZ Zone A,
Yangon Region, Myanmar

Phone No.: (+95) 1 2309051

Website : www.goldendowa.com

Prepared By	Checked By	Approved By
 Htet Lin Zin Htet DC/Authorize	 Myeik Aye EMR/Authorize	 MD or Authorized
01 Oct 2018	01 Oct 2018	01 Oct 2018



Standard Operating Procedure	DOC NO:	GEM-FA-S066E/00
Subject: SOP; Pretreatment of Nonhazardous Waste by Shredding Machine	Issued/Revised Date: 1 Oct 2018	P a g e 2 o f 4

Revision History

Rev	Date	Edited Page	Edited Number	Description of Changes	Requested by
00	01/10/2018	-	-	Initial release	EMR

Standard Operating Procedure	DOC NO:	GEM-FA-S066E/00
Subject: SOP; Pretreatment of Nonhazardous Waste by Shredding Machine	Issued/Revised Date: 1 Oct 2018	Page 3 of 4

Standard Operating Procedure; Pretreatment to disable non-hazardous waste by a shredding machine.

Version; 1

Purpose; to disable the function of waste by the shredding machine

Main object; Waste food with package, waste clothes, waste paper, waste goods and others

Procedure;

1. Check requirements for the waste from customers again.
If customers have special requirements, follow them.
*Pay attention on the treatment of containers and packing materials as well.
 - Recycle; We can recycle or not, and confirm the condition in detail
For example “the level of destruction” and “the treatment for the package” so on.
 - Record; Photo, Report and Certificate so on.
 - Witness; When, Where, Who, What, Why and How
2. Disable the waste by the shredding machine.
 - 1) Take away the sheet from the shredding machine.
 - 2) Look around the shredding machine.
 - 3) Check the condition of mesh plate
 - 4) Set up a jumbo bag at the exhaust port
 - 5) Turn on the power
 - 6) Load the waste into the shredding machine through the feeding port, following the instruction from the responsible person.





Standard Operating Procedure	DOC NO:	GEM-FA-S066E/00
Subject: SOP; Pretreatment of Nonhazardous Waste by Shredding Machine	Issued/Revised Date: 1 Oct 2018	Page 4 of 4

- 7) Continue to shred the waste until the jumbo bag is nearly full.
 - 8) Stop to load the waste temporary.
 - 9) Replace the full jumbo bag to the empty jumbo bag
 - 10) Repeat the step 6) to step 9)
 - 11) Turn off the power
 - 12) Look around the shredding machine.
 - 13) Cover the shredding machine with the sheet
3. Dispose of the shredded waste to non-hazardous landfill after the jumbo bag is carried to non-hazardous landfill, following GENERAL _ Operating Procedure; Non-hazardous landfill

Remarks;

1. Always keep the measurements that customers provided for us.
(Safety measurement, First aid, Leakage measurement and measurement for fire)
(*Refer to "Waste Profile Sheet" that customers provided for us.)

Approved by

Tomoya SUZUKI
Director

Revision;

20180515; Version 1

20180907; Version 2



Standard Operating Procedure	DOC NO:	GEM-FA-S030E/00
Subject: SOP; Treatment of cooking oil waste to hazardous landfill	Issued/Revised Date: 1 Oct 2018	Page 1 of 3

Standard Operating Procedure; Treatment of “Cooking Oil Waste” to hazardous landfill (ISO 14001:2015)

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01 Oct 2018	01 Oct 2018	01 Oct 2018



Standard Operating Procedure	DOC NO:	GEM-FA-S030E/00
Subject: Treatment of cooking oil waste to hazardous landfill	Issued/Revised Date: 1 Oct 2018	Page 2 of 3

Revision History

Rev	Date	Edited Page	Edited Number	Description of Changes	Requested by
00	01/10/2018	-	-	Initial release	EMR

Standard Operating Procedure	DOC NO:	GEM-FA-S030E/00
Subject: Treatment of cooking oil waste to hazardous landfill	Issued/Revised Date: 1 Oct 2018	Page 3 of 3

Standard Operating Procedure; Treatment of “Cooking Oil Waste” to hazardous landfill.**Version; 1**

Purpose; to dispose of “Cooking Oil Waste” to hazardous landfill properly

Main object; “Cooking Oil Waste”. In cooking oils, there is oil which combines with oxygen and heat of reaction is generated, and then there is a danger of firing finally.

Procedure;

1. Check the kind of waste and the waste condition, compared with “Waste Profile Sheet” that customers provided for us.
← (Safety) In the case that it has difference, contact to responsible person.
2. Unloading the waste in “Sorting & Stabilization facility”.
3. Put the sheet on the floor and prepare noncombustible absorbent materials as “Sand”. Put the materials on the sheet and pour the waste to the materials. And then, mix well. If a liquid come out from the materials, we need to add the materials.
← (Safety) In cooking oils, for instance vegetable oils including linseed oil (poppy oil, tung oil, etc.), there is oil which combines with oxygen in the air and causes oxidation reaction in the process of drying. In the reaction, heat of reaction is generated and accumulated, and then there is a danger of firing, in the case that heat radiation does not go well, or there are combustibles closely.
← (Environment) Not get dirty to working place.
4. After that, put the mixture into bags, close the opening of bags with a string and carry the mixture to hazardous landfill.
← (Environment) Pay attention on spill on the way to landfill.
5. Put the mixture on hazardous landfill, and cover the mixture with noncombustible absorbent materials as “Sand”, “Soil” and “Noncombustible solid waste” in order to prevent from firing.

Remarks;

1. When handling waste, always keep the measurements that customers provided for us.
(Safety measurement, First aid, Leakage measurement and measurement for fire)
(*Refer to “Waste Profile Sheet” that customers provided for us.)





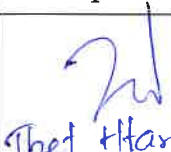

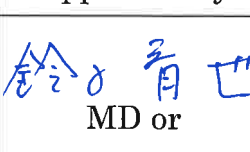
Standard Operating Procedure	DOC NO:	GEM-FA-SO71E/00
Subject: Standard Operating Procedure; Treatment of “Domestic Waste Water” to water treatment facility	Issued/Revised Date: 1 Oct 2018	Page 1 of 5

Standard Operating Procedure; Treatment of “Domestic Waste Water” to water treatment facility (ISO 14001:2015)

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Prepared By	Checked By	Approved By
 Thein Htar Aye DC	 Kyaw Nyein Aye EMR	 MD or Authorized
01 Oct 2018	01 Oct 2018	01 Oct 2018

Standard Operating Procedure	DOC NO:	GEM-FA-SO71E/00
Subject: Standard Operating Procedure; Treatment of “Domestic Waste Water” to water treatment facility	Issued/Revised Date: 1 Oct 2018	P a g e 2 o f 5

Revision History

Re v.	Date	Edited Page	Edited Number	Description of Changes	Requested by
00	01/10/2018	-	-	Initial release	EMR

Standard Operating Procedure	DOC NO:	GEM-FA-SO71E/00
Subject: Standard Operating Procedure; Treatment of "Domestic Waste Water" to water treatment facility	Issued/Revised Date: 1 Oct 2018	Page 3 of 5

Standard Operating Procedure; Treatment of "Domestic Waste Water" to water treatment facility.

Version; 2

Purpose; to dispose of "Domestic Waste water" to water treatment facility properly

Main object; "Domestic Waste water"

*The same treatment is applied to so-called "Grey water" ("Grey water" is water coming from domestic equipment other than toilets (e.g., sinks, bathtubs, showers, sinks and washing machines).

Procedure;

1. Check the kind of waste and the waste condition, compared with "Waste Profile Sheet" that customers provided for us.
 ← (Safety) In the case that it has difference, contact to responsible person.
2. Go to the water treatment facility area after measuring the weight, and then park the tank truck near the pit in our sewer following the instruction. On the other hand, in the case that we collect foreign materials such as plastic trash, lump like we can't pump it up and others (We would put them into some containers), dispose of them to non-hazardous landfill, following the procedure, GENERAL _ Operating Procedure; Non-hazardous landfill.
3. Open the pit lid in our sewer and put the sieves in the sewer pit to eliminate lumps, large solids (i.e. those with a diameter of more than about 2cm) and grit (heavy solids) with domestic waste water
 ← (Safety) These interfere with the operation of facility and often cause severe problems such as "Clogging of pipes" and "Failure of pump-up".
4. Connect the hose to the drain pipe of tank truck and extend the tip of hose to the sieves in the pit. And also extend the hose of fresh water to the sieves.

Standard Operating Procedure	DOC NO:	GEM-FA-SO71E/00
Subject: Standard Operating Procedure; Treatment of "Domestic Waste Water" to water treatment facility	Issued/Revised Date: 1 Oct 2018	Page 4 of 5

5. Wear the body harness, go up to the tank, connect the hook with the bar of truck and open the valve of air pipe slowly.
 ← (Safety) Person who works over 2 m must wear a body harness.

6. Slowly open the valve of drain, and start to unload domestic waste water. Also open the valve of fresh water and flush the sieves with fresh water until finishing the unloading.
 ← (Environment) In the case of opening the valve of drain quickly, domestic waste water might come out from hose.
 ← (Environment) Fresh water can protect the appearance of bad smell while unloading domestic waste water. Also can dissolve domestic waste water and pass domestic waste water from the sieves partly.

7. Our sewer is connected to the final sewage pit with the pump capable of transferring out it to each equalization pond.
 ← (Environment) Pay attention on the diffusion of odor

8. Clean the tank with water and put in the rest domestic waste water there into the pit.

9. Close the valve of drain, take away the hose from the drain and fix the position. When taking away the hose, we need to drain out the rest in the hose completely. Finally close the valve of air pipe.

10. Wash the sieves with water, take out it from the pit and close the lid quickly.
 The sieves are moved as it is and disposed to non-hazardous landfill immediately, following the procedure, GENERAL _ Operating Procedure; Non-hazardous landfill.

11. Place the vehicle at car parking.

12. After step-7, domestic waste water is disposed to our water treatment facility following the procedure, GENERAL _ Standard Operating Procedure; Water treatment facility.



Standard Operating Procedure	DOC NO:	GEM-FA-SO71E/00
Subject: Standard Operating Procedure; Treatment of “Domestic Waste Water” to water treatment facility	Issued/Revised Date: 1 Oct 2018	P a g e 5 o f 5

Remarks;

1. When handling waste, always keep the measurements that customers provided for us.
(Safety measurement, First aid, Leakage measurement and measurement for fire)
(*Refer to “Waste Profile Sheet” that customers provided for us.)

Approved by

Tomoya SUZUKI
Director

Revision;

20180123; Version 1
20180826; Version 2

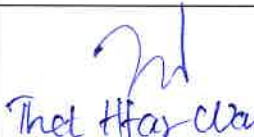
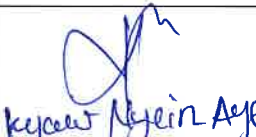
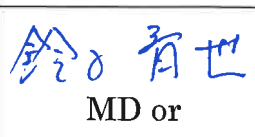
Standard Operating Procedure	DOC NO:	GEM-FA-SO72E/00
Subject: Standard Operating Procedure; Treatment of “Fecal Waste” to water treatment facility	Issued/Revised Date: 1 Oct 2018	Page 1 of 5

Standard Operating Procedure; Treatment of “Fecal Waste” to water treatment facility (ISO 14001:2015)

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01 Oct 2018	01 Oct 2018	01 Oct 2018



Standard Operating Procedure	DOC NO:	GEM-FA-SO72E/00
Subject: Standard Operating Procedure; Treatment of “Fecal Waste” to water treatment facility	Issued/Revised Date: 1 Oct 2018	P a g e 2 o f 5

Revision History

Re v.	Date	Edited Page	Edited Number	Description of Changes	Requested by
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Standard Operating Procedure	DOC NO:	GEM-FA-SO72E/00
Subject: Standard Operating Procedure; Treatment of "Fecal Waste" to water treatment facility	Issued/Revised Date: 1 Oct 2018	Page 3 of 5

Standard Operating Procedure; Treatment of "Fecal Waste" to water treatment facility.

Version; 3

Purpose; to dispose of "Fecal Waste" to water treatment facility properly

Main object; "Fecal Waste"

*The same treatment is applied to so-called "Black water" ("Black water" is the mixture of urine, feces and flush water and/or cleansing materials. Black water contains the pathogens of feces and the nutrients of urine that are diluted in the flush water.)

Procedure;

1. Check the kind of waste and the waste condition, compared with "Waste Profile Sheet" that customers provided for us.
 ← (Safety) In the case that it has difference, contact to responsible person.
2. Go to the water treatment facility area after measuring the weight, and then park the tank truck near the pit in our sewer following the instruction. On the other hand, in the case that we collect foreign materials such as sanitary goods, plastic trash and others (We would put them into some containers), dispose of them to non-hazardous landfill, following the procedure, GENERAL _ Operating Procedure; Non-hazardous landfill.
3. Open the pit lid in our sewer and put the sieves in the sewer pit to eliminate lumps, large solids (i.e. those with a diameter of more than about 2cm) and grit (heavy solids) with fecal waste
 ← (Safety) These interfere with the operation of facility and often cause severe problems such as "Clogging of pipes" and "Failure of pump-up".
4. Connect the hose to the drain pipe of tank truck and extend the tip of hose to the sieves in the pit. And also extend the hose of fresh water to the sieves.

Standard Operating Procedure	DOC NO:	GEM-FA-SO72E/00
Subject: Standard Operating Procedure; Treatment of "Fecal Waste" to water treatment facility	Issued/Revised Date: 1 Oct 2018	P a g e 4 o f 5

5. Wear the body harness, go up to the tank, connect the hook with the bar of truck and open the valve of air pipe slowly.

← (Safety) Person who works over 2 m must wear a body harness.

6. Slowly open the valve of drain, and start to unload fecal waste. Also open the valve of fresh water and flush the sieves with fresh water until finishing the unloading.

← (Environment) In the case of opening the valve of drain quickly, fecal waste might come out from hose.

← (Environment) Fresh water can protect the appearance of bad smell while unloading fecal waste. Also can dissolve fecal waste and pass fecal waste from the sieves partly.

7. Although our sewer is connected to the final sewage pit with the pump capable of transferring out it to each equalization pond, fecal waste is received only in the equalization pond with the cover.

← (Environment) Pay attention on the diffusion of odor

8. Clean the tank with water and put in the rest fecal waste there into the pit.

9. Close the valve of drain, take away the hose from the drain and fix the position. When taking away the hose, we need to drain out the rest in the hose completely. Finally close the valve of air pipe.

10. Wash the sieves with water, take out it from the pit and close the lid quickly.

The sieves are moved as it is and disposed to non-hazardous landfill immediately, following the procedure, GENERAL _ Operating Procedure; Non-hazardous landfill.

11. Flush out our sewer with water for more than 1minute from the washing place, located in the upper stream, besides our sorting & stabilization facility in order not to leave the rest of fecal waste in our sewer.

Standard Operating Procedure	DOC NO:	GEM-FA-SO72E/00
Subject: Standard Operating Procedure; Treatment of "Fecal Waste" to water treatment facility	Issued/Revised Date: 1 Oct 2018	Page 5 of 5

← (Environment) Flush out it well, so that the rest of fecal waste in our sewer might cause the bad smell.

12. Place the vehicle at car parking.

13. After step-7, fecal waste is disposed to our water treatment facility following the procedure, GENERAL _ Standard Operating Procedure; Water treatment facility.

Remarks;

1. When handling waste, always keep the measurements that customers provided for us.
(Safety measurement, First aid, Leakage measurement and measurement for fire)
(*Refer to "Waste Profile Sheet" that customers provided for us.)

Approved by

Tomoya SUZUKI
Director

Revision;

20180123; Version 1

20180820; Version 2

20180826; Version 3



Standard Operating Procedure	DOC NO:	GEM-FA-S019E/00
Subject: SOP; Treatment of Garbage to non-hazardous landfill	Issued/Revised Date: 1 Oct 2018	Page 1 of 4

Standard Operating Procedure; Treatment of “Garbage” to non-hazardous landfill (ISO 14001:2015)

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Standard Operating Procedure	DOC NO:	GEM-FA-S019E/00
Subject: SOP; Treatment of Garbage to non-hazardous landfill	Issued/Revised Date: 1 Oct 2018	Page 2 of 4

Revision History

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00	01/10/2018	-	-	Initial release	EMR

Standard Operating Procedure	DOC NO:	GEM-FA-S019E/00
Subject: SOP; Treatment of Garbage to non-hazardous landfill	Issued/Revised Date: 1 Oct 2018	Page 3 of 4

Standard Operating Procedure; Treatment of “Garbage” to non-hazardous landfill.

Version; 1

Purpose; to dispose of “Garbage” to non-hazardous landfill properly

Main object; “Garbage”. Since garbage has a wide variety of wastes in the case of not sorting enough before, it contaminated with risky things. We must remove risks from garbage.

Procedure;

1. Check the kind of waste and the waste condition, compared with “Waste Profile Sheet” that customers provided for us.
← (Safety) In the case that it has difference, contact to responsible person.
2. Unloading the waste in “Sorting & Stabilization facility”.
3. Must remove things that have risks in our handling process from the waste, as below.
 - 1) Harmful; Battery, Cell, Thermometer, Electric appliance and Chemicals (Medicine, insecticide and pesticide)
 - 2) Combustible / Flammable; Spray can, Battery, Cell, Cigarette lighter, Paint and Thinner
 - 3) Unsanitary; Feces and urine from human and animals, Carcass, things with body fluids
 - 4) Large; Furniture, Bedding, Rug, Long object (Wood and umbrella), Concrete block and Extinguisher
 - 5) Sharp; Glass products, Edge tool (Knife, scissor and cutter) and metal products
4. Follow the procedure, GENERAL _ Operating Procedure; Non-hazardous landfill.

Remarks;

1. When handling waste, always keep the measurements that customers provided for us.
(Safety measurement, First aid, Leakage measurement and measurement for fire)





Standard Operating Procedure	DOC NO:	GEM-FA-S019E/00
Subject: SOP; Treatment of Garbage to non-hazardous landfill	Issued/Revised Date: 1 Oct 2018	Page 4 of 4

(*Refer to “Waste Profile Sheet” that customers provided for us.)



Standard Operating Procedure	DOC NO:	GEM-FA-S021E/00
Subject: SOP; Treatment of Kitchen waste and Canteen waste to non-hazardous landfill	Issued/Revised Date: 1 Oct 2018	Page 1 of 3

Standard Operating Procedure; Treatment of “Kitchen waste” and “Canteen waste” to non-hazardous landfill (ISO 14001:2015)

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Standard Operating Procedure	DOC NO:	GEM-FA-S021E/00
Subject: SOP; Treatment of Kitchen waste and Canteen waste to non-hazardous landfill	Issued/Revised Date: 1 Oct 2018	Page 2 of 3

Revision History

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Standard Operating Procedure	DOC NO:	GEM-FA-S021E/00
Subject: SOP; Treatment of Kitchen waste and Canteen waste to non-hazardous landfill	Issued/Revised Date: 1 Oct 2018	Page 3 of 3

Standard Operating Procedure; Treatment of “Kitchen waste” and “Canteen waste” to non-hazardous landfill.

Version; 2

Purpose; to dispose of “Kitchen waste” and “Canteen waste” to non-hazardous landfill properly

Main object; “Kitchen waste” and “Canteen waste” including food residue and animal / plant residue

Procedure;



1. Check the kind of waste and the waste condition, compared with “Waste Profile Sheet” that customers provided for us.
← (Safety) In the case that it has difference, contact to responsible person.
2. Shift “Kitchen waste” and “Canteen waste” including food residue and animal / plant residue to non-hazardous landfill without unloading “Sorting & Stabilization facility”. Because the waste is watery and has unpleasant smell in many case.
3. Put the waste on non-hazardous landfill, and carry out following things in order to prevent from the diffusion of odor and to keep away from insects and animals.
 - 1) In the case of dry season, cover the waste with soil or waste resemble the characteristics of soil quickly.
 - 2) In the case of rainy season, cover the waste with the sheet quickly. If possible, cover the waste with soil or waste resemble the characteristics of soil quickly.
4. Finish their disposal with that day.

Remarks;

1. When handling waste, always keep the measurements that customers provided for us.
(Safety measurement, First aid, Leakage measurement and measurement for fire)
(*Refer to “Waste Profile Sheet” that customers provided for us.)



Standard Operating Procedure	DOC NO:	GEM-FA-S033E/00
Subject: SOP; Treatment of waste water to water treatment facility	Issued/Revised Date: 1 Oct 2018	Page 1 of 3

Standard Operating Procedure; Treatment of “Waste water” to water treatment facility (ISO 14001:2015)

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Standard Operating Procedure	DOC NO:	GEM-FA-S033E/00
Subject: SOP; Treatment of waste water to water treatment facility	Issued/Revised Date: 1 Oct 2018	Page 2 of 3

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Standard Operating Procedure	DOC NO:	GEM-FA-S033E/00
Subject: SOP; Treatment of waste water to water treatment facility	Issued/Revised Date: 1 Oct 2018	Page 3 of 3

Standard Operating Procedure; Treatment of “Waste water” to water treatment facility.

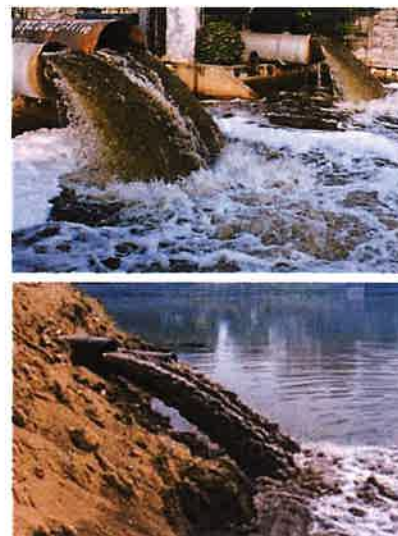
Version; 1

Purpose; to dispose of “Waste water” to water treatment facility properly

Main object; “Waste water”.

Procedure;

1. Check the kind of waste and the waste condition, compared with “Waste Profile Sheet” that customers provided for us.
← (Safety) In the case that it has difference, contact to responsible person.
2. Follow the procedure, GENERAL _ Standard Operating Procedure; Water treatment facility.



Remarks;

1. When handling waste, always keep the measurements that customers provided for us.
(Safety measurement, First aid, Leakage measurement and measurement for fire)
(*Refer to “Waste Profile Sheet” that customers provided for us.)

Appendix I ISO 14001 Certificates and ISO 45001 Certificate

Certificate of Approval

This is to certify that the Management System of:

POSCO International Corporation

Level-3, No. 623, Vantage Tower, Pyay Road, Kamayut Township, 11041, Yangon, Myanmar

has been approved by LRQA to the following standards:

ISO 14001:2015

Approval number(s): ISO 14001 – 00055968

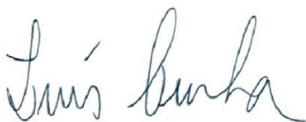
This certificate is valid only in association with the certificate schedule bearing the same number on which the locations applicable to this approval are listed.

The scope of this approval is applicable to:

Operator of SHWE Project, including the operation of SHWE Offshore Platform and its facilities in Bay of Bengal, and Onshore Gas Terminal on Ramree Island, Rakhine State, Myanmar.

This certificate is a continuation of a previous approval from another certification body as follows:

Previous original ISO 14001 approval on 10-Jul-2019, DNV GL certificate number 264165-2018-AE-SGP-UKAS



Luis Cunha

Area Operations Manager - North Asia & SAMEA

Issued by: LRQA Limited



Certificate Schedule

Location	Activities
POSCO International Corporation (Myanmar E & P) Level-3, No. 623, Vantage Tower, Pyay Road, Kamayut Township, 11041, Yangon, Myanmar	ISO 14001:2015 Operator of SHWE Project, including the operation of SHWE Offshore Platform and its facilities in Bay of Bengal, and Onshore Gas Terminal on Ramree Island, Rakhine State, Myanmar.
Onshore Gas Terminal Malagyun st, Leik-Khamaw Village, Kyauk Phyu Township, Rakhine State, 07121, Myanmar	ISO 14001:2015 Onshore Gas Terminal on Ramree Island
Shwe Offshore Platform Latitude (N) 19°40'26.06", Longitude (E) 92°32'35.40", Myanmar	ISO 14001:2015 Gas Production and Facility Operation in Bay of Bengal



Certificate of Approval

This is to certify that the Management System of:

POSCO International Corporation

165, Convensia-daero, Yeonsu-gu, Incheon 21998, Republic of Korea

has been approved by LRQA to the following standards:

ISO 45001:2018

Approval number(s): ISO 45001 – 0073727

This certificate is valid only in association with the certificate schedule bearing the same number on which the locations applicable to this approval are listed.

The scope of this approval is applicable to:

Project development, management and wholesale trade of steel, energy, agro, chemical, mobility, materials, social infrastructure and industrial plant businesses.



Il-Hyoung Lee

Korea Operations Manager

Issued by: LRQA Limited



Certificate Schedule

Location	Activities
POSCO International Corporation 165, Convensia-daero, Yeonsu-gu, Incheon 21998, Republic of Korea	ISO 45001:2018 Project development, management and wholesale trade of steel, energy, agro, chemical, mobility, materials, social infrastructure and industrial plant businesses.
POSCO International Corporation (Myanmar E & P) Level-3, No. 623, Vantage Tower, Pyay Road, Kamayut Township, 11041, Yangon, Myanmar	ISO 45001:2018 Operator of SHWE Project, including the operation of SHWE Offshore Platform and its subsea facilities in Bay of Bengal, and Onshore Gas Terminal on Ramree Island, Rakhine State, Myanmar.
Shwe Offshore Platform Latitude (N) 19°40'26.06", Longitude (E) 92°32'35.40", Myanmar	ISO 45001:2018 Gas Production and Facility Operation in Bay of Bengal.
Onshore Gas Terminal Malagyun st, Leik-Khamaw Village, Kyauk Phyu Township, Rakhine State, 07121, Myanmar	ISO 45001:2018 Onshore Gas Terminal on Ramree Island.



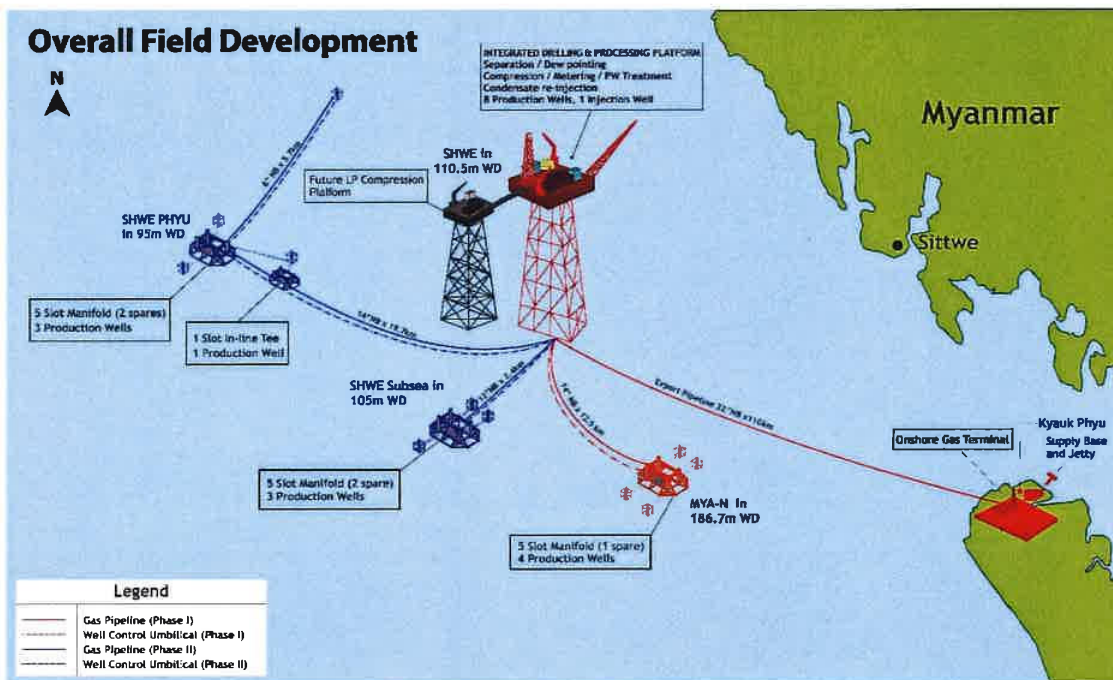
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Appendix J PIC's Emergency response plan (ERP)

PROJECT / JOB TITLE: SHWE PROJECT

DOCUMENT TITLE: OGT EMERGENCY RESPONSE PLAN

DOCUMENT NUMBER: OGT-OM-EP-03-06-0003



5	Issued for Use	OGT HSSE Supervisor	OGT Superintendent	O&M Manager
		27-Nov-23	27-Nov-23	27-Nov-23
Revision Number	Description	Prepared	Checked	Approved

Revision History

Revision Number	Date	Section(s)	Page(s)	Brief Description of Change	Author of Change
1	10-Nov-14	4,6,8,9,10, 18	9,10,12, 20, 22, 23, 24, 26, 33, 34, 35, 46-53, 73, 74	Updated for organizational changes, emergency contact information, and other minor revisions. Muster point during night shift emergency, Gas leak and explosion.	NA, ACT
2	19-Jun-17	4,8,9,10, 12, 13,14, 15, 19	9, 10, 11, 12, 13, 14, 15, 16, 18, 19, 20, 21, 22, 23, 24, 26, 27, 29, 30, 35, 38, 41, 42, 47, 48, 49	Updated: Organization changes, Main muster point, Removed: ECC, Time Out, Shift/Gas leak/explosion muster point, Tsunami, removed repeated references to Cyclone evacuation procedure. Other minor changes.	YTL, SKW, ACT, PS, PB
2	16-Nov-17	8	17, 18	Corrections to main and alternate muster points.	ZL
3	10-August-2020	All	All	Change Company Logo and name, Front Page graphic, Remove Medevac form and replace with new form. Added Bomb Threat action plan. Changed to new emergency CCR # Dial 666	ZL/YTL PB/TD
4	19-Oct-2021	9.2, 9.3, 9.4, 18.16	30, 31, 78,79	Added Acid spillage action plan. Updated Emergency Response Team information	YTL /TD / DC / PS
5	27-Nov-2023	9.2, 9.3, 17.9	30, 31, 48	Update Emergency Management Team, OGT Station Bill and Emergency Heightened Security Situations at Kyauk Phyu	YTL / RC / MK/M MT

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1.0 PURPOSE

This document is intended to define operational responsibilities and identify reporting requirements and resources available both internally and externally to effect a coordinated and timely response to any foreseeable OGT emergency situation.

Together these plans document the overall emergency response process and interfaces, identify potential emergency scenarios, and identify procedures which apply to particular emergency events, define the roles and responsibilities of personnel and the resources available to personnel involved. The main objectives of this manual are:

- To provide guidelines to all levels of management involved in responding to an emergency that may occur at the OGT.
- To ensure that the safety of personnel is always considered as the first priority when dealing with an emergency.
- To minimize the impacts of an emergency that can result in personal injuries or damage to the environment, property, Company reputation and business interruption.
- To provide for safe recovery to normal operations as soon as possible.
- To provide specific procedures in dealing with emergency situations that had been identified as credible scenarios.
- To ensure lines of communication/notification are clearly defined and workable.

2.0 SCOPE

This document provides a summary of the actions required to preserve life, protect the environment, minimize damage to assets and maintain the good reputation of POSCO INTERNATIONAL Corporation Myanmar E&P when the Onshore Gas Terminal personnel including Consultants, Contractors, vendors, service providers and visitor are involved in an emergency situation that threatens the security, safety and steady state operation of OGT its personnel, property and the environment.

The reasonably foreseeable emergency situations that are likely to occur at OGT site have been identified (Refer to Section 7.5 – Emergency Situations). The list is by no means regarded as complete, but it represents the credible scenarios associated with the major hazards in the operational phase of the installation. The emergency response plans covered in this manual address these potential emergencies. It is expected that as operating experience is gained, over time, additional scenarios will be identified and associated response plans developed and added to this manual.

3.0 DEFINITIONS AND ABBREVIATIONS

3.1 Definitions

“A” CLASS RATED FIRE PROTECTION:

An ‘A’ class fire division is one which is constructed of steel or the equivalent divisions and materials, suitably stiffened and so constructed that it will be capable of forming bulkheads preventing the passage of smoke and flame to the end of the standard test. It shall be insulated with approved non-combustible materials such that the average temperature on the un-exposed side will not rise more than 139°C above the original temperature, nor will the temperature at any one point rise more than 180°C above the original temperature, within the time frame identified by the numeric value following the Alpha (i.e. A-60, A-30, A-15, A-0 which set the time limit to 60, 30, 15, or zero minutes respectively). Other divisions apply for specific requirements or higher specifications.

ALARP CRITERION:

Hazards to personnel are reduced not only by OGT design to reduce risks to a level As Low As Reasonably Practicable, but also minimising the exposure of personnel to hazards by minimising the frequency of required intervention and minimising the numbers of personnel required to carry out the required work. The facilities are designed to minimise the need for personal intervention to ensure the required plant safety, availability/functionality.

ALTERNATE MUSTER POINT:

A secondary muster point for the OGT personnel away from the primary muster point when it is deemed to be unsafe i.e. smoke-laden, or the seat of the incident.

BACK UP:

Emergency Team members must be aware that they must be able to perform the function of the person above them in the hierarchy. This is a significant principle of the exercises and drills that will be carried out on a regular basis.

CYCLONE (TROPICAL REVOLVING STORM) Evacuation PLAN:

This activity is part of the overall Emergency Response Plan and includes the advice and the actions to be taken regarding the threat to the OGT and facilities posed by cyclones and a relevant procedure for maintaining personnel safety and OGT security.

EMERGENCY:

Any significant deviation from planned or expected events that could endanger the health and safety of persons, the environment, property or economic status and reputation of the Company.

EMERGENCY COMMANDER:

This is the Onshore Gas Terminal Superintendent. In his absence through incapacitation, his position will be taken by the Emergency Coordinator which is the Production Supervisor who has been trained, assessed and certified to assume this position. The Emergency Commander through his experience and training shall manage the OGT emergency response.

EMERGENCY COMMUNICATIONS OPERATOR:

A member of the Emergency Management Team, who has responsibility for maintaining contact with Emergency Support Center in Yangon Head Office and OGT.

EMERGENCY MANAGEMENT TEAM:

The OGT team who have specific tasks to carry out under the direction of the Emergency Commander (OGT Superintendent) within the Emergency Control Centre. The team will gather in the CCR inside the Technical Building on the initiation of a General Alarms. This team comprises Emergency Commander, Emergency Coordinator, Muster Coordinator, Emergency Communications Operator, and the Scribe. These positions should be interchangeable and have designated backup personnel to account for incapacitation.

EMERGENCY RESPONSE PLAN:

This document details the Emergency Response by providing the rules and decision criteria for an efficient response to emergencies, clearly defining how people and equipment will function under various situations. Hard copies are kept updated in Yangon Head Office, the Onshore Gas Terminal and the SHWE Production Platform.

EMERGENCY RESPONSE TEAM (ERT):

A trained group of OGT technicians led by the Maintenance Supervisor, under the direction of the Production Supervisor from the Emergency Command Centre, who have the experience of the facility and may carry out search and rescue activities, attend to accommodation incidents or perform damage control measures during an emergency. The composition of this team is adequate to form two sections with separate agendas.

EMERGENCY RESPONSE TEAM LEADER:

A member of the Emergency Management Team, the Maintenance Supervisor, who has responsibility for the direction of the Emergency Response Team in carrying out the Emergency Commander's Emergency Response Plan during an emergency.

FM200:

The trade name for Heptafluoropropane, a colourless, odourless Halocarbon which will be used as a fire suppression agent. This product is used particularly in data processing and telecommunications areas where lack of residue, after discharge, is a distinct advantage. Areas protected by the fixed installation of bottled FM200 are in the Technical Building. In the event of a release, there is a time delay and dedicated and distinct alarm that sounds in sections of the Technical Building where this system is installed.

OGT GENERAL ALARM (GA):

The emergency alarm for all personnel. It is an undulating high pitched alarm that is accompanied by a flashing red rotating beacon. When this alarm sounds it indicates that a situation exists on or off the OGT that requires all personnel to STOP working, to make their work site safe and to make their way to their Muster Point.

HAZARDOUS AREA CLASSIFICATION:

OGT is categorized in accordance with *Institute of Petroleum Model Code of Safe Practice Part 15 – code for installations handling flammable fluids, 3rd edition*. The Classification of areas throughout the facility allows for the proper selection of materials and equipment. It ensures that sources of ignition are segregated from potential sources of flammable gas and assists in the location of flammable gas detectors. The overall design philosophy is to make the facility as safe as possible by minimizing the potential sources of release of flammable gas to the atmosphere.

HOT LINE: ECC is not normally manned CCR is the primary Hot Line contact point.

A standalone phone system operating through the Router, VSAT and modem linking the OGT CCR with the CCR and ECC in the SHP and Head Office in Yangon. This is a non-dial system that detects the off-hook condition and rings all remote handsets. The emergency nature of this phone is highlighted by it being red in colour. This phone shall be tested from the OGT radio room and CCR on a weekly basis and at an agreed time with any reported faults rectified immediately and the backup system, Inmarsat, tested and utilised while this phone is unavailable.

INCIDENT COMMAND SYSTEM:

Is an internationally-recognized system which contains: “a set of personnel, policies, procedures, facilities, and equipment, integrated into a common organizational structure designed to improve emergency response operations of all types and complexities.

INMARSAT:

A satellite communication system that can be used if there is a VSAT breakdown. Units are provided in the CCR and Radio room offshore and at the OGT in the CCR and Radio Room.

LEVEL OF EMERGENCY ON INCIDENT:

Level 1, 2 or 3 depending on how serious the emergency is deemed by the Emergency Commander at the incident.

- Level 1 can be contained and returned to normal by the facilities available to the team at the incident without outside assistance.
- Level 2 is a situation where assistance is required from outside the OGT facilities.
- Level 3 is a higher level event that has caused or will cause serious harm to personnel, damage to the environment and the OGT, and escalation of the incident is possible.

LIFE SAVING EQUIPMENT:

That fixed or movable equipment which shall be used to preserve life during an emergency situation. Fire extinguishers, self-contained breathing apparatus, radios and fire water monitors, fire and gas detection system and alarms are commonly considered in this group.

MAJOR ACCIDENT EVENT:

A Major Accident Event is an event connected with a facility, including a natural event, having the potential to cause multiple fatalities of persons at or near the facility.

MEDEVAC

Medical evacuation (Medevac) may be considered for any emergency medical condition, arising from injury or illness, which cannot be appropriately managed with the medical resources available at the site. The decision to evacuate should be generally based upon a first-hand assessment of the injured/ill person by the site Doctor, supported by additional advice.

MANAGEMENT PRIORITIES:

- 1) Personnel
- 2) Environment
- 3) Asset
- 4) Reputation

MUSTER CHECKER:

A regular member of the OGT personnel who has responsibility for checking T-cards at the main muster point which account for all personnel. He communicates directly with the Muster Coordinator and uses a separate radio channel for this purpose.

MUSTER COORDINATOR:

A member of the Emergency Management Team in the CCR with responsibility for receiving and reporting headcount numbers to the Emergency Commander. He has the responsibility for tracking the movement of personnel during an incident and providing an accurate roll call of casualties and missing persons.

MUSTER POINTS:

The locations for personnel to gather where they will be accounted for by T-cards. The Main Muster Point is the OGT Tennis Court; alternate muster points are at the main gate and near the interceptor pond.

MUSTER TEAMS:

Aside from personnel mustering at the main muster point, the Emergency Management Team (EMT) musters at the CCR, the Medical Team at the Ambulance in the Main Office Carpark, and the Emergency Response Team (ERT) at the ERT building.

OIL SPILL CONTINGENCY PLAN:

A document within the overall HSE MS that details the actions that will be taken in the event of an uncontrolled release of polluting material from the OGT and its facilities.

PERSONNEL ON BOARD:

The complete listing of personnel who are actually in the OGT RED ZONE at any particular time. Identifies their position and job title and provides a head count for the muster checker.

PAGA

Public Address/General Alarm (PA/GA) Systems: The site-wide general alarm is initiated upon confirmed fire or gas from the FGS or manually by the CRO. The general alarm sound is that of a rising and falling siren wail that is accompanied by red rotating beacons.

The public address portion of the PAGA systems carries routine and emergency speech and is capable of being heard and understood above the ambient noise level outdoors in the immediate area of facilities.

For Main Office, Accommodation, and Warehouse Buildings, a fire alarm only sounds within that building or area. The OGT CCR will manually activate the site-wide general alarm upon receiving an indication of a building fire alarm, no matter if false or real.

PAGE PARTY SYSTEM:

Through the page function individuals can be contacted anywhere in the facility. For further communication, the party line function allows two or more people to converse without being heard over the speakers.

SCENARIO EXERCISES:

A means of testing the ability of teams and the operational readiness of the system. A regularly initiated and planned event with clear guidelines for implementation and the desired outcome to be achieved examined and commented on by participant's feedback. An annual schedule is contained within the HSSE Plan issued by Yangon HSSE Team.

SCRIBE:

A member of the Emergency Management Team, who has the responsibility for creating and maintaining an accurate log of events.

SHUTDOWN LEVELS:

The Shutdown System provides these levels of shutdown for the OGT.

- Level 1- With Blowdown
- Level 1- Without Blowdown
- Level 2- Process Shutdown
- Level 3- Unit Shutdown

Level 1 (both with and without blowdown) generates an OGT General Alarm.

SHUTDOWN SYSTEM:

A separate control system for pre-determined fire and gas and emergency alarm that makes executive decisions involving the isolation and blow down of plant and the shutdown of major equipment. This system is activated in accordance with the Cause and Effect logic diagram that will put the OGT into a fail-safe position as determined by Hazard Identification exercises.

T-CARD:

T-cards are issued to all persons entering OGT and is the primary mean to account for personnel in case of a drill or an actual emergency. The T-card has a red-coloured side and a green-coloured side. When placed in the appropriate T-card rack it indicates if a person is present (green) or offsite (red).

OGT now has two zones: a GREEN ZONE and a RED ZONE. The Green Zone refers to the area between the perimeter fence and the 2nd (inner) fence. It is not mandatory for personnel in the green zone to muster as it is out of the process area or danger zone or as referred to as the red zone.

3.2 Abbreviations

AFFF	Aqueous Film Forming Foam
ALARP	As Low As Reasonably Practicable
AM	Amplitude Modulation
CCR	Central Control Room
Company	POSCO INTERNATIONAL Corporation Myanmar E&P
Consultants	Employed by recruitment agency for Company
Contractor	Providing contract work or services in Company
CRO	Control Room Operator
DCS	Distributed Control System
EC	Emergency Commander
ECC	Emergency Command Centre
EMT	Emergency Management Team
ERT	Emergency Response Team
ERTL	Emergency Response Team Leader

ESC	Emergency Support Centre in YANGON Head Office
ESD	Emergency Shut Down
FGS	Fire and Gas System
FM	Frequency Modulation
HF SSB	High-Frequency Single Side Band
HSS&E	Health, Safety, Security and Environment
HSSE MS	Health, Safety, Security and Environment Management System
ICSS	Integrated Control and Safety System
LEL	Lower Explosive Limit
NSA	North Storage Area
O&M	Operations and Maintenance Department
PAGA	Public Address General Alarm
POB	Personnel On Board
RO	Radio Operator
SCBA	Self-Contained Breathing Apparatus
VHF	Very High Frequency
VSAT	Very Small Aperture Terminal (Satellite Dish for remote communications)

4.0 ROLES AND RESPONSIBILITIES

An essential part of incident management organization is an understanding of the various roles and responsibilities applicable to each individual in the group. These roles must be clearly defined in advance so that individuals are in no doubt where they should go and what duties they are expected to perform.

During a declared emergency the Emergency Commander which is the OGT Superintendent will expect certain actions to take place and will be relying on the team to carry out duties automatically according to the nature of the incident. The EC will also define and allocate tasks to team members who must be aware of likely scenarios and their assigned roles in those scenarios and then notify the Duty manager or the O&M Manager in Yangon Head Office of the nature of the emergency.

5.0 REFERENCE DOCUMENTS

5.1 Company Documents

Safety Philosophy – Onshore Facilities	OGT-SF-EP-303-0013
Emergency and Crisis Management Plan	YGG-SF-EP-03-06-0001
Medical Evacuation (Medevac) Plan	YGG-SF-EP-03-06-0009
Tropical Storm (Cyclone) Response Procedure	YGG-SF-EP-03-06-0011
SHWE Platform Emergency Response Plan	SHP-OM-MP-03-06-0004
OGT Site Security Management Plan	OGT-OM-EP-03-02-0003
OGT Fixed Fire Protection Philosophy	OGT-SF-EP-303-0002
OGT Active Fire Protection Philosophy	OGT-SF-EP-303-0003
OGT F&G Cause and Effect Matrix	OGT-FG-DC-303-0001
OGT Fire Fighting Equipment Specification	OGT-SF-ES-303-0006
OGT Evacuation Escape and Rescue Analysis	OGT-SF-ET-302-0018
OGT Site Mgt. Plan for Evacuation of SHP to OGT	OGT-OM-03-06-0004

5.2 External References

- Cullen 1990
- Fugro Geos Metocean Study

6.0 OBJECTIVES

The Emergency Response Manual is designed to:

- Create an organizational framework that will guarantee a rapid and effective response in an emergency situation.
- Assign, in advance, the trained and competent personnel who will be responsible for taking actions.
- Determine, in advance, to where all personnel should go in a safe and orderly manner.
- Provide essential communication channels to task coordination.
- Provide a list of actions which must be taken and information which must be checked.

- Provide relevant information applying to different emergency situations.

7.0 OVERVIEW

All available information about an incident such as emergency type, location, wind direction, activated fixed systems and process status will be evaluated prior to committing emergency response personnel in order to ensure the safest possible approach.

A return to normal, stable and safe production is the overall objective.

7.1 Detection of incidents

Incidents and potential incidents are detected, at an early stage of development, by;

- Automatic detection of process deviations, leaks or fires
- OGT Personnel
- Contractors on site

Automatic detection systems, their function, effect and their shutdown actions are described elsewhere. They provide a failsafe condition, generally shutdown and blowdown from where to examine conditions. The Emergency commander with consultation with Yangon will evaluate damage and consider start up or remain shut down, considering isolation and replacement depending on incident severity.

As far as possible, hazardous operating conditions and emergency situations will be prevented by continuous operator monitoring of the facilities and by the control actions of Distributed Control Systems (DCS). However, where such conditions cannot be adequately controlled, final protection will be provided by the Shut-Down System (SDS) and Fire & Gas System (FGS)

The OGT safety systems shall be provided with Triple Modular Redundant systems for Shut-Down System and for the Fire & Gas System (FGS). The SDS shall initiate equipment shutdown, isolation, blowdown and total electric shutdown and initiate an alarm through the PAGA system.

Process shutdown will only be performed by the Shut-Down System (SDS). Process control shall be via a Distributed Control System (DCS).

7.2 Trained and Competent Personnel

Individual positions within the Emergency Response Teams shall be filled by trained and competent personnel. The personnel have been assigned to positions of responsibility in alignment with their operational position. The Company shall ensure that relevant training and assessment courses are carried out by recognized and approved industry trainers to fulfill this emergency response requirement.

7.3 Muster Points

Personnel arriving at the facility must undergo HSSE induction carried out by the HSSE Supervisor who will identify to them the locations of the muster points and also advise them of any responsibilities associated with the individual's role. The person's operational position defines their primary Emergency Response role and therefore the location of their muster area. Visitors, contractors, and VIPs, without exception, will also be assigned to a muster area in every Muster Points.

The Central Control Room

The Central Control Room is within the Technical Building and will be used as the location where the Emergency Management Team will muster.

The CCR or the adjacent meeting room is furnished with:

- White boards are used to keep a running log of events during an incident and track personnel to and from their muster point.
- A Communications Centre which can be used by the Emergency Commander and Coordinator to directly contact resources, Yangon and Shwe Platform, mustered personnel and the external emergency teams.
- Large format plot plans to assist in the decision and planning process and to track events.
- A computer for sending confidential or potentially sensitive information.
- Emergency response plans and relevant related procedures such as phone lists, POB, Chemical handling sheets and MSDS.

Adequate forms from the ERP to make formal requests, such as request for Medevac on decision of the OGT Superintendent after recommendation from the Site Doctor/Medic and to pass information.

The ERT Muster Point

This ERT Muster Point is ERT building which located at the Main Office Carpark; this is strategic location for ERT to immediately respond or need to operate fire truck without delay. The members of the ERT will assemble at this muster point on alarm annunciation where their fire men tunics, boots, helmets, trousers and radios are stored. Equipment comprising SCBA, BA control boards, portable gas detectors, block and tackle, stretchers and other emergency equipment considered essential will also be available here as provided by minimum technical requirement.

The Main Muster Point

The main muster point for personnel in the Red Zone is the Tennis court and Green Zone is the main gate. The route to this point is clearly delineated, from all areas of the installation, by signs and arrows.

Alternative Muster Point

The main muster point may become an unacceptable area for personnel to gather (smoke ingress, site of incident etc.). In this event, alternate muster points are provided. The PA or the muster checker will announce the use of the alternate muster points, as required. Alternative muster point is:

- Near the interceptor pond / Gate-D (inner fence).

Civil Unrest

For Civil Unrest, personnel will be instructed by the Emergency Commander as to where personnel will assemble.

Building Fire

Personnel muster at the primary muster point. As the building fire alarm for the Accommodation, Main Office, & Warehouse Buildings does not sound the site-wide general alarm, the CRO will manually initiate the general alarm, whether an actual fire or false alarm.

Medical Team

The medic and his team will muster at the Ambulance Parking Area which is located at the Office car park. The medical team consists of:

- The OGT Doctor
- The stretcher handling team who are from catering
- The ambulance driver

Muster Coordinator

The muster coordinator who is part of the Emergency Management Team will gather the collective muster numbers from each of the above areas and cross reference these numbers to confirm a full muster or how many are missing.

Fire Truck Driver

The person who is assigned as a dedicated driver for the fire truck during an emergency.

Ambulance Driver

The person who is assigned as a dedicated driver for Ambulance during an emergency. He ensures that the Ambulance is regularly tested for running conditions.

7.4 Communications

Radio Communications

One of the main means of communication used throughout the OGT is by handheld VHF digital radio. During an emergency, and from the initiation of the PAGA, all radios shall be on the Emergency Channel which shall be VHF Channel 4. The muster checker and muster coordinator (only) will use channel 2.

Table of Radio Channel Assignments:

Channel 4 – General channel and Emergency Channel all staff

Channel 1 – Security Team

Channel 2 – Muster Checker and Muster Coordinator used in emergencies

Channel 3 – Open channel i.e. for longer specific dialog

Public Address System

This system performs the function of relaying information to the general OGT population. Access to this system is available from desk-mounted microphones and page party stations. Within this system and supplementary to normal voice transmission is the General Alarm. The General Alarm can be automatically generated through alarm settings in the FGS & SDS.

The General Alarm automatically sounds on:

- Confirmed gas detection in process area
- Confirmed gas detection in utility area
- Confirmed gas detection in building area
- Confirmed fire detection in process area
- Confirmed fire detection in utility area
- Confirmed H2 Gas Detection in Battery Room
- ESD Level 1 with Blowdown Activation
- ESD Level 1 without Blowdown Activation
- MAC (manually activated call point) activation
- Loss of 24VDC UPS Power Supply

The General Alarm will be heard throughout the accommodation and all facilities.

The Public Address system may be accessed through the Page/Party system and any PABX telephone. And can be heard throughout the facility and accommodation.

Dedicated public address desk-mounted microphones are provided for use in the CCR

Telephone

Telephones throughout OGT are connected to the PABX and provide both internal (within OGT), SHP Platform, Yangon Head Office, and international communication links.

During an emergency all telephone use shall be restricted to essential requirements.

Hot Line communications between SHP, OGT and Yangon Head Office are available through a dedicated emergency system operating through the router and VSAT. Off-hook, single push-button or "hook flash" type shall ring all telephone sets on the system. The Hot Lines, designated as Emergency communication lines shall be tested on a weekly basis. There is also Hot Line communications direct to IGS Buyers.

Marine Band & HF/SSB

There is an HF/SSB main and backup radio in the CCR for verbal communication with SHP Platform and Yangon office. These radios provide a back-up system to the VSAT and Inmarsat links.

Others

Inmarsat satellite telephone and computers provide additional communications between offices and personnel.

7.5 Essential Actions

The key to effective emergency response is adequate preparation. Adequate preparation involves training, good communications and a comprehensive planned maintenance program.

Relevant training in emergency response is provided by specific drills and exercises carried out on the facility that are designed to complement the basic skills training provided in meeting statutory requirements. This provides an opportunity to assess any additional training requirements that specific tasks or positions demand. Additional training and assessment are available from specialist Emergency Response groups and training organizations that operate to internationally accepted standards.

These drills, carried out on a weekly basis enable all personnel to familiarize themselves with the principles of mustering and their designated muster area in every muster points. Emergency teams have the opportunity to become familiar with the equipment, team makes up and the potentially hazardous areas of the facility. Supervisory and leadership activities are tested in a stable environment without the intensity of an actual incident.

The maintenance of Emergency Equipment as a Life Support requirement is a priority. All equipment that has been identified as being a Safety Critical Element or related to this function shall be maintained by compliance with this principle.

All Life Saving Equipment, Emergency Equipment, detection and protection equipment shall be in accordance with SOLAS specification and maintenance/inspection program is in line with Company SAP-PM. A rotating program of maintenance of all this equipment shall be included as a priority function.

8.0 EMERGENCY SITUATIONS

The Company's production facilities are fabricated to internationally accepted construction standards using quality materials and meet all safety requirements for reliable operating as far as is practicable. As with all gas production installations, there are foreseeable situations that could potentially occur that fall outside this safety envelope. These situations can be planned for and are briefly identified here.

8.1 Gas Release, Fire or Explosion

These hazards are clearly defined and the areas within which they are likely to occur have been recognized and detection and prevention methods have been developed to counter this threat. In the event of these hazards not being detected there are manual Emergency Shut down (ESD) Buttons strategically placed throughout the facility.

8.2 Accommodation Fire

The accommodation is entirely within the area protected from the hazards of the facility by distance, the protective structure, detection devices and the availability of extinguishing media.

The action required to deal with an accommodation fire is similar to an external facility fire. An incident that is detected automatically will generate an alarm which will be indicated in the CCR.

Safety of the personnel is the priority. For building alarms, the CRO shall initiate the General Alarm, whether confirmed or false, since building alarms are not site-wide.

8.3 Chemical/Diesel Oil Spill

OGT is considered to be at risk from a potential spill. Chemicals, fuel oil and a certain amount of equipment lubricating/hydraulic oils are present throughout the facility and do represent a spill risk.

Response actions are required for these incidents which can be categorized into spills that can be contained. All spills must be reported to the OGT Superintendent and Production Supervisor immediately once they are discovered.

8.4 Serious Illness or Injury

If an injured person is discovered, the correct approach shall be to notify the CRO that an incident causing injury has occurred. Ask for assistance if required and have him call the site doctor.

If it should become necessary to evacuate personnel to a Hospital the doctor with his medical expertise shall make the decision with consultation with the OGT Superintendent.

In the event of a suspected death occurring at OGT, the doctor and OGT superintendent must be contacted immediately and immediate notification to Duty Manager or O&M manager. In the interests of documentary evidence, a doctor is the only person who can pronounce "extinction of life".

A completed Medevac form is required to accompany any casualty that is being removed from the OGT. See Appendix 17.1 - Fax Form Medevac.

8.5 Bomb Threat

OGT possibly can be a vulnerable target of persons or agencies that would like to make particular political statements. No country is exempt from this type of threat. They are high-value assets with a significant business profile. Training and guidance is provided via OGT Site Security Management plan OGT-OM-EP-03-02-0003.

8.6 Civil Unrest

8.6.1 Overview

Civil Unrest is also known as a **civil disorder** or **civil strife** is a broad term that is typically used by law enforcement to describe one or more forms of unrest caused by a group of people. Civil disturbance is typically a symptom of, and a form of protest against, major socio-political problems; the severity of the action coincides with public expression of displeasure.

Refer to OGT Evacuation Escape and Rescue Analysis OGT-SF-ET-302-0018.

8.6.2 OGT Civil Unrest Strategy

- Upon coordination with Duty Manager in Yangon and SHP, the OGT Superintendent will request assistance from the MOGE representative to assist with security resources for OGT and all the Company installations.

- The OGT Superintendent assess and decides when to Shut down and secure the facility and to determine if an evacuation is feasible (helicopter evacuation is possible pending on severity of the situation).

8.6.3 Preventing Civil Unrest

- Deny access to OGT Plant. Continuous Security Patrol around the Perimeter. Increased Security Posture by augmenting existing Physical Security Force.
- Gather intelligence in the surrounding areas for potential events and prepare countermeasures.
- Monitor and record the events with CCTV if and where applicable.
- Assess current events in the surrounding Areas of Interest and Areas of Control.
- Inform Duty manager in Yangon Head Office and request for MOGE Representative to mobilize Local Law enforcement authorities for their presence around the facility.

8.6.4 Civil Unrest - Evacuation and Response

- Upon assessing the situation that there is a civil unrest with the possibility to spread to OGT areas of concerns such as Hanger, Jetty, Landfall, and Pipeline ROW, the OGT facility will only be accessed by OGT personnel.
- No OGT personnel will be allowed to go out of OGT into areas of concern. Personnel from Jetty and Landfall will be evacuated to OGT Plant for easy transport in a helicopter in case abandoning of OGT is required.
- Personnel in the Hangar will stand by and wait for instructions from the Emergency Commander in case unrest escalates the personnel will be evacuated.
- OGT EMT shall have close coordination with local government agencies and Yangon ESC to ensure constant communication is in place.
- All Gates of OGT shall be in lockdown and movement of people and vehicles in/out shall not be allowed, except for OGT staff that is seeking refuge inside OGT.
- All doors of the buildings shall be locked no one is going in/out without the approval of HSSE Supervisor and Emergency Commander.
- Emergency Commander will direct personnel as to their holding or mustering point, accommodation, control room or other.
- Emergency Commander with the assistance of the Emergency Coordinator will coordinate Helicopter personnel evacuations in a structured and orderly fashion.

8.6.5 Return to Site

Upon determining that the security situation has normalized and threats were neutralized the OGT Superintendent with the approval of the Duty Manager or O&M manager will return to OGT site together with essential personnel to conduct an assessment of OGT facilities and prepare for the eventual return of the plant to operation.

8.7 Pipeline ROW Sabotage

8.7.1 Overview

OGT onshore P/L ROW is buried in an open area from Landfall beach valve station in a route going to OGT Plant passing the open area in the rice fields of Gone Chwein Village. The possibility of sabotage is very low but once it occurs the consequence is potentially high that could result in loss or damage to the Company gas production/operations, damage public relations and evolve into public anger against the Company.

8.7.2 Pipeline ROW Sabotage Evacuation and Response

Upon confirmation that sabotage has taken place and escalated that affected the operations of OGT, the OGT Superintendent shall advise Yangon Duty Manager. He may consider ordering a lockdown of OGT facilities in consultation with Yangon ESC.

8.8 Heightened Security Situations at Kyauk Phyu and Surrounding area

A "Heightened Security Situations" refer to any scenario where the usual level of security measures need to be increased due to perceived, anticipated, or actual threats. If such situations arise, all non-essential contractors will be transported back to Yangon or their point of origin using the safest available means of transportation, with the priority being for those 3rd party contractors who may be staying in local hotels due the limited OGT accommodation bedding not being available.

OGT Superintendent, with the assistance from the other camp Supervisors, will review / update OGT camp 'Priority Evacuation List' and maintain close communication with the Yangon Emergency Management team. It's important to note that this list can be adjusted at any time, depending on the evolving circumstances in Kyauk Phyu and surrounding area / security impact on OGT camp, the Gas Sales and its personnel. The OGT camp down-manning and evacuation process is broken down in to categories (which is further detailed within the Tropical Storm (Cyclonic) response procedure (and also detailed further in section 8.9 of this document). Should there be a direct threat to OGT, the 'OGT Civil Unrest Action Plan' will be followed."

Priority 1 (HIGH RISK) – Requiring the facility to be shutdown / depressurised (e.g. High chance of a bomb, explosive weapon landing inside the camp, including a direct hit within the facility from any form of weapon. HIGH Risk also includes civil unrest and large crowd's, potential fighting / shooting at OGT camp perimeter, which requires **Immediate Action**).

Priority 2 (MEDIUM RISK) – Requiring the camp to be FULLY locked-down and operations (Gas Sales) continuing with limited key personnel only (e.g. Increased Military Operations near to OGT camp with escalating trouble and clashes in neighbouring Townships, which requires all personnel staying within OGT camp to heighten their alertness and be ready for potential escalation of the surrounding security situation. During this Medium risk level, NO external patrolling outside of OGT camp will take place and Cargo movement and crew change will only happen after being carefully reviewed by OGT management and Yangon ERT and confirmed safe to do so, with the necessary increased security measures being implemented / followed (e.g. Possible armed Military / police convoy if deemed necessary)

Priority 3 (INCREASING CONCERNS) – Local area restrictions put in place to limit the movement of local area personnel, including restricted land and marine transport movement (e.g. Military road block and check-points limiting / preventing the use of land transportation (i.e. From Yangon to OGT for such things as Diesel and LPG fuel, local fruit and vegetables and drinks) and Naval marine block in local authority waters, both requiring prior formal prior

approval to enable OGT vehicles / vessels to pass through (OGT cargo trucks and crane going to/from the Jetty, OGT minibus to travel between OGT camp and the local area airport, etc.).

OGT operations (Gas Sales) continue with all OGT Core crew members and limited local area daily commuter staff (e.g. Security, Cleaners & Laundry staff, Ground keepers). Normal planned and corrective maintenance will continue (with only limited high priority 3rd party vendor support / mobilisation) and external camp security patrols will be carried out ONLY during daylight hours (within 06-00hrs and 18-00hrs ONLY, which includes the Water wells, GOV pit and SHP to OGT Pipeline ROW). Normal crew change will still occur but should be limited to only one (1) day per week (e.g. ONLY Tuesdays or Fridays, not both) and cargo jetty activities will be planned and agreed in advance.

Day and night shift security teams should still secure the Kyauk Phyu Jetty facility and commute daily from the town (if it is safe to do so and there are no road blocks / check points between the Jetty and their homes).

Day and night shift security teams should still secure the GOV area and ROW entrance (from within the security century building, as long as it remains safe to do so) and should report back any activities noted around the area, including activities at the military road block / check-point to OGT Security Supervisor.

NO OGT personnel will be accommodated in local area hotels, which includes core crew, local daily commuting workers and 3rd party vendors / contractors UNLESS the Priority 3 local area restrictions are all fully removed and it is agreed safe to return to normal operating conditions, without personnel safety threats / concerns.

Examples of Priority Demanning - Evacuation Lists

Priority 1 (High Risk - Red)

No.	Position	Nationality	Priority	Accommodation
1	OGT SUP'T	Myanmar	P1	In Camp
2	Production Supervisor / Lead Operator	Myanmar	P1	In Camp
3	Maintenance Supervisor	Myanmar	P1	In Camp
4	Lead Electrical Tech	Myanmar	P1	In Camp
5	Site Doctor	Myanmar	P1	In Camp
6	Security Supervisor	Myanmar	P1	In Camp

Total POB = 6

Priority 1 – HIGH RISK - Requiring the facility to be shutdown / depressurised (e.g. High chance of a bomb, explosive weapon landing inside the camp, including a direct hit within the facility from any form of weapon. HIGH Risk also includes civil unrest and large crowd's, potential fighting / shooting at OGT camp perimeter,

ESD#1 with Blowdown shall be Initiated Immediately.

Priority 2 (Medium Risk - Orange)

No.	Position	Nationality	Company	Priority	Accommodation
1	HSSE Supervisor	Myanmar	PIC	P2	In Camp
2	Warehouse Supervisor	Myanmar	PIC	P2	In Camp
3	Warehouse Lead	Myanmar	PIC	P2	In Camp
4	Crane Operator / HGV Driver	Myanmar	M&A	P2	In Camp
5	Lead Instrument Tech	Myanmar	PIC	P2	In Camp
6	Instrument Tech	Myanmar	M&A / PIC	P2	In Camp
7	Lead Mechanical Tech	Myanmar	PIC	P2	In Camp
8	Mechanical Tech	Myanmar	PIC	P2	In Camp
9	Electrical Tech	Myanmar	PIC / M&A	P2	In Camp
10	Lead Operator (Acting)	Myanmar	PIC	P2	In Camp
11	Lead Operator (Acting)	Myanmar	PIC	P2	In Camp
12	Production Tech	Myanmar	PIC / M&A	P2	In Camp
13	Production Tech	Myanmar	PIC / M&A	P2	In Camp
14	Chief Cook	Myanmar	M&A	P2	In Camp
15	Asst. Cook / Lundary	Myanmar	M&A	P2	In Camp
16	MOGE Rep	Myanmar	MOGE	P2	In Camp
17	Security (3-Day & 3-Night)	Myanmar	M&A	P2	In Camp
18	Admin	Myanmar	M&A	P2	In Camp

POB = 23

Total POB (P1 + P2) 6 + 23 = 29

Note, the local Security personnel (6 pax for P-2) ONLY stay in the camp when Priority 2 lock down is confirmed.

Priority 2 – Increased Military Operations Near OGT: Should there be a significant increase in military activity near OGT camp, it's essential to increase OGT's personnel awareness and prepare for potential impacts to our facilities and escalation of the heightened security situation.

OGT Camp fully locked down and operation keep running the best with minimun limited resources.

Priority 3 (Increasing Concerns - Yellow)

No.	Position	Nationality	Company	Priority	Accommodation
1	OGT SUP'T	Myanmar	PIC	P3	In Camp
2	HSSE Supervisor	Myanmar	PIC	P3	In Camp
3	Maintenance Supervisor	Myanmar	PIC	P3	In Camp
4	Production Supervisor / Lead Operator	Myanmar	PIC	P3	In Camp
5	Warehouse Supervisor	Myanmar	PIC	P3	In Camp
6	Site Doctor	Myanmar	Leo Medicare	P3	In Camp
7	Lead Mechanical Tech	Myanmar	PIC	P3	In Camp
8	Mechanical Tech	Myanmar	PIC	P4	In Camp
9	Mechanical Tech	Myanmar	PIC	P3	In Camp
10	Lead Electrical Tech	Myanmar	PIC	P3	In Camp
11	Electrical Tech	Myanmar	PIC / M&A	P3	In Camp
12	Electrical Tech	Myanmar	PIC / M&A	P3	In Camp
13	Lead Instrument Tech	Myanmar	PIC	P3	In Camp
14	Instrument Tech	Myanmar	PIC / M&A	P3	In Camp
15	Instrument Tech	Myanmar	PIC / M&A	P3	In Camp
16	Lead Operator (Acting)	Myanmar	PIC	P3	In Camp
17	Lead Operator (Acting)	Myanmar	PIC	P3	In Camp
18	Production Tech	Myanmar	PIC / SMART	P3	In Camp
19	Production Tech	Myanmar	PIC / SMART	P3	In Camp
20	Production Tech	Myanmar	PIC / SMART	P3	In Camp
21	Production Tech	Myanmar	PIC / SMART	P3	In Camp
22	Warehouse Lead	Myanmar	PIC	P3	In Camp
23	StoreMan	Myanmar	M&A	P3	In Camp
24	Assistant Store Men	Myanmar	M&A	P3	In Camp
25	Crane Operator	Myanmar	M&A	P3	In Camp
26	HGV Driver	Myanmar	M&A	P3	In Camp
27	Camp boss	Myanmar	M&A	P3	In Camp
28	Chief Cook	Myanmar	M&A	P3	In Camp
29	Asst. Cook	Myanmar	M&A	P3	In Camp
30	Baker	Myanmar	M&A	P3	In Camp
31	Messboy	Myanmar	M&A	P3	In Camp
32	Lundary Man	Myanmar	M&A	P3	In Camp
33	Admin	Myanmar	M&A	P3	In Camp
34	Security Supervisor	Myanmar	M&A	P3	In Camp
35	MOGE Rep	Myanmar	MOGE	P3	In Camp
36	Office Driver	Myanmar	M&A	P3	In Camp
37	Security (3-Day & 3-Night) FROM Priority 2	Myanmar	M&A	P3	Neaby Villages
38	Security (2-Day & 2-Night)	Myanmar	M&A	P3	Neaby Villages
39	Grass Cutter (5) & Tree Keepers (10)	Myanmar	M&A	P3	Neaby Villages
40	Cleaners (3)	Myanmar	M&A	P3	Neaby Villages

Camp POB - 36 **Note, the local Security personnel (10 pax in total during Priority 3, 6 from P-1, 4 from P2) commute home daily and ONLY 6 will stay in the camp if we move to Priority 2**

Local daily commuting workers - 28

Priority 3 – Restrictions Impacting OGT and Access Control: This priority level addresses situations where there are considerable restrictions affecting OGT operations and restricted movement at checkpoints.

OGT Camp Semi-locked down and operation kept running normal.

i. The manpower structure indicated above was set aside especially to deal with circumstances involving both Priority 2 and Priority 3.

ii. There are now 58 people assigned to the Priority 3 scenario. There are 36 POBs in the camp, but grass cutters, tree keepers, security guards, and cleaners do not reside in the camp because they are still able to safely commute to work from their homes nearby OGT (DON'T need to pass through the check-point)

iii. In the event that the area security situation gets worse, an immediate elevation to fully Priority 2 will be implemented.

iv. Even if OGT's security condition is increased to Priority 2, we are still making us of the opportunity for local workers who live near-by OGT to commute to work (provided it is safe to do so).

8.9 Tropical Storm - Cyclonic Storm

8.9.1 Overview

NOTE: The response to a Tropical Storm - Cyclonic Storm and possible evacuation of the SHP is covered in detail in "Tropical Storm (Cyclone) Response Procedure" YGG-SF-EP-03-06-0011 and "OGT Site Management Plan for the Evacuation of SHP" to OGT OGT-OM-MP-03-06-0004.

This section of the ERP provides information specific to the OGT.

A cyclone can be very damaging and may even threaten the integrity of the OGT or cause unnecessary loss of life. A cyclonic storm will follow a definite pattern and it is anticipated that warnings will be received prior to the arrival of the tropical storm.

Myanmar has two cyclone seasons: pre-monsoon months of mid-April to mid-May and post-monsoon months of October and November. The Company contracted weather forecasting service provider will announce the commencement of the cyclone season, in our area of operations. Weather forecasts are provided every 12 hours throughout the year.

Records indicate from 1978 to 2007, most cyclone events occur in the month of May - 11 out of 28 cyclones in 29 years.

8.9.2 General Characteristic of Cyclones

Cyclones are intense depressions which develop in lower latitudes; they are the cause of very high winds and heavy seas. The wind blows around the centre of a storm in a spiral flow inwards.

The typical size of an affected area (winds more than 34 knots) can be up to 300 km radius from the centre. Cyclone force winds (approx. 64 knots) are likely within a 130km radius of a storm centre. Winds are extremely gusty and maximum wind speeds may be some 30 to 50% higher than mean wind speeds.

In the centre of the storm is the "eye" within which winds can be light and moderate but seas and swell will be very high and confused. The diameter of this "eye" can vary from less than 20 km radius in small intense storms to more than 50 km in larger storms. Surrounding the "eye" is a dense dark wall cloud extending to great altitude with heavy rain beneath. Maximum winds are attained in the inner margin of the wall cloud in a belt averaging 10 to 30km in width. In this zone, visibility is almost nil due to spray and torrential rain.

Light winds are defined as those winds which are less than 5 m s⁻¹ and correspond to a Beaufort Force 3 or less, generating slightly to moderate seas. Light wind conditions may occur at any time during the year.

8.9.3 Pre-Plan

- PERSONNEL CATEGORIES

The personnel on board are categorized into 4 Phases.

- **Alert Level 1 GREEN** - Visitors are normally evacuated.
- **Alert Level 2 YELLOW** - Non-essential personnel are normally evacuated.
- **Alert Level 3 ORANGE** - Regular Crew is normally evacuated.
- **Alert Level 4 RED** - Minimum Manning, essential KEY crew normally remain at OGT.

The personnel categories are identified into the POB list that is dispatched to all concerned parties on the daily basis.

- LOOSE ITEM / EQUIPMENT
 - All loose equipment including lifesaving appliances and firefighting equipment must be secured.
 - A container may be mobilized to store various small items.
 - Scaffolds structures and stored scaffolding material should be removed or minimized.
 - Containers, waste skips shall be secured onto the structure or removed to indoor storage.
- COMMUNICATION EQUIPMENT
 - Communications systems are available with redundancy during normal operation, it is necessary to ensure that backup communications are operational in the event of loss of main communications systems.
 - Telecom shall perform regular functional tests of the entire communication equipment including satellite phones, VHF radio and MF-HF/SSB.
 -
- GENERAL PREPARATION
 - Minimize scaffolding material and secure the remainder.
 - Minimize the number of oil drums and secure the remaining.
 - Minimize the number of storage drums.
 - Secure all safety, firefighting equipment & lifesaving appliances.
 - Minimize and Secure all compressed gas cylinders.
 - Ensure all Diesel oil tanks remain full.
 - Remove or secure containers and minimize empty drums.
 - Ensure that food and drinking water are stored at maximum storage capacity.
 - Remove or secure the waste skips and cover them with a net.

8.9.4 Cyclonic Storm Category: Sustained winds (3-min average)

New Updated in 2015 by IMD

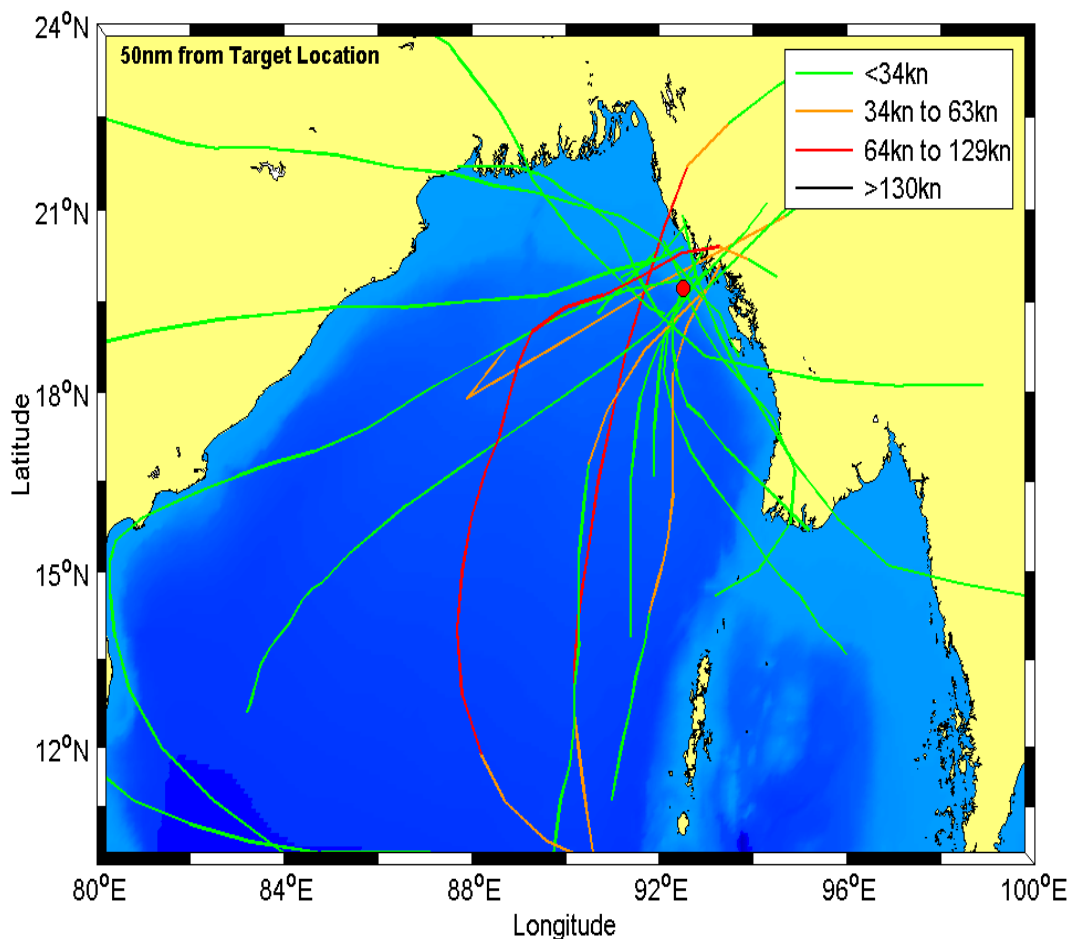
- Cyclonic Storm - (34 - 47 knots / 63 - 88km/h)
- Severe Cyclonic Storm - (48 - 63 knots / 89 - 117km/h)
- Very Severe Cyclonic Storm - (64 - 89 knots / 118 - 165 km/h)
- Extremely Severe Cyclonic Storm - (90 - 119 knots 166 - 220 km/h))
- Super Cyclonic Storm - (≥ 120 knots / ≥ 221 km/h)

8.9.5 Tropical Revolving Storm Events Within 50NM

The storm frequency at 50nm is approximately 0.3 storms per year (or 1 storm every 3.3 years)

Reference: SHWE1-FUG-FEAS-C-R-0109-R4

Table 4.3.1 Tropical Revolving Storms Passing Within 50nm

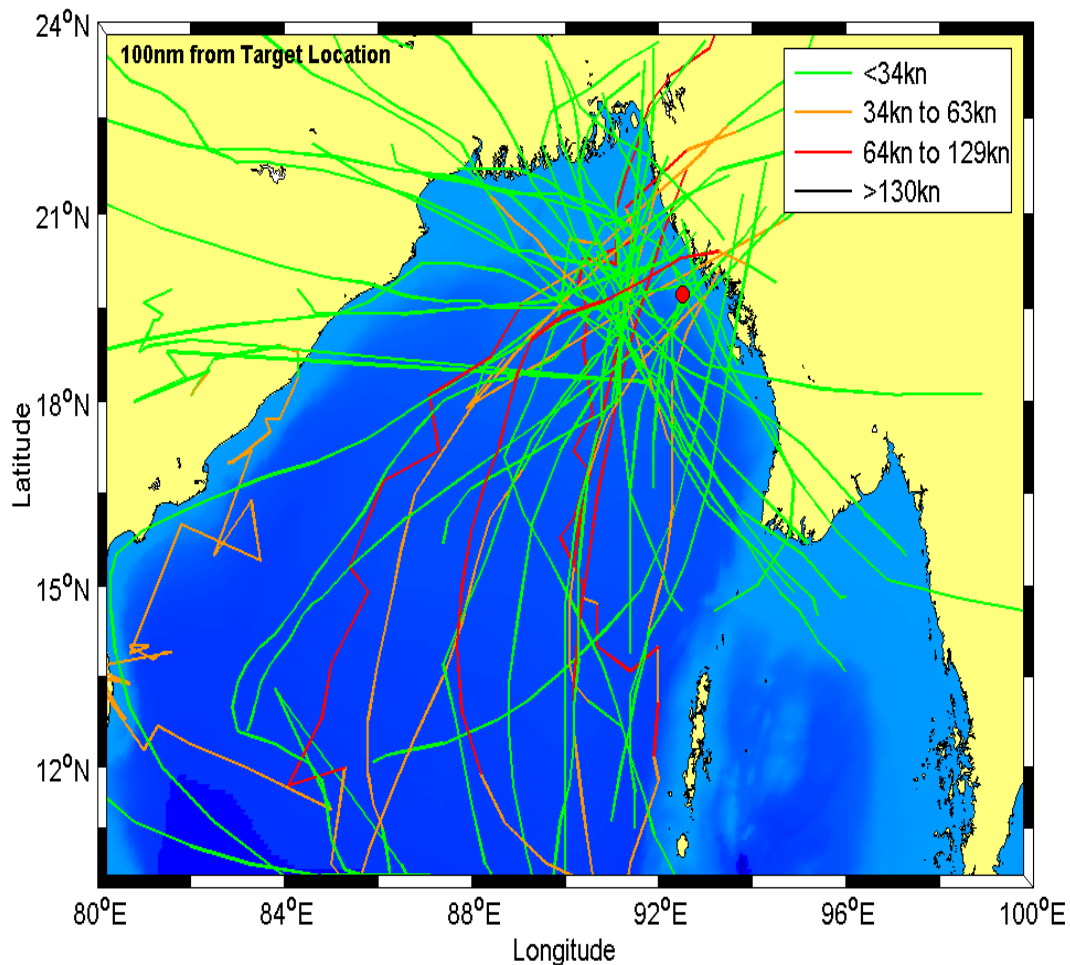


8.9.6 Tropical Revolving Storm Events Within 100NM

The storm frequency at 100nm is approximately 0.8 storms per year (or 1 storm every 1.25 years)

Reference: SHWE1-FUG-FEAS-C-R-0109-R4

Table 4.3.1 Tropical Revolving Storms Passing Within 100nm



8.9.7 Cyclone Roles and Responsibilities

OGT Superintendent

- Prepare and update a plan for securing the personnel and OGT when a storm alert has been initiated.
- Keep informed the Duty Manager or O&M Manager (in Yangon Head Office) for the details of the plan and any update hereof.
- In consultation with the Duty Manager or O&M Manager (in Yangon Head Office), prepare a plan for securing the operations and implement same when agreed.

- Submit a list of the essential crew in each phase and the staged evacuation order of the personnel to Aviation Coordinator (in Yangon Head Office).
- Liaise closely and act as an intermediary between the OGT and Emergency Support Centre (in Yangon Head Office) support to ensure an optimal and coordinated effort.

8.9.8 OGT Cyclone Matrix

- 1) Cyclone matrix has been drawn up for detailing the work to be completed at each phase of the cyclonic storm, the OGT Superintendent will advise department heads when preparations in each stage are to be completed.
- 2) Department heads will advise the OGT Superintendent when all items on the matrix for the appropriate phase of the cyclonic storm have been completed.
- 3) It will be the OGT Superintendent's duty to ensure the timely completion of preparations and to report progress to O&M Manager (in Yangon Head Office).
- 4) The person for receipt of this report shall be the O&M Manager (in Yangon Head Office) or his nominated deputy.

See Appendix 18.7 – OGT Cyclone Matrix.

8.9.9 Meteorological Data

Wind

Extreme wind conditions are dominated by Tropical Revolving Storm (TRS) events.

Reference: SHWE1-FUG-FEAS-C-R-0109-R4

Table 2.5.1 Monthly Maximum, Minimum and Mean Wind Speed at 10m AMSL

MONTH	MAXIMUM (m/s)	MEAN (m/s)	MINIMUM (m/s)
January	11.2	4.5	0.2
February	13.5	3.8	0.0
March	11.7	3.7	0.1
April	26.5	4.4	0.3
May	36.9	5.0	0.0
June	18.9	6.8	0.0
July	15.9	7.1	0.5
August	14.7	6.5	0.8
September	23.8	4.2	0.3
October	18.2	3.2	0.0
November	34.7	4.1	0.3

Air Temperature

Reference: SHWE1-FUG-FEAS-C-R-0109-R4

Table 2.10.1 Monthly Maximum, Minimum & Mean Air Temperature.

MONTH	AIR TEMPERATURE (°C)		
	Maximum	Mean	Minimum
January	30.0	23.8	19.0
February	29.5	24.5	20.0
March	31.7	26.3	22.0
April	33.1	28.3	23.6
May	33.0	29.1	23.4
June	32.1	28.7	23.8
July	33.1	28.1	23.5
August	33.0	27.6	24.0
September	33.5	28.2	22.8
October	33.0	28.5	23.9
November	31.0	27.2	20.0
December	31.0	24.8	20.0

Relative Humidity

Reference: SHWE1-FUG-FEAS-C-R-0109-R4

Table 2.10.2 Monthly Maximum, Minimum & Mean Relative Humidity

MONTH	RELATIVE HUMIDITY (%)		
	MAXIMUM	MEAN	MINIMUM
January	99.2	69.2	38.7
February	97.5	74.4	39.6
March	96.8	78.3	42.5
April	93.9	79.0	47.6
May	101.7	82.7	63.0
June	98.5	84.9	69.9
July	100.0	87.7	69.9
August	100.0	89.2	76.5
September	100.0	85.5	70.9
October	100.0	81.3	62.1
November	100.0	74.3	42.2
December	100.0	70.8	42.4

Atmospheric Pressure

Reference: SHWE1-FUG-FEAS-C-R-0109-R4

Table 2.10.3 Monthly Maximum, Minimum & Mean Atmospheric Pressure

MONTH	ATMOSPHERIC PRESSURE (mbar)		
	MAXIMUM	MEAN	MINIMUM
January	1023.0	1016.1	1005.6
February	1023.3	1014.4	1005.8
March	1019.0	1012.1	1004.0
April	1017.0	1011.1	1000.0
May	1017.2	1006.6	982.6
June	1015.2	1005.6	992.7
July	1013.8	1004.6	991.8
August	1016.7	1005.1	993.0
September	1015.2	1007.9	996.2
October	1019.0	1011.6	999.4
November	1020.6	1013.3	1001.0
December	1021.2	1015.5	1006.0

Rainfall

Reference: SHWE1-FUG-FEAS-C-R-0109-R4

Table 2.10.4 Monthly Mean Rainfall

MONTH	MEAN TOTAL RAINFALL (mm)
January	6.7
February	14.8
March	53.6
April	116.3
May	246.7
June	603.7
July	718.9
August	552.9
September	284.4
October	242.5
November	58.8
December	10.0

9.0 EMERGENCY RESPONSE ORGANISATION

These Emergency Response Procedures detail the organisation and predetermined actions that are in place in order to respond effectively to incidents that may occur on or in the immediate vicinity of the Onshore Gas Terminal. The incident types addressed cover a broad range of scenarios including those associated with Major Accident Hazards.

The Company and OGT Site Management are fully prepared to respond to any emergency situation, which threatens the installation. The facility has been designed and equipped with sufficient emergency response equipment and facilities to ensure the safety of personnel. Details of the emergency response facilities are included in this plan. In addition, these detailed Emergency Response Procedures have been developed and issued to ensure that all personnel is fully aware of their responsibilities and actions in various emergency situations.

9.1 Performance Standards

The response to any emergency will aim to achieve the following order of strategic objectives:

- **Personnel**
- **Environment**
- **Asset**
- **Reputation**

The OGT emergency response organization is headed by the OGT Superintendent (Emergency Commander) who has overall responsibility for the safety of all personnel within the onshore gas terminal. Emergency Response personnel operate within a well-defined structure comprising:


- Emergency Management Team
- Emergency Response Teams
- Medical Response Team
- All Other Personnel (normally at the Primary Muster Point)

Depending on the extent of the emergency situation, the OGT emergency management personnel will be supported by the Emergency Support Centre, based in Yangon Head Office.


The following organisation is in place to respond to OGT operations emergency:

- The **Emergency Management Team (EMT)** led by the OGT Superintendent.
- The CCR in which EMT will operate.
- The Emergency Response Team (ERT) led by the Maintenance Supervisor
- The Medical Team led by the OGT Doctor.

9.2 OGT Emergency Management Team (EMT) Organisation Chart (Example)



OGT Emergency Management Team Structure.



<div>Emergency Command Center (ECC)</div> <div>CCR</div> <div>Telephone 666.</div>		<div>EMERGENCY COMMANDER</div> <div>Superintendent</div> <div>Rey Cagatan</div>		<div>Valid from Date</div> <div>Monday, November 13, 2023</div>
<div>Muster Checker</div> <div>HSSE Supervisor</div> <div>Ye Tun Lin</div>	<div>EMERGENCY COMMUNICATIONS</div> <div>Lead Operator (Day (Acting) /Night)</div> <div>Min Kyi Tun / Aung Thet Khaing</div>	<div>EMERGENCY COORDINATOR</div> <div>Production Supervisor / Lead Operator</div> <div>Khin Maung Phyo</div>		
<div>Alternate Muster Checker</div> <div>Warehouse Lead</div> <div>Than Tun Naing</div>	<div>MUSTER COORDINATOR</div> <div>Production Technician (Day)</div> <div>Paing Hmu Aung / Aung Moe Thu</div>	<div>MUSTER COORDINATOR</div> <div>Production Technician (Night)</div> <div>Maung Thein Tun / Khine Myo Aung</div>		<div>SCRIBE</div> <div>Warehouse Supervisor</div> <div>Zaw Naing</div>
	<div>Electrical Isolating Authority</div> <div>Lead Electrical Technician</div> <div>Tay Zar Htun</div>	<div>Instrument Isolating Authority</div> <div>Lead Instrument Technician</div> <div>Aung Kyaw Myint</div>		

<div>Emergency Response Team Building</div> <div>EMERGENCY RESPONSE TEAM LEADER</div> <div>Maintenance Supervisor</div> <div>Nyi Myo Thu</div> <div>ERT MEMBERS</div> <div>Lead Mechanical Technician</div> <div>Soe Min Win</div> <div>Mechanical Technician</div> <div>Thura</div> <div>Mechanical Technician</div> <div>Thant Zin Aung</div> <div>Electrical Technician</div> <div>Soe Min</div> <div>Electrical Technician</div> <div>Thant Zin Win</div> <div>Instrument Technician</div> <div>Nyan Naing Myint</div> <div>Instrument Technician</div> <div>Ye Nyi Lwin</div>		<div>Medical Team - Ambulance Parking Area</div> <div>MEDICAL TEAM LEADER</div> <div>Dr. Oo Ko</div> <div>Medic Team Members</div> <div>Camp Boss</div> <div>Tun Tun Lin</div> <div>Chief Cook</div> <div>Zaw Min Lwin</div> <div>Assistant Cook</div> <div>Naing Lin Tun</div> <div>Mess Boy</div> <div>Ye Thwe Zan</div> <div>Laundry Man</div> <div>Sai Lin Kaung</div>		<div>Ambulance Driver</div> <div>Aung Moe Thar</div> <div>Ambulance Driver 1</div> <div>Wai Yan Oo</div> <div>Ambulance Dirver 2</div> <div>Win Than Zaw</div>
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9.3 Emergency Management Team

The Emergency Management Team is led by the Emergency Commander and on annunciation of the General Alarm shall locate to the CCR. The EMT is comprised of the senior qualified personnel on the OGT who have been assigned a duty with respect to the Emergency Response Plan. They also have a back-up role which they shall assume when circumstances dictate this. The team have received training in the management of emergencies and these procedures provide suggested guidance of their responsibilities.

Emergency Management Team

Position	Task	Back Up As
OGT Superintendent	Emergency Commander	Emergency Coordinator
Production Supervisor	Emergency Coordinator	Emergency Commander
Lead Operator	Emergency Communications Officer	-
Production Technician	Muster coordinator	Lead Operator

Position	Task	Back Up As
Maintenance Supervisor	Emergency Response Team Leader	-
Mechanical Lead	ERT Section Leader	Emergency Response Team Leader
Warehouse Supervisor	Scribe for activities	-
HSSE Supervisor	Muster Checker	EMT Assistant
Warehouse Lead	Alternate Muster checker	Muster Checker
Day shift lead operator Production Technician	After hours Assistant muster checker	Scribe for Activities

9.4 Emergency Response Teams

The Emergency Response Team consists of OGT technical personnel who have been trained in basic and advanced firefighting in a team environment. Their technical position shall determine their responsibility within the ERT. The Emergency Coordinator in the Emergency Management Team directs the activities of this team by radio. The Emergency Response Team Leader is the Maintenance Supervisor. The ERT Room contains everything necessary to provide the team with adequate sets of firefighting equipment.

Emergency Response Team

Maintenance Supervisor - Emergency Response Team Leader			
Position	Task	Back Up as	
Mechanical Lead Tech	Emergency Response Team Section Leader	ERT Leader	
Mechanical Technician	Emergency Response Team Member		
Instrument Technician	Emergency Response Team Member		
Instrument Technician	Emergency Response Team Member		
Electrical Technician	Emergency Response Team Member		

9.5 Medical Response Team

The medical response is provided by the OGT Site Doctor who musters at the Ambulance (Main Office Carpark) accompanied by his stretcher bearer team. The stretcher bearer team are trained first aiders who have had supplementary training provided by the OGT Site Doctor to enable them to assist the OGT site doctor during an emergency situation.

9.6 Position Responsibility

9.6.1 Emergency Commander (OGT Superintendent)

The Emergency Commander is in charge of the Emergency Response on OGT.

The Emergency Commander shall have the following responsibilities:

- Oversee and coordinate all actions by the Emergency Team and the Emergency Command Team.
- Liaise with the Emergency Support Centre in Yangon Head Office for additional support and resources when required.
- Maintain the "big picture", overall control.
- Ensure designated staff has been called out.
- Direct isolations/shutdown of plant.
- Inform the Emergency Duty Manager of the extent and classification of the emergency.
- Develop a strategy for mitigation of the emergency.
- Make use of written procedures and plans to provide additional assistance.
- Ensure that all personnel are accounted for.
- Keep facility personnel informed and monitor stress levels in others.
- Ensure chronological records are kept.
- In the event of abandonment ensure that partial evacuation is started early.
- Instigate evacuation support in plenty of time.
- Declare the end of the emergency only when it is confirmed as safe to do so.

9.6.2 Emergency Coordinator (Production Supervisor)

The Emergency Coordinator will coordinate the actions of the Emergency Response Team by communicating the Emergency Commanders requests through the Emergency Team Leader. The Emergency Coordinator shall have the following responsibilities:

- Liaise with the Emergency Commander.
- Liaise with the Emergency Team Leader.
- Coordinate resources for operations, isolations or shutdown of plant and equipment as the situation demands in view of safety of all personnel.
- Gather and assimilate information.
- Provide support for the Emergency Response Team Leader.
- Provide back-up assistance to the Emergency Team as required.
- Ensure any casualties are receiving adequate attention and arrange additional help if required.
- Monitor on-site decisions.

- Provide particular process expertise.
- Anticipate requirements and potential escalation developments.
- Ensure that Emergency Evacuation Grab-and-Go-Bag is ready in case evacuation is ordered by Emergency Commander.

9.6.3 Emergency Response Team Leader (Maintenance Supervisor)

The Emergency Response Team Leader is in charge of Search and Rescue and Firefighting activities. The ERTL initially reports to the Emergency Control Centre and is assigned to the Emergency Response Team when they have fully mustered and an initial plan of action has been decided. The Emergency Team Leader is responsible for:

- Establish contact with the Emergency Coordinator and report developments.
- Categorize the incident.
- Initiate the Emergency Procedures.
- Formulate an on-site strategy for approval of the Emergency Commander.
- Ensure that the incident area is checked for casualties.
- Provide damage survey, breach of containment, and loss of control assessment.

9.6.4 Emergency Response Team Member

The Emergency Team Members comprise Operations personnel that have received training in Advanced Fire Fighting, use of SCBA and Search and Rescue techniques. The Emergency Team responds initially by mustering and donning their protective equipment unless requested to muster elsewhere for a particular task.

9.6.5 Production Lead Operator (Control Room Operator)

The Production Operator (Control Room Operator) reports initially to the Emergency Coordinator. The CRO shall respond immediately to any alarm by monitoring the control panels and taking any action required to safeguard personnel and plant equipment. Field technicians shall proceed to the nearest muster point unless required in the field. The CRO shall have the following responsibilities:

- Raise the alarm.
- Make an announcement over the PA that follows a standardized format and gives appropriate information to the mustering personnel. Or as instructed otherwise by the Emergency Commander.
- Check and monitor plant status — action as necessary.
- Relay relevant information to Emergency Commander, Emergency Coordinator, Scribe and Muster Coordinator.
- Accesses Emergency response plan binder for the specific emergency and follows the pre-described procedure and plan
- Commence emergency activity log until Scribe arrives.

9.6.6 Emergency Communications Operator (Production Operator)

If and when requested by the Emergency Commander, The Emergency Communications Operator assumes the role of point of contact for external support resources. He communicates with ESC (in Yangon Head Office), as required.

9.6.7 Muster Coordinator

The Muster Coordinator collates all information on mustered personnel from Muster Checkers and personnel with emergency response duties. The Muster Coordinator reports this information to the Emergency Coordinator and directs Muster Checkers on instructions from the Emergency Commander. Duties also include organizing resources from muster points upon request and tracking movements of personnel and casualties.

9.6.8 Muster Checkers

The Muster Checker will be in charge of an assigned Muster Point and shall be responsible for mustering personnel assigned to the Muster Point and reporting any deviations on the assigned list to the Muster Coordinator.

9.6.9 Medic

On the sounding of a General Alarm, the doctor musters at the Ambulance Parking Area. He then counts all Medical POB then calls it into the Muster coordinator then locates/ checks first response equipment is ready and stands by for instructions from the Emergency Command Centre. Depending on the situation the Emergency Commander via the Emergency Coordinator may deploy the doctor to prepare for treatment of any casualties in the Medical Clinic.

9.7 Events Log Keeper (Scribe)

He shall maintain a log of Key Events. Keep the list of all ERT roles and who are responsible for each role in OGT emergency response organization. Ensure that the Emergency Coordinator is kept fully informed of all changes and new information. The Log Keeper is also responsible for tracking resources, casualties and ensuring this information is correct at all times.

10.0 CONTROL OF EMERGENCIES

10.1 General

The OGT Superintendent (or his deputy if he becomes incapacitated) shall assume command and control of any Emergency occurring on the site.

Detailed procedures have been produced to advise personnel of their duties during Emergency situations. All personnel are briefed on the Emergency Procedures and advised of their responsibilities. The General response in the event of an alarm situation is detailed on the site Station Bill, which is displayed at strategic positions throughout OGT.

Mitigation measures are employed to protect personnel, the environment, and the site from the effects of fire and explosion. These are the fixed detection systems, the shutdown systems and the fixed Fire Fighting systems such as the fire pumps.

10.2 Control

This concerns major accident hazards and the control measures employed to limit or prevent the escalation of an emergency. Control measures are either:

- Remotely operated equipment such as ESD and blow down systems.
- Or deployment of the OGT Emergency Response Team, if it is safe to do so, to go to the incident and manually operate equipment.

The remote operation of equipment and coordination of the Emergency Response Teams is performed by personnel located within CCR. The CCTV will provide the Command Team with visual information regarding the incident without exposing any personnel to danger.

11.0 ESCAPE EVACUATION AND RESCUE

11.1 Objective

The Company is committed to providing adequate facilities, arrangements, resources, and training to facilitate the safe evacuation and escape of personnel from the OGT in the event of any emergency threatening life and/or the structural integrity of the installation.

11.2 Escape

Consideration has been given to where personnel work and how they would get to the safe location in the event of an alarm or the discovery of an incident.

Primary and alternative escape routes are clearly marked and signed throughout OGT and their description forms a part of the OGT induction process for all personnel.

11.3 Muster Point

In the event of an emergency that could lead to eventual evacuation, escape and rescue from OGT. All non-essential personnel will, at the annunciation of the general alarm, muster in the Tennis Court behind the Accommodation. The muster point is designed to provide shelter where personnel can muster, and from where an organised evacuation can be carried out if required.

12.0 EVACUATION

If total evacuation from OGT is necessary the Emergency Commander shall take into account the weather conditions, available external support and the time left to select a method of evacuation, appropriate for the situation.

Abandonment, total evacuation will only be carried out under the specific instructions of the Emergency Commander (OGT Superintendent).

13.0 EMERGENCY COMMUNICATIONS

All personnel arriving on the OGT will undergo an induction which covers emergency procedures, mustering, and escape routes. Personnel will be shown the Muster Points and the escape routes prior to commencing work on the site.

Telephone communications within the Site Buildings are provided by a PABX system which is similar to any office communications system. If an incident develops in OGT, the primary means of communication is likely to be either their radio or the "Page/Party" telephones situated throughout the onshore gas terminal.

Efficient communication is essential during any emergency and the importance of maintaining uninterrupted communication with the site involved in the emergency. The following general rules shall be adhered to in an emergency:

All communications except those directly related to the incident shall cease.

Emergency calls should be brief and accurate.

Telephone messages regarding OGT personnel including casualties, shall always be followed by hard copy such as an e-mail or fax.

An accurate log of all calls made during an emergency shall be kept.

All external transmissions from the OGT by radio, telephone or fax must cease unless authorised by the Emergency Commander.

N.B. Although it is considered unlikely, it is possible during an emergency that direct communications between the OGT and Yangon Office could be lost. In this case, it will be necessary for communications to be handled by a third party.

Extensive communications facilities are available for use during an emergency situation and enable communications to be made throughout the OGT, SHWE Platform and Yangon Office.

The main communications centre utilised during an emergency on the OGT is the Emergency Command Centre. Communication facilities available in the ECC include,

- VHF Handheld Radio
- VHF Marine band radio
- Telephone system(PABX)
- Hot Line
- Inmarsat telephone
- Page party telephone
- E-mail
- VHF Aeronautical band
- Marine (SSB)
- Hand Phone

14.0 DRILLS AND EXERCISES

14.1 Introduction

The OGT workforce require to be well trained and practiced in reacting to any reasonably foreseeable event which could occur on the site, for example, fire and explosion or gas release.

These Emergency Response Procedures contain up-to-date information of the organisation and arrangements in the event of an emergency and the procedures to be followed for all reasonably foreseeable events.

The reasonably foreseeable events have been identified and Action Plans and Emergency Commander and CRO Prompt Cards have been developed. The Action Plans contain up-to-date information on the potential hazards and procedures to be followed for all the reasonably foreseeable events.

Section 19.0 of this manual, which contains the Action Plans, is designed to be extracted and kept as a separate controlled copy immediately available in the Emergency Command Centre for use by the Emergency Management Team.

14.2 Drills

Regular musters, drills and training exercises are carried out on the OGT to ensure that all personnel are familiar with the actions to be taken in the event of an emergency situation arising. A programme of musters and drills exists; these are based on the most significant risks and set out the objectives of the drill or exercise. The Emergency Commander maintains an annual training schedule for various drills and exercises. On completion of every drill a debrief meeting is held to discuss (Lessons Learned) and identify areas of concern and agree on appropriate remedial actions.

14.3 OGT-SHP Joint Exercises

In addition, emergency response exercises are held involving both the OGT and SHP personnel and scenarios are enacted to familiarise all personnel with their responsibilities.

All drills and exercises are monitored to assess the effectiveness of the procedures and the personnel involved and where relevant, corrective measures are implemented. These corrective measures may involve revisions to plans, implementation of further training for personnel or improvement of safety equipment or facilities.

14.4 Pre Incident Plan

PRE INCIDENT PLAN		
UNIT:	TAG #:	DESCRIPTION:
DESCRIPTION OF INCIDENT:		
INCIDENT CONTROL TACTICS		
EXPOSURES / ESCALATIONS		
ESCALATION CONTROL PLAN		
FIRE EQUIPMENT REQUIRED		
POSSIBLE CONSEQUENCES		CORRESPONDING P.E.F.S
PERSONNEL:		
ENVIRONMENT:		
ASSETS:		
REPUTATION:		
PRODUCTION:		

15.0 ORGANIZATION AND ARRANGEMENTS

15.1 Organisation

To ensure that there is no conflict between personnel performing multi functions the roles of individuals are clearly identified in their individual roles and responsibilities. In addition, these Emergency Response Procedures demonstrate that no conflicts occur as a result of personnel performing multi functions.

15.2 Arrangements

In all foreseeable circumstances the prior arrangements provided for emergency response, and the management of these arrangements, will ensure, as far as is reasonably practicable, the safety of OGT Personnel involved in activities connected with it.

These arrangements include:

- Planning for the emergency.
- The prevention, detection, mitigation and control of incidents.
- Manual intervention.
- Informing all personnel of what their response to emergencies should be.
- Informing all personnel of hazardous conditions, their response, and accounting for all personnel following an incident.
- Recovery of personnel on or near the OGT.
- The TR, including escape routes to and from it.
- Evacuation.
- Escape, rescue and recovery.
- Coordination of the response and the cooperation of all personnel involved.
- Support and response from Yangon Office.

The planning and consultation process has provided arrangements for the rapid deployment of the Company's Emergency Management Team in Yangon whereby a team of managers and engineers are available to support any requirement from the OGT Person in Charge.

15.3 Planning

The Company's Emergency and Crisis Management Plan, as part of the HSE Management System, provides support to regulations and benefits from industry best practise. It is recognized that although legislation, design and best practice provide measures that position risk "As Low As Reasonably Practicable" there will be residual risks and emergencies may still arise which could endanger personnel.

By recognizing and assessing these residual risks and what the results of incidents could be, adequate prior arrangements, planning can be carried out so that if there is an incident there will be an immediate and appropriate response. The overriding strategy, which is stated and implied by this plan, is that the preservation of life and the prevention of injury are of paramount importance.

16.0 COMPETENCE

All personnel on the OGT will be competent to respond, as appropriate, to emergencies. This can vary from responding to simple alarms and instructions and going to muster point, to assessing complex situations, taking correct decisions and allocating tasks.

In addition to the basic and refresher survival and safety training given to all personnel working onshore and offshore, all personnel nominated for emergency duties shall be provided with specific training, coaching and assessment by a certifying authority, commensurate with duties and responsibilities.

17.0 APPENDICES

17.1 Medevac Request and Patient Information:

Medevac Request & Patient Information

From: Dr. Site:

To:

Cc:

Date:

Patient information

Family Name: First Name:

Age/DOB Blood group: Company

Medevac associated to an accident: YES ☐
NO ☐

Reason for evacuation:




Additional medical requirement from base/at receiving end (doctor/equipment):

Ambulance required at airport YES ☐
NO ☐



Patient condition

SEATED ☐ STRETCHER ☐ CONSCIOUS ☐ UNCONSCIOUS ☐
BURNS ☐ FRACTURE ☐ P/T ON DRIP ☐


17.2 OGT Fire & ERT Procedure

  	
SUBJECT: Fire Emergency Response Team	
GENERAL: The purpose of this procedure is to communicate the roles and responsibilities of the Emergency Response Team members.	
PROCEDURE: On hearing the alarm ERT members will proceed to their muster point and muster.	
The duties of the team are:	
Emergency Response Team Leader (Maintenance Supervisor) On arrival at the muster point these people will check off on the muster list, dress and proceed as instructed to the scene as instructed by the Emergency Command Center. When at the scene they will assess the situation with Emergency Team Leader reporting back to the Emergency Command Center.	
Fire Fighting Lead(Mechanical Technician) Reporting to Emergency Response Team Leader On arrival at the muster point these people will check off on the muster list, dress and proceed as instructed to the scene as instructed by the Emergency Command Center.	
Responsibility: It will be the responsibility of the Admin to ensure that the Emergency Responsibilities Board is kept up to date. It will be the Responsibility of all persons that hold emergency duties to check the Emergency Responsibilities Board. It will be the Responsibility of the persons that hold emergency duties to advise the departure from the OGT.	
Emergency Response Team: Emergency Team Leader Emergency Response Section Leader Emergency Electrical Isolation Team Leader Electrical Technician Mechanical Technician Instrument Technician	–Maintenance Supervisor –Mechanical Lead –Electrical/Instrument Lead –Emergency Response Team Member –Emergency Response Team member –Emergency Team Member
Trainings: All of the Fire & Emergency response people will be trained and hold Fire Fighting Certificates.	
OGT Superintendent	Rev. 21 May 2019


17.3 OGT Muster Point Procedure

	<h2>OGT POLICY</h2>	
<p>SUBJECT: Muster Point Procedure</p>		
<p>GENERAL: The purpose of this procedure is to ensure that proper muster point procedure is communicated to all affected OGT personnel.</p>		
<p>In the event of alarm you should carry out the following actions;</p> <ol style="list-style-type: none"> 1. If at your place of work ensure you leave your worksite in a safe condition by turning off tools and equipment, and proceed directly to the nearest muster point at your assigned muster area. 2. When in your room put on suitable clothing and foot wear and proceed to the nearest muster point. 3. When at your assigned muster area in muster point report to the muster checker. Tell the muster checker your name and room number. <p>If the muster checker is absent when you arrive, form an orderly queue and wait further instruction.</p> <p>REMEMBER ALWAYS</p> <ul style="list-style-type: none"> ➤ Always follow the instruction of the muster checker. ➤ Muster in orderly fashion to aid head counts if required, which in turn help speed up the overall headcount on the installation. ➤ You or your friend could be the person missing from the muster, so remember it is very important to do it right on <u>FIRST TIME</u>. <div> <div>OGT Superintendent</div> <div>Rev. 21 May 2019</div> </div>		



17.4 OGT Muster Drill Call Procedure

posco INTERNATIONAL	OGT POLICY	
SUBJECT: Muster Drill Call Procedure		
PROCEDURE: After an alarm has been activated the on Duty CRO will make the following announcement <p style="text-align: center;">ATTENTION ALL PERSONNEL, ATTENTION ALL PERSONNEL</p> <p style="text-align: center;">THIS IS A DRILL, THIS IS A DRILL</p> <p style="text-align: center;">STOP WORK, MAKE YOUR WORKSITE SAFE AND PROCEED TO THE NEAREST MUSTER STATION STOP WORK, MAKE YOUR WORKSITE SAFE AND PROCEED TO THE NEAREST MUSTER STATION</p> <p style="text-align: center;">THIS IS A DRILL, THIS IS A DRILL</p>		
<p style="text-align: center;">(AFTER 5 MINUTES)</p> <p style="text-align: center;">ATTENTION ALL PERSONNEL, ATTENTION ALL PERSONNEL</p> <p style="text-align: center;">THE ALARM HAS BEEN TURNED OFF TO AID COMMUNICATION THE ALARM HAS BEEN TURNED OFF TO AID COMMUNICATION</p> <p style="text-align: center;">THE DRILL IS STILL IN PROGRESS, THE DRILL IS STILL IN PROGRESS</p> <p style="text-align: center;">CONTINUE TO MUSTER, CONTINUE TO MUSTER</p>		
<p>Upon completion of the Drill the CRO will make the following announcement</p> <p style="text-align: center;">ATTENTION ALL PERSONNEL, ATTENTION ALL PERSONNEL</p> <p style="text-align: center;">THE DRILL IS COMPLETE, THE DRILL IS COMPLETE</p> <p style="text-align: center;">ALL PERSONNEL STAND DOWN AND RETURN TO YOUR NORMAL DUTIES ALL PERSONNEL STAND DOWN AND RETURN TO YOUR NORMAL DUTIES</p>		
OGT Superintendent		Rev. 21 May 2019

17.5 OGT Control and T-Card Procedure

posco INTERNATIONAL	OGT POLICY	
SUBJECT: Muster Control and T-Card System		
GENERAL: The Purpose of this policy is to advise and implement effective working T-Card muster system		
RESPONSIBLE:		
<p>A. HSSE Supervisor The Muster T-Card Racks will be check by the HSSE Supervisor on a weekly basis.</p> <p>B. HSSE Supervisor Duties</p> <ol style="list-style-type: none"> 1. It will be responsibility of the HSSE Supervisor to ensure that T-Cards are allocated to the oncoming person/and put into the T-card racks. 2. It will be the responsibility of the HSSE Supervisor to adjust the POB on the Emergency Control Center POB Board. 3. It will be the responsibility of the HSSE Supervisor to ensure that the T-Card Racks are check out and all the T-Cards are back in order. <p>C. Muster Checker</p> <ol style="list-style-type: none"> 1. It will be the responsibility of the Muster Checker to collect his relevant T-Card racks from the muster station. 2. In the event of an OGT General Alarm sounding it will be the responsibility of the Muster Checker to return the T-Card racks to the Muster Station on the completion of the emergency situation. 		
OGT Superintendent		Rev. 01 Feb 2020

17.6 OGT Radio Procedure

	<h3>OGT POLICY</h3>	
<p>SUBJECT: Radio Channels during an Emergency Situation</p>		
<p>The point of this policy is to provide instruction to all who will be involved in the use of radio during an Emergency on the OGT.</p>		
<ol style="list-style-type: none"> 1. During emergency alarm being sounded on the OGT the Radio Channels that will be used in Channel 4. 2. All none essential personnel must turn off all radios to assist the communications during an Emergency. 3. EMT will communicate with the Emergency Response Team EMT will communicate with all others on VHF Channel No.4 Muster Coordinator will communicate with the Muster Checker on VHF Channel No.2 4. The Production Team will be required to keep in communication with EMT when all personnel have been Stand Down from the Muster Points. This is to assist the EMT with the investigations of the incident. 		
<p>Other Issues To be monitored over 6 month's period, this is to establish changes to the above if required.</p>		
<p>OGT Superintendent</p>		<p>Rev. 01 Feb 2020</p>

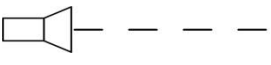
17.7 OGT Cyclone Matrix

Refer to the comprehensive; Tropical Storm (Cyclone) Response Procedure YGG-SF-EP-03-06-0011

17.8 Emergency Contact List

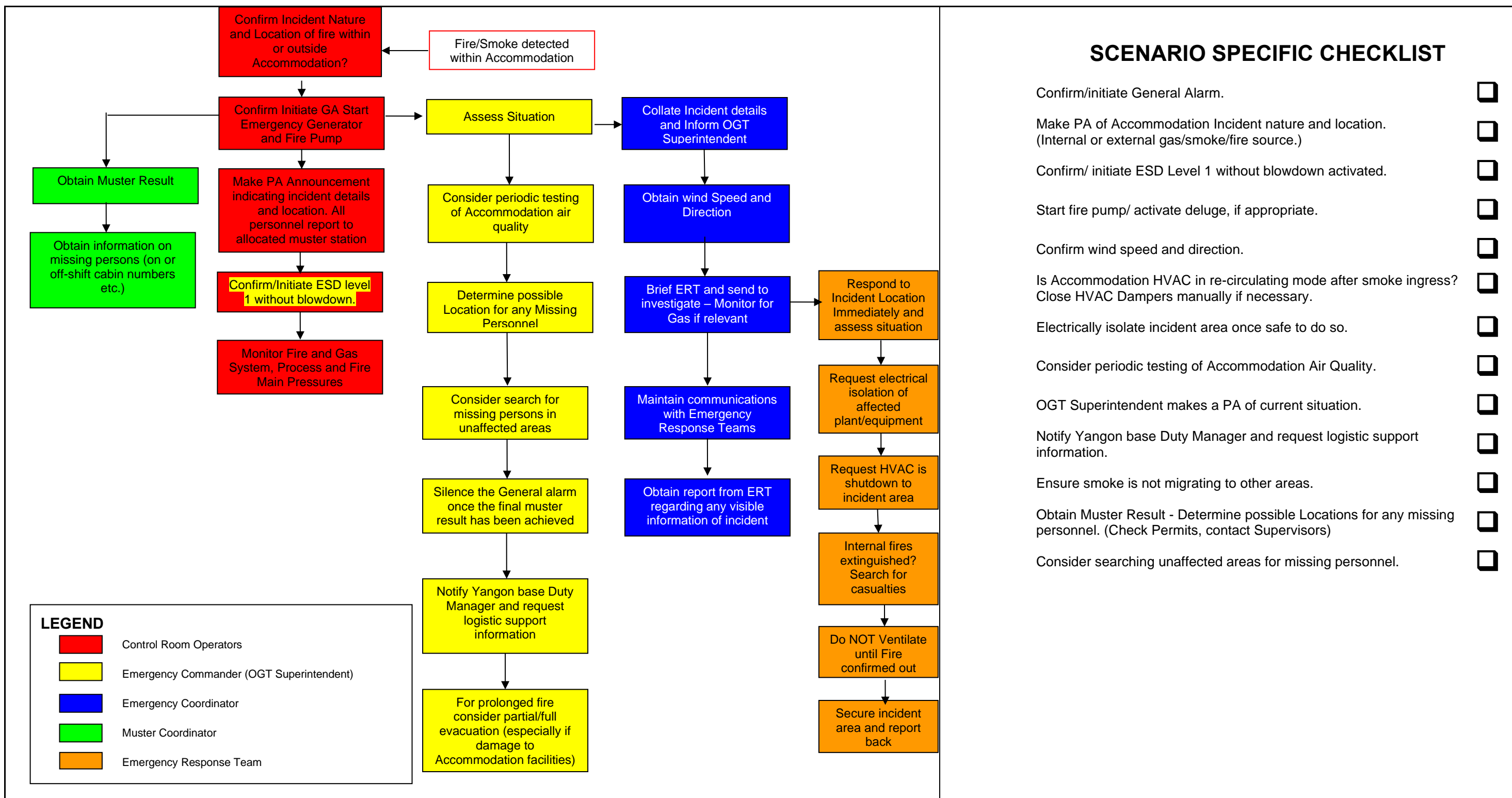
An up-to-date emergency contact list must be available in the CCR.

17.9 OGT Station Bill

posco INTERNATIONAL		STATION BILL – ONSHORE GAS TERMINAL		SHWE	
SECTION 1 OGT EMERGENCY PHONE NUMBER: 666					
SECTION 2 ACTION BY OBSERVER					
INCIDENTS If you see an Incident: It is your responsibility to immediately Inform your supervisor and the CCR of any Hazard. Condensate, gas, chemical or fluid leaks are potential hazard. Your prompt action could save lives.		FIRE If you see Fire Initiate OGT General Alarm and contact the CCR from a safe location. Secure an escape route and call for assistance. If safe to do so, fight the fire until assistance arrives. If unable to fight the fire, proceed to Muster Point and pass on information to CCR.		INJURY If you see someone being injured: Notify the CCR that an accident has occurred. Do not attempt to move seriously injured personnel unless it is to move from further danger. Apply First AID. Stay with casualty until relieved by the medic.	
SECTION 3 ALARMS					
STATUS	AUDIBLE ALARM	VISUAL ALARM	ACTIONS		
			Personnel with Emergency Duties	All Other Personnel	
Normal	None	None	Normal Duties	Normal Duties	
GENERAL ALARM	Single tone sounded intermittently at approximately one second intervals 	Flashing Red Light Beacon	Stop all work and leave work site safe and secure. Stop smoking. Go to Muster Points. Act on the instructions from the Muster Checker/Team Leader/PA	Stop all work and leave work site safe and secure. Stop all smoking. Go to muster point. Act on the instructions from the OGT Superintendent. If in your room, bring your Torch/flashlights and other emergency materials.	
SECTION 4 OGT EMERGENCY DUTIES					
ROLE	EMERGENCY STATION	MUSTER POINT	RESPONSIBILITIES AND ACTIONS		
EMERGENCY COMMANDER (OGT Superintendent)	Central Control Room	2	Assume role of Person In Charge. Manage the Emergency Response.		
EMERGENCY COORDINATOR (Production Supervisor)	Central Control Room	2	Assume the Role of Incident Controller. Assume the role of Person In charge if the OGT Superintendent is incapacitated or unavailable. Coordinate emergency operations and process status.		
SCRIBE (Warehouse Supervisor)	Central Control Room	2	Record data onto White board. Act on the instructions of the Emergency Commander		
MUSTER COORDINATOR (Duty Operator)	Central Control Room	2	Coordinate the POB muster. Track the movement of Personnel. Account for casualties and missing person(s)		
EMERGENCY COMMUNICATIONS Officer (Lead Operator)	Central Control Room	2	Maintain external communications. Act on the instructions of the Person In Charge.		
RESPONSIBLE ELECTRICAL PERSON (Electrical Lead Technician)	Central Control Room	2	Conduct Electrical Isolation as Instructed by Emergency Commander He muster in Central Control Room		
MEDICAL TEAM LEADER (Medic-OGT Doctor)	Ambulance Parking Shed	3	Prepare medical suite for casualty handling. Prepare back pack for onsite activity.		
EMERGENCY RESPONSE TEAM LEADER (Maintenance Supervisor)	ERT Building	4	Report Muster numbers to the Muster Coordinator. Don protective clothing. Inform ECC of readiness. Act on the instructions of the Emergency Coordinator.		
EMERGENCY RESPONSE TEAM	ERT Building	4	Don their Fire fighting suit, ready equipment, ensures to maintain it. Report to the Emergency Response Team Leader		
MUSTER CHECKER (HSSE Supervisor)	Red zone muster point (Tennis Court)	1	Coordinate the POB Muster. Report the Muster numbers to the ECC.		
FIRE TRUCK DRIVER National Technician	ERT Building	4	Drive the Fire Truck. Ensure to operate the engine to maintain water pressure.		
AMBULANCE DRIVER Truck Driver/Crane Operator	Ambulance Parking Shed	3	Drive the Ambulance. Ensure that Ambulance is always ready and operational.		
NON-ASSIGNED PERSONNEL	Red Zone Muster Point (Tennis Court)	1	Report to the Designated Muster checker.		
SECTION 5 MUSTER POINT ALLOCATION					
MUSTER POINT 1	Red zone Muster Point (Tennis Court)		MUSTER POINT 2	Central Control Room	
MUSTER POINT 3	Ambulance Parking Shed		MUSTER POINT 4	ERT Building	
ALTERNATIVE MUSTER POINT					
Announcement will be made to advise personnel when to go to the alternative muster point					
ALTERNATIVE MUSTER POINT 1	General Warehouse Storage –A. Near the interceptor pond / Gate-D		ALTERNATIVE MUSTER POINT 2	Main entrance to the plant	

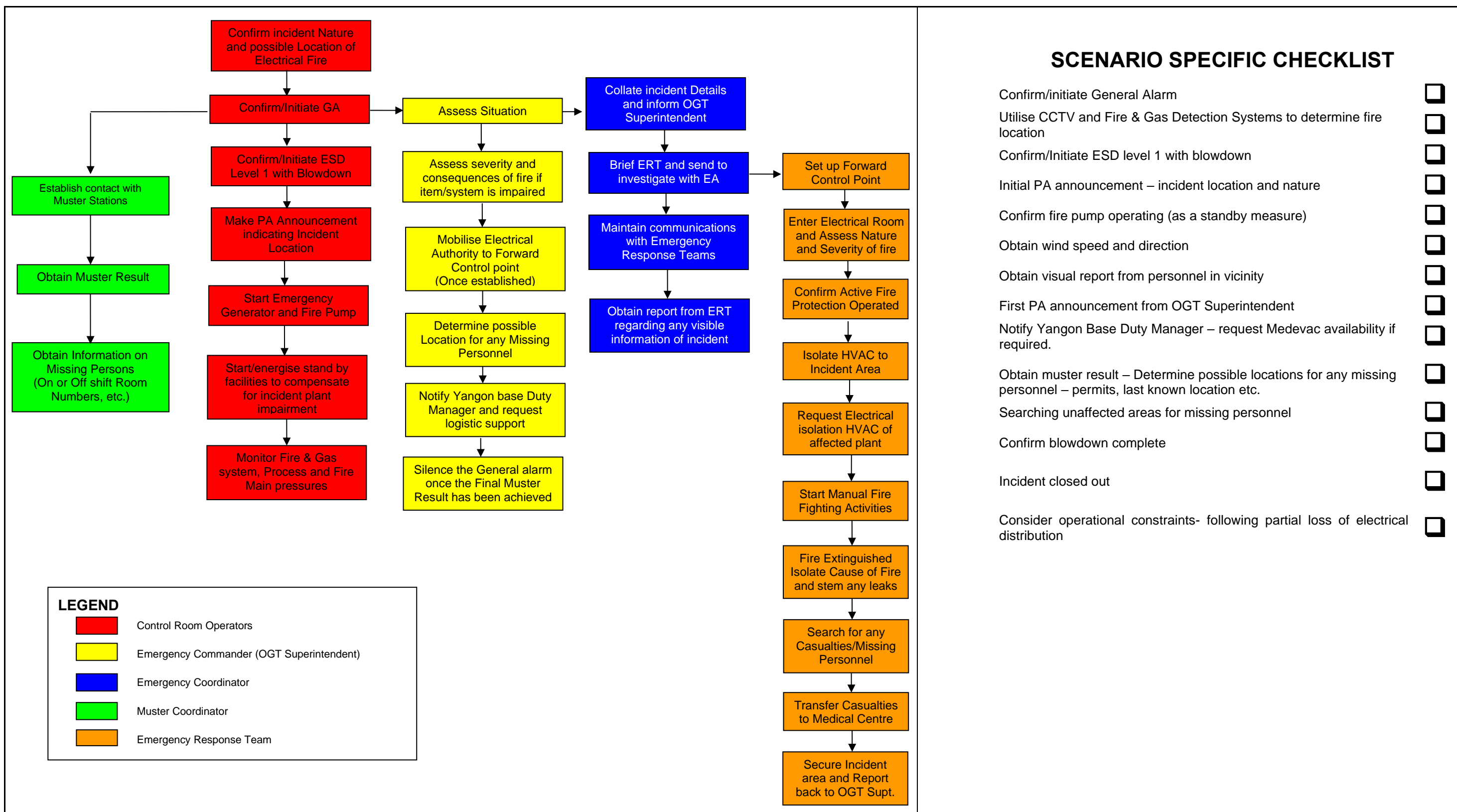
18.0 ACTION PLANS

18.1 Fire or Smoke Ingress to Accommodation



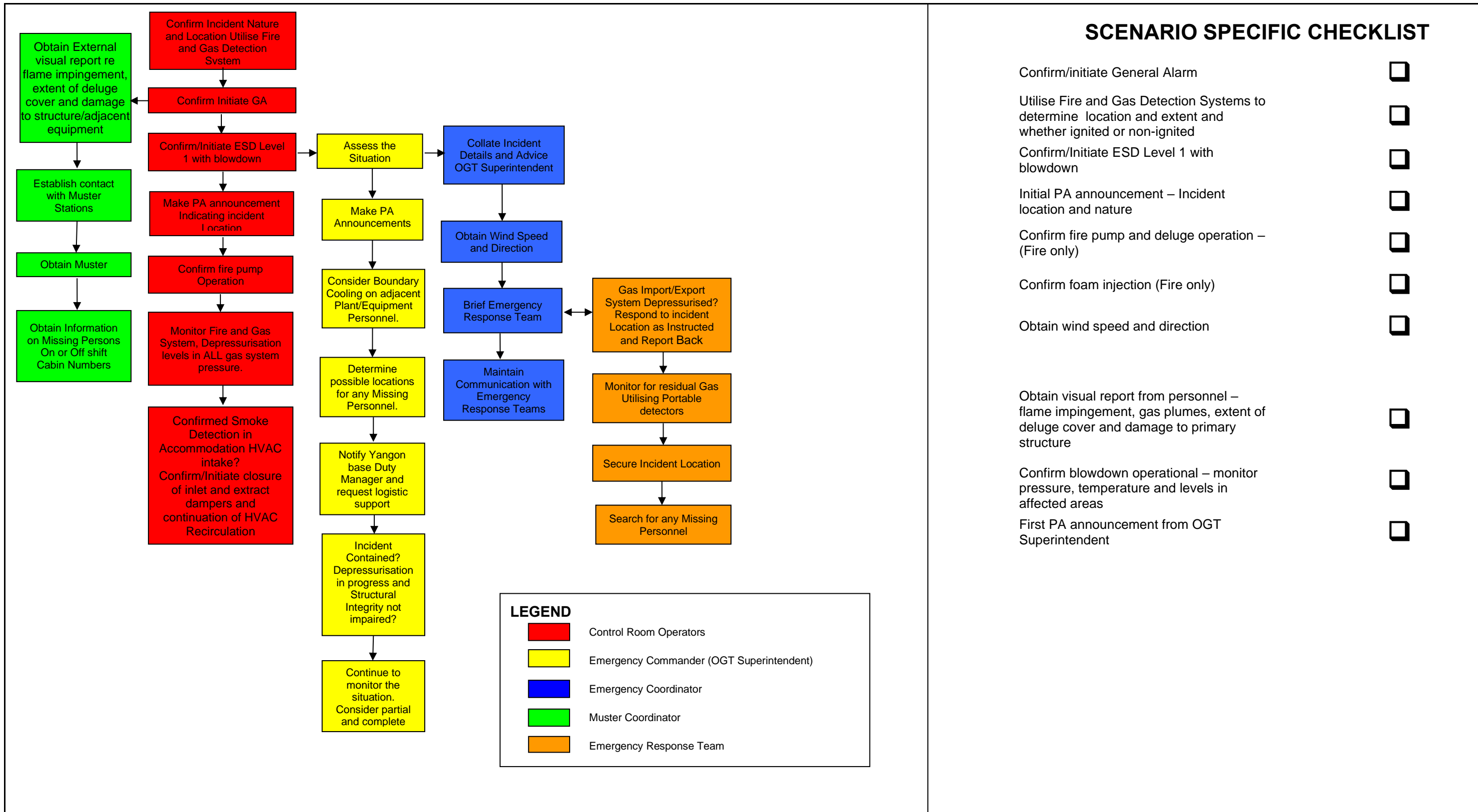
Initiating Event	Escalation Potential	Mitigation
<p>Fire/smoke may arise in the Accommodation due to :</p> <ul style="list-style-type: none"> – Hot work. – Electrical faults. – Galley fires [failure of fitted auto fire fighting system]. – Laundry fire. – Major Hydrocarbon Event. 	<p>Accommodation fire is predicted to have only a minor localised impact and unlikely to cause further fire escalation</p> <p>Other smoke sources:</p> <ul style="list-style-type: none"> – Fire in the galley. – Laundry fire. – External incident such as fire in the car park. 	<p>Each external door on the accommodation block has an airlock.</p> <p>Early detection and response to internal fire in Accommodation will ensure its design integrity.</p> <p>Fire Protection consists of:</p> <p>Fire extinguishers located throughout the accommodation.</p> <p>Fire hydrants located outside each external door. Remotely activated fire protection in the galley.</p>
Environmental Response	Response Strategy and Tactics	
NOT APPLICABLE	Incident Management Team	Emergency Response Team
	<ul style="list-style-type: none"> • Identify source of smoke / fire. Internal or external source? • Monitor Accommodation air quality and put HVAC into Full re-circulating mode if required. • All mustered personnel, unless directed otherwise, remain in muster point until incident is closed out. • Utilise external sources (if available) and CCTV to monitor incident area and report any change in circumstances. • Action ERT to respond to incident location after any required safe electrical isolation is confirmed. • Determine the Probable location for Missing Personnel. • Consider Searching unaffected areas. 	<ul style="list-style-type: none"> • Report back indications of heat or fire migration. Apply cooling where necessary and possible. Conduct a physical search for missing persons. • Secure incident area when fire extinguished and missing or injured persons are accounted for.

18.2 Electrical Fire at Process Area



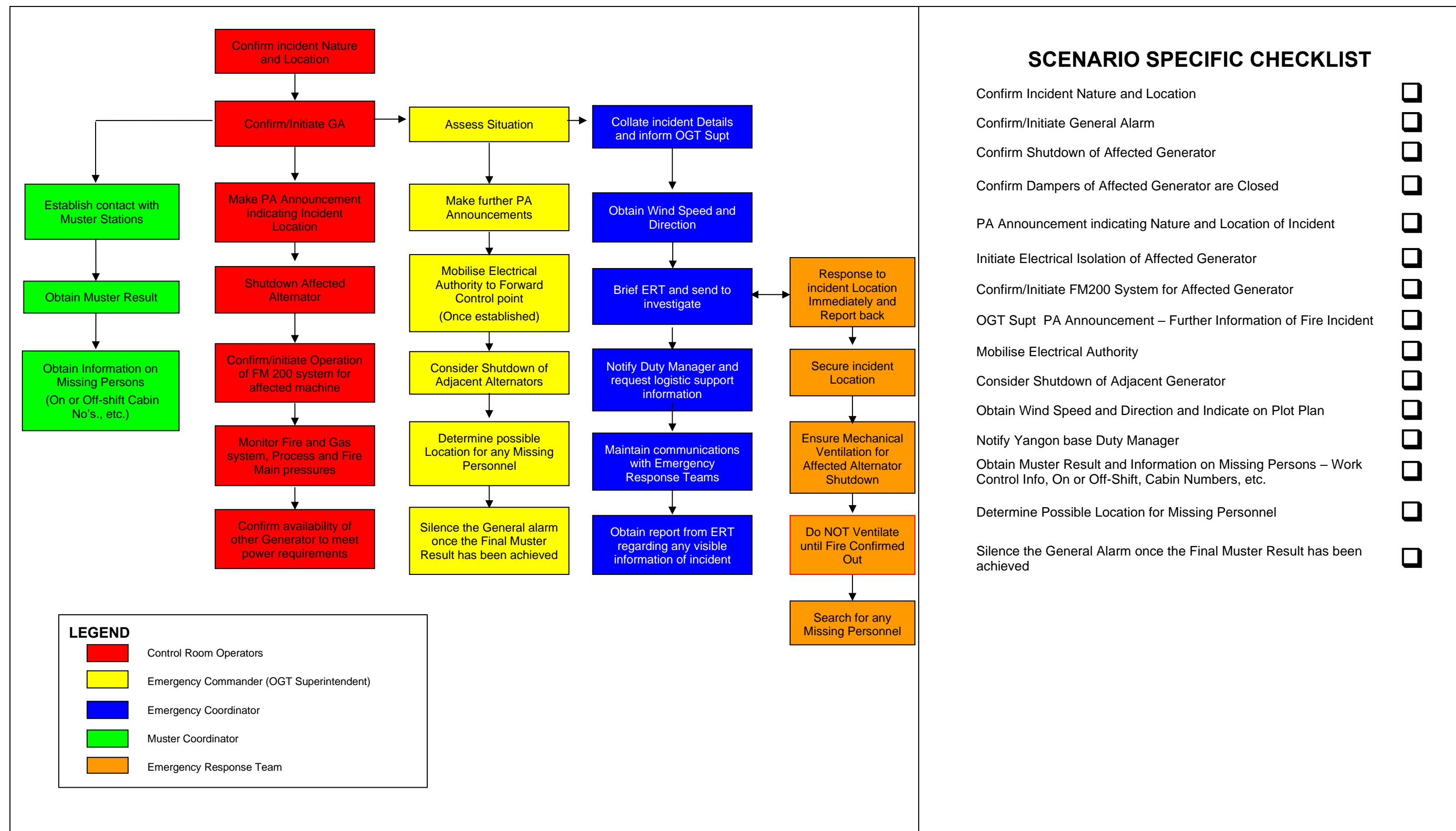
Initiating Event	Escalation Potential	Mitigation
<p>Electrical protective equipment failure</p> <p>Corrosion</p> <p>Maintenance Error</p> <p>Loose connections leading to sparking</p> <p>Defective protection equipment</p> <p>Physical damage to cable insulation with overheating</p>	<p>A fire in a low voltage electrical panel should be self-contained with low risk of escaping smoke until required access by ERT to extinguish the fire</p> <p>A fire in an HV panel (6.6 KV or above) may give rise to a fire of greater intensity with a potential to spread rapidly within the panel area</p> <p>Electrical fires are predicted to have only a minor localised impact and unlikely to cause further fire escalation</p> <p>However, fire damaged panels and bus bars may give rise to non-availability of essential utilities and process equipment until requisite repairs are completed</p>	<p>Containment Integrity – all local electrical equipment rooms are protected from MHE by J15/H60 firewalls. The LER building base is provided with H60 fire rated protection.</p> <p>All electrical rooms fitted with VESDA smoke detection systems requiring manual intervention with portable extinguishers.</p> <p>Operating and maintenance procedures.</p>
Environmental Response	Response Strategy and Tactics	
<p>Environment impairment not predicted</p>	Incident Management Team	Emergency Response Team
	<ul style="list-style-type: none"> All mustered personnel, unless directed otherwise, remain in muster point until incident is closed out Utilise external sources (if available) and CCTV to monitor incident area and report any change in circumstances Assess loss of availability of process or utility systems resulting from the electrical fire. Restore electrical system availability if possible with standby plant. Determine the probability that missing personnel (if any) are in the affected area. Consider searching unaffected areas Action ERT to respond to incident location after safe electrical isolation is confirmed. 	<ul style="list-style-type: none"> Access incident electrical equipment room and identify source of fire. Report back and request safe electrical isolation of the incident panel. Manually apply CO2 and /or dry powder extinguishers onto fire area and extinguish fire. Conduct a physical search for reported missing persons. Secure incident area when fire extinguished and missing or injured persons are accounted for. Report incident conclusions to Incident Management Team.

18.3 Gas Release or Fire



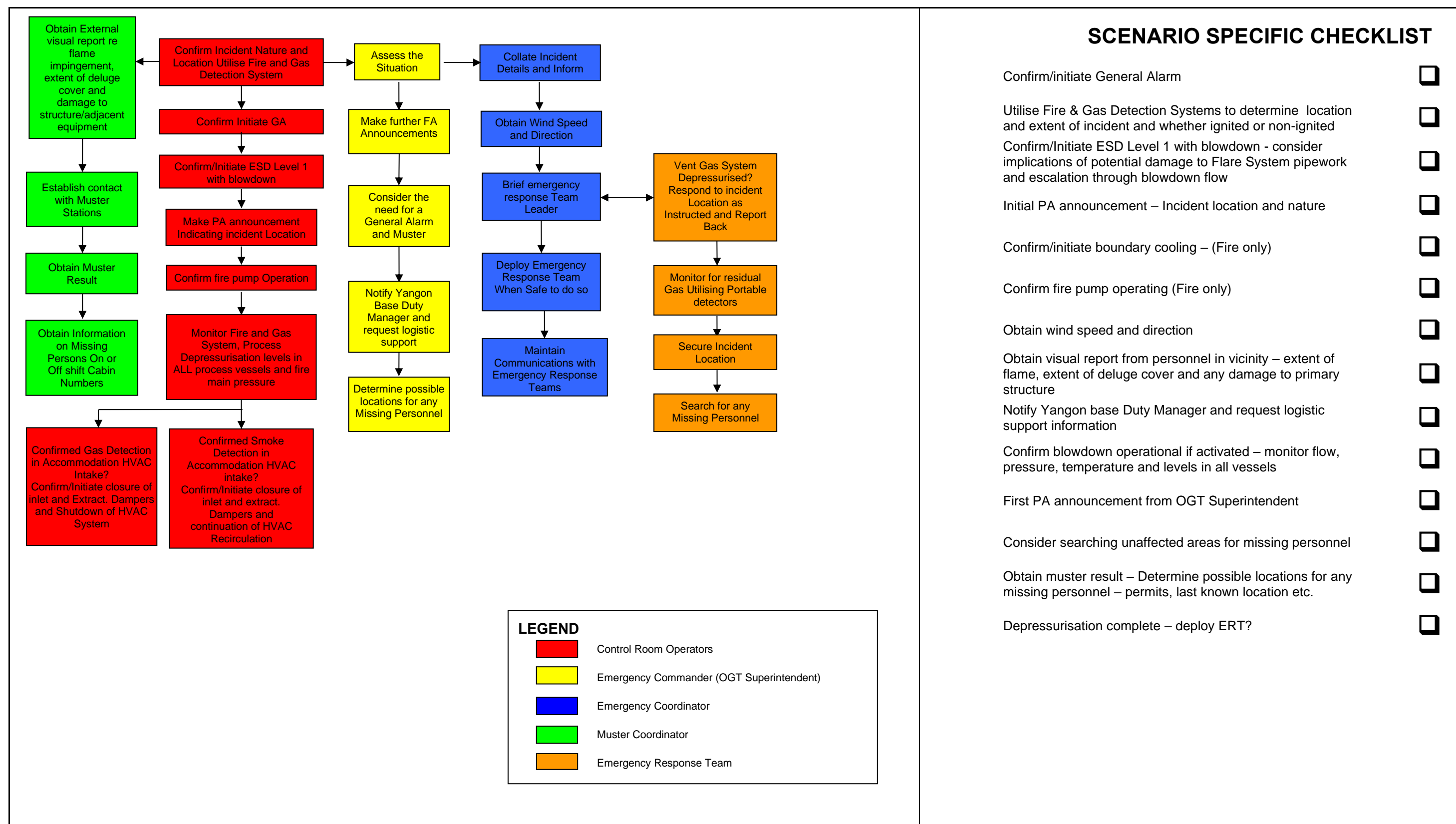
Initiating Event	Escalation Potential	Mitigation
<ul style="list-style-type: none"> • Overpressure • Fitting Leak • Equipment Failure • Corrosion • Maintenance Error • Impact 	Gas Release Large flange leak will rapidly deplete gas release until pressure decays in affected vessel. Gas will spread through to the installation with potential for ignition.	Blowdown System Duration of gas release from large flange leak on pressure vessel and pipe line is approximately 10- 15 minutes before pressure depleted fully
Means of Prevention Containment Integrity High pressure alarms and high-high trips Relief to Vent from pressure vessels and pipe lines Appropriate materials selection Condition monitoring Operating and maintenance procedures Risk assessed lifting procedures	Jet Fires Threat to Primary Structure due to flame impingement Heat radiation affecting personnel and impairing emergency actions Jet fire length – >150 metres for short duration If ignition delayed then potential fireball	Passive Fire Protection Primary Structure is protected for 30 minutes and Accommodation integrity maintained for 60 minutes.
	Pool Fires Large quantity of smoke – potential for smoke in Accommodation HVAC intake. Likely to burn for >30 minutes.	HVAC Confirmed smoke detection in Accommodation HVAC inlet – inlet and extract dampers close and air in recirculation. 1 Hour protection if main and emergency generators unavailable
Environmental Response	Response Strategy and Tactics	
<ul style="list-style-type: none"> • Low Potential for fluids to spread in the ground (Small Inventory) - Notify Operations Manager (Yangon) • Refer to Pollution Contingency Plan – Determine Response Category 	Incident Control Team	Emergency Response Team
	<ul style="list-style-type: none"> • All personnel to remain in Accommodation or safe location until blowdown is complete • Incident contained? – Monitor fire and gas detection, depressurisation status in ALL pressurised vessels (Blowdown effective and fully depressurised?) • Utilise external sources (if available) • Determine the probability that missing personnel (if any) are in the affected area • Consider searching unaffected areas • Action ERT to respond to incident location after associated gas has dispersed or pressurised fires are depleted • Consider retaining all personnel in Accommodation and allowing fire to burn out (utilise fixed systems) if no persons missing 	<ul style="list-style-type: none"> • Establish Control Point • Report back – readings from portable detectors, structural damage and indications of heat or fire. • Apply cooling where necessary. • Conduct a physical search for missing persons in the affected areas. • Decide (OGT Supt. Decision) to facilitate a visual assessment (Do not enter area unless necessary). Do not place ERT at risk • Manually apply foam to affected area to facilitate a physical search if persons are still missing • If no persons missing – consider withdrawing ERT back to Accommodation

18.4 Generator Alternator Fire



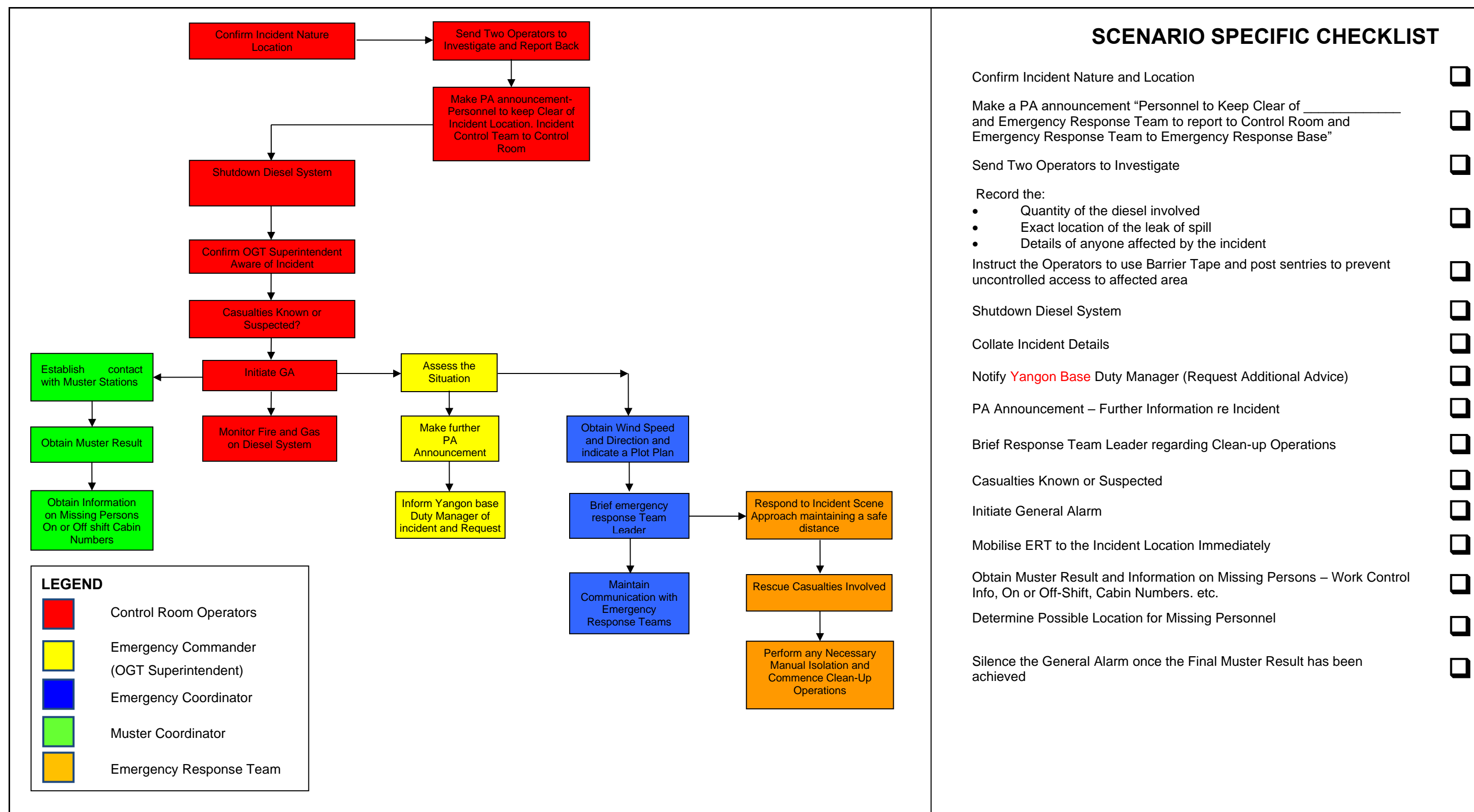
Escalation Potential		Mitigation	
Fire spread of fire to adjacent plant/alternators		Segregation of modules will prevent escalation to other areas	
Environmental Response		Response Strategy and Tactics	
<ul style="list-style-type: none"> No environmental impact 	Incident Control Team		Emergency Response Team
	Shutdown Affected Generator and Isolate Electrically FM 200 will probably extinguish any enclosure fire – Confirm Operation ERT to respond immediately Electrically isolate affected generator Mobilise Electrical Authority to Control Point (once established)		<ul style="list-style-type: none"> Respond immediately Establish Control Point (Wind direction dependent) Perform all necessary local isolations Consider allowing fire to burn out and maintain restriction of air flow to fire Search adjacent areas for missing persons Search affected area once fire is extinguished or diesel pools secured with foam

18.5 Vent KO Drum Gas Release or Fire



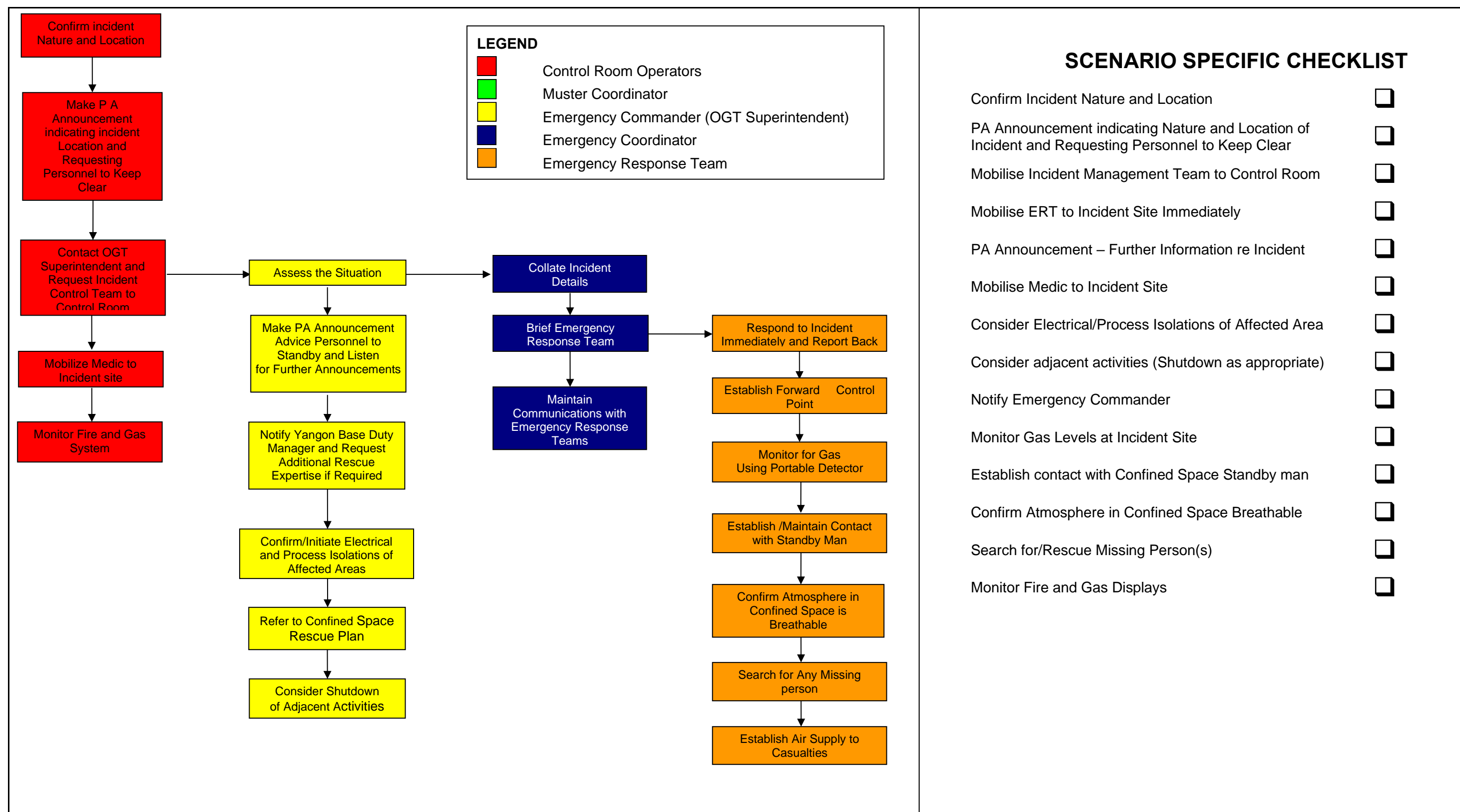
Initiating Event	Escalation Potential		Mitigation
	Jet Fires		Passive Fire Protection
Overpressure Fitting Leak Equipment Failure Corrosion Maintenance Error Impact	Jet fire unlikely due to low pressure in system Heat radiation affecting personnel and impairing emergency actions		Primary Structure is protected for 30 minutes and Accommodation integrity maintained for 60 minutes
Means of Prevention	Pool Fires		Smoke Detection System
	Explosion Overpressure		Blast-Proofing
Containment Integrity High pressure alarms High level alarms and high-high trips Continuous venting to Vent Appropriate materials selection Condition monitoring Operating and maintenance procedures Risk assessed lifting procedures	Small liquid release associated with gas release – No significant pool fire as relatively small amounts of liquid held. Additionally composition likely to be water wet Explosion Overpressures impacting Accommodation unlikely		Confirmed smoke detection in Accommodation HVAC inlet – inlet and extract dampers close and air in Accommodation recirculated. 1 Hour protection if main and emergency generators unavailable H60 wall on LQ designed to withstand 600mb blast overpressure
	Gas Leaks		HVAC
	Low probability for gas to enter the Accommodation HVAC Inlet Distance to 20% LEL could reach in excess of 50 metres from leak source but inventory limited and so rapid dissipation.		Confirmed gas detection in Accommodation HVAC inlet – inlet and extract dampers close and HVAC system shutdown.
Environmental Response	Response Strategy and Tactics		
<ul style="list-style-type: none"> Low Potential for fluids to spread in the ground (Small Inventory) <ul style="list-style-type: none"> Notify Duty Manager (Yangon) Refer to Pollution Contingency Plan – Determine Response Category 	Incident Control Team		Emergency Response Team
	<ul style="list-style-type: none"> All personnel to remain in Accommodation or safe location until blowdown are complete. Communicate incident status to personnel at all mustering locations Incident contained? – Monitor fire and gas detection, depressurisation status in ALL pressurised vessels (Blowdown effective and fully depressurised?) Utilise external sources (if available) Determine the probability that missing personnel (if any) are in the affected area Consider searching unaffected areas Action ERT to respond to incident location after pressure has dissipated and pressurised fires are depleted Consider retaining all personnel in Accommodation and allowing fire to burn out (utilise fixed systems) if no persons missing 		<ul style="list-style-type: none"> Establish a Control Point Report back – readings from portable detectors, structural damage, and indications of heat or fire. Apply cooling where necessary Conduct a physical search for missing persons in areas adjacent to the Vent KO Drum area Decide (OGT Supt. Decision) to facilitate a visual assessment (Do not enter area unless necessary). Do not place ERT at risk Manually apply foam to affected area to facilitate a physical search if persons are still missing If no persons missing – consider withdrawing ERT back to Accommodation

18.6 Diesel Oil Spillage



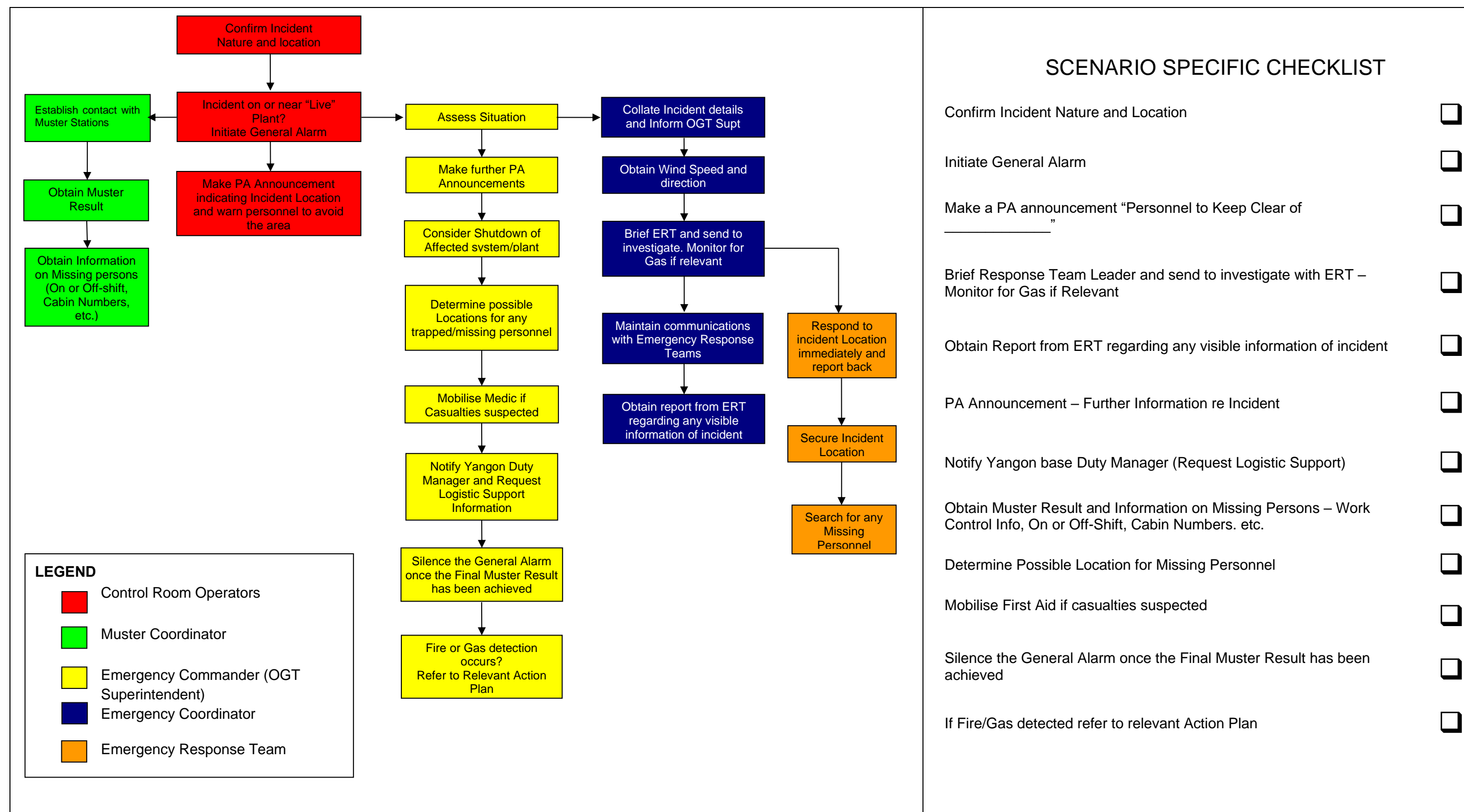
Escalation Potential				Mitigation	
Dependent Upon Diesel Oil Involved				Eye Wash Down Stations	
Environmental Response				Response Strategy and Tactics	
<ul style="list-style-type: none"> Potential contamination of the surrounding soils or groundwater. Notify Operations Manager Refer to Oil Pollution Contingency Plan – Determine Response Category 				Incident Control Team	Emergency Response Team
				<ul style="list-style-type: none"> If no casualties involved response to the incident should reflect this, consider requesting specialist team from onshore and withdrawing OGT personnel. If casualties are known or suspected the ERT should respond immediately utilising PPE. 	<ul style="list-style-type: none"> Establish Control Point Establish a Safe Area Restrict entry to Affected Area Clean Up Perform any necessary Manual Isolations
Equipment Liquid Capacities					
Equipment	Tank Number	Fluid	Capacity per tank		
RAW DIESEL STORAGE TANK	T-6351	LIQUID	147,000 Lts		
TREATED DIESEL STORAGE TANK	T-6355	LIQUID	10,000 Lts		

18.7 Confined Space Rescue



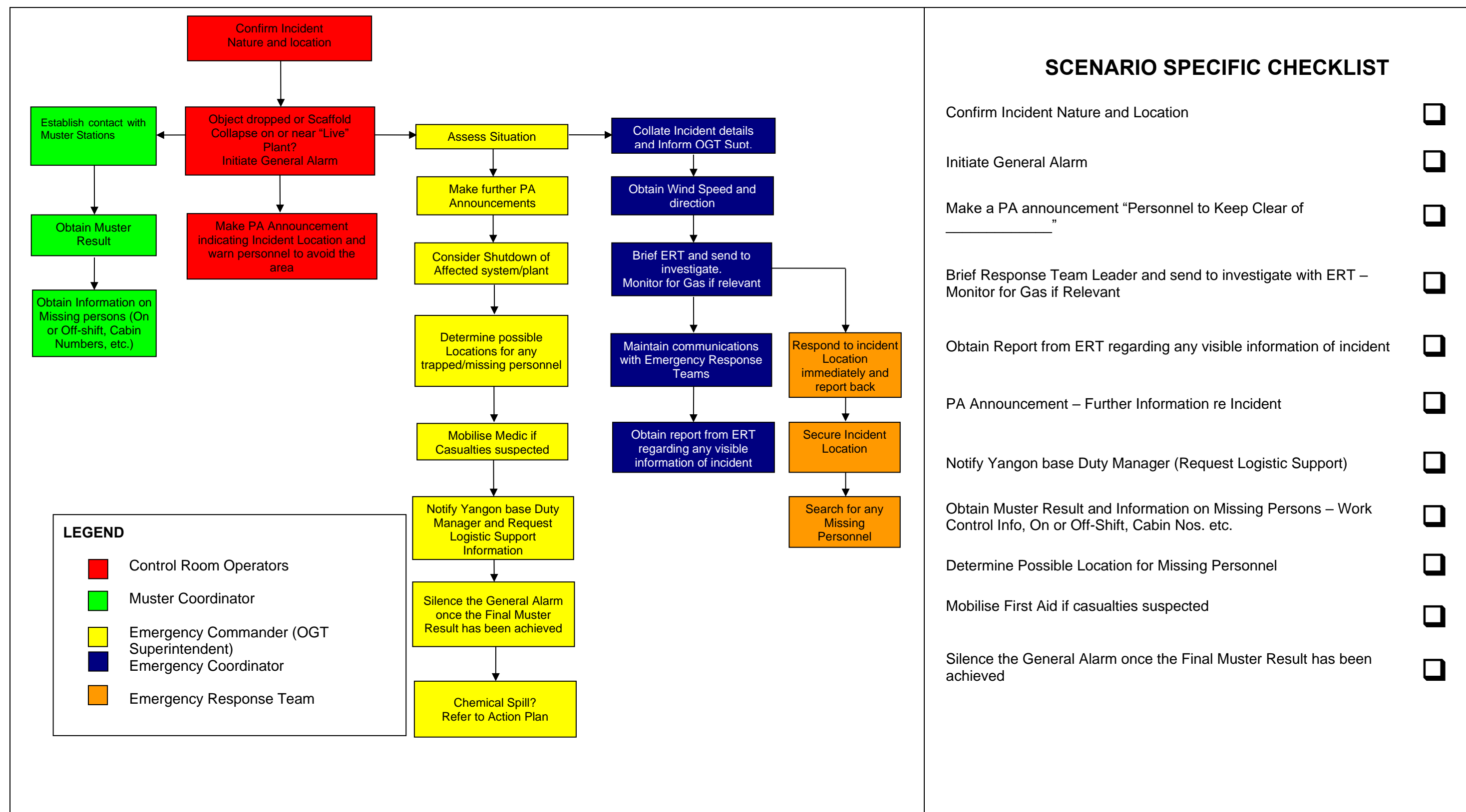
Escalation Potential		Mitigation	
Incident escalation will depend on whether process equipment is affected by the incident		Refer to appropriate Action Plan	
Environmental Response		Response Strategy and Tactics	
<ul style="list-style-type: none"> Environmental impact is dependent on nature and location of incident 	Incident Control Team		Emergency Response Team
	<ul style="list-style-type: none"> Mobilise Emergency Response Team Mobilise First Aid to Forward Control Point Confirm Electrical/Process isolations of affected area PA Announcement – Incident Location, Advise Site personnel to Listen for Further Announcements Refer to Confined Space Rescue Plan Monitor Fire and Gas Detection System and Equipment in affected area Consider adjacent activities (Initiate shutdowns as appropriate) If loss of containment occurs refer to relevant Action Plan 		<ul style="list-style-type: none"> Establish a Forward Control Point Report Back – Physical signs of fire and smoke, gas and casualties Monitor for gas using Portable Gas Detectors Liaise with Confined Space Standby Man Ventilate Confined Space as soon as possible Prevent other personnel from entering the Confined Space Conduct a physical search for casualties in confined space – continue to monitor for gas and oxygen levels Stabilise casualties in situ – resuscitate if necessary Rescue casualties with due consideration for their injuries If Hydrocarbon Gas leak occurs withdraw personnel

18.8 Rescue from a Height



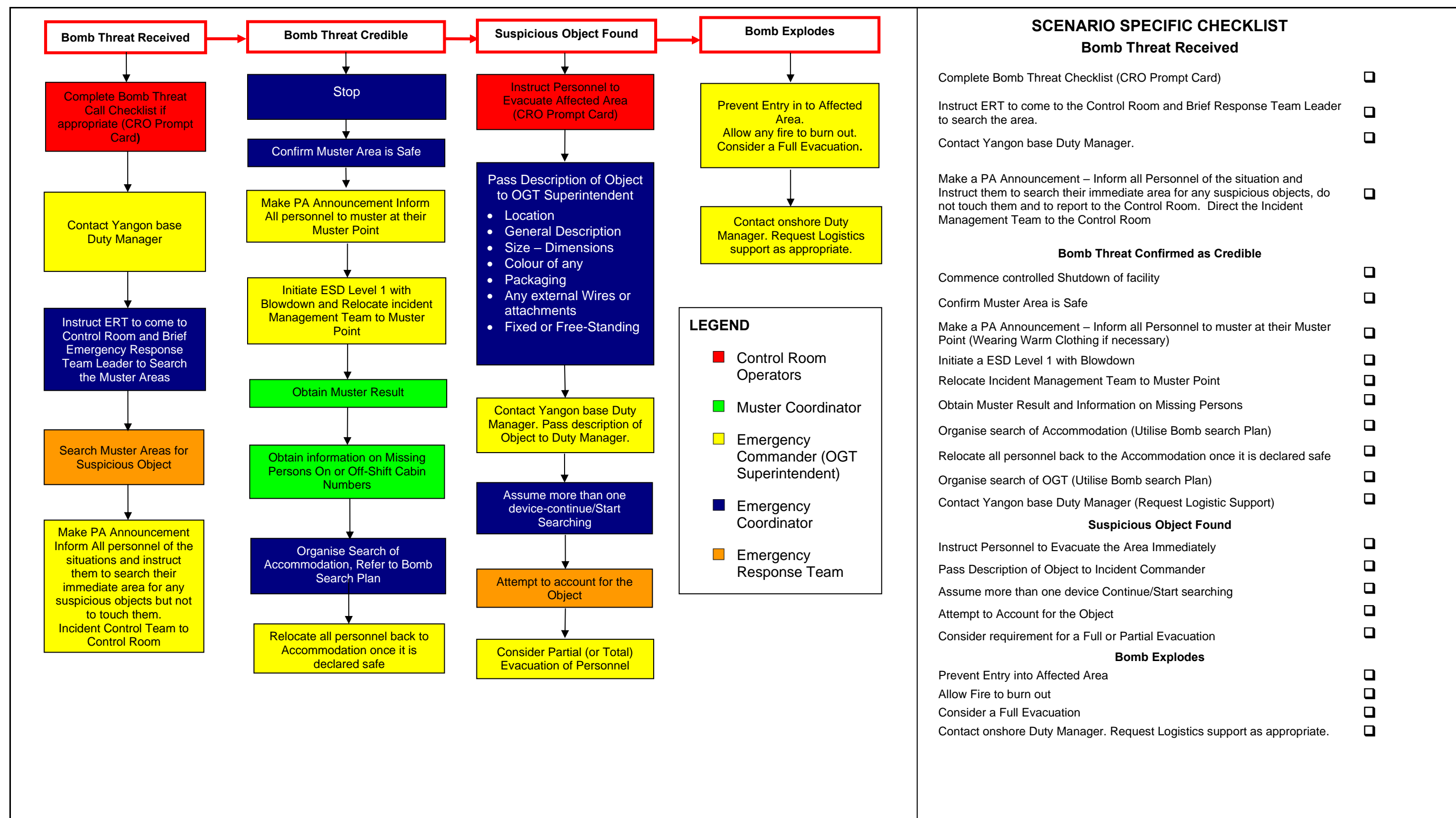
Escalation potential	Mitigation	
Casualty is dropped	Planned and assessed working activity Lifting restricted over “Live” OGT equipment	
Environmental response	Response Strategy and Tactics	
<ul style="list-style-type: none">No environmental impact	Incident Management Team	Emergency Response Team
	<ul style="list-style-type: none">Liaise with EMT re structural adviceIf casualties are known or suspected the ERT should respond immediately in order to assess the hazards associated with the situation	<ul style="list-style-type: none">Establish Forward Control PointAssess the Possibility of further entrapment or scaffold collapseMinimise the number of personnel in the affected areaRescue and treat casualtiesSearch for any Missing personnel

18.9 Dropped Object or Scaffold Collapse



Escalation potential	Mitigation	
Damage to pipelines and/or equipment	Dropped object protection by steel framework module construction Lifting restricted over “Live” OGT equipment	
Environmental response	Response Strategy and Tactics	
<ul style="list-style-type: none"> Potential for Hazardous Chemical Spill Notify Operations Manager Refer to Spill Contingency Plan <ul style="list-style-type: none"> Determine Response Category 	Incident Management Team	Emergency Response Team
	<ul style="list-style-type: none"> If no casualties involved response to the incident should reflect this. Liaise with EMT re-structural advice If casualties are known or suspected the ERT should respond immediately in order to assess the hazards associated with the situation 	<ul style="list-style-type: none"> Establish Forward Control Point Assess the Possibility of further structural or scaffold collapse and if possible cover liquids with absorbent material Minimise the number of personnel in the affected area Assess the risk to personnel from toxic releases Rescue and treat casualties Search for any Missing personnel

18.10 Bomb Threat



Bomb Search Plan					Escalation Potential	Mitigation
Search Area	Team Assigned	Time Search Initiated	Time Search Completed	Comments	Release of Hydrocarbons if device explodes in process area	Accommodation and Structure are designed to withstand significant Explosion Over-Pressures. Shutdown and Blowdown will Reduce Escalation Potential in process Areas
Muster Areas	ERT					
Control Room	CRO					
Accommodation	ERT					
Recreation	ERT					
Office Building	HSSE				An Explosive Device within the Accommodation has the potential to produce a significant Over-Pressure	Initial Muster and Incident Control to take place at the Muster Point until the Accommodation has been searched
(Galley Stores)	Galley Crew				Response Strategy and Tactics	
Electrical Room	Electrical Person					
Workshop Area	ERT					
Process Area	Prod Lead Tech				Incident Management Team	Search Guidance
					<p>Confirm if any threat is Credible – Utilise Security Manager via Duty Manager.</p> <p>While Awaiting Confirmation</p> <p>Inform all personnel of threat and utilise them to perform a quick search of their immediate work area.</p> <p>Search an external area to utilise as a muster area should the threat be deemed credible (Main muster area but alternative may be required). Resume normal work if the threat is not deemed credible</p> <p>Threat Confirmed as Credible</p> <p>Direct personnel by PA to muster in searched area if declared safe. Instruct them to wear warm clothing if necessary. Initiate an ESD Level 1 with Blowdown. Relocate the Incident Management Team to the searched area and coordinate the incident from there until Accommodation is declared safe. Organise search as per Bomb Search Plan concentrating on Accommodation first. When and if the Accommodation is declared safe relocate personnel in the Accommodation – this will</p>	<ul style="list-style-type: none"> Teams to consist of personnel who are familiar with the area to be searched Areas delegated should be capable of being searched within 20 minutes (Except Locker Rooms) UHF Radios should be carried for communication <p>Search Teams are looking for an object which:</p> <ul style="list-style-type: none"> Should not be where it is found Is out of place within its surroundings Cannot be accounted for <p>Actions of Search Teams on finding a suspicious object</p> <ul style="list-style-type: none"> Do not touch, move or tamper with it Do not stay in the immediate vicinity Do not transmit radio messages within the immediate vicinity Memorise a description of the object Withdraw to a safe area along a searched route

BOMB THREAT FORM		
Message sent by: Name, Job Title, Company		
Message sent at: Date & time		
LOCATION:	EMERGENCY: MINOR/MAJOR	
CALL RECEIVED: DATE:	TIME:	
MESSAGE (exact words):		
Was the message given live or did it sound recorded?		
CALLER DETAILS (circle):		
Male/Female	Adult/Child	
Estimate of age:	Accent:	
Speech impediment:	Calm/agitated/intoxicated:	
BACKGROUND NOISES (circle):		
Music	Talking	Typing
Children	Traffic	Machinery
Laughter	Aircraft	Other (specify):
QUESTIONS YOU SHOULD ASK:		
When will it go off?	Where is it located?	
What kind of bomb?	What will make it explode?	
What does it look like?	Why are you doing this?	
Who are you?	Where are you?	
ANY OTHER RELEVANT INFORMATION:		

provide some protection against external explosions. If no suspicious object is found resume normal work

Suspicious Object Found

Evacuate the immediate area around the object and attempt to account for it. Pass description of object to Duty Manager for assessment of potential device Assume that more than one device is present - continue or start searching. Consider Shutdown and Depressurisation if the object is in a Process Area to reduce the effect of any explosion. Consider a partial evacuation.

Device Explodes

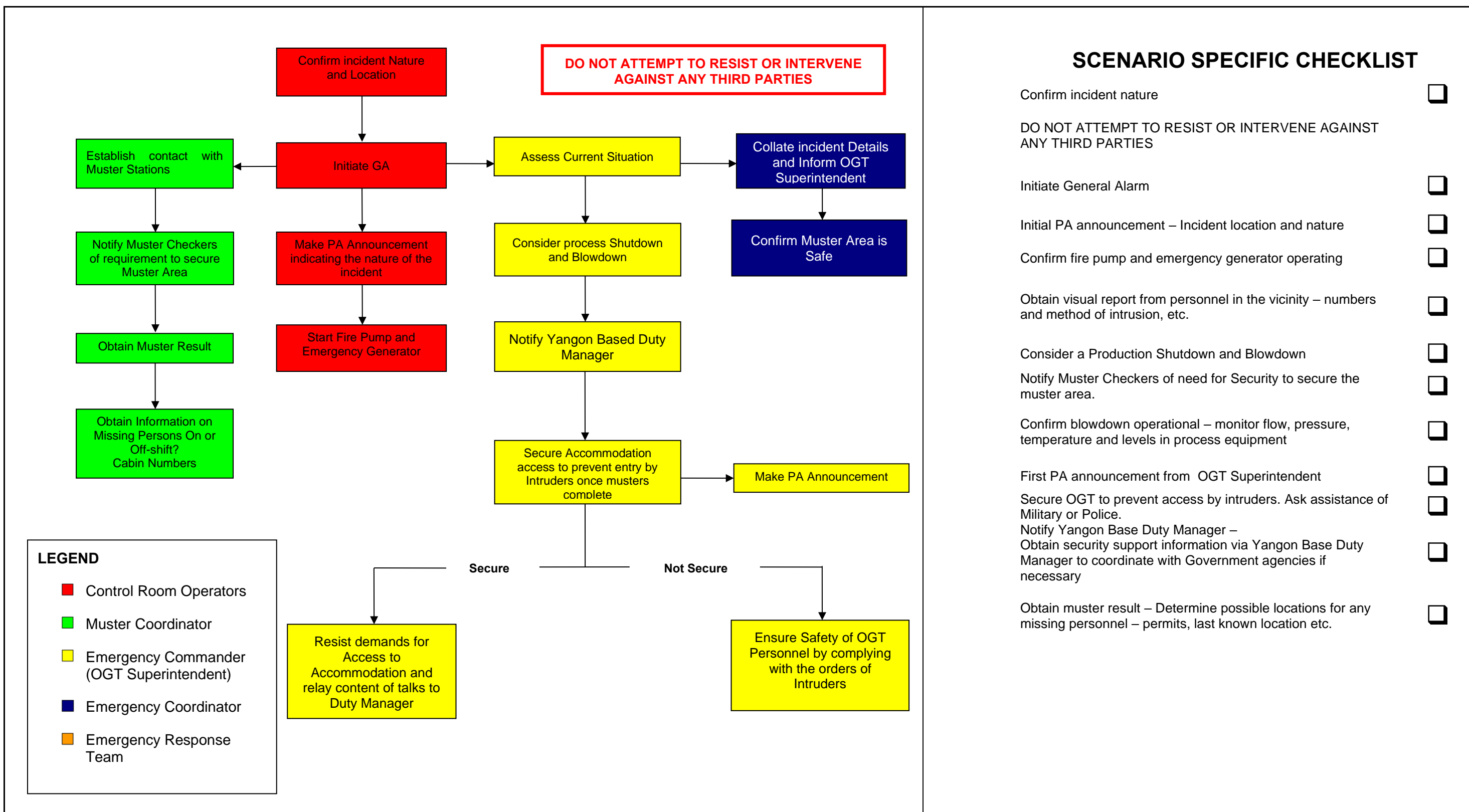
Prevent entry in to affected area as secondary device may be present and allow any resultant fires to burn out. Consider a full evacuation.

- Report find to the Incident Management Team

Description of Object

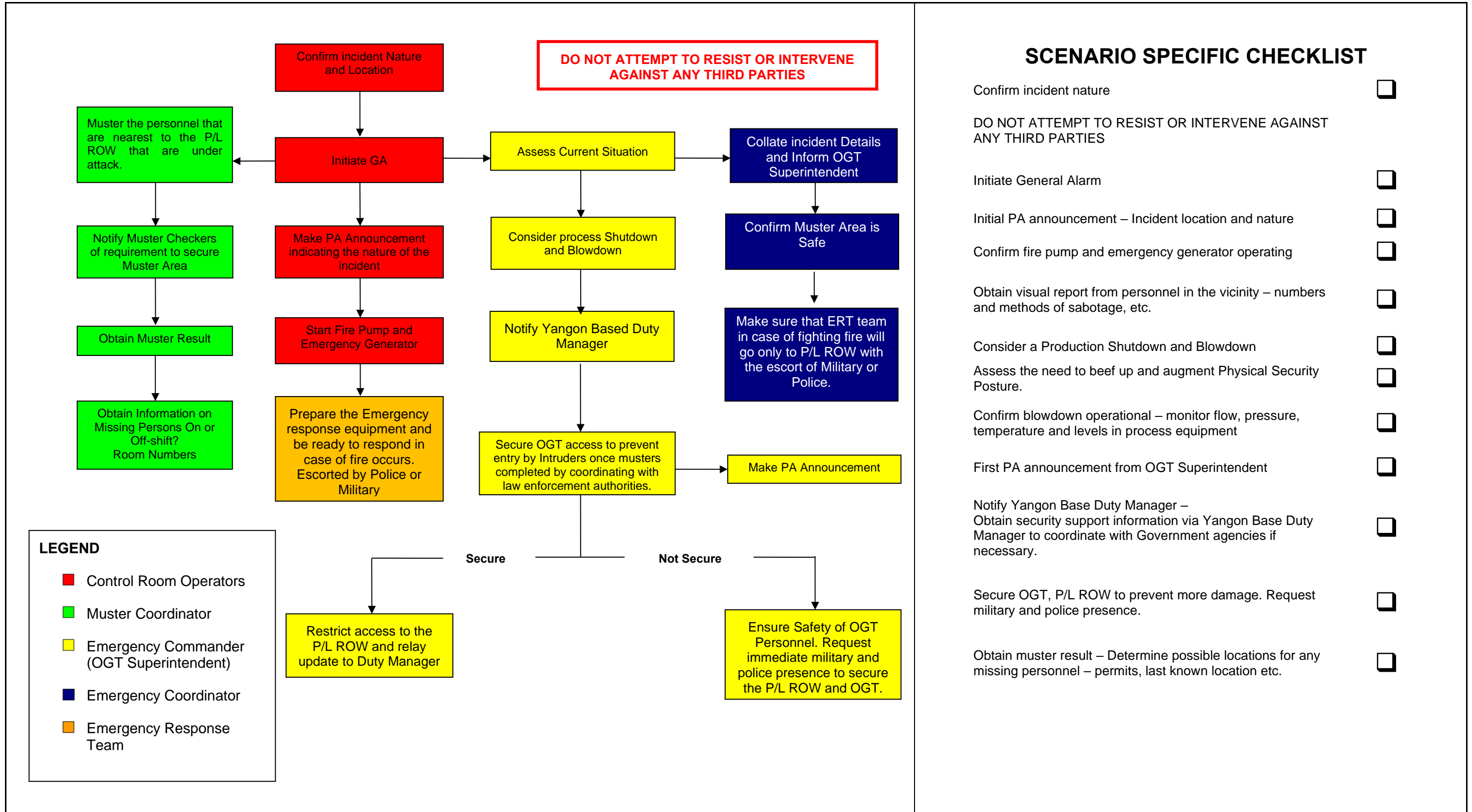
- Location
- General Description
- Size - Dimensions
- Colour of any Packaging
- Any external Wires or attachments
- Fixed or Free-Standing

18.11 Civil Unrest – Illegal Entry



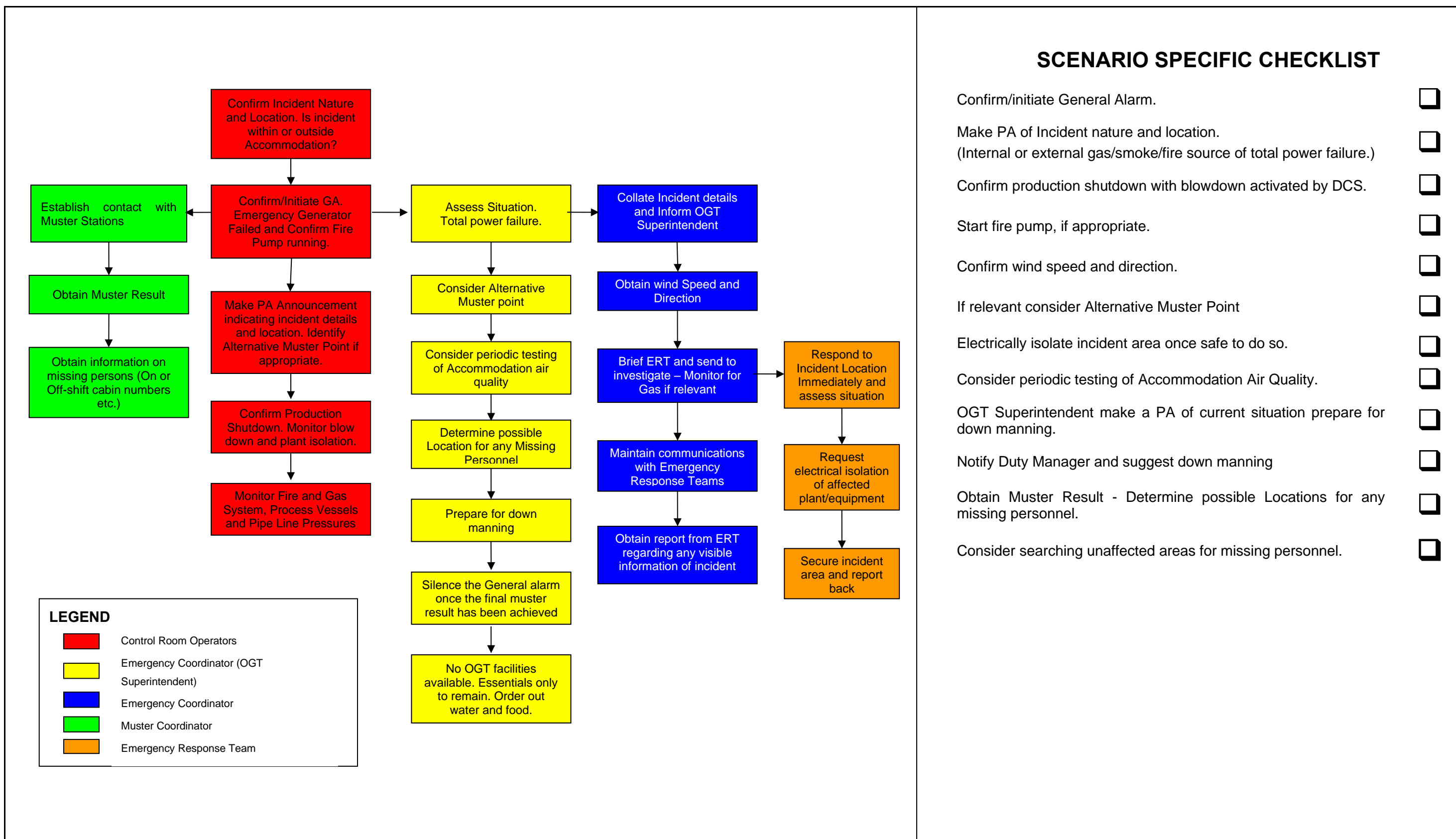
Initiating Event Unidentified vehicle requests access. Attack on civilian spread to private installation. Prevention <ul style="list-style-type: none"> Deny access to the terminal. Continuous Security Patrol around the Perimeter. Beef up Security Posture by augmenting existing Physical Security Force. Gather intelligence in the surrounding areas for potential events and prepare countermeasures. Assess current events in the surrounding Areas of Interest and Areas of Responsibilities, and implement preventive measures. Proper and regular coordination to intelligence network with Law enforcement Authorities such as military, Navy, Police and Local community authorities. Inform Local Law enforcement authorities such as Military or Police and request for their presence around the facility. 	Escalation Potential	Mitigation
	Jet Fires Not applicable unless deliberate breach of containment by boarders	Blowdown System As per normal system blowdown timing Passive Fire Protection
	Pool Fires Not applicable unless deliberate breach of containment by boarders	Smoke Detection System and HVAC Confirmed smoke detection in Accommodation HVAC inlet – inlet and extract dampers close and air in Accommodation re-circulated. 1 Hour protection if main and emergency generators unavailable
	Explosion Overpressure Not applicable unless explosives utilised to breach Accommodation to obtain access	Blast-Proofing H60 wall on Accommodation designed to withstand 600mb blast overpressure
	Gas Leaks Not applicable unless deliberate breach of containment by boarders	HVAC Confirmed gas detection in Accommodation HVAC inlet – inlet and extract dampers close and HVAC system shutdown.
Environmental Response	Response Strategy and Tactics	
Not applicable unless Intruders activity results in deliberate breach of hydrocarbon containment and loss of inventory.	Incident Management Team	Emergency Response Team
	Hold installation muster and establish anyone missing. Attempt to secure OGT once muster complete. Ask military and police presence to secure OGT. Accommodation Secure Establish identity and purpose of Intruders. Verbally resist any demand for access to the Accommodation. Consider situation if crew member taken hostage. Relay content of talks to Yangon base Duty Manager. Accommodation Occupied Ensure safety of personnel by complying with the orders of the Intruders. Secure the release of any restrained personnel. Progress treatment of any injured personnel in the Sickbay. Maintain communications links with Yangon base Duty Manager. Get Management approval to designate a negotiator to liaise with the Intruders to resolve the situation as rapidly and amicably as possible.	<ul style="list-style-type: none"> Act to instructions of OGT Superintendent.

18.12 Pipeline (P/L) ROW Sabotage



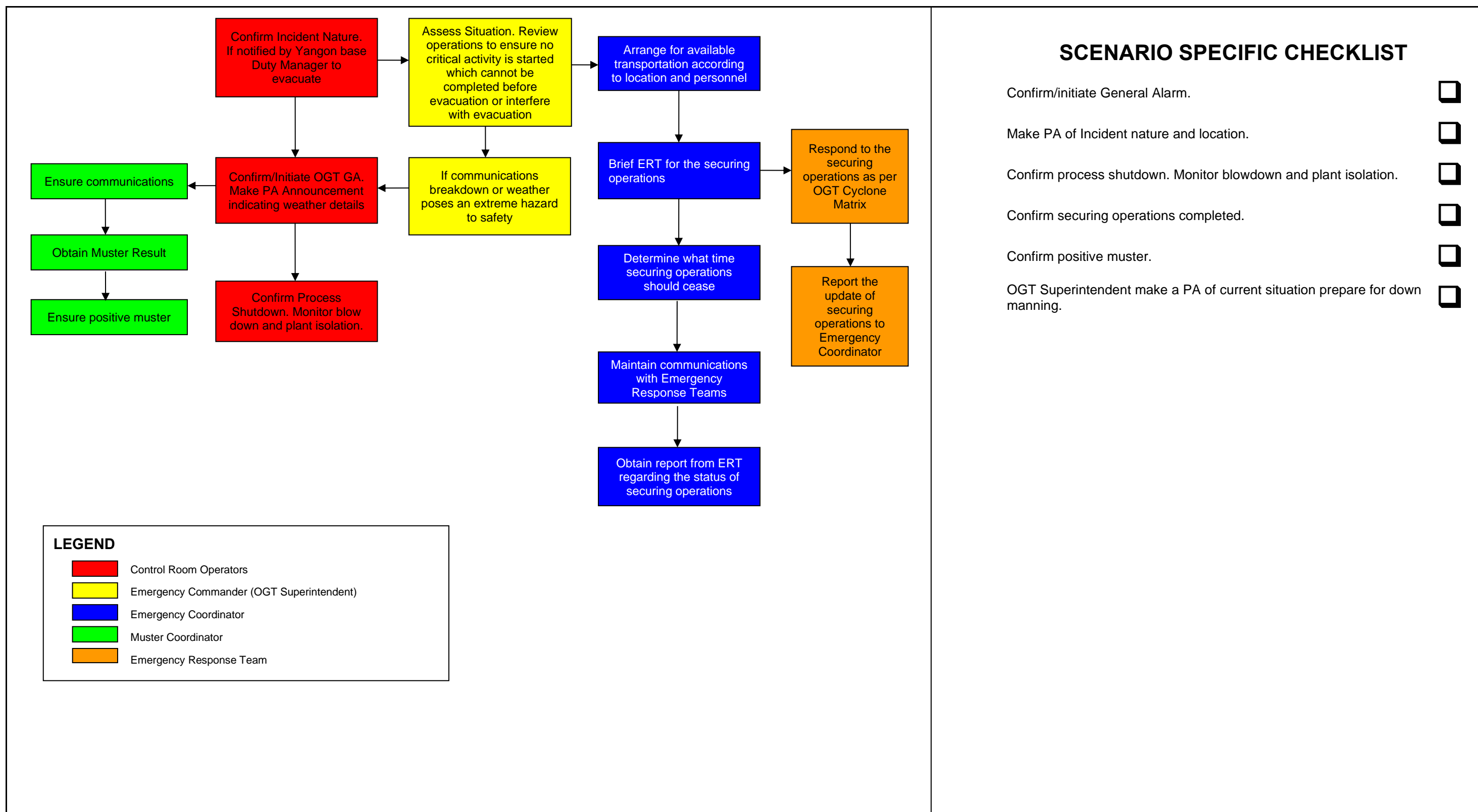
Initiating Event	Escalation Potential	Mitigation
<p>Suspicious activity within the P/L ROW. Disturbances in the community or in the area of operations.</p> <p>Prevention</p> <ul style="list-style-type: none"> Continuous Security Patrol around the Perimeter. Beef up Security Posture by augmenting existing Physical Security Force. Gather intelligence in the surrounding areas coordinates with intelligence authorities for potential events and prepare countermeasures. Assess current events in the surrounding area of interest and implement preventive measures. Proper and regular coordination with Law enforcement Authorities such as military, Navy, Police and Local community authorities. Inform Local Law enforcement authorities such as Military or Police and request for their presence around the facility. 	<p>Release of hydrocarbon if there is an explosion in the P/L ROW has the potential to spread to nearby communities that could reach to OGT.</p>	<p>Pipeline is buried under the soil.</p> <p>Shutdown and blowdown will reduce escalation potential in the process areas.</p>
Environmental Response	Response Strategy and Tactics	
<p>Not applicable unless Intruders activity results in deliberate breach of hydrocarbon containment and loss of inventory into the ground.</p>	<p>Incident Management Team</p> <p>Hold installation muster and establish anyone missing.</p> <p>Attempt to secure P/L ROW using the help of Military or Police.</p> <p>P/L ROW and OGT Secured</p> <p>Establish identity and purpose of Intruders/saboteurs.</p> <p>Consider situation if OGT personnel or workers taken hostage.</p> <p>Relay content of talks to Yangon base Duty Manager</p> <p>P/L ROW Occupied</p> <p>Ensure safety of personnel by complying with the orders of the intruders/saboteurs.</p> <p>Secure the release of any restrained personnel.</p> <p>Progress treatment of any injured personnel in the Sickbay.</p> <p>Maintain communications links with Yangon base Duty Manager.</p> <p>Ask Management to designate a negotiator to liaise with the Intruders/saboteurs to resolve the situation as rapidly and amicably as possible.</p>	<p>Emergency Response Team</p> <p>Act to instructions of OGT Superintendent.</p>

18.13 Total Power Failure

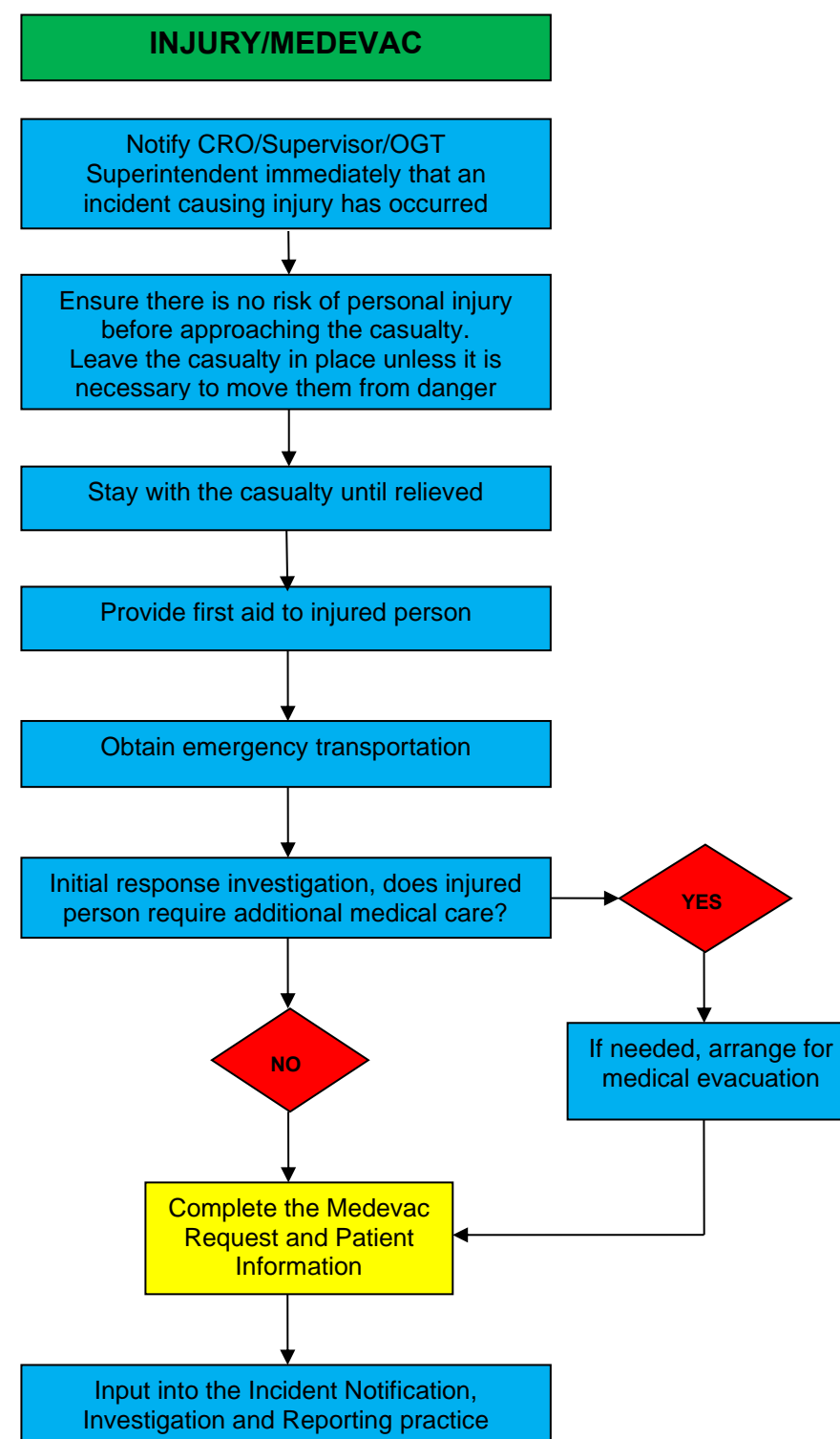


Initiating Event	Escalation Potential	Mitigation
<p>Fire/smoke may arise in the Accommodation due to :</p> <ul style="list-style-type: none"> Hot work. Electrical faults. <ul style="list-style-type: none"> Machinery space fire. 	<p>Other smoke sources:</p> <ul style="list-style-type: none"> Fire in the galley. Laundry fire. 	<p>Accommodation. The accommodation block is rated A60.</p> <p>Each external door on the accommodation block has an airlock.</p> <p>Early detection and response to internal fire in Accommodation will ensure its design integrity.</p>
Environmental Response	Response Strategy and Tactics	
NOT APPLICABLE	Incident Control Team	Emergency Response Team
	<p>Identify source of smoke / fire. Internal or external source? If relevant.</p> <p>Monitor Accommodation air quality.</p> <p>All mustered personnel, unless directed otherwise, remain in Accommodation until incident is closed out.</p> <p>Utilise external sources (if available and report any change in circumstances.</p> <p>Action ERT to respond to incident location after any required safe electrical isolation is confirmed.</p> <p>Determine the Probable location for Missing Personnel.</p>	<p>Conduct a physical search for missing persons.</p> <p>Secure incident area and missing or injured persons are accounted for.</p>

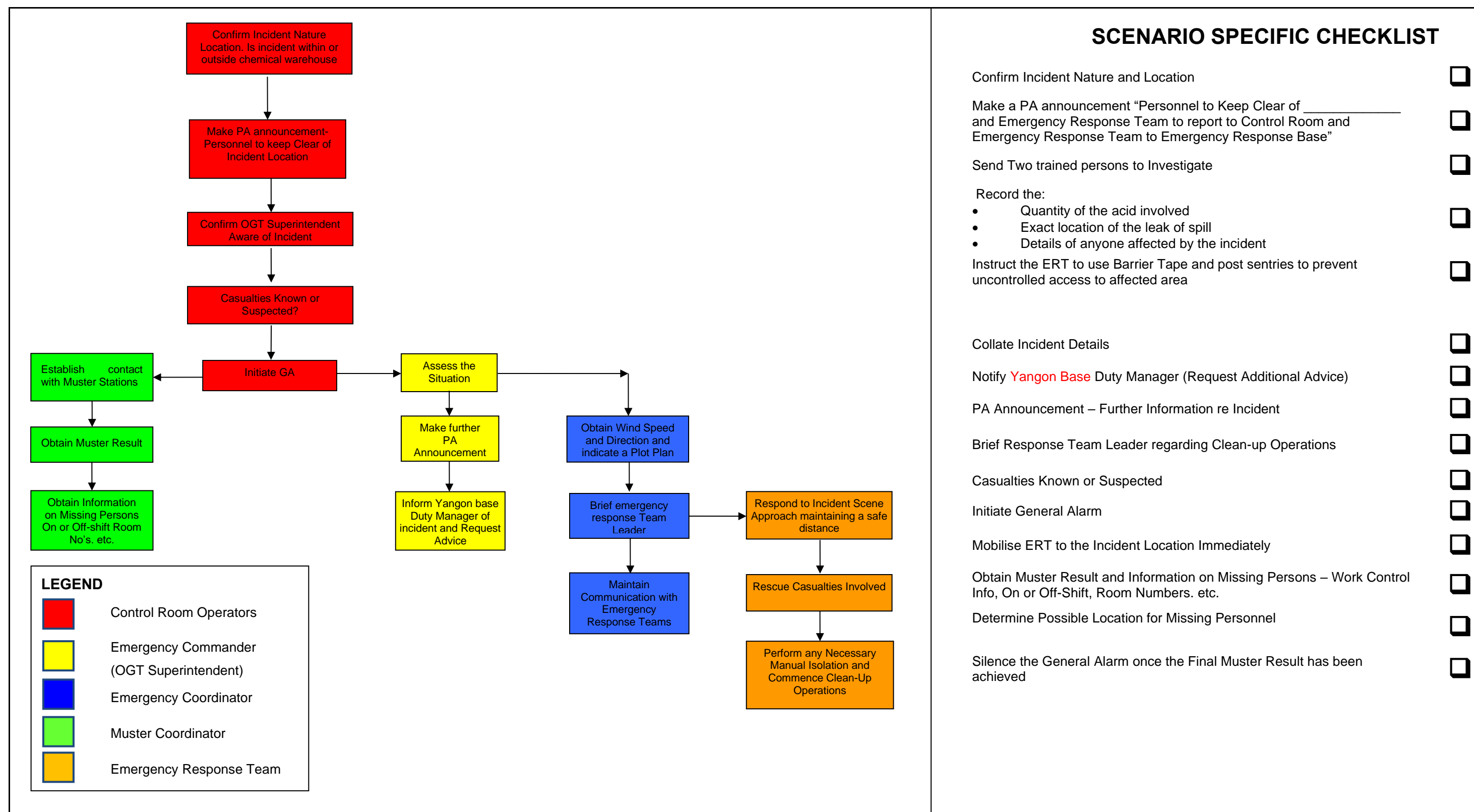
18.14 Severe Weather



18.15 Injury/Medevac



18.16 Acid Spillage

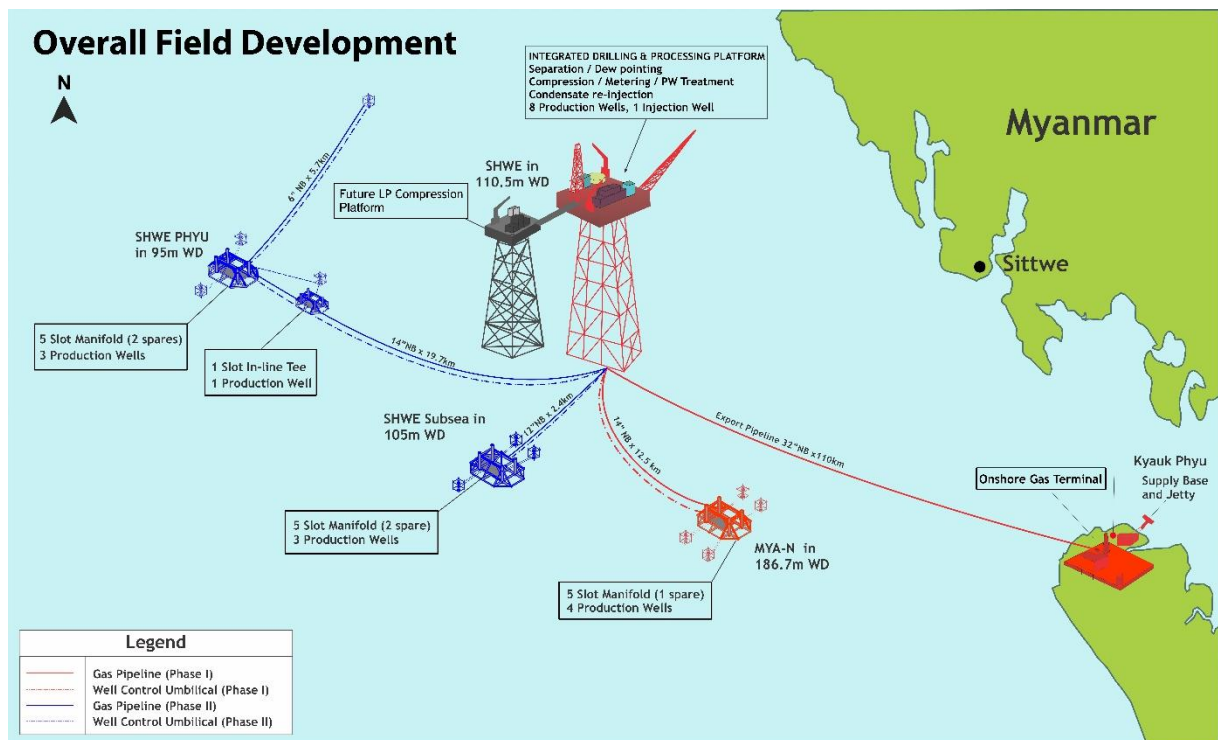


Escalation Potential				Mitigation	
Dependent Upon Sulphuric acid Involved				Acid storage room has hazardous drain to prevent escalation to other areas. Use only outdoors or in a well-ventilated area	
Environmental Response				Response Strategy and Tactics	
<ul style="list-style-type: none"> Environmental impact is dependent on nature and location of incident Notify Operations Manager 				Incident Control Team	Emergency Response Team
				<ul style="list-style-type: none"> If no casualties involved response to the incident should reflect this, consider requesting specialist team from onshore and withdrawing OGT personnel. If casualties are known or suspected the ERT should respond immediately utilising PPE, as appropriate to the hazards. Refer to the Material Safety Data Sheet. 	<ul style="list-style-type: none"> Establish Control Point Establish a Safe Area Restrict entry to Affected Area Clean Up, absorb with earth, sand or other non-combustible material Perform any necessary Manual Isolations
Equipment Liquid Capacities					
Location	Container	Fluid	Capacity per tank		
Chemical Warehouse	IBC Tank	LIQUID	1,000 Lts		

PROJECT / JOB TITLE: SHWE PROJECT

DOCUMENT TITLE: SHWE PLATFORMS (SHP & SHK) EMERGENCY RESPONSE

DOCUMENT NUMBER: SHP-OM-MP-03-06-0004



7	Re-Issued for Use	MM - P3 Coordinator	SHP OIM	O&M Manager
		17-11-2023		
		02-Oct 2023 Martin Mackenzie P3 Consultant O&M		
Revision Number	Description	Prepared	Checked	Approved

Revision History

Revision Number	Date	Section(s)	Page(s)	Brief Description of Change	Author of Change
1	12-11-13	17.10	74	Updated Actions and additional response team muster area.	JL
2	22-04-16	All	All	Complete revision and updated / consolidated action plans. Company logo change.	JL
3	06-11-17	7.3	20	Updated communications details.	JL
4	31-10-18	7.5.12, 17.17	32, 79-80	Added Pipeline Rupture / Subsea Event Action Plan in accordance with the Safety Case actions list, Action #63. Updated cover page field lay-out.	JL
5	2-12-20	All	All	Overall 2 yearly review and update of contact numbers and general descriptions. Updated to current practices. Short note on Pandemic response added.	AM / RC
6	11-01-23	4.1, 8.1,12.4 14, 16.2	8, 36,40, 41,43, 46	Update ERT Leader from Maintenance Supervisor to Safety Officer. Change Muster location of Electrical Isolating Authority from Fireman's Room to ECC. Update New Scenario Drill Plan, Station Bill & EMT Organisation Chart.	DC
7	17-11-23	4.1 7.2 7.5.4 & 14 16.1 & 2 17.13 & 17.19	21 42, 45 56,57 83 85 94	General Review and Reference to include SHK Platform. Levels of Emergency Response Add SHK Muster Station locations New Earthquake Narrative Add new Rev 7 SHP & SHK Station Bill from SHP-SF-EP 03-03-0003 New "Earthquake" Action Response Plan 17.19	MM

HOLD Record

Hold Number	Date	Section(s)	Page(s)	Brief Description of Hold	Cleared

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1.0 INTRODUCTION

The SHWE and SHWE Phyu fields are located within Block A-1 and MYA field is located within Block A-3 in the Bay of Bengal, which is offshore Western Myanmar.

Water depth varies across the SHWE and SHWE Phyu fields between 90 meters and 140 meters. The MYA field, South West of SHWE, has water depth between 140 meters in the north and 950 meters in the south. These fields lie approximately 110 km north-west of Kyauk Phyu on Ramree Island, Rakhine State, Myanmar.

The SHWE, SHWE Phyu and MYA fields are essentially gas fields with limited liquids present and low CO₂ and H₂S. The development project for these fields is referred to as “SHWE Project” and has different phases of development during the life of field.

POSCO INTERNATIONAL Corp. (Myanmar E&P) is acting as Operator of the SHWE Project and the joint venture partners are ONGC, Videsh Limited (OVL), Korean Gas Corporation (KOGAS) and Gail Limited (Gail). The Engineering, Construction, Installation and Commissioning (EPCIC) work was completed by Hyundai Heavy Industries (HHI).

Phase 1 development of SHWE Project, SHWE and MYA North fields was developed with conventional platform and subsea facilities. The production gas from each field is processed at the SHWE platform (SHP) and then transported through a 32” gas export pipeline, approximately 110 km long to the onshore gas terminal (OGT) near Kyauk Phyu on Ramree Island, Rakhine State Myanmar.

The phase 1 development of SHWE consists of the following main elements:

- One conventional jacket with 15 slots and 4 subsea wellheads at MYA North in approximately 186 m water depth and about 12 km from SHP.
- One 14” flowline from MYA North to SHP (12 km long).
- One 32” export pipeline from SHP to OGT (110 km long) which is composed of an offshore section from SHP to landfall (105 km long) and an onshore part from landfall to OGT (5 km long).
- One onshore gas terminal (OGT) including a supply base, on Ramree Island.
- One jetty facility at the township of Kyauk Phyu on Ramree Island.

The Phase 2 development of SHWE added 8 new subsea wells, tied back to SHP. Four at SHWE Subsea and four at SHWE Phyu via in-field flow lines, 12” from SHWE subsea and 14” from SHWE Phyu. SHP topsides modifications include the necessary piping, instrumentation, valves and associated equipment to safely produce from the two new sub-sea areas.

Phase 3 development of SHWE added the SHK Jacket and Topside, complete with Low Pressure compression modules which is located 100m to the SE of the SHP platform, connected to SHP via a permanent bridge. , This additional facility supports the ongoing production from the existing gas fields (with the reducing reservoir pressures, stepping up the pressure such that SHP existing topsides can still be used to process / condition the gas and then export it to OGT, meeting the required contracted Gas Production quotas.

2.0 PURPOSE

This document is intended to define operational responsibilities and identify reporting requirements and resources available both internally and externally to effect a coordinated and timely response to the most likely offshore emergency situations offshore.

Together the emergency response plans document the overall emergency response process and interfaces, identify potential emergency scenarios and identify guidance procedures which apply to particular foreseeable emergency events, define the roles and responsibilities of personnel and the resources available to personnel involved. The main objectives of this manual are:

- To provide guidance for all levels of management involved in responding to an emergency at the SHWE combined SHP & SHK Production Platforms and Subsea infrastructure of Mya North, Shwe Phyu and Shwe subsea.
- To ensure that the safety of personnel is always considered as the first priority when dealing with an emergency.
- To minimize the impact of an emergency that can result in personal injuries, damage to the environment, assets, company reputation, or business interruption.
- To help promote safe recovery to normal operations as soon as possible.
- To provide guidance that is specific to emergency situations that have been identified as credible scenarios.
- To ensure lines of communication / notification are clearly defined and workable.

3.0 SCOPE

This document provides a summary of the actions required to preserve life, protect the environment, minimize damage to assets and maintain the good reputation of POSCO-INTERNATIONAL Corporation when the offshore SHWE Production Facilities, attending support vessels and rotary wing aircraft, personnel or external agencies are involved in an emergency situation that threatens the security, safety and steady state operation of the SHWE Gas Production Facilities, its personnel or the environment.

The reasonably foreseeable emergency situations that are likely to occur at the SHWE Production Platform Facilities have been identified (Refer to section 7.5 - Emergency Situations). The list is by no means complete, but it represents the credible, foreseeable scenarios associated with the major hazards during the operational phase. The emergency response plans covered in this manual address these potential emergencies. Additional scenarios may be identified over time and associated response plans can be added to this manual.

4.0 DEFINITIONS AND ABBREVIATIONS

4.1 Definitions

A60:

Class Rated Fire Protection. An 'A' class fire division is one which is constructed of steel or the equivalent divisions and materials, suitably stiffened and so constructed that it will be capable of forming bulkheads preventing the passage of smoke and flame to the end of a 1-hour standard test. It shall be insulated with approved non-combustible materials such that the average temperature on the un-exposed side will not rise more than 139°C above the original temperature, nor will the temperature at any one-point rise more than 180 °C above the original temperature, within the time frame identified by the numeric value following the Alpha (i.e. A-60,

A-30, A-15, A-0 which set the time limit to 60, 30, 15, or zero minutes respectively). Other division ratings apply for specific requirements or higher specifications.

ALARP CRITERION:

ALARP refers to the reduction of risks to personnel to a level that is As Low As Reasonably Practicable. This is accomplished through safe platform design and also by minimising the exposure of personnel to hazards. It may also be achieved in part, through provision of procedures, development of safe practices, and provision of training, protective equipment and by minimising the frequency of hazardous tasks.

ALTERNATE MUSTER STATION:

Is an alternative secondary muster point for platform personnel, separate from the primary muster station, for use when the primary muster station is or could become compromised and unsafe. This could be due to the primary muster point being the seat of the emergency, smoke logged, gas affected or inaccessible due to structural damage or blocked access etc. This alternative area shall provide the same facilities as the primary muster point with communications, Personnel On Board lists, life jackets and easy access to the lifesaving equipment. Public address announcements shall be made when this alternative muster station usage is required. Both SHP and SHK have alternate muster stations. Refer to the combined Station Bill's for their locations.

BACK UP:

The emergency follows no rules and Emergency Teams must be aware that part of their team or equipment may have been directly affected. Everyone must be able to perform the function of the person above them in the hierarchy and be aware of alternative locations for emergency equipment. This is a significant principle of the exercises and drills that are carried out on a regular basis.

CYCLONE, TROPICAL REVOLVING STORM PLAN:

This is part of the overall Emergency Response Plan where a precautionary partial or full evacuation of the Facility may be required and includes advice and actions to be taken, regarding the threat to personnel and facilities, posed by cyclones and other severe weather conditions. A separate Company Procedure YGG-SF-EP-03-06-0011 Tropical Storm (Cyclone) Response Procedure provides more detailed tracking and response information.

DELUGE SET:

This refers to an arrangement of valves, pipe work, spray or sprinkler nozzles and activation mechanism that can direct a flow of high pressure water from the fire ring main onto a defined area of plant in such a way that any fire in that area may be extinguished and cooling achieved. The deluge systems can be operated manually by localised push buttons, by operating deluge valves and is triggered automatically under command of the Fire and Gas System and remotely from the Control Room console.

EMERGENCY:

An Emergency is any significant deviation from planned or expected events, that could endanger the health and safety of persons, the environment, asset or economic status and reputation of the company.

EMERGENCY COMMAND CENTRE:

This is a specific room in the SHP platform accommodation adjacent to the Central Control Room and Radio Room. This room contains sufficient facilities to communicate internally and externally to locally manage a facility or field emergency.

EMERGENCY COMMANDER:

This is the Offshore Installation Manager (OIM). The Emergency Commander through his experience and training including the Management of Major Emergencies (MME), shall manage the platforms' emergency response activities, by assessing the incoming information reported to him, by referring to Company emergency response recommended actions and by developing a robust Plan of Action to bring the situation under control as quickly as safely possible. At the initiation of an Emergency situation and periodically during the event, he shall call the Duty Manager and appraise him of the Emergency Situation status, provide updates with regards the action plan, timings casualty status (if applicable), facility POB and request additional outside support (if required).

The EC shall make use of periodic "Time-Outs" system to confirm the current situation; POB accounted for; situation status, (is it escalating, diminishing, being brought under control); his response Plan and assign duties to his Team; check for feedback and confirm understanding of his Plan and Instructions.

As contingency, both the Production Supervisor and Maintenance Supervisor will be trained, assessed and certified in the Management of Major Emergencies to enable them to perform the Emergency Commander role if/when required.

EMERGENCY COMMUNICATIONS OPERATOR:

As a member of the Emergency Management Team, the Radio Operator or Communications Technician, who has responsibility for maintaining contact with the Stand-By Vessel, other support vessels, Helicopter base and related onshore facilities.

EMERGENCY COORDINATOR:

This is normally the Production Supervisor. The Emergency Coordinator through his experience and training including the Management of Major Emergencies (MME), shall as instructed by the Emergency Commander (OIM) and in accordance with the emergency response plans, direct and coordinate through the Emergency Response Team Leader and/or directly with the Emergency Response Teams 1 or 2, their assigned tasks required to bring the emergency situation back under control. He will also liaise with the production Shift Supervisor and/or CRO on status of the Production Plant and direct them with regards any adjustment required to ensure the Production Process is aligned with current Emergency Response Plan requirements.

EMERGENCY MANAGEMENT TEAM:

The offshore team, who have specific tasks to be carried out under the direction of the Emergency Commander (OIM) within the Emergency Command Centre. The team will gather in the Emergency Command Centre (ECC) on the initiation of all General Platform Alarms (GPA's). This team comprises of Emergency Commander, Emergency Response Coordinator, Muster Coordinator, Emergency Communications Operator, Control Room Team, Responsible Electrical Person, Emergency Plan Checker and a Scribe- (Log Keeper). These positions are inter-changeable to account for incapacitation. The SHP Emergency Team structure – Positions and Names are shared and transmitted daily by the SHP Admin Clerk in a daily email that includes SHP POB Report, and Emergency Management Team Structure attachments.

EMERGENCY RESPONSE PLAN:

The latest revision of this document; SHP-OP-MP-03-06-0004 which details Emergency guidance to aid response to foreseeable accident scenarios and which provides for response to emergencies.

EMERGENCY RESPONSE TEAM:

A trained group of platform technicians led by the Safety Officer, under the direction of the Production Supervisor (Emergency Response Coordinator) from the Emergency Command Centre. Who have sufficient experience and knowledge of the facility, and who may carry out emergency response at site, including search and rescue activities, attend to accommodation incidents or perform damage control measures during an emergency. The composition of the facility personnel permits two response teams who can be given separate tasks or provide mutual support.

EMERGENCY RESPONSE TEAM LEADER:

A member of the Emergency Management Team, the Safety Officer, who has responsibility for the direction of the Emergency Response Team(s) in carrying out the Emergency Commander's emergency response plan during an emergency. He will muster with the ERT where he will receive first-hand information regarding the incident prior to leading the Emergency Team(s) to a suitable Forward Control Point. He will maintain direct radio communication with the Emergency Coordinator.

FIRE EXTINGUISHER:

This is an active fire protection device used to extinguish or control fires. There are two main types of fire extinguishers: stored pressure and cartridge-operated. In stored pressure units, the expellant is stored in the same chamber as the fire-fighting agent itself. Depending on the agent used, different propellants are used. Normally N2 Nitrogen or CO2 Carbon Dioxide but compressed air is also used in some cases. Stored pressure fire extinguishers are now the most common type. Cartridge-operated extinguishers contain the expellant gas in a separate cartridge that is punctured prior to discharge into the extinguishing agent container, propelling it out of the discharge nozzle. Fire extinguishers are positioned at sign-posted positions around the facility, at points relevant to their duty.

FIRE FIGHTING EQUIPMENT (FFE):

FFE includes Fire pumps and the fire water ring-main, Foam systems, fixed fire-fighting (Fire Suppression) systems, Portable Fire extinguishers, Fire & Gas detection system and alarms. In the offshore environment, this also include Self Contained Breathing Apparatus, Fire-man outfits and accessories, helicopter crash boxes and components, radios, fixed deluge sets and temporary shelters.

FM200:

Is the trade name for Heptafluoropropane, a colourless, odourless, non-flammable halocarbon which is used as a fire suppression agent by removing free radicals disrupting an element of the fire tetrahedron which effectively prevents the chemical reaction that allows fire to burn. This product is used particularly in data processing, telecommunications, electrical switching areas, Battery rooms and Instrument Equipment Rooms, where lack of residue, after discharge, is a distinct advantage. The main entrance to protected spaces have audible and visual warning devices and local control panels. Signs are posted at entry doors to indicate that the area is protected by an extinguishing agent. Audible and visual alarms are initiated inside the protected

space, prior to the release of FM200. The alarm is activated before the agent is released through an adjustable time delay allowing personnel time to exit the space.

GENERAL PLATFORM ALARM (GPA):

This is the emergency alarm for all emergencies other than abandoning the platform. It is a 'single tone' sounded intermittently at approximately one second intervals and is accompanied by flashing red (rotating beacon) lights. When this alarm sounds it indicates that a situation exists on or off the platform that is out-with the normal platform status and that emergency action is required. The alarm activation, which can be automatically or manually activated will be initiated on both SHP and SHK platforms and on the access Bridge between them. Sounding of the GPA Alarm requires all personnel to immediately **STOP WORK**, make their work sites safe and then to make their way directly to their designated Emergency Muster Station on SHP. For those personnel returning to SHP from SHK, they **MUST** turn their associated T-cards as they cross the SHP-SHK adjoining access bridge. The GPA will be interrupted to give specific directions (PA announcements) if these are required, provided initially by the Control Room Operator (CRO) and then by the Emergency Commander (OIM), when he arrives in the ECC. The alarm sound will continue until the Emergency Commander decides that the emergency is over or he needs to silence the alarm to aid communications. The OIM will make periodic Public Address announcements to inform personnel of the current situation as the emergency develops and then comes under control, or if additional actions are required. All Permits to Work are suspended during an alarm and will only be revalidated after the emergency has been controlled and the situation made safe. (Refer to ISSOW & PTW Manual YGG-OM-MP-03-07-0049). Personnel who are in their allocated cabin at the time the GPA is sounded must remember to take their "Grab Bag" from the locker. A GPA alarm initiated on either SHP or SHK will simultaneous and in unison activate, emergency status beacons & sound on both platforms.

GRAB BAG

This is a bag containing additional personal Life-Saving Equipment. Each allocated cabin bed has an associated wardrobe and in the storage space above each wardrobe there is a 'Grab Bag' which contains a Life-jacket, Flash-light and ELSA (Escape breathing apparatus). Personnel who are in their cabin space when an emergency alarm sounds have access to this personal equipment should remember to take their "Grab Bag" from the locker and use the selection of equipment provided as necessary, for any situation they may be confronted with. While there are sufficient life-jackets at each lifeboat station, the Grab Bag jacket can be used. Likewise, if night time or there is no lighting in the LQ during an emergency the flash-light can be used and if there is smoke in the LQ then the ELSA should be worn. Personnel must be reminded that if they exit their cabin into a dark or smoke-filled alley-way, they should proceed to the LQ exit doors on the same level and not attempt to use the internal LQ stairs, then follow an alternative route to their appointed Muster or Lifeboat Station.

HAZARDOUS AREA CLASSIFICATION:

Both SHP and SHK Platforms are categorized in accordance with Institute of Petroleum Model Code of Safe Practice Part 15 - code for installations handling flammable fluids. The Classification of areas throughout the facility allows for the proper selection of materials and equipment. It ensures that, in design, sources of ignition are segregated from potential sources of flammable gas. Note that PIC Electrical equipment technical specifications requires electrical equipment to be Atex Zone 2 rated even if installed in Non-Hazardous zones.

HELICOPTER CRASH BOX:

Secure watertight cabinets or chests situated in the vicinity of the SHP heli-deck that contains specific tools and rescue equipment, as directed by Standards for Offshore Helicopter Landing

Areas - CAP 437, (section 5.45 – Table 1.), that may be used to gain access to, or restrict the movement of, a damaged helicopter on the heli-deck or in its vicinity.

HOT LINE:

This is a stand-alone phone system operating through the Router, VSAT and modem, linking the SHWE platforms (CCR, ECC, Radio Room and OIM) with the CCR and ECC in the Onshore Gas Terminal and Head Office in Yangon. This is a non-dial system that detects the off-hook condition and rings all remote handsets. The emergency nature of this phone is highlighted by it being red in colour.

INCIDENT COMMAND SYSTEM:

Is "a set of personnel, policies, procedures, facilities, and equipment, integrated into a common organizational structure designed to improve emergency response operations of all types and complexities."

INMARSAT:

A marine satellite communication system that can be used if there is a VSAT system breakdown. Telephone handsets are available in the ECC, OIM Office, Radio Room and CCR.

LEVEL OF EMERGENCY:

Level of Emergency Response may be Tier 1, 2 or 3 depending on the severity and potential impact of the emergency. Refer to Emergency and Crisis Management Plan (YGG-SF-EP-03-06-0001).

- Tier-1 Emergency (Emergency with serious and/or major consequences) can be contained and returned to normal by the facilities available to the team at the incident without outside assistance.
- Tier-2 Emergency (Emergency with major consequences) is a situation where assistance is required from outside the platform facilities.
- Tier-3 Emergency (Emergency with catastrophic is a higher level incident that has caused or will cause serious harm to personnel, damage to the environment and the platform and/or company reputation.

LIFE SAVING APPLIANCES (LSA):

Equipment which is used to preserve life during an emergency situation, including Life-boats, Life-rafts, Life jackets, Stretchers, First Aid kits, emergency position indicating radio beacons (EPIRB). LSA also includes vertical escape devices, used to assist safe access to the sea, from heights at which jumping poses an injury risk to the individual.

MANAGEMENT PRIORITIES:

- Personnel
- Environment
- Asset
- Reputation

MEDICAL TEAM:

This is an emergency response team, led by the doctor and assisted by stretcher bearers and first aiders from the catering crew. This team musters in the LQ Level 3 Medical suite, (Muster Station 5), as listed in Emergency Management Team Structure and/or Medical & Stretcher Team – Muster List, and is augmented by an experienced Posco Core Crew technician who will act as a guide when the medical team are deployed anywhere outside the LQ. The medical team takes instruction from the Emergency Coordinator initially and from the ERTL on arrival at the site of any casualties.

MEDEVAC, MEDICAL EVACUATION:

This refers to the need for a patient, or IP (Injured Party) being transported ashore for further medical attention. There are 3 Medevac requirement levels; Level 1 – Routine, Level 2 – Urgent, Level 3 – Life Threatening. Refer to Medical Evacuation Plan YGG-SF-EP-03-06-0009 for guidance and notifications required.

MUSTER CHECKER:

Is a regular member of the offshore crew who for Muster points 1 & 6 is appointed under SHP Emergency Management Team Structure from their allocated Lifeboat; for Muster point 2 (LQ Level 2 ECC) is the ECC Muster coordinator; for Muster points 3 & 4 is the ERT Team Leader's; for Muster point 5 (LQ Level 3 Medical Waiting Room) is the Medical Team Leader, these allocated personnel have the responsibility for ascertaining the complete head count of individuals at their allocated muster station during a muster in response to the emergency situation. He shall supply this information to the Muster Coordinator in the ECC by phone or radio, either directly or via the Emergency Coordinator, as soon as all personnel assigned to his station have been accounted for or report any missing persons who have not arrived at the muster station within a reasonable time. When reporting in to the Muster Coordinator, the Muster Checker must give the actual total number of personnel at his allocated muster station, followed by the number of personnel missing (if any) followed by the missing personnel's name's and duty's. For example, Lifeboat 2 Muster Checker will call ECC to Report and use phrases like "Lifeboat 2 has 35 people Mustered we have Full Muster", alternatively if they are short, they should report "Lifeboat 2 has only 33 people Mustered and we have 2 Personnel Missing, their names are Kyaw Lin – Mechanical Technician and Nay Thu – Electrician". Note: It is the duty of all personnel who are unable to proceed to their appointed muster station on SHP, that they report in to the Muster Coordinator in the ECC by phone or radio advising their location, total number of personnel with them, and reason, (for a group of people, normally the senior person in charge shall assume this responsibility).

MUSTER COORDINATOR:

A member of the Emergency Management Team, normally assigned to the Administration Clerk, with responsibility for receiving and reporting personnel numbers, to ensure a complete head count of all personnel present at the Muster stations, which must be reported to the Emergency Commander. He has the responsibility for tracking the movement of personnel during an incident and providing an accurate roll call of casualties, locations and any missing persons.

MUSTER STATIONS and T-Cards:

The Muster stations on SHP are the primary areas for all controlled congregation of personnel in order that they are all accounted for in a timely manner and everyone located in safe areas that are suitably equipped to support all emergency role(s). All personnel arriving at their assigned muster station are responsible for turning their own T-Card from "Named" side facing out to "blank" side facing out, indicating they are present at their Primary Muster Station or secondary Lifeboat Muster Station, as instructed / required. The Muster Checker needs to

manage the personnel and ensures the no one moves or turn anyone else's T-Card 'other than their own', as this may lead to confusion in the number of personnel mustered. (The physical number count of personnel mustered should equal the numbered of turned T-Cards). Each muster area has an assigned Muster Checker who will ensure that all personnel are accounted for and that a correct full muster is reported to the ECC (or advise the ECC if person(s) are missing). Personnel who have been deployed to SHK for required duties are also expected to immediately return to their primary assigned SHP Muster Station and remember to turn their SHK Bridge T-Cards at either end of the platform adjoining access bridge. However, in the event the Bridge Access from SHK to SHP has become unsafe, they may muster on SHK cellar deck at their Alternate Muster Station 7 during a GPA alarm or Secondary Muster Station 8 during a PAPA alarm.

During installation of SHK Topsides and SHK to SHP access bridge, or future Construction/Maintenance which involves a barge or vessel being closely moored or operating on Dynamic positioning (DP) in close proximity of SHK with a bridge link access gangway deployed, and acting as a Flotel for platform workers. In an Emergency, the Flotel will become the Primary Muster Station for those workers deployed from the Flotel. If the Flotel's bridge link access gangway is removed before their workers can return, the remaining Flotel workers should Muster on SHK and communicate with the ECC (As SHP lifeboats and emergency facilities are only designed to cater for SHP Maximum POB and not additional 3rd parties not staying on board SHP, unless direct de-mobilisation from SHP helideck is already confirmed for those effected personnel).

NON DIRECTIONAL BEACON (NDB):

NDB is a radio transmitter with an antenna around the perimeter of the helideck that transmits a signal for helicopters to "home in" on.

OIL SPILL CONTINGENCY PLAN:

A document within the overall HSE MS that details the actions that will be taken in the event of an uncontrolled release of polluting material from the SHWE Production Platforms, its facilities, vessels, barges and helicopters within the control of the OIM. Refer to Oil Spill Contingency Plan SHP-SF-EP-03-06-0007.

PERSONNEL ON BOARD LIST (POB):

The POB is a complete and current list of personnel who are actually on the platform at any particular time. This document Identifies the name, job title, nationality, employing company, LQ room number and bunk identifier, Muster Station, Assigned Lifeboat number, body weight, current number of days on board and evacuation priority. Each line number on the POB provides an individual tracking number which helps to prevent confusion where names are being discussed by radio. The POB is conveniently prepared with a summary sheet, showing the total numbers of personnel from each employing company, the number expected at each muster station and the total numbers allocated to each lifeboat. This document is used by the Muster Checkers and Muster Coordinator, during an emergency and is copied to PIC Yangon office after each crew change, to provide these details also to the onshore EMT.

PREPARE TO ABANDON PLATFORM ALARM (PAPA):

An intermittent repeated rising frequency tone sounded from the Public Address system accompanied by flashing blue beacon lights initiated by the Emergency Commander (by pushbutton in either the ECC or on the Heli-deck, initiated before total platform abandonment).

This is alarmed on both SHP and SHK platforms and the adjoin Bridge between them. If the Emergency Commander has concluded after consultation with his Emergency Management Team that this is the safest course of action during an emergency situation, then the Emergency Commander shall inform the individual muster point controllers and Emergency Response Team Leader that he requires them to make their way to the Life boat stations on SHP, in an orderly fashion and that he is changing the emergency status from General Muster to Prepare for possible evacuation of the Platform. **Note that if this PAPA alarm sounds, without a precursory GPA, all personnel shall muster immediately at their assigned lifeboats on SHP, put on their life jackets, turn their T-cards and await further instructions.** Personnel who are in their allocated cabin at the time an alarm is sounded must remember to take their "Grab Bag" from the locker. A PAPA alarm initiated on either SHP or SHK will simultaneous and in unison attenuate on both platforms and bridge, requiring the same personnel emergency muster action

SAFETY DRILLS AND EXERCISES:

Regular drills are a means of testing the ability of emergency response teams and operational readiness of the emergency response System. Regularly initiated and planned events as per Posco HSE performance standard schedule from a simple mustering drill to a protracted scenario exercise with various levels of POB both pre announced and unannounced should be held. This response plan document should be referred to in the drill planning setting clear goals for implementation and a desired outcome to be achieved examined. A post drill meeting should be held with key participants to highlight what worked well and, if any, where room for improvement or equipment improvements required. These drills and exercises provide an opportunity for training and/or certification purposes, and as an audit of documentation and for testing communications and other readiness.

SCRIBE / LOG KEEPER:

Is a member of the Emergency Management Team, the off-duty Production Shift Supervisor currently is tasked with this role, who has responsibility for creating and maintaining an accurate and chronological sequence of event log & check lists on the whiteboards provided. On completion of a drill or real emergency, the information is retained until the Safety Officer can formally record all the whiteboard notes.

SEQUENCE OF EVENTS LOG:

Maintained by the scribe, an accurate chronological record of activities and actions carried out during response to an emergency from the start of the incident until its resolution or abandonment. This log shall be retrievable either manually, by electronic method or photography. On completion of a drill or real emergency, the information is retained until the Safety Officer can formally record all the whiteboard notes by photographing them, then write up this information in the Emergency/Drill Report which he then forwards the report to onshore HSE Team. Once the Safety Officer has taken photos of whiteboard and/or completed the report he will wipe the boards clean so they are ready for the next Emergency Event/Drill.

SHUTDOWN LEVELS:

The Shutdown System provides these levels of shutdown for the platform.

- Level 1- With Blowdown
- Level 1- Without Blowdown
- Level 2- Process Shutdown

- Level 3- Unit Shutdown

SHUTDOWN SYSTEM:

This is the automated supervisory system for detected fire and gas and emergency alarm points that makes executive decisions resulting in the isolation and blow down of plant and the shutdown of major equipment. This system is activated in accordance with Cause and Effect matrices that are intended to place the platform into a fail-safe condition as determined by hazard identification exercises and prevent the potentially hazardous situation escalating. The Shutdown System executive actions can also be initiated manually from the control room and also by manual call points (MAC's) located around the Process area, which will initiate the same process shutdown response as a confirmed fire

STATION BILL:

The 'Station Bill' is a notice, displayed prominently at locations throughout the facility, both for SHP and SHK Platforms, detailing the most essential emergency information for all personnel and illustrates those emergency response positions that are filled by assigned competent personnel. Personnel assigned to emergency response roles are all core platform personnel with a long term association with the facility, plus also having completed the required training and have experience regarding the emergency role assigned. The Station Bill explains the general response, for all personnel, in the event of an emergency situation. It describes the facility alarm sounds and the Muster Stations for all personnel, alternative muster stations, emergency team duties, life boat & life raft locations and the facility emergency phone number. See O&M SHP Station Bills Procedure SHP-SF-EP-03-03-0003.

All personnel are made aware of the Station Bill / Muster List, during the arrival safety induction briefing and are required to familiarize themselves with the content.

TEMPORARY REFUGE:

The Temporary Refuge, SHP LQ (Living Quarters) accommodation, offices and workshops building over 5 floors at the west end of SHP Platform is designed to provide a safe place of refuge and maintain life support, structural integrity and essential command support for a minimum amount of time, as designated by the rating, providing sufficient time in order to conduct a safe muster and evacuation. On the SHWE Platform this area is within the accommodation protected by A60 rated bulkheads.

TIME OUT:

A structured technique used by the Management Teams at periodic times during an incident, (usually every 10 minutes), to take stock of response status and re-allocate duties if required. This technique follows a pattern that adds structure to an emergency response and allows the Emergency Commander to disseminate his action plan to his team, to confirm the current situation; POB accounted for; situation status, (is it escalating, diminishing, being brought under control); advise the response Plan and assign duties to his Team; check for feedback and confirm understanding of the Plan and Instructions. Then immediately after the Time-Out, contact the onshore Duty Manager with the update and then take the opportunity to provide information and comfort to the mustered personnel over the PA system.

4.2 Abbreviations:

AFFF Aqueous Film Forming Foam

AR-AFFF Alcohol Resistant-Aqueous Film Forming Foam

ALARP	As Low As Reasonably Practicable
AM	Amplitude Modulation
API	American Petroleum Institute
ASME	American Society of Material Engineers
BA	Breathing Apparatus
BOP	Blow out Preventer
BOSIET	Basic Offshore Safety Induction and Emergency Training
CCR	Central Control Room
CMO	Chief Medical Officer
CRO	Control Room Operator
DCS	Distributed Control System
DP	Dynamic Positioning
ECC	Emergency Command Centre
EMT	Emergency Management Team
EPIRB	Electronic Position Indicating Radio Beacon
ESC	Emergency Support Centre
ESD	Emergency Shut Down
ERT	Emergency Response Team
F&G	Fire and Gas
FGS	Fire and Gas System
FM	Frequency Modulation
FRC	Fast Rescue Craft
GMDSS	Global Marine Distress Safety System
GPA	General Platform Alarm
HF SSB	High Frequency Single Side Band
HDA	Helideck Attendant
HLO	Helicopter Landing Officer
HS&E	Health Safety and Environment
HSE MS	Health Safety and Environment (Department) Management System
ICSS	Integrated Control and Safety System
IMO	International Maritime Organization
LEL	Lower Explosive Limit
LQ	Living Quarters
MAC	Manual Alarm Call
MOB	Man Over Board

MOHS	Ministry of Health and Sport
MSDS	Material Safety Data Sheet (also CSDS – Chemical Safety Data Sheet)
OIM	Offshore Installation Manager
OMD	Operations and Maintenance Department
PA	Public Address system
PA/GA	Public Address / General Alarm
PAPA	Prepare to Abandon Platform Alarm
PIC	POSCO-INTERNATIONAL CORPORATION
PIC	Person In-Charge
PLET	Pipeline End Termination
POB	Personnel On Board
RO	Radio Operator
RPO	Radiation Protection Officer
SAR	Search And Rescue
SBV (SV)	Supply Boat Vessel
SCE	Safety Critical Elements
SCBA	Self Contained Breathing Apparatus
SDS	Shutdown System (Safeguarding System)
SOLAS	Safety Of Life At Sea
STEL	Short Term Exposure Limit
TEMPSC	Totally Enclosed Motor Propelled Survival Craft (Lifeboat)
TER	Telecoms Equipment Room
TR	Temporary Refuge
VHF	Very High Frequency
UPS	Uninterruptable Power Supply
UHF	Ultra High Frequency

5.0 ONSHORE SUPPORT ORGANISATION

An essential part of an incident management organization is a clear understanding of the various roles and responsibilities applicable to each individual or group. These roles must be clearly defined in advance so that individuals are in no doubt where they should go and what duties they are expected to perform.

During a declared emergency the Emergency Commander (OIM) will call the onshore Company Duty Manager. The Duty Manager will call on the Emergency Management Team who will provide support from the Yangon Company office, emergency support centre (ESC).

The onshore emergency management team comprises of those from each different PIC area on weekly rotational duty (e.g. O&M Director, O&M Manager, Aviation / Marine, HSE, discipline

technical specialists from operations, production, maintenance and engineering as required, HR, IT, etc.), who will coordinate specific emergency response requirements which must be coordinated and dispatched from on-shore. They will also perform the necessary notifications to Government departments, Partners and Head office, deal with the press and where necessary, arrange for notification of next of kin where the emergency situation has resulted in injuries or missing persons.

The Duty Roster Procedure, document number YGG-SF-EP-03-06-0006 describes the onshore Emergency response duty system and the Emergency Support Centre Plan, covers the response procedures for onshore management.

6.0 REFERENCE DOCUMENTS

6.1 Company Documents

Minimum Technical Requirements	SHG-GE-EP-303-0012
DCS SDS FGS Function Designs	SHG-IN-ES-303-0108
Safety Philosophy – Offshore Facilities	SHG-SF-EP-303-0012
SHP & SHK Station Bills	SHP-SF-EP-03-03-0003
Oil Spill Contingency Plan	SHP-SF-EP-03-06-0007
SHP Fixed Protection Philosophy	SHP-SF-EP-303-00002
SHP Active Fire Protection Philosophy	SHP-SF-EP-303-0003
SHP Passive Fire Protection Philosophy	SHP-SF-EP-303-0006
Process Control & Operating Philosophy	SHG-PR-EP-303-0001
SHP Process Cause and Effect Diagram	SHG-PR-DC-301-0002
SHP F&G Cause and Effect Matrix	SHG-FG-DC-303-0001
F&G Detection Philosophy	SHG-FG-EP-303-0004
SHP Fire Fighting Equipment Specification	SHP-SF-ES-303-0006
SHP Failure Modes and Effect Analysis	SHP-SF-ET-301-0021
SHP Evacuation Escape and Rescue Analysis	SHP-SF-ET-301-0020
Tropical storm (Cyclone) Response Procedure	YGG-SF-EP-03-06-0011
Personnel Transfer Procedure	SHG-OM-MP-03-07-0029
Medical Evacuation Plan	YGG-SF-EP-03-06-0009
Control of Radioactive Substances	YGG-OM-MP-03-07-0010
Medical Evacuation Plan	YGG-SF-EP-03-06-0009
SHP Helicopter Operations Guide	YGG-SF-EP-03-06-0022
Duty Roster Procedure	YGG-SF-EP-03-06-0006
Emergency and Crisis Management Plan	YGG-SF-EP-03-06-0001
SHP Emergency Response Plan	SHP-OP-MP-03-06-0004

7.0 OBJECTIVES

The Emergency Response Plan is designed to:

- Create an organization framework that will support a rapid and effective response in an emergency situation.
- Assign, in advance, the trained and competent personnel who will be responsible for taking actions.
- Determine, in advance, where all personnel should go to congregate in a safe area and be accounted for.
- Reconcile POB numbers – account for the whereabouts of all personnel assigned to the Facility
- Provide communication channels essential to task coordination.
- Provide a list of actions which must be taken and information which must be checked.
- Provide relevant information applying to different emergency situations.

As far as practicable, hazardous operating conditions and emergency situations will be prevented by continuous operator monitoring of the facilities and by the control actions of Distributed Control Systems (DCS). However, where such conditions cannot be adequately controlled, final protection will be provided by the Shutdown System (SDS) and the Fire and Gas System (F&G). The strategy is to remove the fuel source while utilizing fixed systems such as deluge sprays to provide initial containment and/or suppression of any major fire which would be considered a primary serious threat. Since fire and explosion are considered potential threats these are highlighted however this is only one of the foreseeable incidents that this Emergency Response Plan addresses.

All available information about the incident such as emergency type, location, wind direction, activated fixed systems and process status will be evaluated prior to committing emergency response personnel in order to ensure the safest possible approach.

Once all personnel have been accounted for and their safety ensured, a return to normal, stable and safe production is the overall objective. This objective can only be achieved after a thorough examination and evaluation of plant and equipment condition and after necessary elements of an incident investigation have been carried out by competent personnel.

7.1 Trained and Competent Personnel

Individual positions within the Emergency Response Teams shall be filled by trained and competent personnel. These personnel have been assigned to positions of responsibility in alignment with their operational position. The Company shall ensure that relevant training and assessed courses are carried out by recognized and approved industry trainers to fulfil this emergency response requirement. Records of Training and planning of refresher training is maintained by the Training Coordinator and managed through PIC groupware intranet based system.

The facility Station Bill illustrates those positions that require to be filled by competent personnel. Personnel assigned to Emergency Management Team Structure and Emergency Response roles shall be those that have or tend to have permanent association with the facility.

Standard and refresher training in Emergency Response roles is regulated by statutory training or industry best practice. A statutory training requirement is BOSIET, in which all offshore personnel must participate; best practice is to have an adequate number of first aid trained

personnel available. The Company shall track and align the training of personnel in their records and provide early indication of training requirements. It is most effective for this training to be undertaken by designated teams in a structured environment when there is an opportunity for role play.

In this way, back up and succession planning can be progressed on the facility, involving teams participating in drills, training and exercises that provide functional experience and promote competence.

Visiting personnel to the Facility with no active operational role may be given an exemption to BOSIET training requirement by the Company and acknowledged by OIM (on a case by case basis), but they will still be required to participate in the Helicopter flying safety briefing and Platform safety induction.

7.2 Muster Stations

Personnel arriving at the facility will be assigned to a particular muster station. This will be identified to them in the facility induction process carried out by the Safety Officer who will also advise of any responsibilities associated with the individual's role and by the issuing of T-cards by the SHP Administrator. The person's operational position defines their primary Emergency Response role and therefore the muster station to which they are assigned. Visitors, contractors and VIPs, without exception, will also be assigned to a muster station. VIP's who are on a short same day visit need not be issued T-cards if they are allocated a chaperon from SHP core crew who will be with them throughout their visit and guide them to their allocated muster station when required.

Designated SHP and SHK muster stations are:

- | | |
|--|------------------|
| • The Main Muster Station (Level 0) | Muster Station 1 |
| • The Emergency Command Centre (Level 2) | Muster Station 2 |
| • ERT 1 – The Fireman Room (Level 0) | Muster Station 3 |
| • ERT 2 – The Fireman Room (Upper Deck) | Muster Station 4 |
| • The Medical Suite (Level 3) | Muster Station 5 |
| • SHP Lifeboats & Alternative Muster Area (By Lifeboats) | Muster Station 6 |
| • SHK Alternative Muster Station (SHK Cellar Deck NW) | Muster Station 7 |
| • SHK Life rafts Muster Station (SHK Cellar Deck SE) | Muster Station 8 |

The muster stations situated within the Temporary Refuge (1, 2, 3 and 5), are within the accommodation, providing a safe and secure environment, protected from the effects of heat, smoke, flames and from the risk of unignited Gas Release, which for the majority of personnel on board are not directly involved in Emergency response and managing the emergency situation. Muster station 6 would only be used in the event that the SHP LQ Accommodation was compromised by the emergency situation or the OIM has ordered a prepare to abandon platform.

Note; In the event of a GPA/PAPA alarm, the Primary Muster Station for personnel who have been assigned daily work duties on SHK is their SHP assigned Muster station and will only muster on SHK if the access bridge route is compromised, if they have been advised over the PA system to do so, or their self-assessment of the situation indicates this is the only safe muster

option, so they would then muster at SHK muster stations 7 for a GPA or muster station 8 for a PAPA, reporting immediately back to the ECC. During special well workover / well intervention campaigns, the work should be planned to enable work activities to be safely suspended and the well made safe, in the event of a GPA/PAPA Emergency situation occurring, allowing the work over team to make their work site safe and muster at level 0 on SHP. The need for a separate well work over team Muster station on the drill floor or pipe deck should be avoided. Reminder, the drill floor doghouse is no longer classed as a temporary refuge as it no longer has electrical power, thus, no lighting, or HVAC pressurisation providing life support capabilities.

Note: During Phase 3 Campaign 2 – Installation of SHK Topsides and access Bridge, until hand-over, mustering arrangements on SHK will depart from SHWE Station Bill Procedure SHP-SF-EP-03-03-0003 and the SHK station bill found therein, (on page 12). Until hand-over the Phase 3 work force assigned to SHK will be based on the construction/accommodation barge linked by an access tower and removable gangway. Phase 3 will assign the temporary safe mustering location either on SHK or on the construction / accommodation barge as directed in HHI P3C2 Bridging document and temporary signage.

The purpose of the muster is to safely account for all personnel, to assemble the management team in a suitable environment and to ensure that teams with specific tasks are brought together to properly equip themselves for their response.

Personnel shall proceed to their Muster Stations when the GPA is activated or on the request of the OIM by the PA system. The GPA is a fixed frequency tone sounded intermittently at approximately one second intervals. The intention of this alarm is to get everyone's attention. This alarm will be accompanied by flashing red lights. When personnel hear this alarm they shall:

- **STOP** whatever they are doing.
- **MAKE** their worksite SAFE.
- **GO** directly to their designated muster station by the safest route.
- **LISTEN** for important information that will be broadcast over the PA system. It is imperative that the mustering process is carried out as efficiently and quickly as possible as this creates a number of benefits:
 - Allows for an early reconciliation of the Personnel Onboard numbers.
 - Speeds up the response time to any incident.
 - Brings the majority of personnel to one place, to allow control.
 - Creates order where chaos might otherwise reign.

To assist in achieving these benefits, drills and exercises shall be carried out to make effective mustering an automatic reaction.

If for any reason personnel cannot get to their designated muster station they should go to the nearest safe muster point and contact that muster station coordinator. Alternately they should go to the nearest phone point and explain their location to ensure that they are accounted for and can receive instructions.

General Rules for Mustering

- Know Your Role in an Emergency.
- Know Your Designated Muster Point in Relation to your Role.
- Know the steps you must take on arrival at the Muster Point.

- Know the most Efficient and alternative Routes to your Muster Point.
- Understand the Contingency Plan for Alternative Muster Points.
- Manage your own T-cards, placing in the correct locations and, take time to remind yourself each time you arrive at the SHWE Platforms and collect from Heli-admin upon arrival (and return before departure).
- Be prepared to step-up and take over role of anyone who fails to report to their designated muster station and assigned role - missing person.

REMEMBER: A Change in Role May Mean a Change of Muster Points.

The Emergency Command Centre

This station is situated across the corridor from the Radio Room and adjoining to the Central Control Room (CCR) on Level 2 South Side of the LQ accommodation. During an incident or drill, this is where the Emergency Management Team muster (Muster Station 2)

The ECC room is furnished with:

- White boards a stand-alone blank double sided board on a wheeled stand, plus 3 wall mounted pre-marked boards. These boards are used to keep a chronological running sequence of events log during an incident and track personnel to and from their muster stations. A list of vessels in field, current weather conditions and a reminder check-list of items to do. There is a stand-alone wall mounted clock above the sequence of events log board. The scanner on the wheeled board is no longer functional and the boards are now photographed to record information.
- A3 format General Arrangement drawings to assist in the decision and planning process and to help track events.

Emergency response action plans as prescribed in section 17 of this procedure give guidance notes, check-list reminders, likely escalation potential and relevant related procedures to refer to.

The ECC is a Communications Centre which can be used by the Emergency Commander and Coordinator to directly contact resources, Yangon and OGT, mustered personnel and the external emergency teams. The following communication systems are available:

- CDMA long range mobile phone connected to Myanmar network. (Dial 095130137 for Duty Manager) – **Currently not available following Sittwe telecoms tower being destroyed during cyclone Mocha and not replaced!**
- Inmarsat desktop satellite phone.
- VSat PAXB desktop phone.
- Red Hotline phone direct link to OGT and Yangon ESC Room.
- VHF Multi-Channel Marine Band Radio.
- Aviation VHF Air-band Radio.
- MF-HF SSB Multi Frequency Radio.
- PAGA Public Address General Alarm and Party Paging System
- Portable VHF Radios on Emergency Channel 1

- Portable Inmarsat radio (for outside use) The phone aerial must be in line of sight with the Geo-Stationary Inmar-Satelite to make a connection. The Indian Ocean Inmarsat is due South of the platform, and Pacific Ocean Inmarsat is due East.

The Main Muster Area - Muster Station 1

The main muster area is on Level 0 of the LQ accommodation within the Temporary Refuge which is used as a Games room and General Meeting room, situated between the Laundry and Gymnasium on West side of the LQ. The route to this station is clearly delineated, from all areas of the platform, by signs and arrows. The floor area is divided into designated lifeboats stations (LB1, LB2, LB3 & LB4) aligned with the 4 wall mounted Lifeboat T-card boards.

Each person on board is allocated to one of the 4 SHP Lifeboats, refer to your T-card issued by Admin on arrival.

The 4 Lifeboats are numbered from North to South 1, 2, 3, & 4, which are located on the West side of Level 0 and are accessible directly from the Muster Area via the emergency exit doors during an emergency or drill. Each Lifeboat certified carrying capacity is for 80 Persons (which gives a maximum capacity of all four (4) lifeboats of 320), Although our EERA study recommends we should only load upto 72 people per Lifeboat.

Muster checkers allocated to individual lifeboats have the responsibility for accounting for all the personnel allocated to that station (Refer to Section 4 abbreviations, describing the muster checkers full roles and responsibilities). The Muster checker will match up person as they arrive at the muster station with their name on the current POB list and cross-check with the T-card board and also by physical head count. The POB list is updated by the facility administrator whenever personnel leave or arrive at the facility. All personnel are issued with 2 T-Cards, on arrival at SHP, one for their level 0 Muster station (to be inserted in the assigned Lifeboat muster board) and another for their outside actual Lifeboat station (where their second T-card must be inserted within the lifeboat muster board within the weather proof enclosure next to the lifeboat station). During an emergency personnel arriving at their muster station shall turn their own T-card from the side displaying their names to the blank side, thus indicating that he/she is present at that muster station.

The muster checker will communicate the completed muster of their station by telephone or radio, to the Muster Coordinator in the ECC.

All personnel who are called to muster by the annunciation of the GPA shall wear proper protective clothing if possible. This shall include:

- Coveralls
- Hard hat
- Work boots/shoes with covered toes

It is recognized that personnel should not waste time going to the changing rooms first to collect their PPE. However, shorts, sleeveless tops and open sandals are to be avoided in emergency situations.

Fully mustered groups will remain in this main muster area, quietly, so that essential information can be passed and understood. Use of mobile phones is prohibited.

In the event of a partial down manning or evacuation by Helicopter being planned, the mustered groups shall make their way, when instructed to the helideck or life boat stations, on the decision of the Emergency Commander.

When the platform POB is less than 144, the OIM may decide to utilise fewer than the provided four lifeboats and this will be advised when your T-card is issued on arrival to the platform and/or by the Administrator during your stay (this also applies at all times when one lifeboat is out for maintenance or out-of-service, then personnel will be suitably assigned (or reassigned) to the available lifeboats in service).

This mustered group at Muster Station 1 may be requested to make available, suitably experienced personnel for any specific duties requested, by the Emergency Management Team, in support of the Emergency Response or Medical teams. If this is requested their movement shall be tracked by the Muster Coordinator.

SHP Alternate Main Muster Station – Muster Station 6

The main muster area may become an unacceptable area for personnel to gather (smoke ingress, site of incident etc.). In this event, the alternate muster station is the outside lifeboats mustering station, as allocated on your T-card. Instruction to use or move to the alternate muster station, will be announced via the PA system as required.

The main and alternate muster areas are considered to be at the furthest point from most potential hazards and provide suitable areas in which to muster.

The Firemen Rooms (Level 0 and Upper Deck) – Muster Stations 3 & 4

These emergency stations 3 & 4 are situated on Level 0 of the Accommodation and at the Upper Deck respectively. The Emergency Response Team Leader is in overall charge of both teams and generally will deploy with whichever team is closest to the incident. Each Emergency Response Team (ERT) should consist of 6 members with 1 of the 6 being the Team Leader. The members of the Emergency Response Teams 1 and 2 will assemble at these positions on alarm annunciation where their firemen tunics, boots, helmets, trousers and radios are stored. Equipment comprising SCBA, BA control boards, portable gas detectors, tools, flash-lights and other emergency equipment considered essential is also available here as provided by minimum technical requirement.

Mustering in here will be:

- The Emergency Response Teams, comprised of trained operational personnel.
- The Emergency Response Team Leader where he will gain an overall assessment of the incident from the ECC.

These spaces remain closed (not locked) during normal operations and the Safety Officer maintains radios, SCBA and emergency equipment that is stored inside. Used or partially used BA cylinder must be replaced with spare fully charged cylinder after deployment for training drill or actual emergency. Empty or partially used BA cylinders must be re-charged as soon as practicably possible after deployment. ERT team members are responsible for ensuring their equipment is cleaned and in good operational order, they are responsible for ensuring their BA cylinder has sufficient air and if necessary change out for fully charged spare cylinder prior to deployment.

Medical Suite – Muster Station 5

The facility Doctor and his team will muster in the Hospital which is on Level 3 of the accommodation. The medical team consists of 8 members:

- The facility Doctor

- The stretcher handling team
- Designated first aiders
- A Medical Team Guide (Operation or Maintenance Technician)

They shall report when mustered to the Muster Coordinator in the ECC. The Doctor will prepare the medical suite for casualties and set up a triage station. The medical suite has telephone communications, internet communication and portable radio reception.

The Doctor is equipped with a crash bag and portable resuscitator which he will transport to a casualty whenever in-situ advanced life support is required.

The Medical Team takes instruction from the Emergency Coordinator until they are deployed to the site of any casualty where they will then take instruction and guidance from the ERTL. The team guide is provided to ensure the team are taken on the safest and most direct, route to the reported casualties and safe return to the Level 3 medical suite.

Muster Coordinator

The SHP Admin Clerk is normally assigned the role of muster coordinator who is part of the Emergency Management Team who will gather the collective muster numbers from each of the above muster areas and cross reference these numbers with the total POB list to hopefully achieve a reconciliation of numbers (or identify specific missing personnel). The attainment of a full head count achieves the EMT first priority.

The muster coordinator must present an accurate disposition of personnel to the Emergency Commander. This must also include the tracking of personnel who have been removed from their designated muster station to assist in other duties. (Stretcher-bearers, runners, helideck crew, crane operator etc.) There is a dedicated white board in the ECC to track these ad-hoc assignments.

The POB muster board reflects the disposition at each muster station. The names of any personnel absent from their assigned Muster Station are identified, logged on the white board and tracked until resolution. All personnel are to be accounted for on this board.

7.3 Communications

Radio Communications

One of the main means of communication used throughout the platform is by hand held and desktop mounted radios. Under normal conditions different channels are allocated for separate operational (production, maintenance, Emergency, etc.) functions. During an emergency, and from the initiation of the PA/GA, all radios shall be on the emergency channel which shall be Channel 1.

Platform Supply Vessel and Standby Vessel, if in the field, shall communicate with the ECC via Marine VHF channel 67 or other as agreed. This requires prompt action from the Radio Operator in the ECC to update the Standby Vessel of the Emergency situation and of any immediate requirements and of any visual information that they can see.

All communication on Channel 1 shall be incident related. Radios and essential communications equipment are battery operated or have power supplied from a secure electrical source (UPS) ensuring availability during an emergency. Helicopter communications take place only on the designated VHF Aero band frequencies. The HLO and Radio Operator have access to this

particular band. In the event of helicopter operations during or subsequent to an incident, the HLO and team will provide the liaison between the helicopter and the ECC.

Emergency Position Indicating Radio Beacon (EPIRB) equipment is part of the Global Marine Distress Signalling System and is carried on-board the Lifeboats. When activated, this transmits identification data and position to GEOSAR Satellites. The EPIRB is attached to the life boat at all times. Instructions for its use are provided on the unit.

All Lifeboats are equipped with VHF radio transceivers. The batteries are kept charged by trickle charge from a flying lead power supply (and there are spare new sets of disposable batteries for last resort use). This must be disconnected by Lifeboat Coxswain prior to the launch of the life boat.

Hand held digital (dual band) VHF portable radios are provided to personnel working throughout the facility as required and to personnel with emergency response duties.

Although unlikely, if all other internal facility communication means have failed, it is acceptable to make use of personnel to carry messages within the facility. Message runners must always be dispatched in pairs.

Public Address & General Alarm (PA/GA) System

This system performs the function of relaying information to the general platform population. Access to this system is available from desk mounted microphones. Within this system and supplementary to normal voice transmission there resides the automatically generated alarms of PA/GA and PAPA. The PA/GA alarm is automatically generated upon receiving commands from the Fire and Gas supervisory system or by manual initiation from the PA/GA panel in the CCR, Radio Room, ECC or from the PA/GA cabinet HMI in the Telecoms Equipment Room (TER).

PA/GA alarms are automatically generated on:

- Confirmed Gas Detection in Hazardous and Non-hazardous area
- Confirmed Fire Detection in Hazardous and Non-hazardous area
- Confirmed H₂ Gas Detection in Battery Room
- ESD Level 1 with Blowdown Activation
- ESD Level 1 without Blowdown Activation
- MAC (manually activated call point) activation
- Loss of 24VDC UPS Power Supply

The PA system for PA/GA annunciation is audible throughout the accommodation and general external platform areas. From the PA/GA HMI control panel in the ECC the volume of the alarm can be reduced in certain key areas as listed, to enable OIM PA messages to be clearly heard and also to reduce the extremely loud continuously sounding GAP and / or PAPA alarm in muster areas which are very populated during emergency situations, as follows:

- | | |
|--------------|--|
| i. Level 0 | Muster Station 1 |
| ii. Level 0 | Alternative and Lifeboats Muster Station 6 |
| iii. Level 3 | Medical Team Muster Station 5 |
| iv. Level 2 | CCR and ECC |

During any PA Speech announcement, the Speech volume is automatically returned to its full setting so important information messages can be clearly heard by the Mustering personnel at

ALL locations. Once the Emergency is over the alarm volume control button on the ECC PA/GA HMI panel should automatically reset the speaker volume. *(Note, in addition, the 2 ceiling mounted PA/GA speakers in the ECC and OIM's office have been disconnected, to prevent interference with voice communications).*

The PAPA alarm can be activated from the PA/GA HMI screens in the ECC or from the Main PA/GA control Panel in the Telecoms Equipment Room (TER). Additionally, the PAPA alarm can be generated by the Blue coloured, PAPA marked pushbuttons from the ECC, the MCR, the main Lifeboat muster point 6 and via the PAPA pushbutton at the helideck.

Note; Pushing any of these PAPA buttons, if not already done, will initiate an ESD Emergency Shut Down with Blow Down.

The PAPA tone is a repeated rising frequency tone sounded from the PA/GA speakers and accompanied by flashing blue beacons.

Telephones

Telephones are provided in safe areas throughout the external modules of the platform and these are supplemented by a Gaitronics Page/Party system. Throughout the accommodation and in safe areas CISCO telephones operate through the PABX. During an emergency all telephone use is restricted to essential requirements.

Telephones allow communication with shore (Yangon and OGT) through the VSAT system. Hot-line communications between SHP, OGT and Yangon are available through a dedicated emergency system operating through router and VSAT. These are located in the CCR, ECC, Radio Room and OIM office.

A CDMA (Code Division Multiple Access) phone system which is basically a long range public wireless phone network, is available in the OIM Office, ECC, Radio Room and Control Room, which works just like an onshore mobile phone allowing communication with mobile phones throughout Myanmar and dialling to fixed phone numbers in the office. This additional system allows telephone communications with onshore in the event of VSAT failure. It is a voice only system and cannot be used for messaging or other text communications.

ISAT (Inmarsat) Portable Mobile satellite phones

SHP has three (3) battery powered ISAT mobile telephones. One is held with the OIM, one is on stand-by in the Emergency Command Centre on Level 2 of the accommodation and a third is held by the Communications Technician as a Spare for visiting office senior management, where other means of communication are unavailable. As these are satellite phones requiring a line of sight from the antenna to the satellite, they must be used outside the LQ on a clear open deck area. Due to the location of the preferred geostationary satellite, best operational signal reception is from the platform upper deck, South-east corner. For reference, the Indian Ocean Inmarsat is due South of the platform, and Pacific Ocean Inmarsat is due East. These phones are not intrinsically safe and can only be used in production areas of the platforms after Shut down Blow down has been completed with the accompaniment of a portable gas detector.

Marine Band (SSB) Radio

There are Single Side Band (SSB) Medium/High Frequency radio in the Radio Room, ECC & CCR for verbal radio communication with marine vessels. An SSB radio transceiver is also

located at OGT and a further unit in the helicopter hangar, providing another communication link from the Platform to onshore. These radios provide back-up to the VSAT and Inmarsat links.

Others

Inmarsat satellite communication is provided as back up to VSAT in an emergency situation when other telecommunications means have failed. Desk phone sets are also available in the OIM Office, ECC, Radio Room and CCR. These do however require a mains voltage supply.

Extreme cases

A final alternative method for communicating from the field to onshore emergency support is by relaying messages via the field stand-by boat, either through OGT or direct to the Yangon Emergency Response Management team, Duty Manager by telephone or the Stand-by vessels e-mail system. This requires radio communication between the facility and stand-by vessel which can be accomplished via hand-held walkie-talkie radios on the available Marine channels

7.4 Essential Actions

The key to effective emergency response is adequate preparation. Adequate preparation involves training, good communications and a comprehensive planned maintenance program.

The training requirement as addressed by statutory training (T-BOSIET) provides all personnel with the minimum acceptable knowledge base necessary.

Relevant training in emergency response is provided by specific drills and exercises carried out on the facility that are designed to complement the basic skills training provided in meeting statutory requirements. This provides an opportunity to assess any additional training requirements that specific tasks or positions demand. Additional training and assessment is available from specialist Emergency Response groups and training organizations that operate to internationally accepted standards.

These drills carried out at least every two weeks enable all personnel to familiarize themselves with the principles of mustering and their mustering stations. Emergency teams have the opportunity to become familiar with equipment during specific Scenario Drills, team make up and the potentially hazardous areas of the facility. Supervisory and leadership activities are tested in a stable environment without the intensity of an actual incident.

Facility knowledge can be acquired under structured conditions and with Competent supervision. Equipment handling and familiarity is gained prior to its use during an emergency situation. Any potential problem areas are identified and further training initiated or developed.

Communications are important during normal operations and during an emergency are vitally important. Speech is the most recognizable form of communication and Primarily English language shall be used as the main speech medium on the SHWE Production Platform. Important Emergency announcements shall be broadcast by the OIM in English and whenever possible re-broadcast in Myanmar by the Radio Operator. Telephone messages, radio messages and written language shall be in English.

Radio and telephone messages shall be short and relevant. The message shall be repeated by the recipient to confirm understanding of the message. It is essential to gain agreement on the message that is being transmitted.

E-mails that are required to be sent relating to an emergency situation shall be, as far as possible, prepared to a standard format from the prepared forms in this ERP manual. In this manner the input material can be recognized immediately as being the most important.

The maintenance of emergency equipment as a life support requirement is a priority. All equipment that has been identified as being a Safety Critical Element or related to this function shall be maintained by compliance to this principle.

All lifesaving equipment, Fire-fighting equipment, detection and protection equipment is identified, catalogued and referenced within SAP to a specific compliance maintenance program.

7.5 Key Emergency Situations

The POSCO INTERNATIONAL production facilities are fabricated to internationally accepted construction standards using quality materials and meet all safety requirements for reliable operating as far as is practicable. As with all gas production installations there are foreseeable situations that could potentially occur that fall outside this safety envelope. These situations can be planned for and are briefly identified in this section.

However, it is worthy of note that certain Emergencies, while foreseeable, may be the result of unforeseen sequences of events and will require responses for which detailed response plans cannot be generated. The remaining parts of this section discuss easily foreseeable emergencies and the Response Plans at the end of this document present guidance on response actions. It must always be remembered that any emergency response will depend on the exact circumstances of the case and that the best plans always remain as guidance only.

7.5.1 Man Overboard

Someone who observes a person falling overboard or notices someone already in the water must immediately raise the alarm to ensure prompt communication of the emergency to the Stand-by Vessel and the Emergency Management Team. The observer's actions should include,

- Try to keep the person "in sight" at all times.
- Point in the direction of the person in the water.
- Attract the attention of others by shouting "Man Overboard".
- Throw the nearest available lifebuoy in the direction of the person in the water.
- If possible, get others to maintain a watch and contact the Control Room Operator. In his contact with the CRO the observer shall deliver such useful information as he is aware of that can assist in the incident response, such as:
 - i. The name of the caller and where calling from.
 - ii. The location of the person in the water.
 - iii. Approximate time of entry into the water.
 - iv. Condition of casualty, conscious or unconscious.
 - v. Direction of drift from the platform.
 - vi. Does this caller know the person in the water?
- The CRO shall immediately contact the stand-by vessel to come to close stand-by and launch the FRC to carry out SAR in the area
- The CRO shall manually initiate the General Platform Alarm, as this is the quickest way to raise the alarm and muster the Emergency Management and Response Teams.

- NOTE, there is no requirement to initiate a production shut-down.
- Make a Public Address announcement stating Man Overboard and approximate position.
- Request observer/s to remain at observation position and continue to monitor MOB, until relieved by ERT team members.
- Deploy Emergency Response Teams to site of MOB as soon as they have mustered to take over from initial observer/s

In the event of fire impairing the bridge, search and rescue operation is extended to the vicinity of SHK for personnel working onboard SHK and evacuation by life rafts provided is not feasible.

The primary recovery method is via the FRC to the SBV and the most suitable method of retrieval to the platform will be decided taking into account the conditions of the casualty and the prevailing weather conditions at the time. The first choice will depend on the condition of the man-overboard and their immediate first aid treatment requirements. SHP Doctor may be required to transfer to Standby vessel to treat and stabilise any injuries prior to recovery to SHP.

Refer to Personnel Transfer Procedure SHG-OM-MP-03-07-0029.

In the event that visual contact with the casualty is lost. The standby vessel and its FRC shall engage in a structured search.

The search shall not stop until visibility, weather, or nightfall makes it impossible to continue. The OIM, will seek guidance from the Duty Manager and onshore senior management on the forward plan and any necessary notifications.

7.5.2 Fire or Gas Release

These hazards are clearly defined and the areas within which they are likely to occur have been recognized and automatic detection and prevention methods have been developed to counter this threat. In the event of these hazards not being detected and being discovered by personnel, the required course of action is as follows:

- **PUSH** the nearest MAC push-button or contact CCR.
- **SECURE** an Escape Route towards the LQ, retreat from any gas release.
- **CALL** for assistance.
- **ATTEMPT** to fight the fire (if trained and safe to do so) until relieved. (Incipient fire only)
- **ENSURE** Deluge Fire Water has been released for Major Production Area Fires
- **PROVIDE** the Emergency Team with information concerning any persons who may be trapped and the status of the emergency.
- **GO** to your muster point and adopt your emergency role.

The automatic response is defined in the cause and effects matrix for detection and protection and any response that generates a GPA will also shut down the process. Emergency Team actions are restricted to damage control, adjacent equipment cooling and search and rescue, as required.

In all fire or gas release events an immediate announcement must be made to stop smoking, stop laundry machines, stop all galley activities and switch off appliances and for all personnel to close accommodation doors as they go to muster.

7.5.3 Accommodation Fire

The accommodation is entirely within the area of the Temporary Refuge and protected from the hazards of the facility by distance, the protective structure, detection devices and the availability of extinguishing media.

The action required to deal with an accommodation fire is similar to an external facility fire. An incident that is detected automatically will generate an alarm which will be indicated in the CCR. The HVAC is designed to protect against an external fire. Dampers shall shut and a secondary Emergency HVAC system shall start-up to maintain pressurisation in the control room, muster areas, ECC, Telecom Equipment Room, Telecom Workshop, Radio Room and stairwells, while exhausting return air to assist with smoke dissipation. The fire rated doors on each level will close when holding open magnetic mechanisms are de-energised and the alarm will be sounded automatically in the LQ only.

Accommodation incidents should be investigated and confirmed wherever possible, prior to executive action taking place. The other consideration is the safety of personnel and where they should muster. The requirement to muster external to the accommodation is a decision that will be taken by the Platform Emergency Management Team and announced over the PA system just prior to or immediately after initiation of GPA.

In all LQ fire events an immediate announcement must be made to stop smoking, stop laundry machines, stop all galley activities and switch off appliances and for all personnel to close accommodation doors as they go to muster. Note that Stairwell doors should close automatically through the action of the door closers when the electro-magnetic holders are released. Any doors being held open by other means must be closed manually.

The emergency response team/s shall provide the active response to an accommodation incident if this has not been attempted by the observer. An early response from the team with a situation report for the EMT is crucial.

7.5.4 Methanol Fires

Methanol fires have no or very little visible flame (are slower burning and generally generate less heat than hydrocarbon fires) and the areas within which they are likely to occur have been recognized and special detectors installed with prevention methods being developed to counter this threat. A fire hydrant is provided in a dedicated area and capable of supplying a 3% AR-AFFF (Alcohol Resistant – Aqueous Film Forming Foam) foam solution from a localised foam tank unit. The actions required to deal with a methanol fire is similar to any external facility fire.

7.5.5 Chemical / Diesel or other Spills

The SHWE Production Platform is not considered to present the risk of a potential major spill. The produced fluids are extremely volatile in the vapour or condensate phases. Chemicals, diesel fuel and a certain amount of lubricating/hydraulic oils are present throughout the facility and do represent minor spill risk. The greatest spill risk occurs during diesel transfer from supply boats to the facility and when burning condensate, with unburnt condensate precipitating from the burn off smoke cloud downwind. Prevent Bunkering Spills by checking and timely renewal of bunkering hoses and dry break couplings, Only Bunker when weather is within appropriate Bunkering limits for wind & swell and only with contracted vessel.

Response actions are required for those incidents which can be categorized as; spills that can be contained on board and spills that escape overboard or are as a result of a marine or subsea equipment failure. All spills must be reported to the OIM immediately when they are discovered.

The types of operational spills that could occur are:

- Accidental spills of hydrocarbon condensate.
- Accidental loss of diesel fuel, hydraulic oil or chemicals during transfer.
- Diesel from or intended for Generators.
- A problem onboard an attendant vessel.

In all respects the first action should be to stop the spillage continuing. In the event of a spill all efforts should be made to contain, absorb and safely gather or disperse the spill. All spills shall be accounted for and a reconciliation of inventory carried out.

- Stop the spill by isolation of the affected area.
- Be aware of potential hazards to personnel, consult MSDS.
- Remove any injured parties if safe to do so.
- Inform the Control Room and request assistance.
- Condensate should only be burned off when there has been a total failure of the Condensate Re-Injection Disposal system.

Proprietary spill kits containing PPE, absorbing materials, containment bunds, mops, buckets, neutralizing agents and disposal bins are provided at appropriate sites throughout the facility.

Eye wash stations and emergency showers are provided at all points of storage and supply of chemicals.

Minor spills are defined as being of a size and quantity that one person can adequately contain the spill and carryout a clean-up operation with localised equipment on his own. Actions to contain and remove a spillage should:

- Involve the use of suitable absorbent material.
- Absorb or contain the maximum amount of material spill.
- Collect all material used in a suitable container for disposal following the guidance provided in the MSDS.
- Wash down affected area using a suitable degreaser/cleaner and copious amounts of water.

Large spills are defined as being an amount that is unlikely to be contained and cleaned up by the actions of a single person. The spill could cause a danger to personnel in the vicinity and the attention of the Emergency Response Team will be required. For large spills the following should be used as a guide to the clean-up procedure:

- Evacuate all people in the vicinity not involved with the clean-up.
- Consult the MSDS for the chemical involved. If the data sheet is not in close proximity to the affected area contact the Control Room to provide a hard copy from file.

- Consider the possibility of escalation if an ignition source is available to any vapours being given off.
- Ensure that all personnel have adequate protective equipment as specified in the relevant MSDS.
- If significant amounts of vapours are being developed from the spill, consider the use of BA for the team and the use of foam to suppress the vapour. Approach from up-wind.
- Prevent the spill liquids from spreading by the use of granules, bunds, rags etc. on the perimeter of the spill.
- Work inwards with the absorbent materials in layers moving towards the center of the spill.
- Place all contaminated absorbent material in suitable containers for transport and disposal following the waste management procedure. Be aware that organic material containing Volatile Organic Compounds (VOCs) can spontaneously combust due to internal heat generation so containers must be metal with air-tight lids and the contained materials wetted with water to prevent spontaneous combustion. The containers must be shipped as Dangerous Goods / Hazardous waste, for disposal.
- Thoroughly wash down the previously affected area with an approved degreaser / cleaner and water.

DO NOT WASH SPILLAGE DIRECTLY INTO THE SEA

7.5.6 Helicopter Emergency

Helicopter tracking is conducted in accordance with SHP-OM-OP-03-08-0023 and aircraft are never out of contact for more than fifteen minutes. Normal flying time from Kyauk Phyu helicopter base to SHP is 30 minutes, SHP Radio Operator is informed of take-off departure time, number of Pax on board and ETA at SHP. There are 2 more reporting Waypoints on the Flight Route A1 at 20Nm (10 minutes out) from Kyauk Phyu and A2 at 40Nm (20 minutes out) from Kyauk Phyu where the outbound flight reports in to SHP and updates ETA. In addition to radio reporting of flights position, helicopter flights are also monitored real time online using "Trootrax EMS Tracker" app, with a refresh rate of approximately 3 minutes depending on bandwidth.

The Helicopter Landing Officer (HLO) and his team carry out an equipment check on the heli-deck prior to the helicopter lifting off from the helicopter base. The flight time to the platform is in the region of thirty minutes. The HLO or Radio room carries out a SAR call five minutes after lift-off and subsequently provides a statement of the helideck condition and the weather variables. Further to these communications the HLO should only speak to the pilot when information is requested.

Helicopter emergencies can be sub divided into incidents that may happen on the facility and incidents that may occur in the vicinity of the facility.

- The helicopter may be overdue.
- An emergency landing may be requested.
- The helicopter crashes onto the facility.
- The helicopter ditches near the platform.

Protocol for helicopter movements demands a rigorous procedure of communications to be adhered to. Regular check-in is required from pre take off, during flight and on approach. Overdue communications indicate either:

- A loss of communications.
- Catastrophic failure.
- Ditching without a "Mayday".

All of these eventualities require immediate communications with the helicopter base to be established.

A helicopter pilot requesting an emergency landing on the facility is an indication that this is a precautionary request. It is not standard practice for a helicopter pilot to bring a genuine emergency to a platform. In that event the helicopter is more likely to be ditched alongside the facility.

Helicopter emergencies do happen suddenly often associated with mechanical failure. A crash on deck will involve a significant platform group. The potential incident involves any or all of:

- Mechanical damage to the facility from the helicopter.
- Fuel spillage.
- Injured personnel.
- Helicopter rolling over from the helideck onto upper-deck or down the West face of the facility.
- Helicopter ditching from the helideck.
- Fire and collateral damage.

Action shall be taken to carry out the first priority of the protection of personnel. In this case a shutdown of the facility would be called for.

A helicopter ditching will require the assistance of the standby vessel, crew and fast rescue craft. The HLO and the helideck crew shall be involved for the benefit of communications and the overview of the incident that they can give. Crane operator, deck crew and medical team may be required for recovery or treatment of rescued personnel from the Stand-by vessel to the facility.

Helicopter Operations Procedures, including emergency response guidance are contained in Company document YGG-SF-EP-03-06-0022.

7.5.7 Vessel Emergency

A vessel emergency is declared when either:

- A vessel in the area declares itself to be in distress.
- A vessel in the area is acting in a suspicious or potentially dangerous manner.

The main requirement with regard to vessel proximity is that all entry into the 500meter zone is controlled strictly by exclusion and that the standby vessel maintains a good collision watch for approaching vessels. There is no potential collision early warning radar on board the facility.

An exclusion zone of approximately 10 x 15 nautical miles has been publicized and marked on international nautical charts. This covers the SHWE gas producing fields. Any vessel, not

associated with field operations, within this area must be closely monitored and any risk of collision with the platform identified as early as possible by the field standby vessel.

While Ships Masters, and other actors, have a fundamental rule of international law of the “Duty” to rescue persons in distress at sea, the proviso is providing it’s at no risk to the Ships Master, his crew or vessel. In case of SHWE standby vessel, the OIM would need to consider that after the rescue the Standby vessel would need to return to KPU to offload the “rescued seafarers” leaving the field exposed without a standby vessel which could be construed as “putting O&M personnel at risk”, which could be used as an acceptable defence why not to get involved in the rescue. The Ship’s Master should also consider the risk he could be exposing him his crew and ship to being over-run by rescuing potentially a large number of foreign nationals. On No account should rescued personnel be transferred to the platform, in the event, consider via MOGE requesting the Navy Vessel to come and collect the rescued seafarers. Consider the Potential risk of Covid and the threat of disease transfer, violence, hijack or armed robbery. With the 5-mile exclusion zone around our facilities, the likelihood of our Standby vessel needing to be used to rescue unknown personnel is unlikely. However, there is always the possibility that one of our contracted vessels carrying out O&M related business on our field or future development areas may require their personnel to be rescued which would be acceptable.

In the case of a declared medical emergency on board a distressed vessel the Doctor may provide advice upon agreement with his company. None company contract vessels would not be allowed in our exclusion zone and would be advised to make best possible speed to Sittwe or Kyauk Phyu. In the case of one of our company contracted vessel, providing the vessel met the required criteria for coming alongside and in the case of Life threatening injuries or medical condition, providing management approval was given a helicopter medivac should be acceptable and facilitated. It’s unlikely that it would be considered to transfer the SHP Doctor off the platform to assist as that would leave the platform exposed to no medical health care provision.

A key duty of the field standby vessel is to maintain a radar watch and provide the first indication of any potentially suspicious vessel activity. A relatively small vessel has the potential to inflict significant damage to the production platform. It is therefore imperative that no unauthorized vessels are allowed to encroach within the platform's exclusion or approach zones without a clear understanding of their intention and capabilities. However, bear in mind that from our experience, the small wooden fishing vessels which have breached the exclusion zone in the past have poor radar reflecting properties and are usually only a mile off before they get visually spotted, and at night time they are in full stealth mode with no navigation lights exhibited.

7.5.8 Serious Illness or Injury

If injured or ill personnel are discovered, by anyone at any time, the correct approach shall be:

- Notify the CRO that an incident causing injury has occurred or that an illness has been identified.
- CRO immediately informs the OIM who will decide if a precautionary GPA muster is required as quickest way to assemble the medical team is required and /or Process shut down is required, if Process SD required then initiate GPA.
- Ensure there is no risk of personal injury before approaching the casualty.
- Leave the casualty in place unless it is necessary to move them from danger.
- If required / possible, Administer First Aid.
- Stay with the casualty until relieved.

- Doctor and Medical team arrive on scene and assess patient.
- Correct Emergency response is initiated.

If it should become necessary to evacuate personnel out-with their normal rotation this decision will be taken by the SHP Doctor. He shall consult with his onshore medical support expertise when a significant accident or illness is deemed to be of such a nature that offshore medical care is not adequate.

In the event of a sudden unexpected death caused by medical illness or accidental trauma occurring offshore, the SHP Doctor must be contacted immediately. In the interests of documentary evidence, a Doctor is the only person who can pronounce "extinction of life" and in consultation with LEO our Contracted Health Provider will confirm and the extinction of life with date and time thereof and suspected causes. The report of death will be issued to PIC Management, SHP MOGE Representative and if cause of death requires, Kyauk Phyu Township Medical Officer / Hospital Medical Representative, and the KPU Police, who may require to visit the scene for further investigation. Under Myanmar Law may have to have Police flown offshore to investigate as legal requirement.

In the event of death by accidental trauma, in tandem with the Doctors Medical report, The Safety Officer should secure the scene immediately it safe to do so along with taking evidential photos to be used in subsequent Incident Report.

Refer also to Company document YGG-SF-EP-03-06-0022 Medical Evacuation Plan.

A completed medevac Doctors report form is required to accompany any casualty or deceased person, that is being removed from the platform. Refer to Injury / MEDEVAC Action Plan 17.18.

7.5.9 Radioactive Source Incident

The use of radioactive sources on the platform are categorized as either for measurement, metering, logging, inspection or survey use.

The use of radioactive sources for surveying purposes will normally be restricted to well intervention use as a down hole logging tool. For NDT purposes such as wall thickness testing or welding inspection normally contractor will provide a Radiation Generator to emit the required x-rays as fixed sources are more difficult to import and obtain the required licensing for. While on the platform, radioactive sources shall be fully accounted for by the responsible contract company technician. It is this technician's responsibility to use the source under strict guidelines and never to expose platform personnel to harm from its use.

Radioactive Cs-137 sources are utilised in the Phase 2 well flow measurement Roxar Multi-phase flow meters. Four (4) of these are installed in the process area, Main-deck North on the incoming lines from Phase 2 sub-sea fields.

Company guidance is contained in document YGG-OM-MP-03-07-0010 Control of Radioactive Substances, which includes emergency response requirements for potentially dropped Cs-137 source containers and recovery into safe storage. Special Radioactive Source recovery equipment is provided on SHP for use in this emergency scenario.

In the unlikely event of a radioactive source becoming misplaced the actions required by procedure should be:

Report the loss, drop or otherwise potentially exposed source to the CRO immediately when the loss is discovered and maintain the suspected area(s) under barrier control as per PTW.

The CRO shall inform the OIM and make a PA announcement for personnel to comply with restrictions in place. Non-essential personnel movements restricted to LQ areas only or consider precautionary down-manning until source is located and made safe.

The OIM shall contact the Duty Manager and report the loss.

The Contractors trained site personnel shall commence a radioactivity meter check in the area of the source's last known position. For MPFM sources the Safety Officer will conduct a dose-rate survey with the Tracerco meter and establish a safe approach to recover the source container and place it in the specially provided emergency recovery box, where it shall remain until a specialist contractor can be mobilized to assist with re-instatement or removal and replacement. Radiation PPE is provided for the person assigned to recover the source and 'lead-shot' bags are provided in the Radiation Emergency Response kit which can be used to temporarily cover the source container, if necessary.

For a lost source, the search area is widened until the lost source is found or confirmed as no longer on the facility. If lost overboard, a report to the Authorities via MOGE must be made.

OIM to inform Duty Manager of progress and request input from the Contractor or Company RPO. The operating procedures for the use of radioactive sources as supplied by the NDT or gauging company shall be referred to as the guidelines for emergency management of an incident involving a third party source and Company procedures are to be followed for an incident involving the sources provided for use in the MPFM.

7.5.10 Bomb Threat

Offshore installations are particularly vulnerable targets for agencies that would like to make particular statements. No country is exempt from this type of threat. They are high value assets with a significant business profile.

A bomb threat is unlikely to be relayed directly to an offshore installation. This information is more likely to be sent to the Company local business premises by hard copy, electronic means or telephone. The initial point of contact may be a receptionist or secretary. These employees require to be prepared for this eventuality. They need to be able to follow a structured response to the receipt of any threat. This will be the same action if the threat is delivered to any other point of contact. The form for the response to a bomb threat, by telephone, shall be available to all administrative offices. See appendix 18.13 - Bomb Threat Form.

When this type of threat is received, especially by telephone, certain information is vital. **Where** and **When** the threat is to be carried out, are important. It is also important to listen to what is being said and how. Is the person lucid, is this a prepared statement, how much do they know about the installation, what does the bomb look like? Record the exact wording of the threat as much as possible. Note the caller's voice, manner, language and background noises. Try to determine the appearance, shape and type of bomb and what will cause detonation.

If a bomb threat has been received the place and activation time, as declared by the perpetrator(s), are the priorities. Whoever takes the call must pass this information to the Duty Manager immediately. Offshore or onshore a time-line shall be developed to allow for facility shut down, blowdown and evacuation. If the facility is the target and there is time to carry out a search of all areas, then this could be an acceptable plan:

- The first priority must be the safety of personnel. (Down-manning to be considered.)
- Search the area of the main evacuation points, helideck, muster points and lifeboats.
- Ensure evacuation routes are clear.

- No-one knows what a bomb looks like, if something is out of place be suspicious.
- Follow the priorities as previously established.

The time line, if provided should be followed by the Emergency Commander. Consideration shall also be given to possible radio interference or movement sensitivity. The Duty Manager should be prepared to involve outside resources, police, military, and or specialist agencies. The police will have an emergency response that probably relies heavily on facility participation by POSCO INTERNATIONAL personnel. A structured, planned response is recommended and will depend on the circumstances of the case.

7.5.11 Cyclonic Storm

7.5.11.1 Overview

A cyclone can be very damaging and may even threaten the integrity of the Platform or cause unnecessary loss of life. Weather forecasts are received on the facility and will give some warning of the approach of a storm.

Refer to Tropical Storm (Cyclone) Response Procedure, document No. YGG-SF-EP-03-06-0011. Tropical Revolving Storm (TRS) may occur in the Bay of Bengal at any time of the year but is most likely during the Monsoon transition periods and through the Southwest Monsoon period, April through to November.

During the “Cyclone Season”, the Company will heighten its awareness of any such possible threat, with closer monitoring of weather forecast data, in preparation for any required Company action.

Such actions may involve suspension of work activities (especially all over the side work), securing of the asset(s), Down-Manning of non-essential support personnel and possible total Down-Manning of personnel to a safe haven and sail away of Field Support Vessels.

Whenever possible any precautionary down manning of personnel by helicopter should be carried out when the weather is still good enough for the standby vessel to be able to launch and recover its FRC in event of helicopter ditching and completed before the weather exceeds only scramble net recovery available. Refer to cyclone procedure and in field vessel procedure for weather limitations.

7.5.12 Pipeline / Flow line Rupture

7.5.12.1 Overview

Rupture of any subsea hydrocarbon transport pipeline, jumper or manifold piping will always have a detrimental effect to PIC business. The extent of the effect will depend on many factors and will almost certainly depend on the circumstances of the individual case. Elements such as pipeline affected, physical location of the rupture, cause / mechanics of the rupture, proximity to potential third parties, etc.

The SHWE project includes sub-sea pipelines/flow-lines as follows;

Phase 1:

One 14” Flow-line from Mya North to SHP (approximately 12 kilometers long).

One 32” Pipeline from SHP to the Land-fall near Kyauk Phyu on Ramree Island (approximately 105 kilometers long).

Additionally, there are 4 x 6" diameter field jumpers between Subsea wells and the Mya North manifold. These are approximately 16 meters long.

Phase 2:

One 12" Flow-line, from SHWE Subsea development to SHP (approximately 2.4 kilometers long).

One 6" Flow-line from Well SHD-M to SHWE Subsea Manifold (approximately 9 kilometers long).

One 14" Flow-line, from SHWE Phyu Manifold to SHP (approximately 20 kilometers long) inclusive of an in-line tee.

One 6" Flow-line from Well SPD-D to the SHWE Phyu Manifold (approximately 5.5 kilometers long).

Additionally, there are 8 x 6" diameter field jumpers between Subsea wells and the manifold, PLETs and in-line tee. These are up to 45 meters long.

Phase 3:

Phase 3 (LP booster compressors platform, bridge linked to SHP) relates to the inter-field flow-lines which may operate at pressures below the sea-water depth hydrostatic pressure. In the event of a rupture in these areas, sea water may initially enter the flow-lines.

The pipeline risks from highest to lowest potential (Volume and pressure) will be;

- (a) 32" export pipeline from SHP to Kyauk Phyu landfall.
- (b) 14" inter-field flow-line from SHWE Phyu to SHP.
- (c) 14" inter-field flow-line from Mya North to SHP.
- (d) 6" Well flow-line from SHD-M to the SHWE Subsea manifold.
- (e) 12" flow-line from SHWE Subsea manifold to SHP.
- (f) 6" Well flow-line from SPD-D to SHWE Phyu Manifold.

Detection of Rupture

Detection of a pipeline rupture will be by different means at different phases of the SHWE project.

Until phase 3 it is likely that flow-line ruptures will result in produced fluids escaping into the sea whereas in later field life, post phase 3, a rupture may be detected by sea water ingress into a flow-line. The 32" export pipeline from SHP to OGT, due to operating pressure, will always initially result in gas release into the sea.

Potential actions on detection

Depending on the mechanics of the rupture (what happened), method of detection (how do we know) and the location of the rupture (where did it happen), there may be an immediate risk to personnel on a vessel or fixed installation. This risk must first be mitigated by moving the vessel upwind or commencing down-manning of a fixed facility.

If the rupture is causing leaked pipeline fluids to escape into the sea, the composition will be either 'produced well fluids' for all lines upstream of SHP or conditioned export gas, in the case of the 32" pipeline to shore.

Produced water should not present a hazard and liquid condensate would evaporate and disperse readily. The produced gas presents the greatest risk with the potential for fire, explosion and reduction in buoyancy for vessels located in any large area affected by gas bubbles rising to surface at the vessel.

Mitigation

In all cases, the Duty Manager shall be called and all known details relayed. If attempts to start depressurisation of the pipeline are approved, this may be commenced by the most judicious method, after shutting down all production from subsea and surface wells. The various pipelines can be blown-down to the SHP platform flare but this operation may take days, although the line pressure would only need to be reduced to below the sea water hydrostatic pressure at the point of rupture, until a repair plan is approved.

In the event that gas and condensate are rising to the sea-surface, a PIC chartered standby vessel should be assigned (if available) to take up station upwind and at a safe distance from the 'event' to warn any other surface vessels of the hazard. Radio broad-casts of a SÉCURITÉ message should be made from the nearest facility or vessel to the pipeline incident to warn other surface vessels of the hazard. A Notice to Mariners should be issued to Myanmar authorities via MOGE

The Yangon, Emergency Control Centre shall be manned as soon as possible to provide support and guidance to site personnel.

7.5.13 Pandemic / Epidemic of an infectious disease

Response to identification of an infectious disease at site will depend on many variables and advice is to be sought from Yangon office and through the contracted Medical Health Services provider. As witnessed during the COVID-19 Pandemic, advice specific to the Energy sector was often confusing but all recommendations from the Myanmar Ministry of Health and Sports (MOHS), regional and township Chief Medical Officers (CMO) and Company HQ shall be followed.

When a formal list of symptoms has been issued, all site personnel shall be made aware of what to look out for and report immediately to the site Doctor, if they develop any such symptoms.

The OIM will decide whether to arrange demobilisation to Yangon and a recommended medical centre or to isolate the potentially affected individual until the site Doctor has sufficient information to propose demobilisation or other course of action.

In the case of a Pandemic being declared and test kits being available, Company will procure the most suitable rapid test kits available and decide on a testing regime which will also involve quarantine of personnel, before travel to site and on return from site, if required by MOHS.

Site actions should initially also include setting up one or two cabins for isolation of suspected cases and cordon off access to that 'isolation area' except for the site Doctor and provide a method of safely delivering food and water to the isolation area until further actions are approved. The suspected case(s) and anyone who was sharing a cabin with the person presenting symptoms should be isolated and the original accommodation space, cleansed in accordance with published methods, then left unoccupied for the published recommended period until reused.

As the actions to be taken for any infectious disease will depend on the virulence and method and rate of transmission, no fixed guidance is presented in the action plans attached to this procedure. Specific guidance and action plans will be drawn up as information becomes available, as was the case during the COVID-19 Pandemic of 2020.

Note that P&L Aviation team must be consulted to discuss (and implement if possible) any requirements from the Rotary wing service provider, for transportation of personnel who may be carrying an infectious disease.

7.5.14 Earthquake

Earthquakes are a seismic event caused by a sudden slip on the fault line of 2 of the earth's adjacent tectonic plates. The tectonic plates are always slowly moving, but they get stuck at their edges due to friction and when the stress on the edge overcomes the friction the energy released travels through the earth's crust transmitting up our platforms piled support jackets and causes the shaking that's felt in the topsides. Earthquakes occur in the crust or upper mantle, which ranges from the earth's surface to about 800 kilometers deep (about 500 miles). The strength of shaking from an earthquake diminishes with increasing distance from the earthquake's source (epi-centre), so the strength of shaking at the surface from an earthquake that occurs at 500 km deep is considerably less than if the same earthquake had occurred at 20 km depth. Small earthquakes last for a just few seconds, moderate earthquakes typically last around 10-30 seconds and extremely large earthquakes can last several minutes.

Myanmar and the south-east side of the Bay of Bengal are in close proximity of the fault line between the subducting Indian Tectonic plate and the converging eastern end of the Eurasian plate (also called the Burma microplate) in this region. As of November 2023 Myanmar has had 3 earthquakes in the past 7 days, 5 in the past 30 days, and 58 in the past 365 days, all of Magnitude 1.5 or greater, with the largest in Kachin state which was of 5.8 Magnitude. From this evidence, risk of an earthquake affecting our platform is a credible risk and in the past since SHP was installed offshore, we have records of the platform being shaken, from minor tremors to tremors large enough to cause people to be unable to walk unaided, though fortunately no reports of any damage.

Occasionally, small earthquake tremors of no consequence can be noted at the platform by either feeling the swaying motion or noting movement of the liquid in your drinks cup or water bottle. No action is required for these small tremors.

When larger magnitude earthquake tremors, suddenly hit the Platform's and the seismic wave induced motions which cause personnel to be off balance and immediate concern for their own safety, personnel should take the following action;

"Drop" – "Cover" – "Hold" are the 3 words of earthquake - "what to do" safety advice given by most Safety Organisations world-wide and hold true for all our Posco Facilities. As it stops you from being knocked over, makes you a smaller target for falling and flying objects, and protects your head, neck and vital organs.

- **DROP** down on your hands and knees. This protects you from falling over but lets you move if you need to
- **COVER** your head and your neck with your arms and hands. If there is a sturdy desk or table within close range, scuttle underneath it.
- **Hold** on to any fixed structure within your reach.

Offshore during an earthquake, the biggest risk to personnel from the earthquake shaking is the potential for personnel to be injured, by being thrown off balance onto the deck, into equipment, down access stairs, out of bunk beds, etc.

For information of recent earthquakes near Myanmar, visit:
www.earthquaketrack.com/p/myanmar/recent

8.0 EMERGENCY RESPONSE ORGANISATION

These Emergency Response Procedures detail the organisation and predetermined actions required to respond effectively to foreseeable incidents on or in the immediate vicinity of the SHWE production platform. The incident types addressed cover a broad range of scenarios including those associated with major accident hazards.

POSCO INTERNATIONAL and the SHWE production platforms SHP & SHK are fully prepared to respond to any emergency situation, which threaten the platforms. The facility has been designed and equipped with sufficient emergency response equipment and facilities to ensure safety of personnel. Details of the emergency response facilities are included in this plan. In addition, these detailed Emergency Response Procedures are made available to all personnel.

An emergency response organisation has been established for the SHWE production platforms and is ready to respond as required to any potential emergency situation.

To ensure that all personnel are fully aware of the emergency response actions and the facilities available in the event of an emergency situation, induction training, exercises and drills are regularly held both on the platforms and onshore.

The following organisation is in place to respond to a SHWE Platforms SHP & SHK operations emergency:

- The Emergency Management Team (EMT) led by the OIM. (Emergency Commander)
- The Emergency Command Centre from which EMT will operate.
- Emergency Response Teams
- Medical Response Team
- Main Muster Checkers
- Lifeboat Coxswains

8.1 SHWE Production Platform EMT Organisation Chart (Example)

posco INTERNATIONAL		SHP Emergency Management Team Structure.		SHWE	
Emergency Command Center (ECC) Level 2. Muster point 2. Telephone 559.		EMERGENCY COMMANDER OIM Derek Clark		Valid from Date Thursday, January 12, 2023	
CONTROL ROOM TEAM Duty CRO Ferdinand Burog Off-Duty CRO 'Edward Esteban/Myo Htay Aung	EMERGENCY COMMUNICATIONS Radio Operator Saw Ne He Miah	EMERGENCY COORDINATOR Production Supervisor Soo Bum Jung	SCRIBE Shift Supervisor Gordon John Rhind		
SCRIBE Shift Supervisor Anthony James Kirby	MUSTER COORDINATOR Admin Clerk Wai Lin Aung	- Construction Superintendent Paolo Benaglio	EMERGENCY PLAN CHECKER Maintenance Supervisor Colin McDonald		
RESPONSIBLE ELECTRICAL PERSON Electrical Supervisor Aung Shwe Htoo					
Level 0. General Muster Area Muster point 1. Telephone 550.					
LIFEBOAT 1 - MUSTER CHECKER Crane Operator Aye Min Thant LIFEBOAT 1 - ASSISTANT CHECKER Lead Production Technician Humphrey LIFEBOAT 1 COXSWAIN Production Technician M Naw Mai	LIFEBOAT 2 - MUSTER CHECKER Planner Soe Naing LIFEBOAT 2 - ASSISTANT CHECKER Comms & IT Tech Kyaw Kyaw Thu LIFEBOAT 2 COXSWAIN Mechanical Technician Sit Naing	LIFEBOAT 3 - MUSTER CHECKER Instrument Supervisor Elmer Cruz LIFEBOAT 3 - ASSISTANT CHECKER Production Technician Saw Gur Gler Moo LIFEBOAT 3 COXSWAIN Production Technician Soe Htut Kyaw	LIFEBOAT 4 - MUSTER CHECKER - LIFEBOAT 4 - ASSISTANT CHECKER - LIFEBOAT 4 COXSWAIN -		
Levels 0 and 5 Firemans Lockers Muster Points 3 and 4. EMERGENCY TEAM LEADER Safety Officer Win Htet Level 0. Telephone 551. EMERGENCY RESPONSE TEAM 1. TEAM LEADER Mechanical Supervisor Sann Myint Tun (02) ERT 1 MEMBERS Lead Mechanical Tech Ye Myo Aung (03) Instrument Technician Htun Htun Linn (04) Production Technician Pyae Phyo Kyaw (05) Lead Production Technician 'Htet Naing Htoo (06) Electrical Technician Than Naing Oo (07)			Level 5. Telephone 552. EMERGENCY RESPONSE TEAM 2. TEAM LEADER Services Supervisor Renan Vasquez (01) ERT 2 MEMBERS Lead Electrical Technician Myo Kyaw (02) Instrument Technician Nay Lin (03) Electrical Technician Zin Bo Oo (04) Turbo Technician Aung Chan Thar (05) Production Technician Than Htwe Aung (06)		
Medical Waiting Room. Level 3. Muster Point 5. Telephone 553. MEDICAL TEAM LEADER Doctor Dr. Wunna Kyaw			Medical Waiting Room. Level 3. STRETCHER TEAM MEDICAL TEAM GUIDE Instrument Technician Ye Kyaw Thu Mess Boy Zaw Htet Room Boy Saw Myo Chit Aung Room Boy Nay Myo Naing Asst Cook Sithu San Maung		
Helideck Crews 1) Renan Vasquez 2) Win Naing 3) Saw Tun Lin Oo 4) Than Min Htay 5) Saw Aung Min Soe					

9.0 ESCAPE EVACUATION AND RESCUE

9.1 Objective

POSCO INTERNATIONAL is committed to providing adequate facilities, arrangements, resources, and training to facilitate the safe evacuation and escape of personnel from the SHWE Platform in the event of any emergency threatening life and/or the structural integrity of the platform.

As part of this objective, the SHWE Platform has a secure muster area, Temporary Refuge. An alternative muster point is provided adjacent to the lifeboat embarkation point, for each life-boat, if access to the main muster area is restricted by an emergency such as an accommodation fire.

In the event of an incident in an area of the platform where entrapment is possible local escape and evacuation facilities / devices are provided, as far as is reasonably practicable, to allow people to move away from that area either to the Temporary Refuge or directly to the sea.

9.2 Escape

Consideration has been given to where personnel work and how they would get to the TR in the event of an alarm or the discovery of an incident.

Primary and alternative escape routes are clearly marked and sign-posted throughout both SHP & SHK platforms and interconnecting safe access Bridge. Their description forms a part of the platform induction process for all personnel.

Davits, Escape descent devices, Harnesses, Lifejackets and Life rafts are located at 4 locations on SHP and 1 Location on SHK to facilitate an escape directly to the Sea, for use when personnel find it impossible to reach the TR or the alternative life boat muster point 6 on SHP during a major emergency incident.

9.3 Temporary Refuge

In the event of an emergency that could lead to eventual evacuation, escape and rescue from the platform all non-essential personnel will, at the annunciation of the alarm, muster in the Temporary Refuge on level 0 of the accommodation.

9.4 Personal Survival Equipment / “Grab Bag”

Each member of the platform crew has been allocated an individual package of safety equipment. This equipment is stored within their allocated cabin in the accommodation wardrobes. This equipment is intended to be used as a means of affecting an escape from a smoke logged accommodation and includes a 10-minute air escape set, torch and a life jacket. Personnel who are in their cabins at the time of an alarm should bring their grab bag with them and where necessary utilising the equipment there-in when required. An adequate number of life-jackets are available at the boat stations.

10.0 PRECAUTIONARY DOWNMANNING AND EVACUATION

10.1 Precautionary Down manning

The severity of the incident, the Emergency Response plan or the decision of the Emergency Commander may dictate that an evacuation is the preferred response to the incident. This will be done in a controlled fashion using the normal means of getting to and from the installation — in most cases by helicopter. If time and weather permits this would be the choice for all partial or complete down-manning. An alternative means of evacuation is provided where the primary method cannot operate because of the nature of the incident, environmental conditions or due to the insufficient capacity to evacuate everyone in the time available. If this is the case the lifeboats are considered as the principal means of down manning. Whenever down manning is being considered finding a place of safety is the priority.

The SHWE production platform is an isolated facility that is not attached to or close to a safe haven. The platform supply vessel or Stand-by Vessel can provide a place of safety for personnel leaving the platform by life boat, if a safe means of transfer is possible. Otherwise the Supply / Standby vessel will only provide guidance relating to sailing directions to bring the boats into close proximity with each other, clear of the emergency and possibly sailing directions or tow, to shore. The Standby and Supply Vessels do not have a helideck so transfer of personnel by helicopter is not possible. The helicopter can provide only a limited down manning potential and is not normally used for emergency down-manning but may present the best option for medevac in the case of casualties caused by the emergency or while responding to it.

Transfer of personnel to a Supply or Standby Vessel is possible only by personnel transfer basket, if it is safe to do so, or there are no safer alternatives. Fast rescue craft from these vessels can be used to rescue personnel in the water. **Use of the boat landing is not a safe, approved method of abandonment from an emergency on the platform.**

Whenever partial down manning or total evacuation is being considered this must take place according to a relevant plan. When the decision is taken to down man, the down-manning groups/priority identified in the POSCO INTERNATIONAL Tropical Storm (Cyclone) Evacuation Plan YGG-SF-EP-03-06-0011, will be followed.

Four Totally Enclosed Motor Propelled Survival Craft, (TEMPSC) are provided on the Platform. They are situated on the West face of the platform on the accommodation Level 0. These lifeboats are rated for 80 personnel each (but it is recommended not to exceed 72 people in any one lifeboat). This provides redundancy in use. They are davit launched with standard release systems for operating the hooks. Every person on board is allocated to a specific lifeboat and this allocation determines their particular muster station within the TR. Other means of escape are life rafts and descent devices to the sea, essentially available for personnel who are prevented from making their way to the TR and hence utilising the life boats. Personnel descent devices (Protecta “Sauvmatic”) are located at the life-raft stations situated where the elevation above sea level would make it hazardous to jump direct to the sea.

10.2 Evacuation

If total evacuation from the platform is necessary the Emergency Commander shall take into account the weather conditions, sea state, available external support and the time left to select a method of evacuation, appropriate for the situation, in order of preference.

- Helicopter
- Life boat
- Standby vessel

- Life raft
- Direct to the sea

Abandonment (total evacuation) will only be carried out under the express instructions of the Emergency Commander (OIM). The platform log will be removed, command of the situation will be handed over to the standby vessel's Captain, the Duty Manager shall be informed, all platform facilities shall be shut down except the fire pumps and UPS and a Mayday message shall be broadcast, unless all personnel are accounted for on the standby vessel.

11.0 EMERGENCY COMMUNICATIONS

Telephone communications within the living quarters block are provided by a PABX system which is similar to any office communications system.

Efficient communication is essential during any emergency and the importance of maintaining uninterrupted communication with the site involved in the emergency cannot be emphasised too highly. The following general rules shall be adhered to in an emergency:

- All communications except those directly related to the incident shall cease.
- Messages between the facility and Yangon Office, regarding the emergency shall, whenever possible, be by e-mail or telephone, thus maintaining some degree of confidentiality. This is of particular importance with regard to the names of casualties.
- Emergency calls should be brief and accurate.
- Telephone messages regarding personnel on board (POB), including casualties, shall be followed up by hard copy through e-mail, whenever possible.
- An accurate log of all calls made during an emergency shall be kept.
- During emergency response and immediately thereafter, all other external transmissions from the platform by any means must cease unless authorised by the OIM.
- Personal communications to onshore family members etc. may only recommence after confirmation from Yangon Management that this is permitted. This is because inaccurate messages to anyone outside the Company organization can result in media attention and Company reputation issues.

N.B. Although it is considered unlikely, it is possible during an emergency that direct communications between the platform and the onshore Emergency Control Centre could be lost. In this case, it will be necessary for communications to be routed through a third party, for example, OGT facility or the standby vessel.

12.0 DRILLS AND EXERCISES

12.1 Introduction

The offshore workforce requires to be well trained and practiced in reacting to any reasonably foreseeable event which could occur on the SHWE production platform, for example, fire and explosion, structural damage, ship collision.

The reasonably foreseeable events have been identified and action plans and Emergency Commander and CRO prompt sheets have been developed. The action plans contain up-to-date information on the potential hazards and guidance to be followed for all such events.

Section 18.0 of this manual, which contains the action plans, is designed to be extracted and kept as a separate controlled copy immediately available in the Emergency Command Centre for use by the Emergency Management Team.

12.2 Drills

Regular musters, drills and training exercises are carried out on the platform to ensure that all personnel are familiar with the actions to be taken in the event of an emergency situation arising. A programme of musters and drills exists, provided annually from the HSSE department. On completion of every drill a debrief meeting should be held to identify areas of concern and agree on appropriate remedial actions or procedural changes.

12.3 Exercises

In addition to site drills, emergency response “exercises” are held involving both the onshore and offshore personnel and scenarios are enacted to familiarise all personnel with their responsibilities. These are planned and directed by the HSSE department and may involve external parties.

All drills and exercises are monitored to assess the effectiveness of the procedures and the personnel involved and, where relevant, that corrective measures are implemented. These corrective measures may involve revisions to plans, implementation of further training for personnel or improvement of safety equipment or facilities.

12.4 Drill Scenario Plan

A method for preparing the ERT for various emergency scenarios and to incorporate the most important lessons learned from drills or exercises is to develop a scenario plan.

This is a form used to work through any emergency scenario and record proposals for possible emergency response. By preparing a scenario plan for foreseeable incidents, the EMT / ERT will have some guidance available.

An example is presented on the following page, for guidance.

Fire & Explosion Drill at process area

Date & Time : TBC
 Location of fire drill : Cellar Deck North-East, Habitat#11 (store of welding & heat treatment equipment)
 Reported to CCR by : AECC Scaffold supervisor via **Walkie-Talkie**

Scenario:

- ☐ On the day of scenario drill, about 06:30hr, fire was occurred at Cellar deck , Habitat#11. Some of electric cables/welding cables at Habitat#11 were overheating and catches fire which quickly spreads to nearby combustible materials in that area. It was noticed by AECC scaffold supervisor who was working nearby and immediately reported to CCR via Walkie-Talkie about the situation of fire.

Mustering:

- ☐ General alarm sounded and all personnel proceed to their respective mustering stations .
- ☐ Necessary Blow down/Shut down will be carried out under decision making by OIM. ECC team will communicate with all muster stations to ensure no body is missing and informed ERT team to make ready to go the scene.
- ☐ Non-essential personnel to remain at muster point and await instruction.

Actions:

- ☐ CCR report to OIM about incident after receive a call and subsequently activated GPA to muster.
- ☐ The standby boat was instructed to perform 360 of Platform from safe distance and report.
- ☐ After completion of full muster & complete BD/SD, ERT Team#01 to be mobilized for boundary cooling, fire fighting and necessary investigation.
- ☐ Medical Team to be standby for any assistant.
- ☐ ERT team extinguished the fire upon arrival as per procedure and report to OIM/ECC after situation was under control and drill complete.

Ideal Effects:

- ☐ Initiated ESD level-1 with blow down and deluge system was activated.
- ☐ Near by structures and pipes to be damaged due to the fire and smoke was producing out from that area.
- ☐ No causality and only property damages.

Other Consideration:

- ☐ If there is a fire at Habitat, ERT have to confirm that all electric supply to Habitats are disconnected before extinguish.
- ☐ ERT team consider to wear full BA just before approaching to the scene even though there is open space because of the smoke.
- ☐ BACO controller to record whoever putting on SCBAs mask and consistently monitor and reminding.
- ☐ Consider wind direction & laying out fire hoses before approaching to the scene and necessary boundary cooling to be done before putting out fire.

13.0 ORGANIZATION AND ARRANGEMENTS

13.1 Organisation

To ensure that there is no conflict between personnel performing multiple functions, the roles of individuals must be clearly identified. These Emergency Response Plans are intended to help ensure that no conflicts occur as a result of personnel performing multiple functions and also to ensure that tasks are not duplicated.

13.2 Arrangements

In all foreseeable circumstances the arrangements outlined above, provided for emergency response and the management of these arrangements, will help ensure the safety of all persons on-board the platform or involved in activities connected with it.

These arrangements include:

- Planning for the emergency.
- The prevention, detection, mitigation and control of incidents.
- Manual intervention.
- Informing all personnel of what their response to emergencies should be.
- Informing all personnel of hazardous conditions, their response, and accounting for all personnel following an incident.
- Recovery of personnel on or near the platform.
- The TR, including escape routes to and from it.
- Evacuation.
- Escape, rescue and recovery.
- Coordination of the response and the cooperation of all personnel involved.
- Onshore support and response.

The planning and consultation process has provided arrangements for the rapid deployment of the POSCO INTERNATIONAL Emergency Management Team in Yangon whereby a team of managers and engineers are available to support any requirement from the SHWE production platform Person in Charge / or from other Company facilities, contractors or Yangon based company personnel.

13.2.1 Planning

The POSCO INTERNATIONAL Emergency Response Plan, as part of the HSE management system, benefits from industry best practise. It is recognized that although legislation, design and best practice provide measures that position risk "as low as reasonably practicable" there will be residual risks and emergencies may still arise which could endanger personnel.

By recognizing and assessing these residual risks and what the results of incidents could be and making adequate prior arrangements, planning can be carried out so that if there is an incident there will be an immediate and appropriate response. The overriding strategy, which is stated and implied by this plan, is that the preservation of life and the prevention of injury are of paramount importance.

The safety of personnel including those directly responding to the incident will always take priority over environmental, property and business considerations and the actions described in these Emergency Response Procedures will continue to reflect this.

14.0 COMPETENCE

All personnel on the SHWE production platform will have the required competencies to respond as appropriate, to emergencies. This can vary from responding to simple alarms and instructions and going to muster stations to assessing complex situations, taking correct decisions and allocating tasks. In addition to the basic and refresher survival and safety training given to all personnel working offshore, all personnel nominated for emergency duties shall be provided with specific training, coaching and assessment commensurate with duties and responsibilities.

The platform safety induction, station bill, operations procedures and instructions, and training on the platform in the operation of safety critical equipment are all elements in the instruction process. All personnel receive appropriate instruction on how they will respond to emergencies and on any safety equipment they may have to use.

Some personnel are required to fulfil a critical role when responding to an emergency. The selection process must ensure that such duties are considered. Personnel selected are required to be proven suitable. The competence of those personnel with a critical role in an emergency is established by mapping necessary training, experience and knowledge prior to appointment.

The command structure and command cell approach allows for the eventuality of the non-availability of critical personnel, their roles are covered if they are not available by others thus setting the required standard of competence of their deputy. On the SHWE Production Platform those personnel considered to have a critical role in an emergency are:

- The Emergency Commander (OIM)
- Control Room Operator
- Production Supervisor
- Safety Officer, ERTL
- Medic
- Helicopter Landing Officer and HDA
- Muster checkers and coxswains
- Muster Coordinator
- Discipline leads and team members
- Scribe / Log keeper

15.0 DETECTION OF INCIDENTS

Incidents and potential incidents are detected, at an early stage of development, by;

- Automatic detection of process deviations, leaks or fires
- Personnel on the platform
- Standby vessel

Automatic detection systems, their function, effect and their shutdown actions are described in Cause and Effects matrices. They are intended to provide a failsafe condition, generally shutdown and blown down.

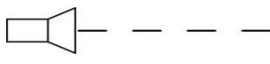



As far as possible, hazardous operating conditions and emergency situations will be prevented by continuous operator monitoring of the facilities and by the control actions of the Distributed Control System (DCS). However, where such conditions cannot be adequately controlled, final protection will be provided by the Shutdown System (SDS) and Fire & Gas System (FGS).

Standby vessels or helicopters provide a unique perspective on platform activities and conditions. They are able, by their mobility, to supply a rapid all around view of any platform incident and its possible escalation. They can provide the Emergency Management Team with valuable information from a safe distance that is not available during an incident even with CCTV. Such information can be requested by or relayed to the EMT or CCR.

16.0 APPENDICES

16.1 SHP Platform Station Bill

(Ref: Company Document SHP-SF-EP-03-03-0003 SHP & SHK Station Bill)

<div>posco</div> <div>INTERNATIONAL</div>		STATION BILL – SHP PLATFORM		(Revision 7 of SHP-SF-EP-03-03-0003)	
SECTION 1 SHP & SHK EMERGENCY PHONE NUMBER: 555					
SECTION 2 ACTION BY OBSERVER					
<div>INCIDENTS</div> <div>If you see an Incident, Accident or Unsafe Condition:</div> <div>It is your responsibility to immediately Inform your supervisor and/or the CCR. Condensate, gas, chemical or fluid leaks are a serious hazard. Your prompt action could save lives.</div>		<div>FIRE</div> <div>If you see Fire:</div> <div>Raise the Alarm - Contact the CCR by radio or from Paging point or by telephone on 555. Secure an escape route and call for assistance. If safe to do so, fight the fire until assistance arrives. If unable to fight the fire, proceed to Muster Point and pass on all relevant information to CCR.</div>		<div>MAN OVERBOARD</div> <div>If you see man overboard:</div> <div>Raise the alarm – shout “Man Overboard”. Keep the person in sight or get others to maintain a visual watch. Throw the nearest life buoy towards the person in the water. Notify the CCR of the location and drift direction of person(s) overboard.</div>	<div>INJURY</div> <div>If you see someone injured:</div> <div>Notify the CCR that an incident has occurred. Do not attempt to move seriously injured personnel unless it is to move from further Danger. Apply First AID. Stay with casualty until relieved by the Doctor or emergency response teams.</div>
SECTION 3 ALARMS					
STATUS	AUDIBLE ALARM	VISUAL ALARM	ACTIONS		
			Personnel with Emergency Duties	All Other Personnel	
Normal	None	None	Normal Duties	Normal Duties	
GENERAL PLATFORM ALARM (GPA)	Single tone sounded intermittently at approximately one second intervals 	Flashing Red Light (Rotating Beacons) 	Stop All work and leave work site safe and secure. Stop smoking. Go to respective Emergency muster stations. Act on the instructions from the Muster Checker / Team Leader / Emergency Commander via PA announcements. Report number of POB Mustered to ECC	Stop All work and leave work site safe and secure. Stop smoking. Stop Laundry machines and shut-down galley equipment. Go to LQ Level 0 Main Muster Station (1) unless directed to Alternate Muster Station (6) by PA. Act on the instructions from the Muster Checker / PA. If in your cabin, bring your grab bag with you. Report number of POB Mustered to ECC	
PREPARE TO ABANDON PLATFORM ALARM (PAPA)	Rising frequency repeated tone. 	Flashing Blue Light (Rotating Beacons) 	Withdraw from any scene of emergency. Go to alternate Muster Station (6), at lifeboats. Don Lifejacket. Coxswain's prepare lifeboats for boarding & launching. Act on Muster checker / Emergency Commander via PA announcements or Coxswains instruction. Report number of POB Mustered to ECC	Proceed to alternate muster station (6), at lifeboats. Act on Muster checker / Emergency Commander via PA announcements or Coxswains instruction. Don Lifejacket. Report number of POB Mustered to ECC	
SECTION 4 SHP EMERGENCY DUTIES					
ROLE	EMERGENCY STATION	MUSTER STATION	RESPONSIBILITIES AND ACTIONS		
EMERGENCY COMMANDER (OIM)	Emergency Command Centre	2	Assume role of Person In Charge. Manage the Emergency Response.		
EMERGENCY COORDINATOR (Production Supervisor)	Emergency Command Centre	2	Assume the Role of Incident Controller. Assume the role of Person In charge if the OIM is incapacitated or unavailable. Coordinate emergency operations and process status.		
SCRIBE (LOG KEEPER) (Off Duty CRO)	Emergency Command Centre	2	Record Emergency Response Log data onto White board or other media. Act on the instructions of the Person In Charge.		
MUSTER COORDINATOR (Planner/Admin)	Emergency Command Centre	2	Coordinate the POB muster. Track the movement of Personnel. Account for casualties' and record injuries as informed.		
EMERGENCY COMMUNICATIONS (Radio Operator)	Emergency Command Centre	2	Maintain external communications. Act on the instructions of the Person In Charge.		
MEDICAL TEAM LEADER (Doctor)	Medical Waiting Room	5	Report Muster numbers to the ECC muster coordinator (Ext 559) Don PPE. Prepare medical suite for casualty handling. Prepare medical crash kit pack(s) for any necessary onsite activity.		
STRETCHER PARTY (Assigned Catering Crew members)	Medical Waiting Room	5	Don PPE. Prepare stretcher (s) for onsite activity. Assist Doctor with First Aid Treatment Carry Medical crash kit, Defibrillator, Stretcher, as instructed.		
GUIDE TO MEDICAL & STRETCHER PARTY (Assigned Maintenance Technician)	Medical Waiting Room	5	Guide the Medical Team & Stretcher Party to the required location based on instruction from the Emergency Coordinator.		
EMERGENCY RESPONSE TEAM LEADER (Safety Officer)	Firemen Room (LQ Level 0)	3	Report Muster numbers to the Muster Coordinator (Ext 559). Don protective clothing. Inform ECC of readiness. Act on the instructions of the Emergency Coordinator. Formulate and action site response.		
EMERGENCY RESPONSE TEAMS 1	Firemen Room (LQ Level 0)	3	Report Muster numbers to the ECC Muster Coordinator (Ext 559). Don protective clothing. Inform ECC of readiness. Act on the instructions of the ERTL / Emergency Coordinator.		
EMERGENCY RESPONSE TEAMS 2	Firemen Room (Upper Deck)	4	ERT2 Leader to report Muster numbers to the ECC Muster Coordinator (Ext 559). Don protective clothing. Inform ECC of readiness. Act on the instructions of the ERTL / Emergency Coordinator		
MUSTER CHECKERS (As designated)	Main Muster Station	1	Coordinate the POB Muster. Report the Muster numbers to the ECC.		
COXSWAINS (Assistant / Alternative Coxswains)	Main Muster Station	1	Report to Muster Checker. Await Instruction: Responsible for safe preparation, boarding, launching and operation of TEMPSC.		
NON-ASSIGNED PERSONNEL & VISITORS	Main Muster Station	1	Report to Muster Checker. Remain quiet and await instruction. Don Lifejacket – Do NOT Inflate		
SECTION 5 MUSTER STATION ALLOCATION			SECTION 6 LIFEBOAT LOCATIONS – ACCOMMODATION LEVEL 0.		
MUSTER STATION 1 Location: LQ Level 0 – TV Room In Charge: Muster Checkers		MUSTER STATION 2 Location: LQ Level 2 - ECC In Charge: Emergency Commander			
MUSTER STATIONS 3 & 4 (ERT 1. ERT 2) Locations: ERT 1 = LQ Level 0 - Firemen Room ERT 2 = Upper Deck - Firemen Room		MUSTER STATION 5 Location: LQ Level 3 – Medical Waiting Room In Charge: Doctor			

MUSTER STATION's 7 & 8 SHK Alternate MUSTER STATION 7 Location: SHK Cellar Deck at or in Firemen's Equipment Room. SHK Secondary MUSTER STATION 8 Location: SHK Cellar Deck at Life rafts (SE corner)	MUSTER STATION 6: Lifeboats & SHP Alternative Mt Point Location: Level 0 Adjacent to assigned Life Boats In Charge: Muster Checkers Personnel will be advised by public address when t to the SHP alternative muster station.	
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16.2 SHK Platform Station Bill

(Ref: Company Document SHP-SF-EP-03-03-0003 SHP & SHK Station Bill)

<div>poscoINTERNATIONAL</div>		<div>STATION BILL – SHK PLATFORM (Note: SHK Maximum POB 48)</div> <div>(Revision 7 of SHP-SF-EP-03-03-0003)</div>							
SECTION 1 SHP& SHK EMERGENCY PHONE NUMBER: 555									
SECTION 2 ACTION BY OBSERVER									
<div>INCIDENTS</div> <div>If you see an Incident, Accident or Unsafe Condition:</div> <div>It is your responsibility to immediately Inform your supervisor and/or the CCR.</div> <div>Condensate, gas, chemical or fluid leaks are a serious hazard.</div> <div>Your prompt action could save lives.</div>		<div>FIRE</div> <div>If you see Fire:</div> <div>Raise the Alarm - Contact the CCR by radio or from Paging point or by telephone on 555. Secure an escape route and call for assistance. If safe to do so, fight the fire until assistance arrives. If unable to fight the fire, proceed to Muster Point and pass on all relevant information to CCR.</div>		<div>MAN OVERBOARD</div> <div>If you see man overboard:</div> <div>Raise the alarm – shout “Man Overboard”.</div> <div>Keep the person in sight or get others to maintain a visual watch.</div> <div>Throw the nearest life buoy towards the person in the water.</div> <div>Notify the CCR of the location and drift direction of person(s) overboard.</div>		<div>INJURY</div> <div>If you see someone injured:</div> <div>Notify the CCR that an incident has occurred.</div> <div>Do not attempt to move seriously injured personnel unless it is to move from further Danger.</div> <div>Apply First AID.</div> <div>Stay with casualty until relieved by the Doctor or emergency response teams.</div>			
SECTION 3 ALARMS									
STATUS		AUDIBLE ALARM		VISUAL ALARM		ACTIONS			
Normal		None		None		Personnel with Emergency Duties		All Other Personnel	
GENERAL PLATFORM ALARM (GPA)		Single tone sounded intermittently at approximately one second intervals		Flashing Red Light (Rotating Beacons)		Normal Duties		Normal Duties	
						Stop All work and leave work site safe and secure. Return to SHP via the Bridge Safe Access. Remember to turn SHK Bridge Access T Card. Go to SHP allocated Emergency Muster Stations Act on the instructions from the Muster Checker / Team Leader / Emergency Commander via PA announcements. If SHK Bridge Access is Unsafe / Blocked / Damaged; or ECC PA advises to Muster on SHK instead – Go to SHK Alternative Muster Station (7) at Cellar Deck NW corner at or in Firemen's Equipment Room. Report number of POB Mustered to ECC		Stop All work and leave work site safe and secure. Return to SHP via the Bridge Safe Access. Remember to turn SHK Bridge Access T Card. Go to LQ Level 0 Main Muster Station (1) Act on the instructions from the PA./ own safety self-assessment of situation (Is bridge access safe?) If SHK Bridge Access is Unsafe / Blocked / Damaged; or ECC PA advises to Muster on SHK instead – Go to SHK Alternative Muster Station (7) at Cellar Deck NW corner. Report number of POB Mustered to ECC	
PREPARE TO ABANDON PLATFORM ALARM (PAPA)		Rising frequency repeated tone.		Flashing Blue Light (Rotating Beacons)		Withdraw from any scene of emergency. Return to SHP via the Bridge Safe Access. Go to SHP Lifeboats Muster Station 6 If bridge access to SHP is Unsafe / Blocked / Damaged, or ECC PA advises – Go to SHK Muster Station 8 at Life rafts on Cellar Deck SE corner. Don Lifejacket. Act on Muster checker / Emergency Commander via PA announcements. Report number of POB Mustered to ECC.		Return to SHP via the Bridge Safe Access. Go to SHP Lifeboats Muster Station 6 If bridge access to SHP is Unsafe / Blocked / Damaged, or ECC PA advises – Go to SHK Muster Station 8 at Life rafts SHK Cellar Deck SE corner) Proceed to Secondary Muster Area, at life rafts. Act on Muster checker / Emergency Commander instruction or via PA announcements. Don Lifejacket and Prepare to Abandon Platform Prepare Descent Device and Harness Prepare Davit for Descent Device Prepare Life raft for Launching Report number of POB Mustered to ECC	
SECTION 4 EMERGENCY DUTIES are performed by the designated personnel on SHP									
ROLE		RESPONSIBILITIES AND ACTIONS							
EMERGENCY COMMANDER		Assume role of Person In Charge. Manage the Emergency Response.							
EMERGENCY COORDINATOR (Production Supervisor)		Assume the Role of Incident Controller. Coordinate emergency operations and process status. Maintain internal communications with Emergency Commander (OIM) on SHP or SHK. Maintain external communications, if required.							
MUSTER COORDINATOR (Planner/Admin)		Coordinate the POB muster. Record Emergency Response Log data onto White board or other media. Track the movement of Personnel. Account for casualties' and record injuries as informed							
MEDICAL TEAM LEADER		Prepare Emergency Handling Kit (located in KIR) for any necessary onsite activity.							
STRETCHER PARTY		Prepare stretcher(s) for onsite activity. Assist Medical Team Leader with First Aid Treatment Carry Medical crash kit, Defibrillator, Stretcher, as instructed.							
EMERGENCY RESPONSE TEAM LEADER (Safety Officer)		Report Muster numbers to the Muster Coordinator (Ext 559). Don protective clothing. Inform ECC of readiness. Act on the instructions of the Emergency Coordinator. Formulate and action site response.							
EMERGENCY RESPONSE TEAM		Report Muster numbers to the ECC Muster Coordinator (Ext 559). Don protective clothing. Inform ECC of readiness. Act on the instructions of the ERTL / Emergency Coordinator.							
MUSTER CHECKERS (As designated)		Coordinate the POB Muster. Report the Muster numbers to the ECC.							
NON-ASSIGNED PERSONNEL & VISITORS		Report to Muster Checker. Remain quiet and await instruction.							
SECTION 5 MUSTER STATIONS		SECTION 6 MUSTER & LIFERAFT LOCATIONS – SHK CELLAR DECK							
Primary Muster Stations are on SHP – MUSTER STATIONS 1 to 6 when Bridge Access to SHP is Safe		<div>PRIMARY MUSTER</div>							

MUSTER STATION 7 – SHK ALTERNATE MUSTER AREA (When Bridge Access to SHP NOT Safe)

Location: SHK Cellar Deck NW Corner at or in Firemen's Equipment Room (near bridge to SHP)
In Charge: Emergency Coordinator

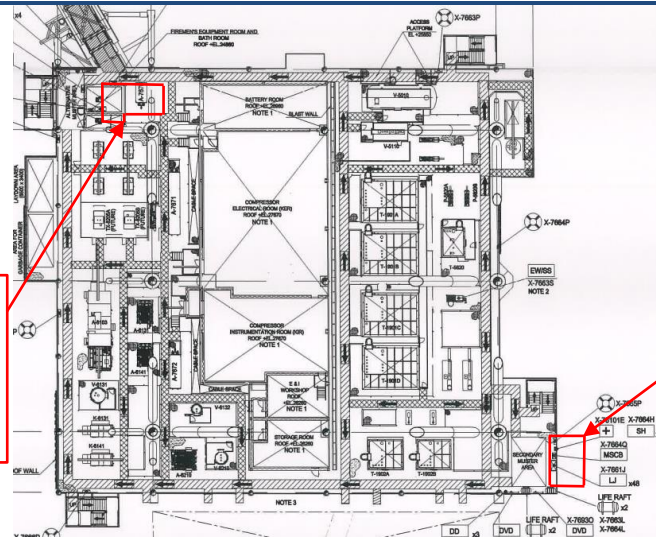
MUSTER STATION 8 – SHK SECONDARY MUSTER AREA (When Bridge Access to SHP NOT Safe)

Location: SHK Cellar Deck SE Corner (next to Life Rafts and Emergency Descent Devices)
In Charge: Emergency Coordinator

Personnel should listen to advice issued by public address.

MUSTER STATION 7
SHK Alternate Muster
When Bridge Access
Route Unsafe

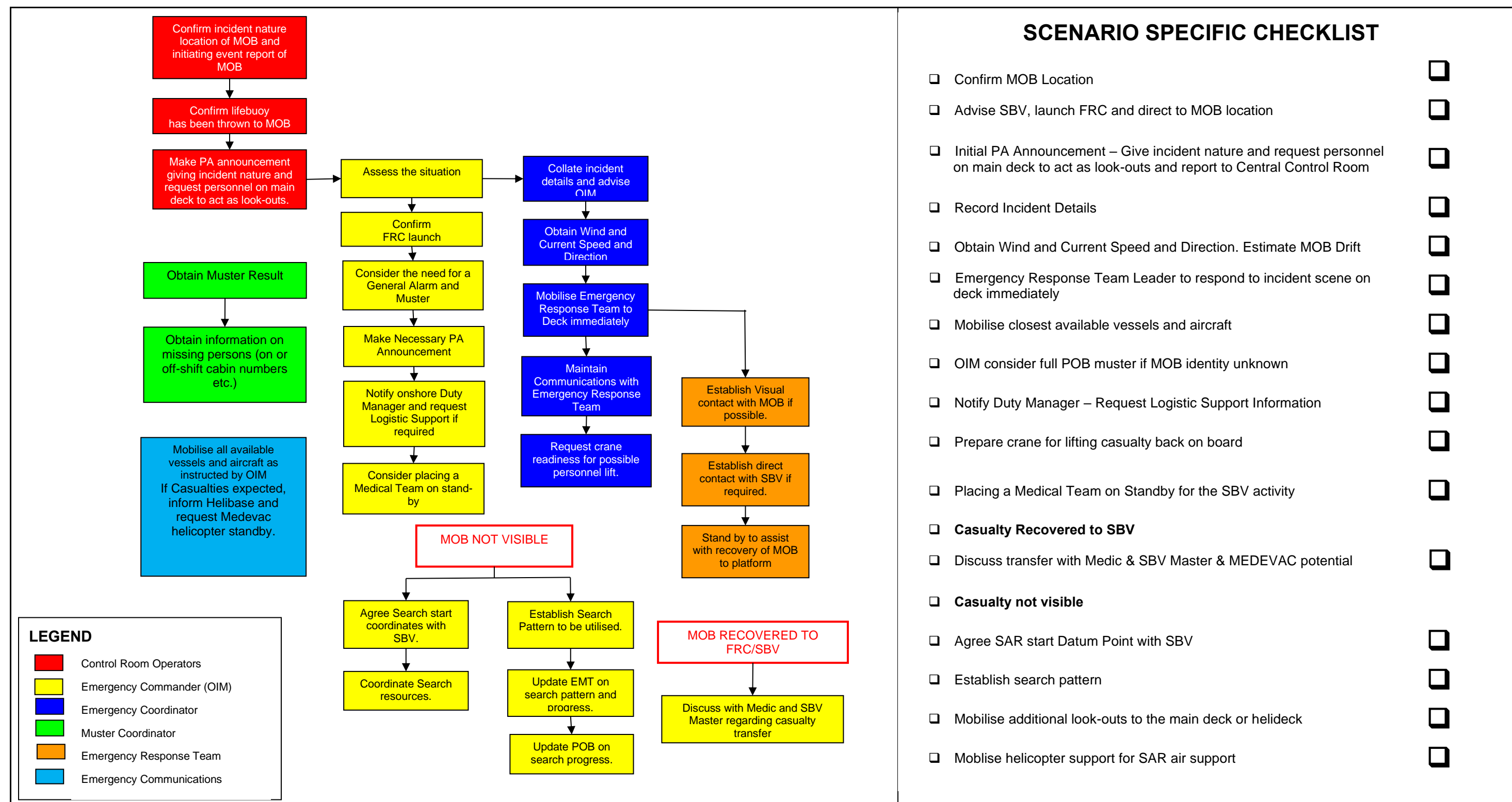
MUSTER STATION 8
SHK Secondary
Muster Area for PAPA
Maximum POB 48
When Bridge Access
Route Unsafe



Platform North

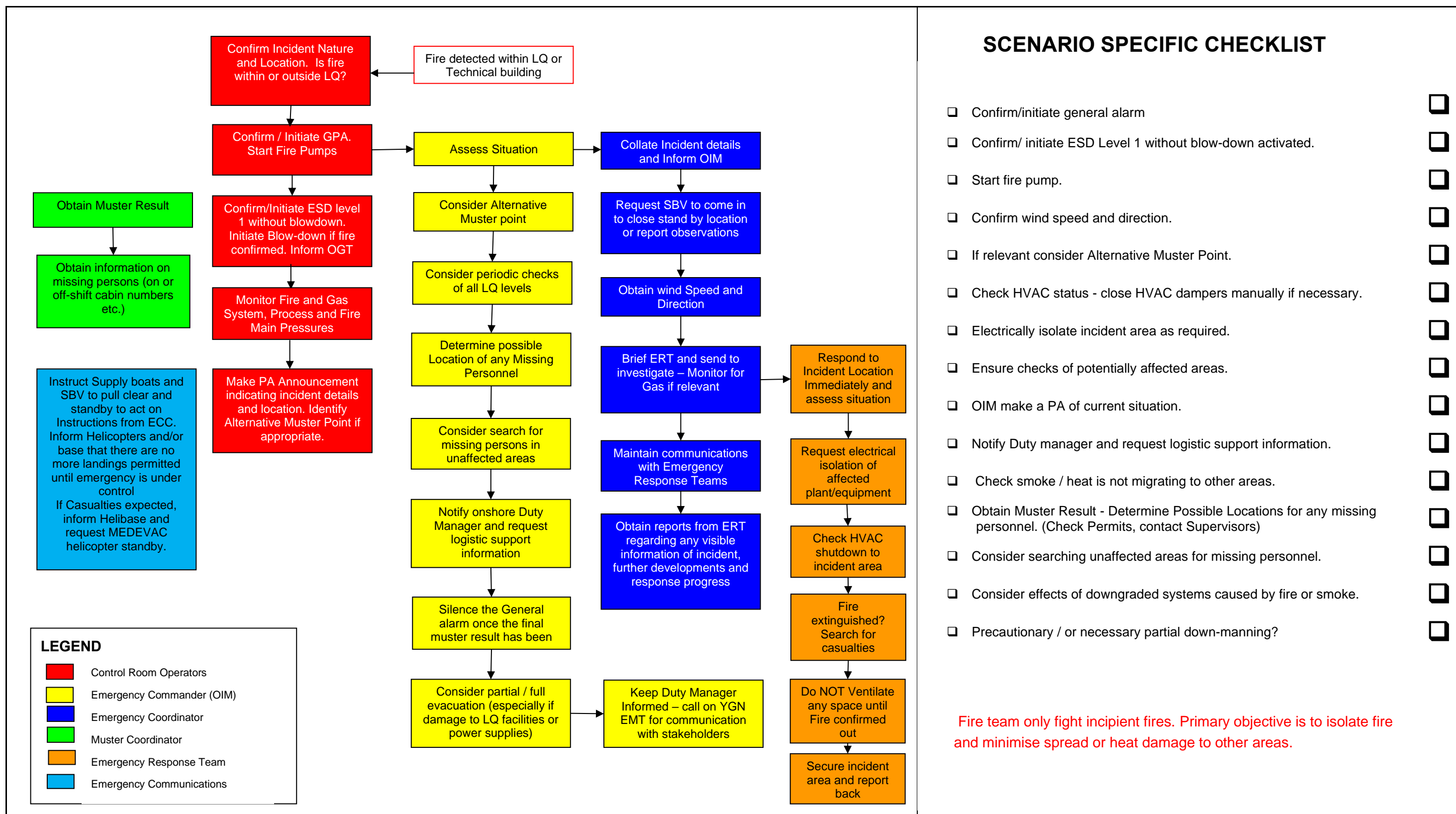
17.0 ACTION PLANS

17.1 Man Overboard



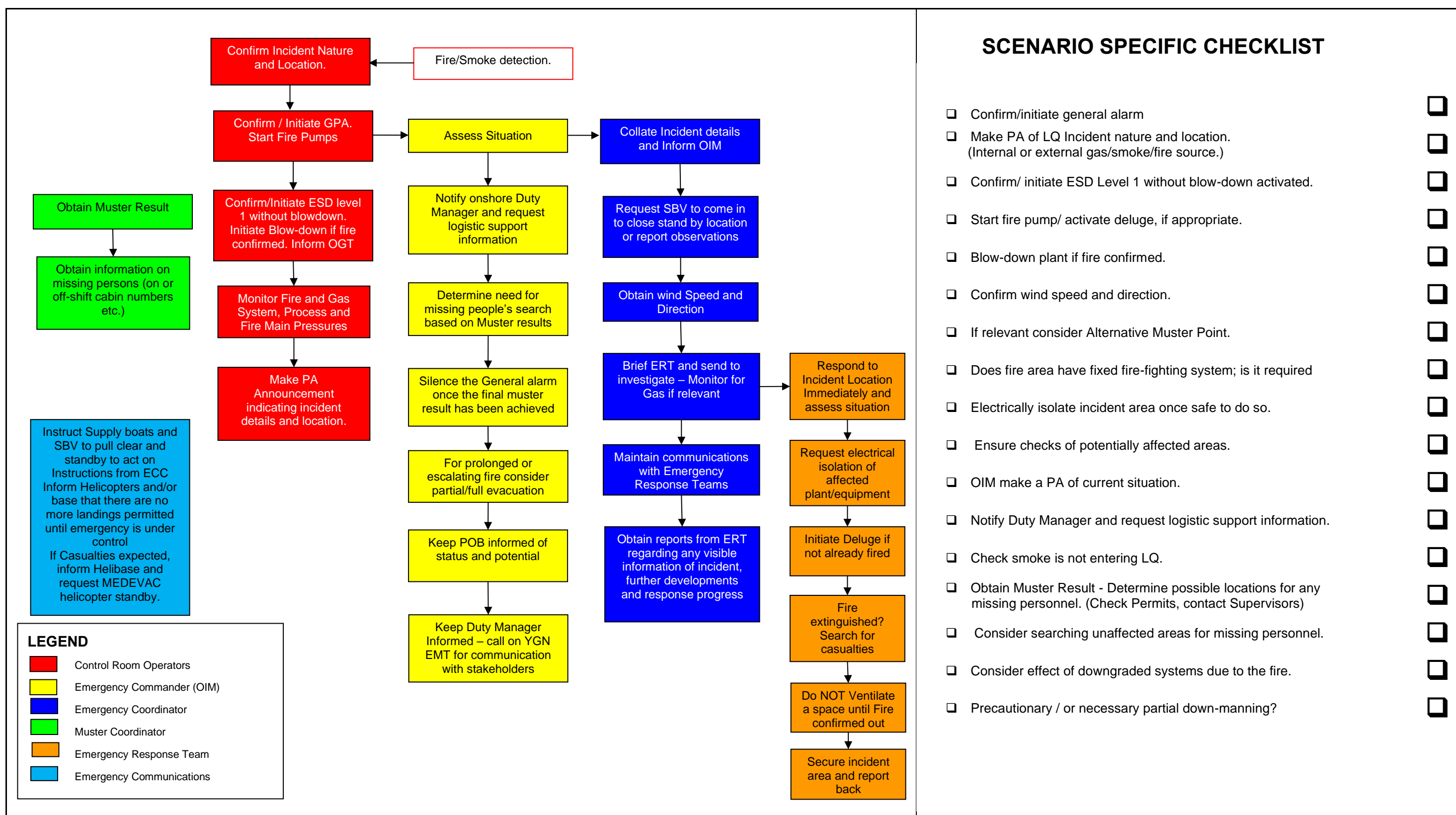
Escalation Potential		Mitigation	
LOW		PTW control of over side activities and SBV Close Stand-by. Relevant associated procedures	
Environmental Response	Response Actions		
Not applicable.	Incident Management Team		Emergency Response Team
	<ul style="list-style-type: none">• Co-ordinate search activities with Emergency Response Team and SBV Master• Request assistance from other marine craft in the vicinity• Liaise with EMT and consider additional resources• Identify MOB from muster results• Notify and report incident, status, progress and results• Request MEDIVAC if relevant		<ul style="list-style-type: none">• Establish over side watch and retain sighting of person in the water• Use SBV search light at night• Note direction of drift of person in the water• Direct SBV / FRC to last sighting of person in the water• Assist with recovery to platform

17.2 Fire inside LQ or Technical Building



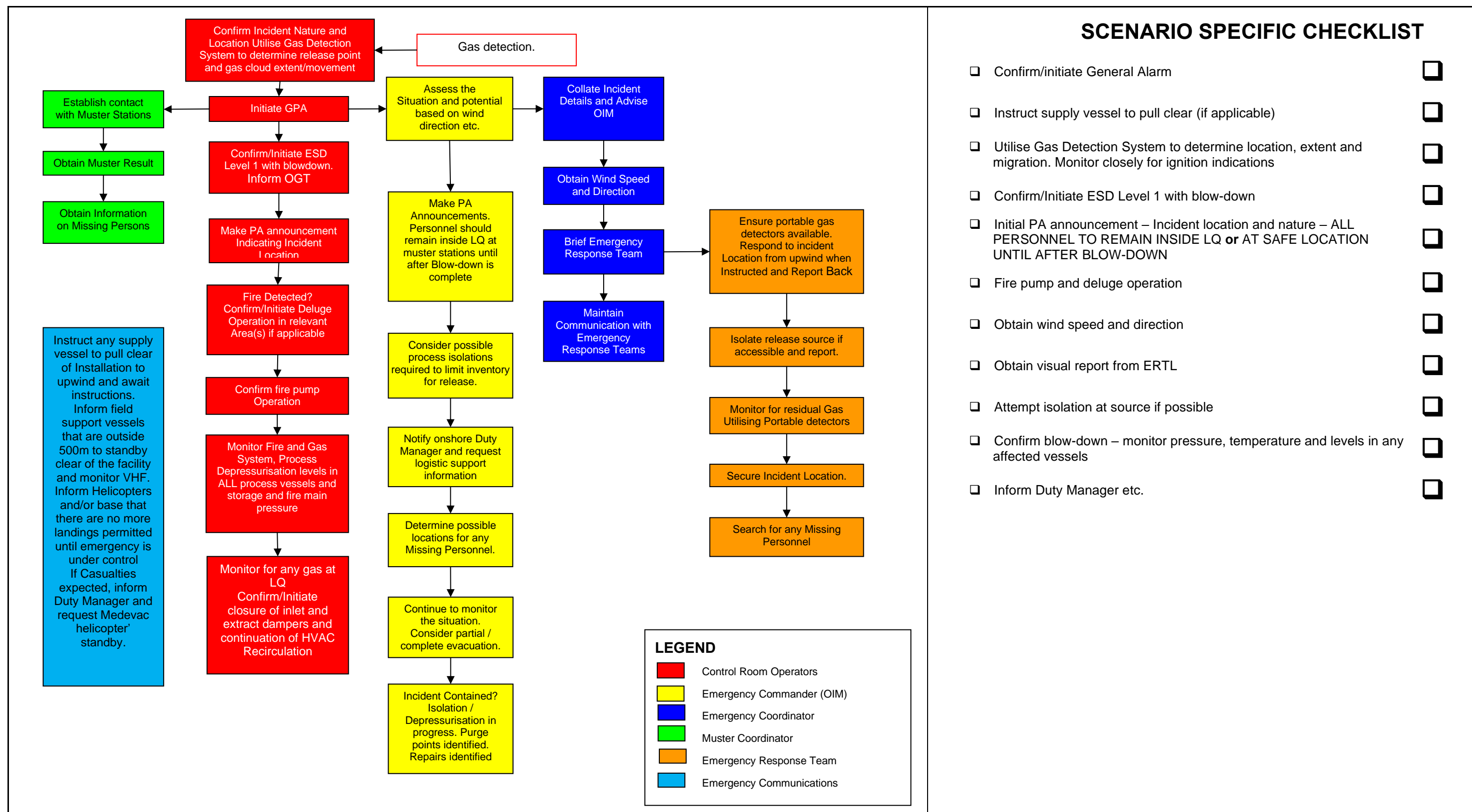
Initiating Event	Escalation Potential - HIGH	Mitigation
<p>Fire/smoke may arise in the LQ / TB due to:</p> <ul style="list-style-type: none"> – Ignited hydrocarbon release – Hot work. – Electrical faults. – Galley fires [failure of fitted auto fire fighting system]. – Laundry fire. – Cabin fire. – Public Space fire. – Major Hydrocarbon Event. 	<p>Jet Fire and/or Explosion Overpressure of LQ</p> <p>There are no potential sources of Jet Fire which would directly impact the LQ structure except possibly from below, which is passively protected. Explosion over-pressure of the LQ is unlikely unless there is gas ingress and an ignition source within the LQ.</p> <p>Other fire/smoke sources:</p> <ul style="list-style-type: none"> – Helideck incident. – Work-shop incidents. – External incident smoke migrating into LQ / TR. 	<p>All external bulkheads of the accommodation block are rated A60. Normal access / egress external doors have airlocks, Emergency escape doors do not.</p> <p>Early detection and response to internal fire in LQ / TB will ensure its design integrity.</p> <p>Fire Protection consists of:</p> <p>Fire extinguishers located throughout the accommodation. Fire hydrants located outside each external door. Remotely activated fire protection for galley cooking range, Radio Room, Telecoms room and Instrument Electrical Room. First-aid hoses are in the accommodation alley-ways. Fire-main extends externally to all decks at access points. LQ has A60 doors separating each level into smaller areas, Stair well doors close automatically.</p>
Environmental Response	Response Strategy and Tactics	
Not applicable.	Incident Management Team	Emergency Response Team
	<p>Identify source of smoke / fire. Internal or external source?</p> <p>Monitor all areas adjacent to the fire seat.</p> <p>Check HVAC shut-down and dampers closed.</p> <p>Alternative muster station use if LQ Level 0 may be affected.</p> <p>Monitor F&G system.</p> <p>Utilise ERT to monitor incident area and adjacent areas and report any change in circumstances.</p> <p>Action ERT to respond to incident location after any required safe electrical isolation is confirmed.</p> <p>Determine the Probable location for any Missing Personnel.</p> <p>Consider Searching unaffected areas.</p> <p>Continuous open communication through Duty Manager</p> <p>Consider effect of downgraded systems or facilities</p>	<p>Report back indications of heat or fire migration.</p> <p>Isolate the fire area physically by closing doors.</p> <p>Apply cooling where necessary and possible.</p> <p>Conduct a physical search for missing persons.</p> <p>Secure incident area when fire extinguished and missing or injured persons are accounted for.</p> <p>Consider activation of fixed fire-fighting system if available.</p>

17.3 Fire in Utilities, Process or DFR areas



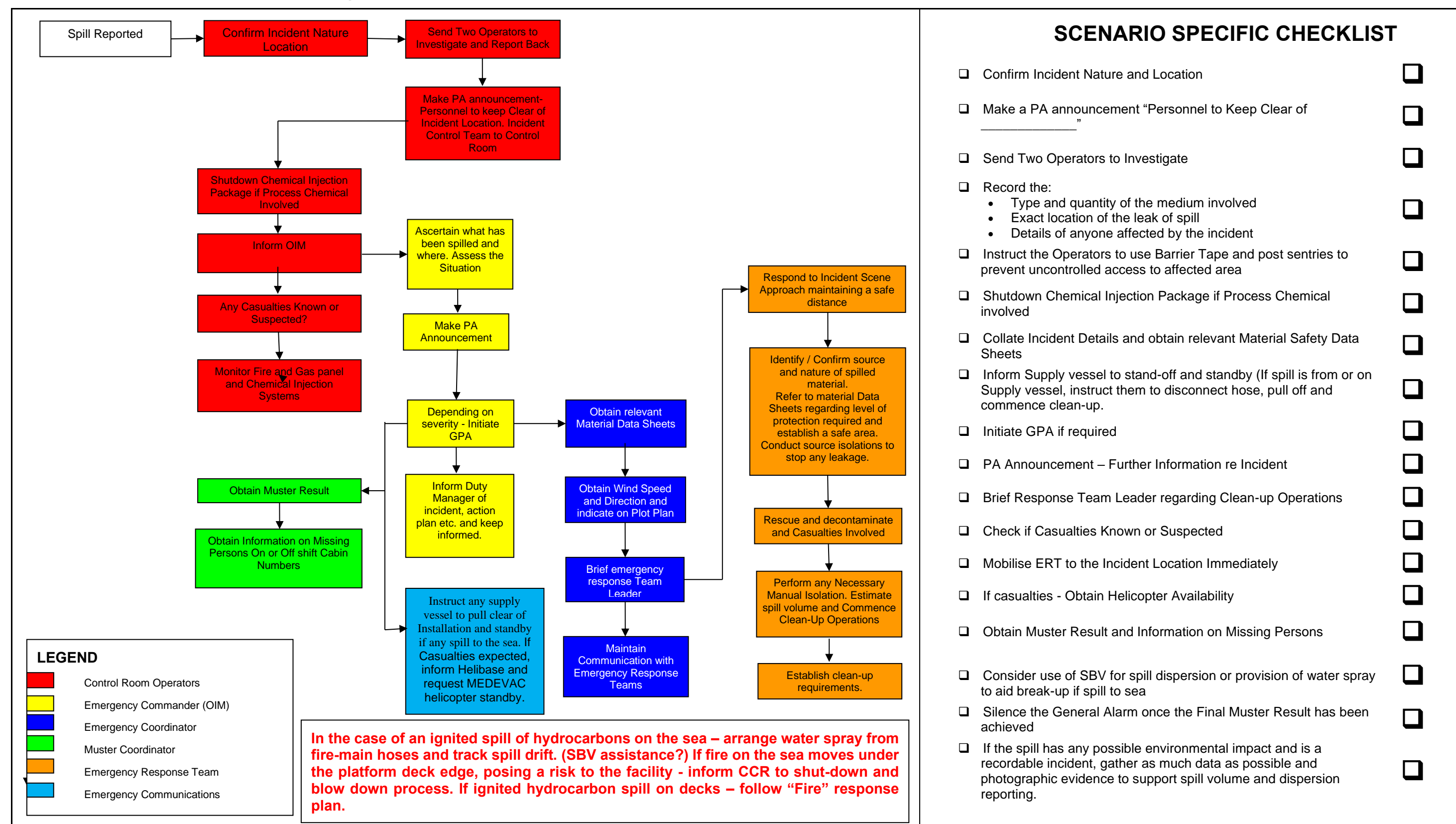
Initiating Event	Escalation Potential - HIGH	Mitigation
<p>Fire in these areas could be due to:</p> <ul style="list-style-type: none"> – Operational failures. – Well bay incidents. – Mechanical damage. – Hot work. – Electrical faults. – Hydrocarbon releases or spills. – Major Hydrocarbon Event. – Ship collision. 	<p>Jet Fire and/or Explosion Potential</p> <p>Potential sources of Jet Fire abound and could foreseeably impact the structure or adjacent process vessels under pressure.</p> <p>There are stored liquid hydrocarbons in tanks and vessels.</p> <p>Pool fires are also possible due to the potential of ignited spills from hydrocarbon storage vessels or tanks.</p>	<p>Key structural members are passively fire protected, close to potential gas sources.</p> <p>The F&G system provides early indication of gas release or fire. Heat sensing cable loops can automatically initiate deluge activation. The ESD system can shut-down production wells and blow-down gas inventory.</p> <p>Process system piping and vessels are protected from over-pressure by PSVs.</p> <p>Fire Protection consists of:</p> <ul style="list-style-type: none"> Deluge systems within the Process areas. Fire-main with hydrants, hoses and foam stations. Portable fire extinguishers. FM200 Protection for DFR Machine and mud spaces.
Environmental Response	Response Strategy and Tactics	
Not applicable.	Incident Management Team	Emergency Response Team
	<p>Identify source of smoke / fire.</p> <p>Shut-down and blow-down process systems</p> <p>Stop all hydrocarbon liquid transfers</p> <p>Initiate deluge coverage as relevant</p> <p>Muster all mustered personnel.</p> <p>Utilise ERT to monitor incident area and report any changes or other developments</p> <p>Action ERT to respond to incident location</p> <p>Determine the Probable location for any Missing Personnel.</p> <p>Consider Searching unaffected areas.</p> <p>Consider potential support from attendant vessels</p> <p>Consider effects of down-graded systems</p> <p>Consider partial or complete down-manning</p>	<p>Report back indications of heat or fire migration, smoke details and developments.</p> <p>Manually initiate deluge if appropriate and available.</p> <p>Apply cooling where necessary and possible.</p> <p>Conduct a physical search for missing persons.</p> <p>Consider fixed fire-fighting systems use for enclosed areas.</p> <p>Secure incident area when fire extinguished and missing or injured persons are accounted for.</p>

17.4 Gas Release



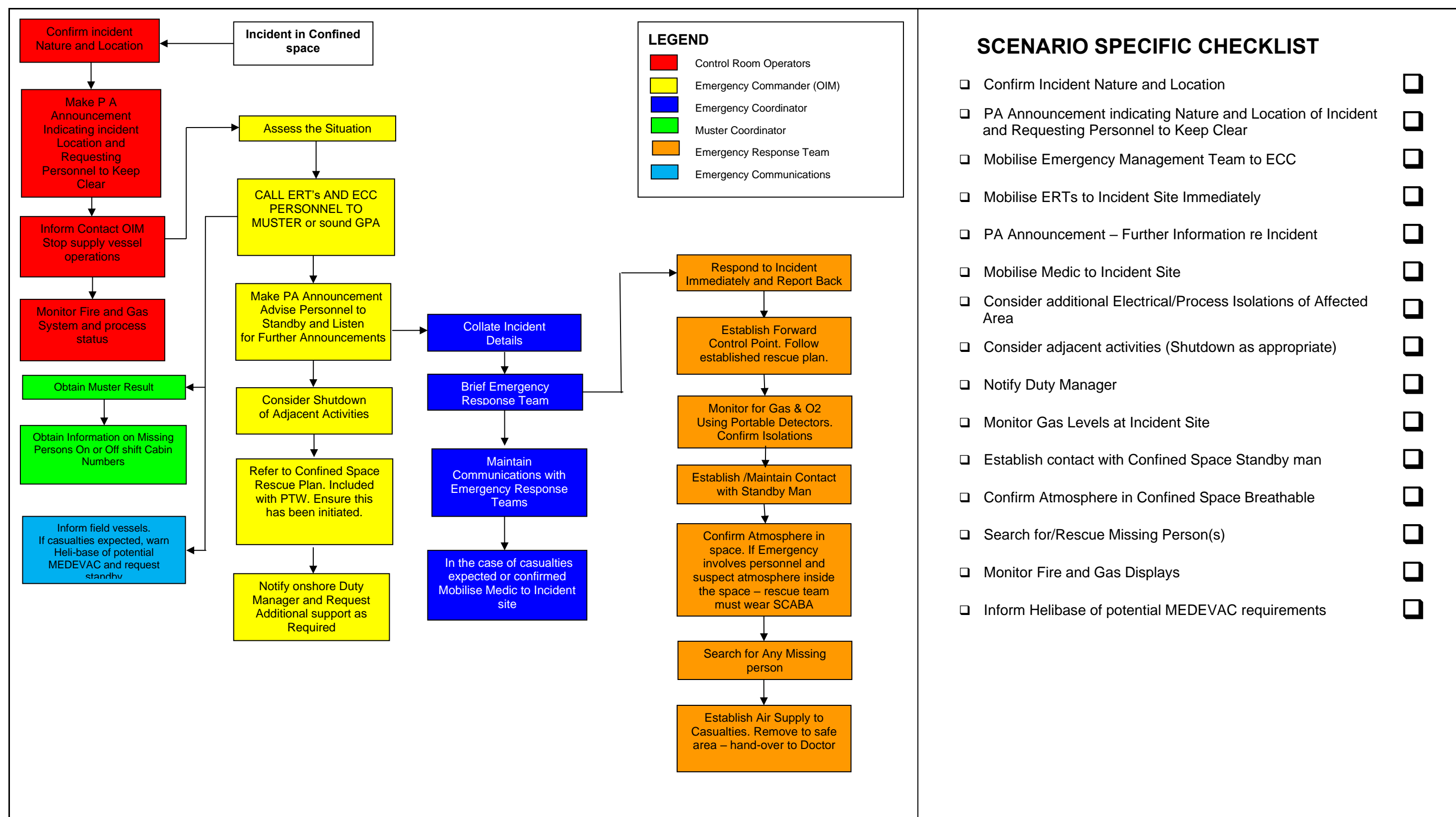
Initiating Event <ul style="list-style-type: none">• Overpressure• Fitting Leak• Equipment Failure• Corrosion• Maintenance Error• Impact	Escalation Potential - HIGH	Mitigation
	Pressurised Release Large flange leak will rapidly deplete a gas inventory. Incident continues until pressure decays in affected vessel. Any Liquids may spread through to deck(s) below and/or overboard with potential for pollution incident and/or ignition on decks below or on surface of sea.	Blow-down System Designed to blow down the system pressure to flare.
Means of Prevention Containment Integrity High pressure alarms and high-high trips Relief to flare from pressure vessels Appropriate materials selection Condition monitoring Operating and maintenance procedures Risk assessed lifting procedures	Jet Fires Threat to Primary Structure due to flame impingement Heat radiation affecting personnel and impairing emergency actions Jet fire length can be extreme for short duration If ignition delayed, then potential fireball from ignited gas cloud	Passive Fire Protection Primary Structure is protected for 30 minutes and TR integrity maintained for 60 minutes. Design Fire analysis indicates adjacent vessels will not be breached under jet fire impingement.
	Pool Fires Large quantity of smoke – potential for smoke in TR HVAC intake. Likely to burn for >30 minutes without deluge operation. If no immediate ignition, then any fluid may spill through to decks below and may be discharged to sea so may result in pool fire on cellar deck or possibly on sea.	Deluge System and HVAC A fully functioning deluge system will extinguish pool fires and disperse flammable fluids. The drainage system is designed to prevent the discharge of burning fluids into the sea. Confirmed smoke detection in TR HVAC inlet – inlet and extract dampers close and air in LQ is recirculated. 1 Hour protection if main and emergency generators unavailable.
	Explosion Overpressure Explosion over-pressure possible if gas cloud ignited Explosion Overpressures are likely to be high from stoichiometric gas mixes.	Blast-Proofing H60 wall on LQ designed to withstand 600mb blast overpressure. A blast/fire wall is installed ‘full-width’ between the process areas and utilities areas. Active deluge system can reduce explosion over-pressures.
Environmental Response (If applicable)	Response Strategy and Tactics	
<ul style="list-style-type: none">• Potential for fluids to enter the sea - Notify Duty Manager (Yangon)• Refer to Oil Pollution Contingency Plan – Determine Response Category	Incident Management Team	Emergency Response Team
	<ul style="list-style-type: none">• All personnel to remain in TR or safe location until blow-down is complete• Monitor fire and gas systems for affected areas, extent and gas migration, Monitor DCS for process depressurisation status and liquid levels in ALL vessels (Blow-down effective and liquids contained?)• Utilise external sources (if available) to monitor for fire or explosion indications, gas plumes, extent of deluge cover and any structural damage.• Determine the probability that missing personnel (if any) are in the affected area• Consider searching unaffected areas• Action ERT to respond to incident location after associated gas has dispersed or pressurised fires are depleted• In the event of gas ignition Consider retaining all personnel in TR and allowing fire to burn out (utilise fixed systems) if no persons missing	<ul style="list-style-type: none">• Establish a Forward Control Point• Report back – readings from portable detectors, structural damage, extent of deluge cover and indications of heat or fire.• Apply cooling where necessary.• Conduct a physical search for missing persons in areas adjacent emergency area.• Decide if deluge(s) can be isolated (OIM Decision) to facilitate a visual assessment (Do not enter area unless necessary). Do not place ERT at risk• If no persons missing – consider withdrawing ERT back to TR

17.5 Chemical, Diesel or other Spillage



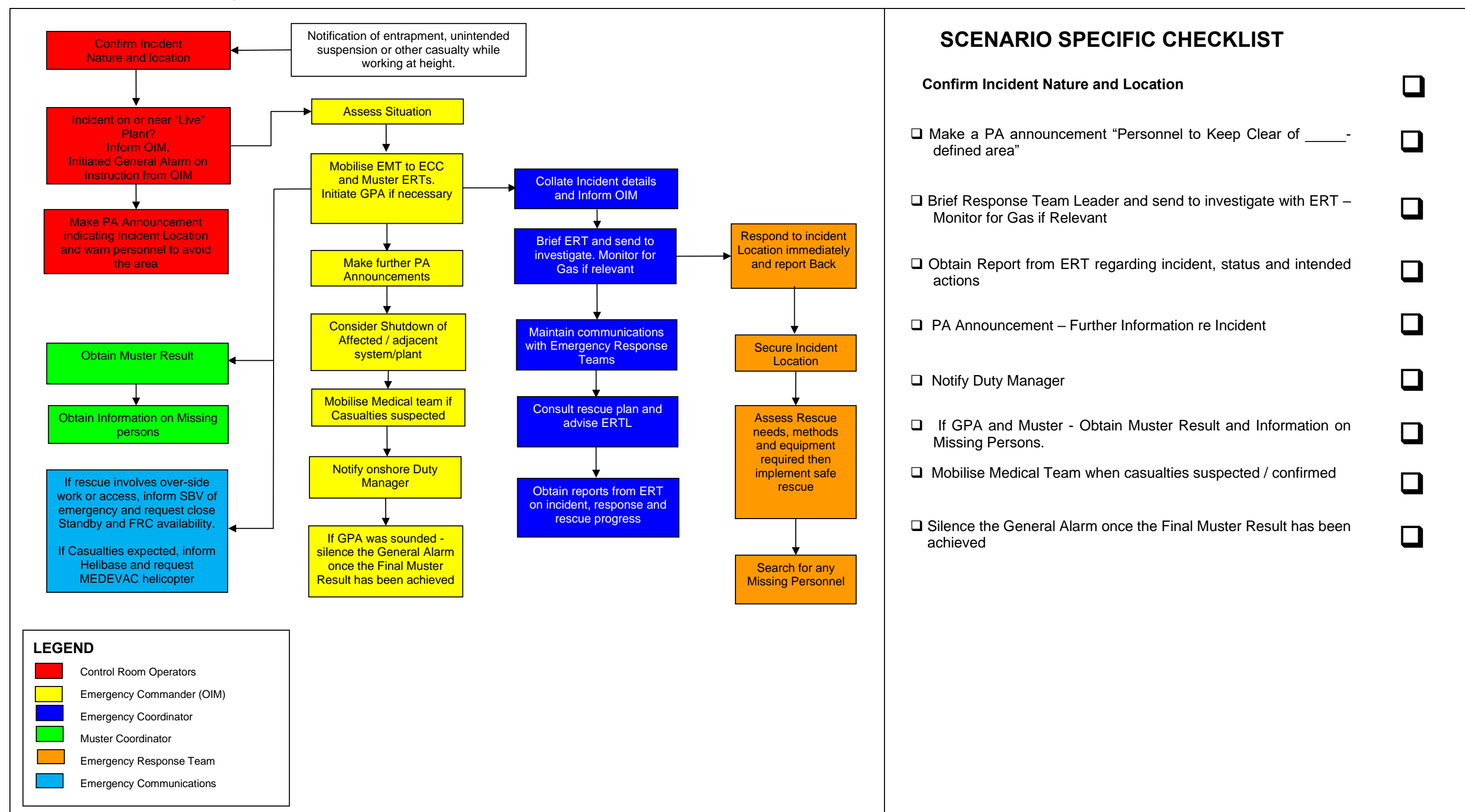
Escalation Potential - MODERATE				Mitigation
Dependent Upon Chemical Involved				Spill kits, Wash Down Stations, Deluge system, fire-main and hoses. Relatively small inventories. Relevant associated procedures
Environmental Response				Response Strategy and Tactics
<ul style="list-style-type: none"> Potential for chemical to enter the sea – Standby Vessel to Monitor. Notify Duty Manager In consultation with Duty Manager and onshore Management, consider dispersion methods and agree any forward plan. Normally, chemical or diesel spills would disperse naturally, long before any chance of land-fall but must be accurately estimated and clearly reported. 				Incident Management Team
				Emergency Response Team
				<ul style="list-style-type: none"> If no casualties involved response to the incident should reflect this. Absorbing and disposal, wash-down residuals to drains, or as otherwise directed in the MSDS. If casualties are known or suspected the ERT should respond immediately utilising PPE advised on Material Safety Data sheet
				<ul style="list-style-type: none"> Establish Control Point Establish a Safe Area Restrict entry to Affected Area Follow advice on Material Safety Data Sheet regarding PPE, Clean Up, and Decontamination Perform any necessary Manual Isolations Decontaminate Team Members and Casualties as appropriate
Chemical Tank Liquid Storage Capacities (Information)				
Equipment	Tank Number	Fluid	Capacity per tank	
MEG TANK	T-4920	LIQUID	13000 Lts	
METHANOL TANK	T-4905	LIQUID	25000 Lts	Highest Ignition potential
CORROSION INHIBITOR TANK	T-4903	LIQUID	50 Lts	
REVERSE DEMULSIFIER TANK	T-4902	LIQUID	700 Lts	
SCALE/CORROSION INHIBITOR TANK	T-4901	LIQUID	20200 Lts	
DEFOAMER TANK	T-4908	LIQUID	1000 Lts	
DEFOAMER TANK	T-4909	LIQUID	1000 Lts	
BIOCIDE TANK	T-4907A	LIQUID	220 Lts	
BIOCIDE TANK	T-4907B	LIQUID	220 Lts	
KHI TANK	T-4940	LIQUID	6500 Lts	
Diesel Fuel Liquid Storage Capacities (Information)				
Equipment	Tank Number	Fluid	Capacity per tank	
RAW DIESEL STORAGE TANK	T-6301A	LIQUID	85000 Lts	
RAW DIESEL STORAGE TANK	T-6301B	LIQUID	85000 Lts	
TREATED DIESEL STORAGE TANK	T-6305	LIQUID	21000 Lts	
EDG Diesel Storage Tank	A-8101 Local Tank	LIQUID	5500 Lts	
BSDG Diesel Storage Tank	A-8102 Local Tank	LIQUID	5500 Lts	

17.6 Confined Space Rescue



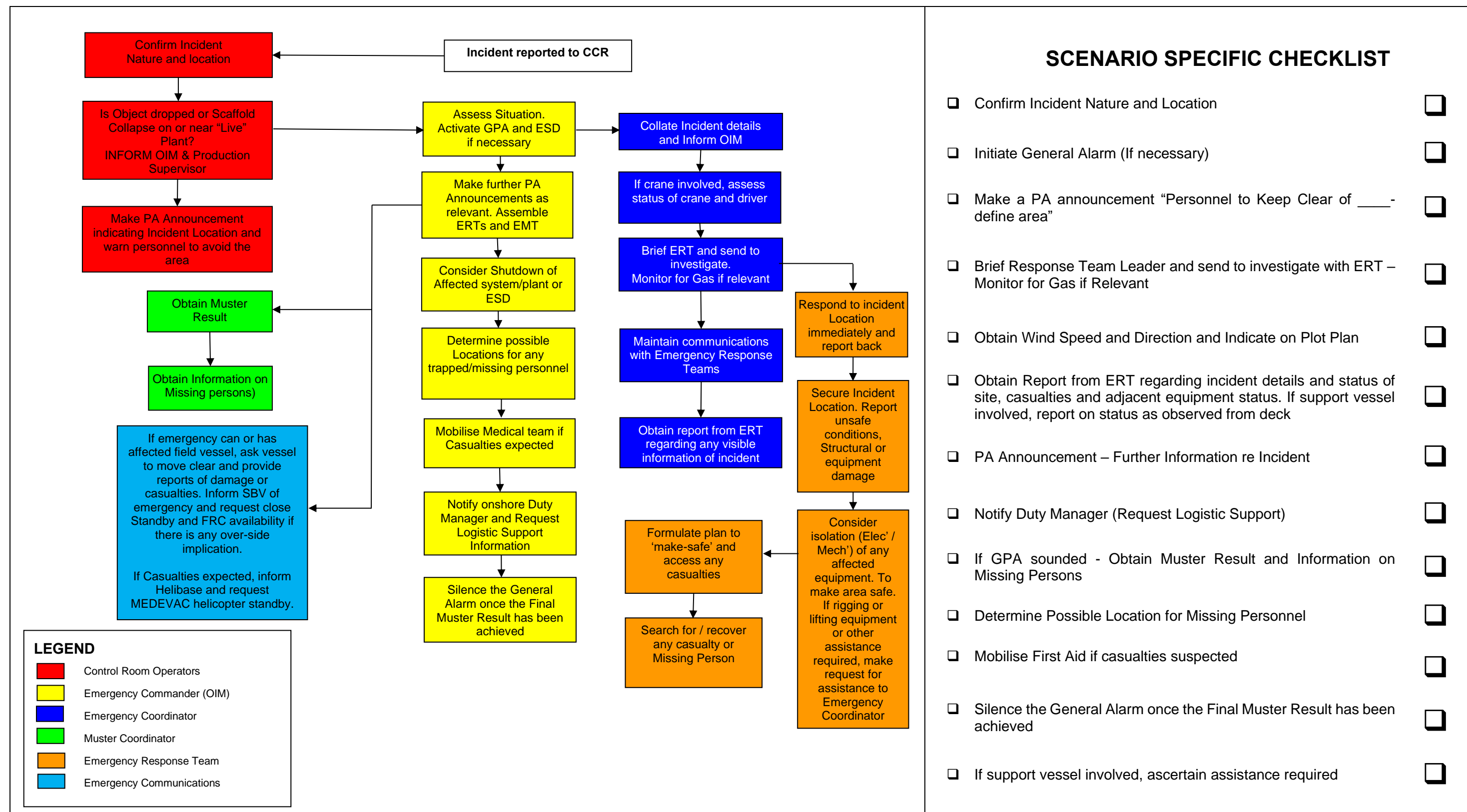
Escalation Potential – HIGH for casualties.		Mitigation	
Incident escalation will depend on rescue time and outcome		Appropriate PTW with Rescue Plan and Rescue equipment on-site Confined Space Entry and rescue training Relevant associated procedures	
Environmental Response		Response Strategy and Tactics	
<ul style="list-style-type: none"> None perceived 	Incident Management Team		Emergency Response Team
	<ul style="list-style-type: none"> Mobilise Emergency Response Team Mobilise First Aid to Forward Control Point Confirm Electrical/Process isolations of affected area PA Announcement – Incident Location, Advise Site personnel to Listen for Further Announcements Refer to Confined Space Rescue Plan Monitor Fire and Gas Detection System and Equipment in affected area Consider adjacent activities (Initiate shutdowns as appropriate) If loss of containment occurs refer to relevant Action Plan 		<ul style="list-style-type: none"> Establish a Forward Control Point Report Back – Physical signs of fire or smoke, gas and casualties Monitor for HC gas O2 using Portable Gas Detectors Liaise with Confined Space Standby Man Follow approved rescue plan Prevent personnel from entering the Confined Space except trained rescue team Conduct a physical search for casualties in confined space – continue to monitor for gas and oxygen levels Stabilise casualties in situ – resuscitate if necessary Rescue casualties with due consideration for their injuries If Hydrocarbon Gas leak occurs withdraw personnel Rescued casualties handed over to Medical team MEDEVAC arrangements made Yangon Duty Manager and EMT informed.

17.7 Rescue from a Height



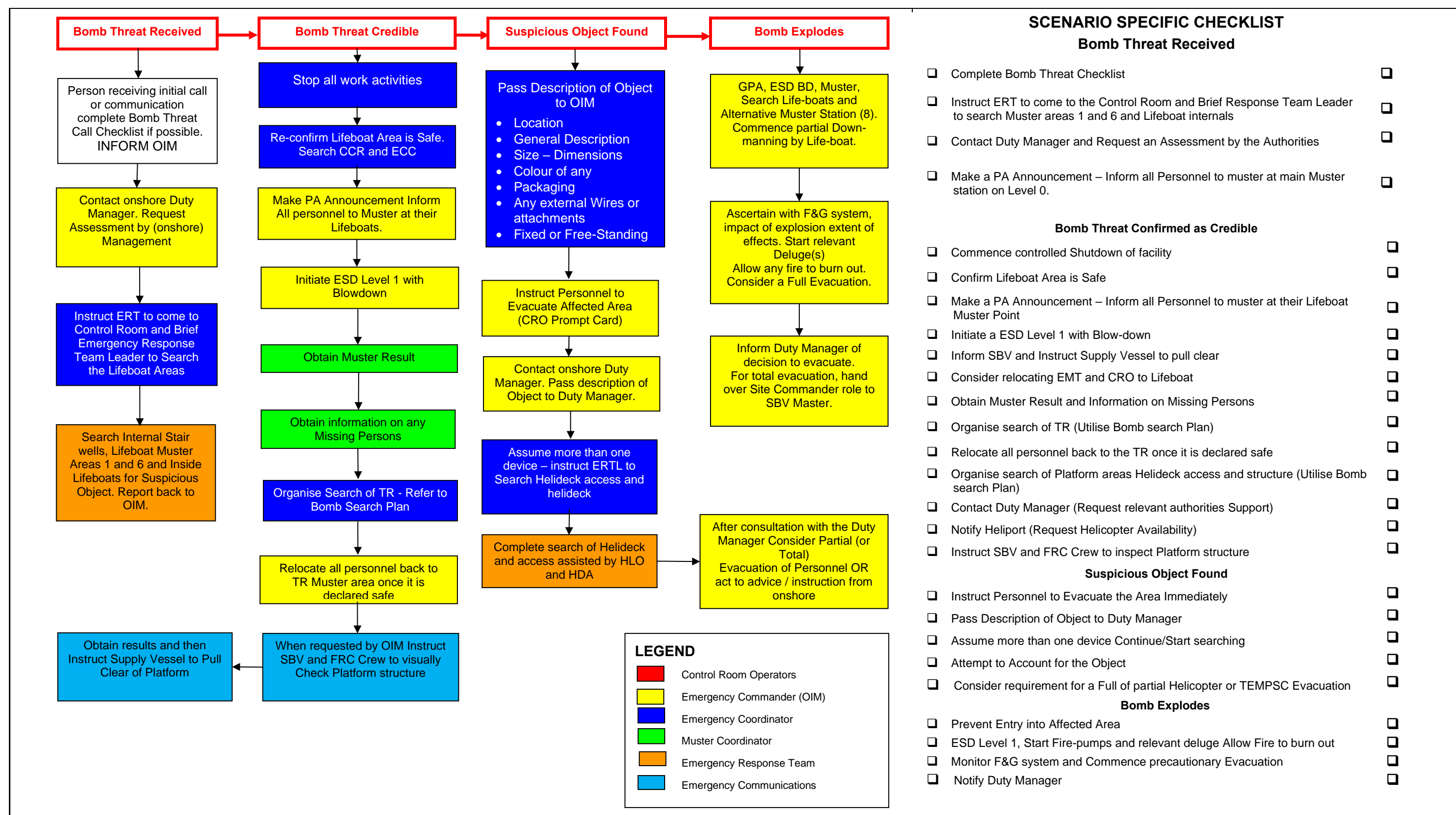
Escalation potential - Moderate	Mitigation	
<ul style="list-style-type: none"> • More than one casualty • Rescue team encounter difficulties • Suspension trauma potential for casualty suspended in a harness 	<ul style="list-style-type: none"> • Planned and assessed work activity • PTW includes a prepared rescue plan • Rescue from heights drills and training • Relevant associated procedures 	
Environmental response	Response Strategy and Tactics	
<ul style="list-style-type: none"> • No environmental impact 	Incident Management Team	Emergency Response Team
	<ul style="list-style-type: none"> • If casualties are known or suspected the ERT should respond immediately in order to assess the hazards associated with the situation • Medical team mobilisation for confirmed casualties 	<ul style="list-style-type: none"> • Establish Forward Control Point • Assess the access and rescue potential • Review planned rescue procedure associated with the PTW • Assess possibility of over-loading access equipment during rescue • Formulate rescue procedure and muster required equipment if not already at site • Minimise the number of personnel in the affected area • Rescue and treat casualties

17.8 Dropped Object or Scaffold Collapse



Escalation potential - Moderate	Mitigation	
Possible Damage to piping, Instruments, equipment or structure resulting in gas release or unsafe conditions.	Dropped object protection by steel framework module construction Lifting restricted over “Live” platform equipment Scaffolding built by trained personnel and inspected under scaff-tag system Relevant associated procedures Crane operations by competent crane drivers	
Environmental response	Response Strategy and Tactics	
<ul style="list-style-type: none"> Potential for Hazardous Chemical or Diesel Spill to sea Refer to Chemical or Diesel spillage response plan 	Incident Management Team	Emergency Response Team
	<ul style="list-style-type: none"> If confirmed that no casualties are involved response to the incident should reflect this. Liaise with EMT regarding structural conditions, process damage, making safe If casualties are known or suspected the ERT should prioritise safe access for rescue / recovery If piping, instruments, or process vessels affected Shut-down and blow-down process systems Action ERT to respond to incident location Consider effects of any down-graded systems In the event of Gas Release Fire or Spill, refer also to relevant plans 	<ul style="list-style-type: none"> Establish Forward Control Point Assess the Possibility of further structural or scaffold collapse and if possible cover liquids with absorbent material Minimise the number of personnel in the affected area Assess the risk to personnel from toxic releases Assess area safety and request shut-down of electrical or process equipment Assess stability of any collapsed materials or damaged structure Ensure safe access of rescue team members Rescue and treat casualties Search for any Missing personnel

17.9 Bomb Threat



Bomb Search Plan					Escalation Potential		Mitigation	
Search Area	Team Assigned	Time Start	Time Complete	Comments	Potential for release of Hydrocarbons if device explodes in process area	TR and Platform Structure are designed to withstand significant Explosion Over-Pressures. Shutdown and Blow-down will Reduce Escalation Potential in process Areas		
Lifeboat Areas	ERT 1							
Control Room	CROs							
LQ Level 0 (TR) & Stairs	ERT 1				An Explosive Device within the TR has the potential to produce a significant Over-Pressure	Initial main Muster to take place at the Lifeboats until the TR has been searched		
LQ Level 1 (Galley & Stores)	Galley Crew / Camp Boss							
LQ Level 2 & Stairs	ERT 2				Response Strategy and Tactics			
LQ Level 3 & Stairs	ERT 2							
LQ Level 4 & Stairs	ERT 2							
LQ Roof areas	HLO / HDA or ERT				Incident Management Team		Search Guidance	
Helideck and access	Helideck Crew							
Electrical Switch-room	REP				Confirm if threat is Credible – Utilise Shore Management via Duty Manager.	<ul style="list-style-type: none">• Teams to consist of personnel who are familiar with the area to be searched, minimum of 2 men• Areas delegated should be capable of being searched within 20 minutes• VHF Radios should be carried for communication Search Teams are looking for an object which: <ul style="list-style-type: none">• Should not be where it is found• Is out of place within its surroundings• Cannot be accounted for Actions of Search Teams on finding a suspicious object: <ul style="list-style-type: none">• Do not touch, move or tamper with it• Do not stay in the immediate vicinity• Do not transmit radio messages within the immediate vicinity• Memorise a description of the object (See Below)• Withdraw to a safe area along a searched route• Report find to the Emergency Management Team• Description of Object<ul style="list-style-type: none">• Location• Size - Dimensions• Colour of any Packaging• Any external Wires or attachments• Fixed or Free-Standing• Smells or sounds		
Workshop Area	ERT							While Awaiting Confirmation;
Turbine Enclosures	Turbo Techs							
Electrical building	Electrical Lead & Tech				Inform all personnel of potential threat and utilise ‘platform familiar’ small teams to perform a quick search of their normal work and recreation areas.			
Process Area	Prod Lead & Tech							Search Lifeboat muster area to utilise as a safe muster area should the threat be deemed credible (lifeboat muster area 8 and then LQ muster point 1). Resume normal work if the threat is not deemed credible
Compressor Area	Mech Lead Tech							
Wellhead Area	Prod Lead Tech				Threat Confirmed as Credible			
Platform Jacket	SBV and FRC Crew							Direct personnel by PA to muster in searched area (Muster area 6) if declared safe. Instruct all to wear normal work PPE. Initiate an ESD Level 1 with Blow-down. Locate the Emergency Management Team in a searched area and coordinate the incident from there until TR is declared safe. Organise search as per Bomb Search Plan concentrating on TR first. When and if the TR is declared safe relocate personnel to the TR – this will provide some protection against external explosions. If no suspicious object is found anywhere then resume normal work.

BOMB THREAT CALL RECORD FORM

Message sent by:
Name, Job Title, Company
Message sent at:
Date & time

LOCATION:

EMERGENCY: MINOR/MAJOR

CALL RECEIVED: DATE:

TIME:

MESSAGE (exact words):

Was the message given live or did it sound recorded?

CALLER DETAILS (circle):

Male/Female

Adult/Child

Estimate of age:

Accent:

Speech impediment:

Calm/agitated/intoxicated:

BACKGROUND NOISES (circle):

Music

Talking

Typing

Children

Traffic

Machinery

Laughter

Aircraft

Other (specify):

QUESTIONS YOU SHOULD ASK:

When will it go off?

Where is it located?

What kind of bomb?

What will make it explode?

What does it look like?

Why are you doing this?

Who are you?

Where are you?

ANY OTHER RELEVANT INFORMATION:

Suspicious Object Found

Evacuate the immediate area around the object and attempt to account for it. Pass description of object to Duty Manager for assessment of potential by shore management. Assume that more than one device is present - continue or start searching. Consider Shutdown and Depressurisation if the object is in a Process Area to reduce the effect of any explosion. Consider a partial evacuation by helicopter

Device Explodes

Use Fire or Explosion response plan.

Imitate ESD 1 with BD.

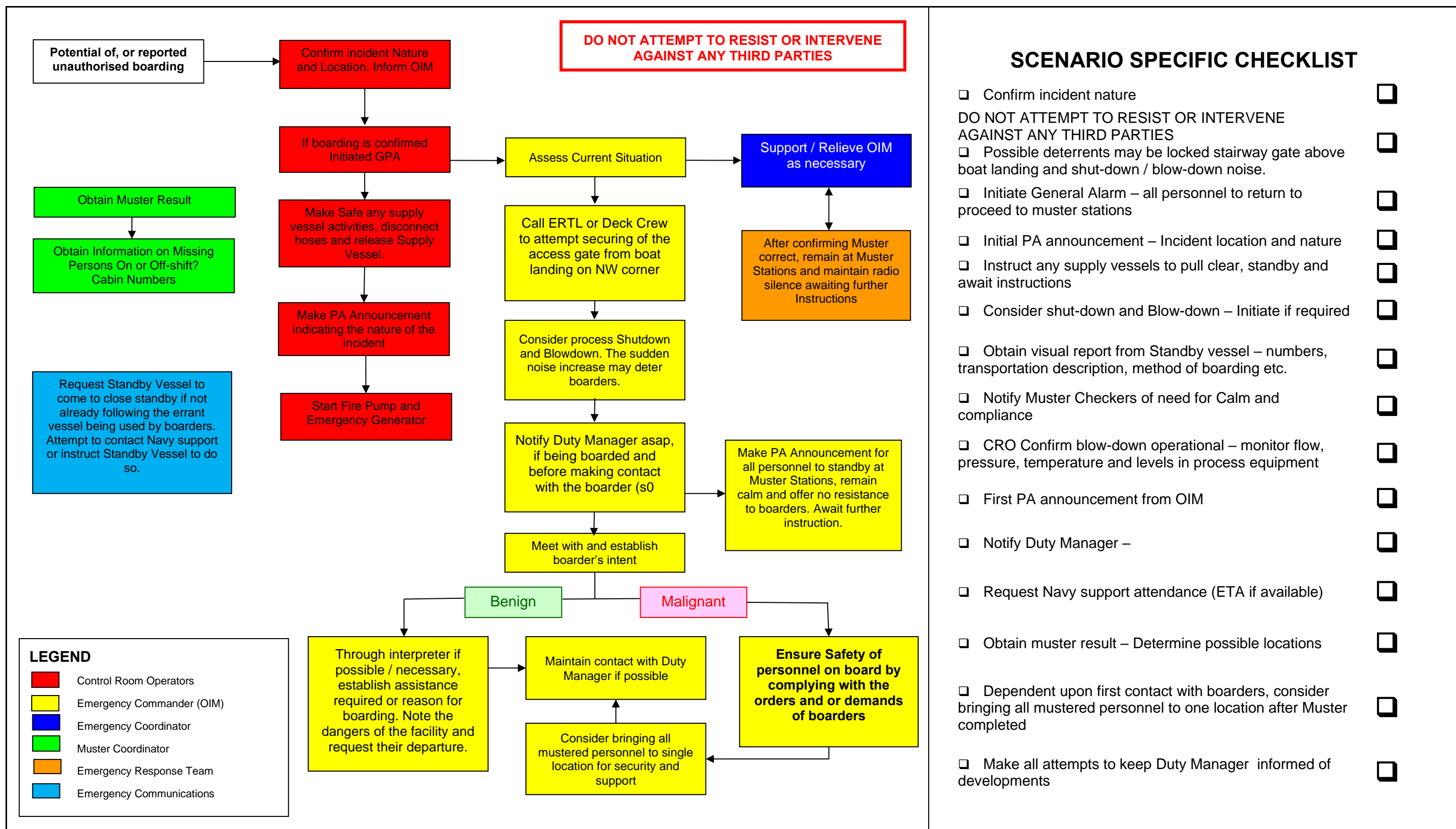
Activate relevant deluge(s).

Monitor F&G panel for gas releases or fire spread.

Prevent any entry in to affected area as secondary device may be present and allow any resultant fires to burn out.

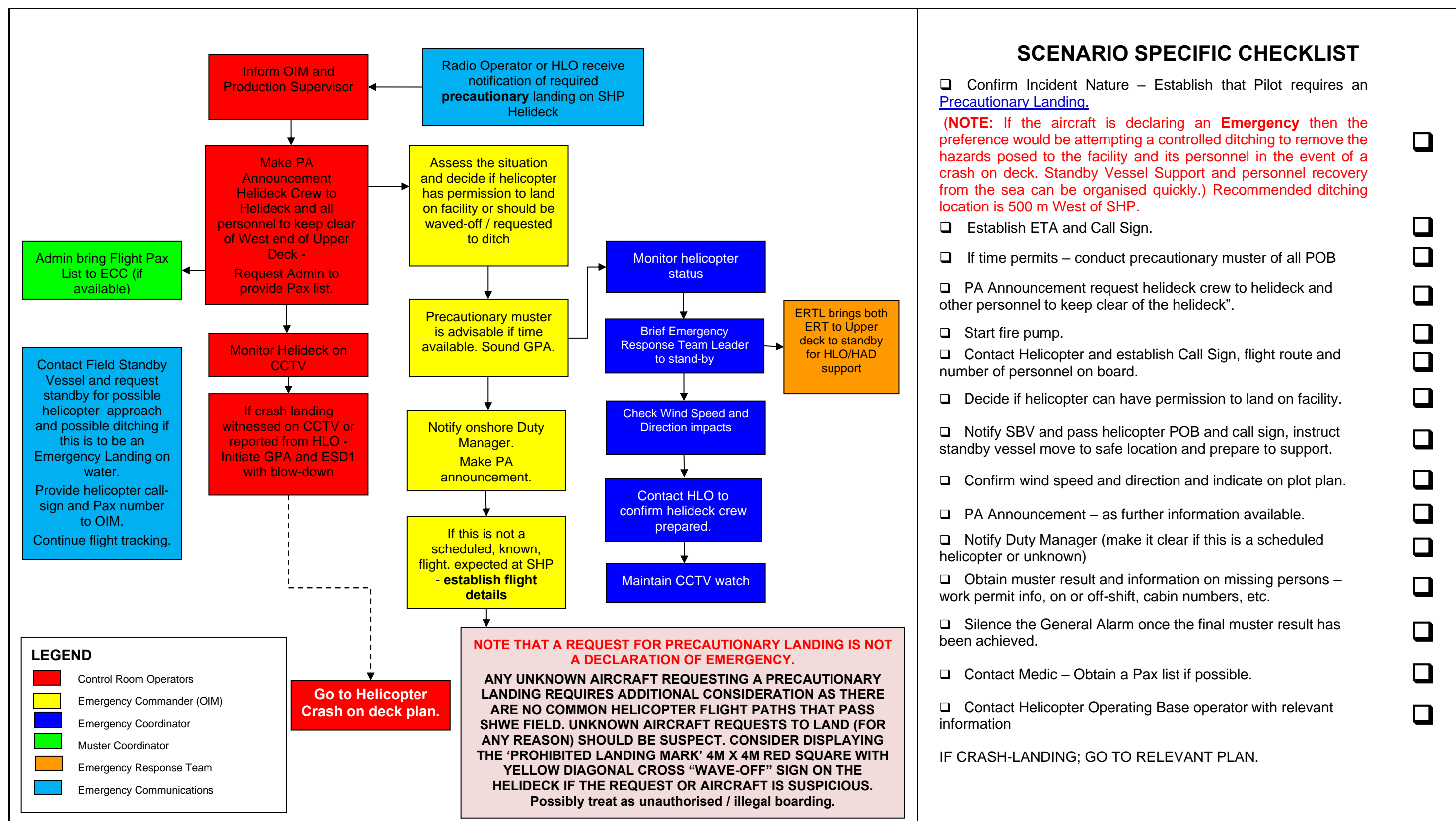
Commence precautionary partial down-man by Helicopter or Life-boats. Consider a full abandonment by Lifeboat if the circumstances warrant.

17.10 Illegal Boarding



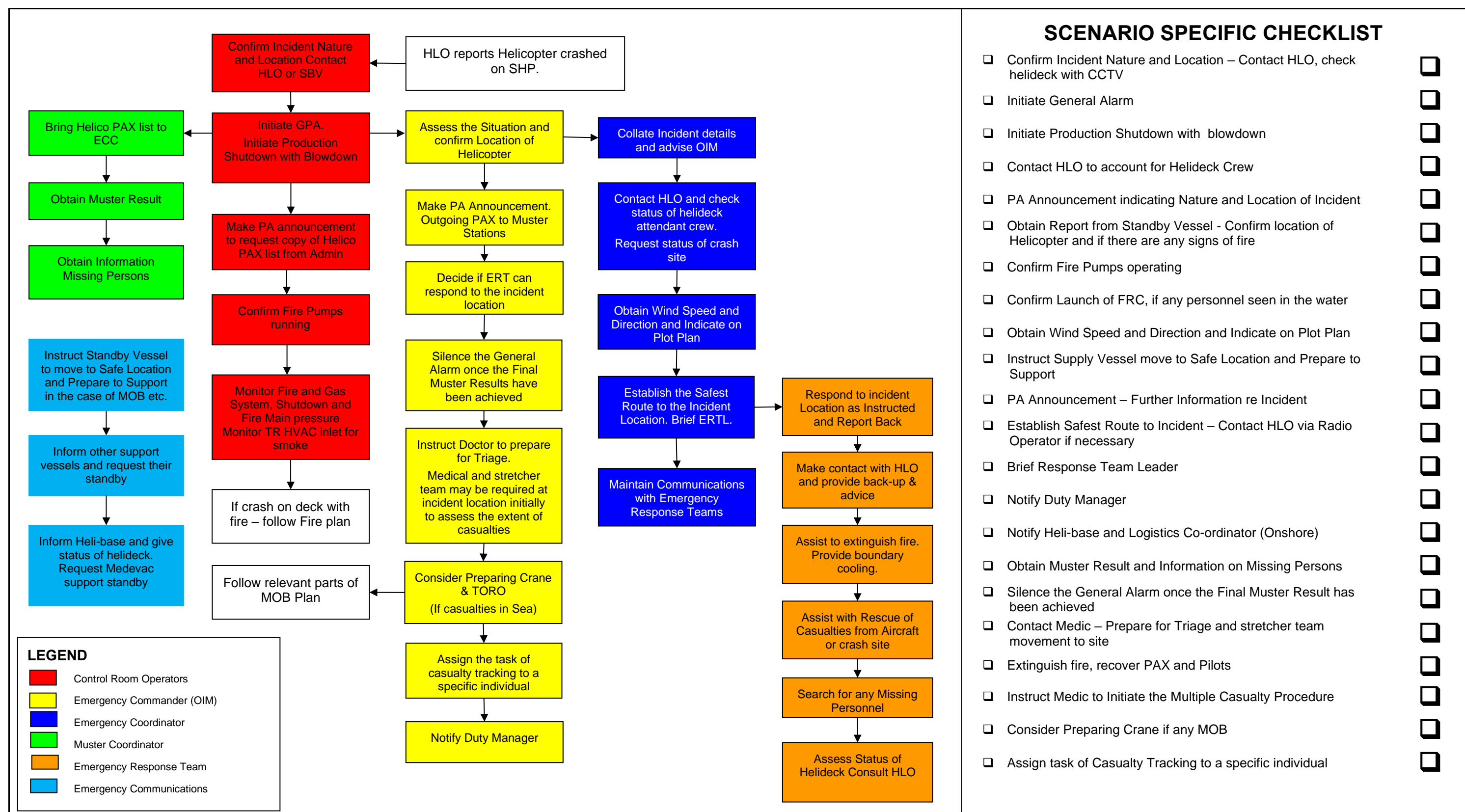
Initiating Event	Escalation Potential	Mitigation
<p>Unidentified aircraft or vessel requests access</p> <p>Prevention</p> <p>Deny access to helideck or boat landing</p> <p>Initiating Event</p> <p>Unidentified vessel enters exclusion zone</p> <p>Prevention</p> <p>Ensure all Overside equipment that may assist boarding is removed. Secure gate on access stairs from boat landing at NW corner.</p> <p>Standby vessel should have notified facility of errant vessel approach and can attempt to communicate with it. SBV must not endanger the errant vessel or her own vessel and crew but can use search-lights and sound signals to attempt to deter errant vessel approach to the platform.</p>	<p>Jet Fires</p> <p>Not applicable unless deliberate breach of containment by boarders</p>	<p>ESD & Blow-down System</p> <p>Fire and Gas detection system</p> <p>Passive Fire Protection</p> <p>Deluge system</p>
	<p>Pool Fires</p> <p>Not applicable unless deliberate breach of containment by boarders</p>	<p>Fire and Gas detection system</p> <p>Deluge System</p>
	<p>Explosion Overpressure</p> <p>Not applicable unless explosives utilised in sabotage or to gain access</p>	<p>Blast-Wall between process and Utilities/LQ</p> <p>H60 wall on LQ designed to withstand 600mb blast overpressure</p>
	<p>Gas Leaks</p> <p>Not applicable unless deliberate breach of containment by boarders</p>	<p>HVAC</p> <p>Confirmed gas detection in TR HVAC inlet – inlet and extract dampers close and HVAC system shutdown.</p>
Environmental Response	Response Strategy and Tactics	
<p>Not applicable unless boarding results in deliberate breach of hydrocarbon containment and loss liquid hydrocarbon of inventory into the sea</p>	Incident Management Team	Emergency Response Team
	<ul style="list-style-type: none"> • Attempt to secure Access gate on stairs from boat landing • Sound GPA and ESD/Blow-down – Inform Duty Manager and Navy support • Hold installation muster and establish anyone missing • Establish identity and purpose of boarders • Relay content of talks to Duty Manager • Ensure safety of personnel by complying with the orders of the boarders • Maintain communications links with Duty Manager • Liaise with the boarders to resolve the situation as rapidly and amicably as possible • Consider change in circumstances if crew member(s) assaulted or taken hostage • Attempt to have any injured person(s) treated by Doctor or hostage(s) released • Comply with demands of malicious boarders 	<ul style="list-style-type: none"> • Act to instructions of OIM

17.11 Helicopter Precautionary Landing



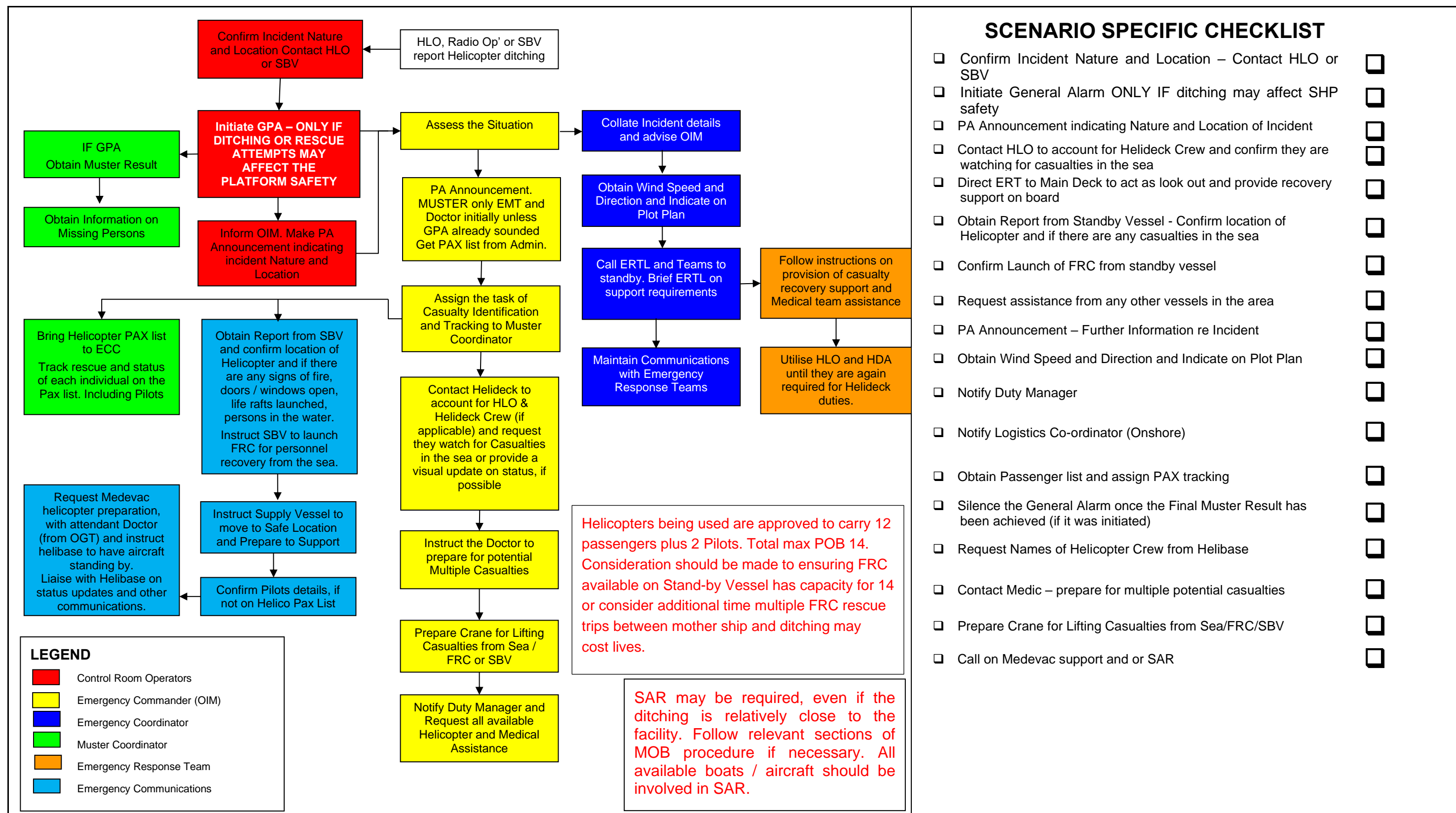
Escalation Potential		Mitigation	
<p>Potential for helicopter crash landing on the helideck or other platform area</p> <p>Potential hazard to HLO and HDA providing helideck support</p> <p>Potential Casualties – Helicopter passengers and crew and helideck crew.</p>		<p>Helideck is constructed to code.</p> <p>HLO and deck crew attendance and fire-fighting standby</p> <p>HLO and HDA trained</p> <p>Helicopter Operations Guidance Procedures</p>	
Environmental Response		Response Strategy and Tactics	
<p>See Helicopter crash landing plan in the event of this emergency developing.</p> <p>Environmental impact unlikely from Precautionary Landing.</p>	Incident Control Team		ERT and Helideck Crew
	<ul style="list-style-type: none"> • Time permitting, all personnel mustered, except Helideck Crew, to attend muster stations until Helicopter has landed. • Standby for a potential escalation and Production Shutdown with blow-down. • Time permitting ERT to move to upper deck fireman's room for stand-by until Helicopter is safely shut-down on the helideck. • After a precautionary landing, it may be necessary to move the aircraft to the parking area (to permit arrival of second helicopter with engineers etc.) • The Crew and passengers from the helicopter should be added to the POB and assigned a place to stand-by awaiting onward transportation. 		<ul style="list-style-type: none"> • Do not apply Foam to Helideck prior to the Helicopter landing. • Prepare foam system monitors. • Time permitting, All Helideck Crew to be dressed in Fire Fighting equipment, SCABA to be made available. • Take up normal positions for landing. • If aircraft lands safely do not operate foam monitors. • Be aware of rotor blades while Helicopter is shutdown. • Ensure passengers and crew safely exit from the helideck.

17.12 Helicopter Crash on Platform



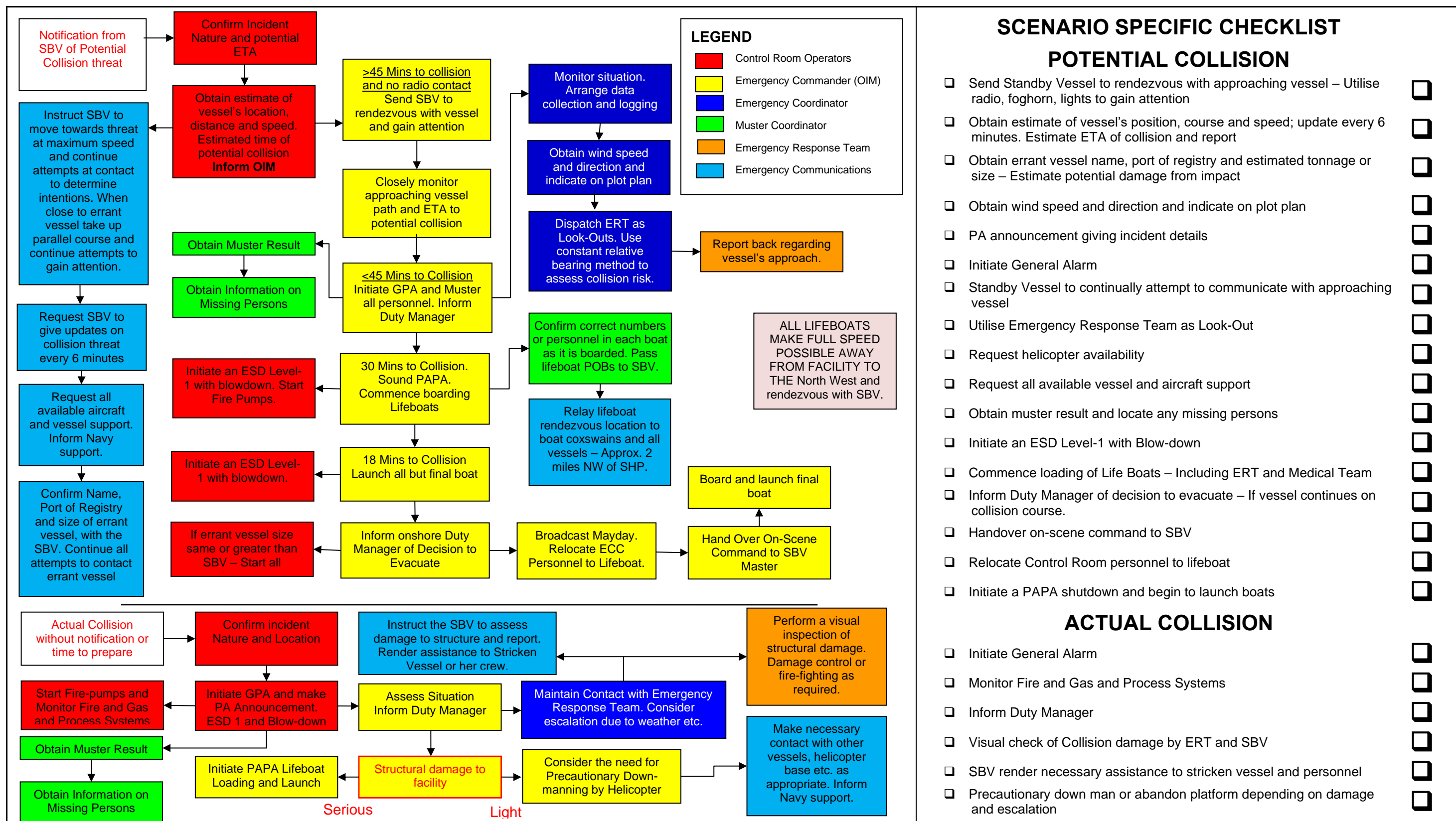
Escalation Potential		Mitigation
Potential for fuel and debris to fall onto Upper Deck and/or down the West side of LQ. Possibly affecting Lifeboat station. Potential for Smoke Ingress in to the TR HVAC. Hazard to persons at the incident scene HLO/HDA/ERT Potential Casualties – Helicopter Passengers and Crew, Helideck Crew, On-Shift Crew etc.		Helideck constructed to code. The main inlet and extract dampers of the HVAC close automatically when smoke or gas is detected at the inlet, leaving the system recirculating air. Foam system and fire monitors at Helideck. Trained HLO and HDA.
Environmental Response	Response Strategy and Tactics	
Potential for Helicopter Fuel to enter the sea. Notify Onshore Duty Manager Monitor for ignited / burning fuel on the sea	Incident Control Team	Emergency Response Team
	<ul style="list-style-type: none">• Muster• Initiate a Production Shutdown with Blowdown• Utilise CCTV from Derrick to monitor situation.• Establish contact with the HLO, via Air-band radio via Radio Operator if necessary. Helideck Crew may also be injured – Helideck crew will appear as missing from muster.• ERT to respond to the incident as soon as possible. Safe access route to crash site should be established if not on helideck• Fire-fighting first – Before rescue.• FRC from the standby vessel to be launched if personnel may be in the sea (MOB) and to be warned of any possible debris falling in to the sea.• A large amount of medical assistance will almost certainly be needed this should be mobilised immediately as it can always be stood down once the situation becomes clearer.• Once the Aircraft has been stabilised – External and Internal fires extinguished, fuselage secure and spilled fuel covered in foam; a large amount of resources (first aiders and stretcher parties) should be sent to the incident scene. The Doctor may be required at the incident scene initially to assess the status of casualties.• Tracking casualties and collating names and injuries will prove onerous and this should be allocated to an individual solely dedicated to the task.	<ul style="list-style-type: none">• Extinguish any external fire and cover exposed fuel with a foam blanket.• Extinguish accessible fires on the helicopter deck.• Electrically isolate helicopter.• Extinguish any internal fire or engine bay fire.• Allow or assist walking wounded to escape from helicopter.• ERT / HDA to enter aircraft to ensure that trapped, immobile or seriously injured passengers are breathing. Medic may be required at the incident scene to advise on casualty treatment and prioritising.• Remove passengers / pilots from helicopter quickly but with due consideration to injuries• One person to monitor and maintain foam blanket.• Emergency response personnel working inside or near the helicopter, if not in BA, should wear dust masks.• Water or foam should be applied to all fuselage fractures, damaged areas until the deck is cleared.

17.13 Helicopter Ditching



Escalation Potential	Mitigation	
Potential Casualties – Helicopter Passengers and Crew.	Field Stand-By Vessel. Aircraft maintained to standard. All passengers trained in BOSIET + HUET. Flight Safety video briefings.	
Environmental Response	Response Strategy and Tactics	
<ul style="list-style-type: none"> High Potential for Helicopter Fuel, hydraulic and lubricating oils to enter the sea – Standby Vessel to Monitor. Notify Onshore Duty Manager 	Incident Control Team	Emergency Response Team
	<ul style="list-style-type: none"> Casualty recovery from the sea to be coordinated by the SBV Master Casualty recovery from the SBV and movements for treatment to be coordinated by the ERTL Doctor and First-Aiders may require additional stretcher teams ERT to respond to the incident immediately to act as additional Look-Outs if required FRC from standby vessel to be launched in all circumstances Additional medical assistance may be required Tracking casualties and collating names and injuries will prove onerous and this should be allocated to an individual solely dedicated to the task Ensure Duty Manager and Heli Base are kept informed of any status updates or information 	<ul style="list-style-type: none"> Helideck Crew to remain in position and watch for Casualties ERT to respond to Main Deck (or Lower Levels if appropriate) to watch for Casualties in the sea ERT to provide recovery support and assistance to Medical team when recovering personnel to facility ERTL to establish contact with SBV or relay comms through ECC

17.14 Potential /Actual Vessel Collision

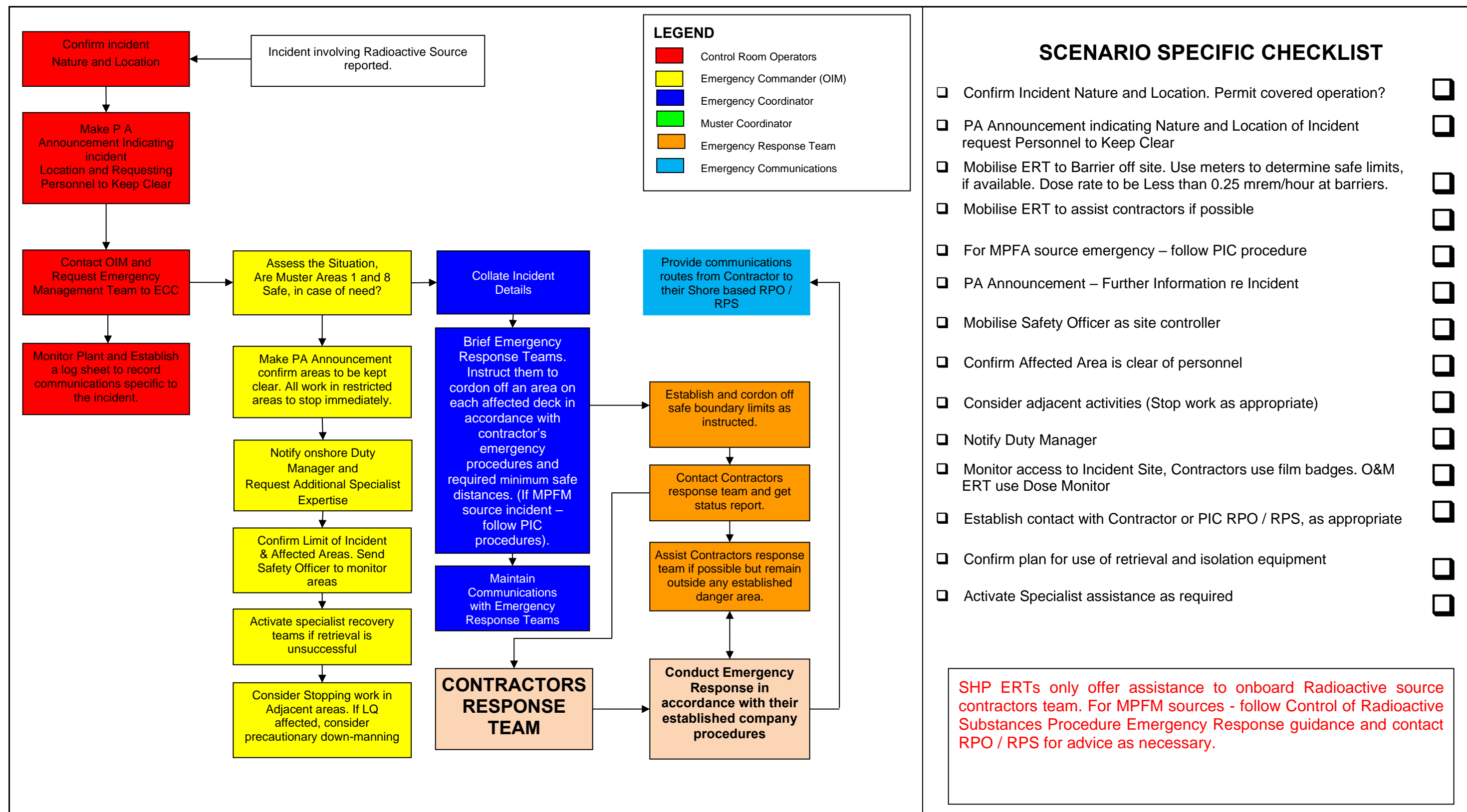


Escalation Potential			Mitigation	
Depending on size and approach speed of errant vessel, the collision could result in major damage and subsequent risks to the Platform or POB. There is also the potential for loss of hydrocarbon containment. Spills from ruptures vessels or tanks etc. An explosion or sea fire may result following damage to Platform risers, gas release and potential fire-ball.			ESD Level -1 with blowdown prior to impact. Fire Pumps and deluge system operating. Evacuation of personnel (time permitting) Physical danger to personnel will be minimised by timely evacuation. Field Stand-by vessel availability	
Environmental Response			Response Strategy and Tactics	
<ul style="list-style-type: none">• Potential for total platform liquid capacity to enter the sea if catastrophic damage occurs.• Notify Onshore Duty Manager.• Be aware of potential for spills from stricken vessel as it is moved free			Potential Collision	Actual Collision
			<ul style="list-style-type: none">• Utilise the SBV to determine if the vessel is on a collision course and to estimate speed & time of impact.• If unable to contact approaching vessel, send SBV to rendezvous with it and attempt to gain attention by utilising all available means.• Small drifting vessels may be towed off course if the SBV can attach a line with the help of the vessel's crew.• If the vessel is large enough and fast enough to cause significant damage to the platform and remains on collision course, follow abandonment procedure.• Alert Helicopter base via Duty Manager to have helicopters standing by.• Initiate GPA and begin to load boats early – if possible. Allow time for boarding, launch and moving clear.• Initiate an ESD Level-1 with blow down and Relocate Control Room Personnel to Lifeboat allowing time for boarding, launch and clearance of the final boat.• Initiate PAPA and begin to Launch Lifeboats at minus 24Mins. <p>Note – A vessel is on a collision course if its bearing from the platform remains constant</p>	<ul style="list-style-type: none">• Follow Fire Emergency Plan if necessary.• Utilise Deluge if there is any threat of fire.• Utilise SBV and ERT to assess damage to Platform jacket and Topsides.• Monitor fire and gas detection systems• Evacuate immediately if there is a potential for collapse of the primary structure.• Otherwise consider if a partial evacuation is necessary.• Contact Duty Manager to obtain specialist advice.• If possible email photographs and clear details of damage to the EMT in Yangon.• Utilise SBV to provide assistance to stricken vessel or crew.
Equipment Liquid Capacities			<p>The timing noted above may be unrealistic in cases of large international trading vessels. Bear in mind that with the 15 x 10-mile exclusion zone, for the SHWE field, as marked on the Nautical charts, a vessel doing 15 knots may appear as a collision threat while still outside our exclusion zone but then alters course on a routine passage, posing no real threat. This "plan" will depend on the actual circumstances of the case and depends entirely on the point at which the "threat" is first identified and thence develops over time. Diligent radar watch by the SBV and decisive early action are required in all cases. It is expected that collision risks are more likely from smaller coastal vessels, fishing boats etc. (or from deliberate activity).</p>	
Equipment	Liquid	Capacity per Item		
The nature of this potential incident precludes identifying individual hydrocarbon spill inventories. Any leaks from risers will be of a major magnitude and difficult to initially quantify.				

17.14.1 Potential Vessel Impact distance/speed/time table

		Vessel Approach Speed												
		0.25 Knots	0.5 Knots	1 Knot	2 Knots	3 Knots	4 Knots	5 Knots	7 Knots	10 Knots	12 Knots	15 Knots	20 Knots	25 Knots
Vessel Distance From Installation	Time to Impact													
	200 Metres	25.9 Minutes	13.0 Minutes	6.5 Minutes	3.2 Minutes	2.2 Minutes	1.6 Minutes	1.3 Minutes	0.9 Minutes	0.6 Minutes	0.5 Minutes	0.4 Minutes	0.3 Minutes	0.3 Minutes
	500 Metres	1.1 Hours	32.4 Minutes	16.2 Minutes	8.1 Minutes	5.4 Minutes	4.0 Minutes	3.2 Minutes	2.3 Minutes	1.6 Minutes	1.3 Minutes	1.1 Minutes	0.8 Minutes	0.6 Minutes
	1000 Metres	2.2 Hours	1.1 Hours	32.4 Minutes	16.2 Minutes	10.8 Minutes	8.1 Minutes	6.5 Minutes	4.6 Minutes	3.2 Minutes	2.7 Minutes	2.2 Minutes	1.6 Minutes	1.3 Minutes
	1Nm	4.0 Hours	2.0 Hours	1.0 Hours	30.0 Minutes	20.0 Minutes	15.0 Minutes	12.0 Minutes	8.6 Minutes	6.0 Minutes	5.0 Minutes	4.0 Minutes	3.0 Minutes	2.4 Minutes
	2Nm	8.0 Hours	4.0 Hours	2.0 Hours	1.0 Hours	40.0 Minutes	30.0 Minutes	24.0 Minutes	17.1 Minutes	12.0 Minutes	10.0 Minutes	8.0 Minutes	6.0 Minutes	4.8 Minutes
	3Nm	12.0 Hours	6.0 Hours	3.0 Hours	1.5 Hours	1.0 Hours	45.0 Minutes	36.0 Minutes	25.7 Minutes	18.0 Minutes	15.0 Minutes	12.0 Minutes	9.0 Minutes	7.2 Minutes
	4Nm	16.0 Hours	8.0 Hours	4.0 Hours	2.0 Hours	1.3 Hours	1.0 Hours	48.0 Minutes	34.3 Minutes	24.0 Minutes	20.0 Minutes	16.0 Minutes	12.0 Minutes	9.6 Minutes
	5Nm	20.0 Hours	10.0 Hours	5.0 Hours	2.5 Hours	1.7 Hours	1.3 Hours	1.0 Hours	42.9 Minutes	30.0 Minutes	25.0 Minutes	20.0 Minutes	15.0 Minutes	12.0 Minutes
	6Nm	24.0 Hours	12.0 Hours	6.0 Hours	3.0 Hours	2.0 Hours	1.5 Hours	1.2 Hours	0.9 Hours	36.0 Minutes	30.0 Minutes	24.0 Minutes	18.0 Minutes	14.4 Minutes
	7Nm	28.0 Hours	14.0 Hours	7.0 Hours	3.5 Hours	2.3 Hours	1.8 Hours	1.4 Hours	1.0 Hours	42.0 Minutes	35.0 Minutes	28.0 Minutes	21.0 Minutes	16.8 Minutes
	8NM	32.0 Hours	16.0 Hours	8.0 Hours	4.0 Hours	2.7 Hours	2.0 Hours	1.6 Hours	1.1 Hours	48.0 Minutes	40.0 Minutes	32.0 Minutes	24.0 Minutes	19.2 Minutes
	9NM	36.0 Hours	18.0 Hours	9.0 Hours	4.5 Hours	3.0 Hours	2.3 Hours	1.8 Hours	1.3 Hours	54.0 Minutes	45.0 Minutes	36.0 Minutes	27.0 Minutes	21.6 Minutes
	10Nm	40.0 Hours	20.0 Hours	10.0 Hours	5.0 Hours	3.3 Hours	2.5 Hours	2.0 Hours	1.4 Hours	1.0 Hours	50.0 Minutes	40.0 Minutes	30.0 Minutes	24.0 Minutes
	15Nm	60.0 Hours	30.0 Hours	15.0 Hours	7.5 Hours	5.0 Hours	3.8 Hours	3.0 Hours	2.1 Hours	1.5 Hours	1.3 Hours	1.0 Hours	45.0 Minutes	36.0 Minutes
	20Nm	80.0 Hours	40.0 Hours	20.0 Hours	10.0 Hours	6.7 Hours	5.0 Hours	4.0 Hours	2.9 Hours	2.0 Hours	1.7 Hours	1.3 Hours	1.0 Hours	48.0 Minutes

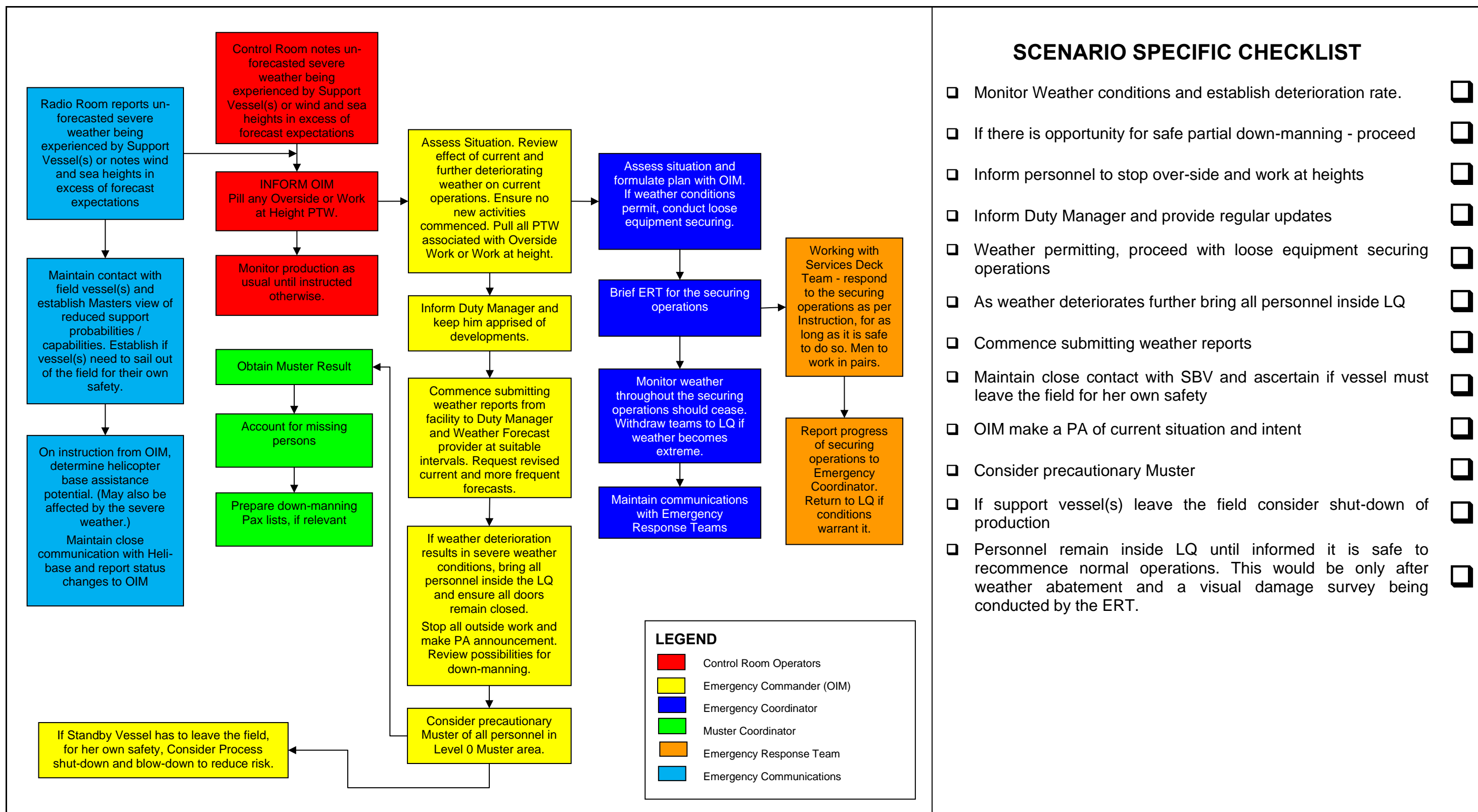
17.15 Radioactive Source Incident



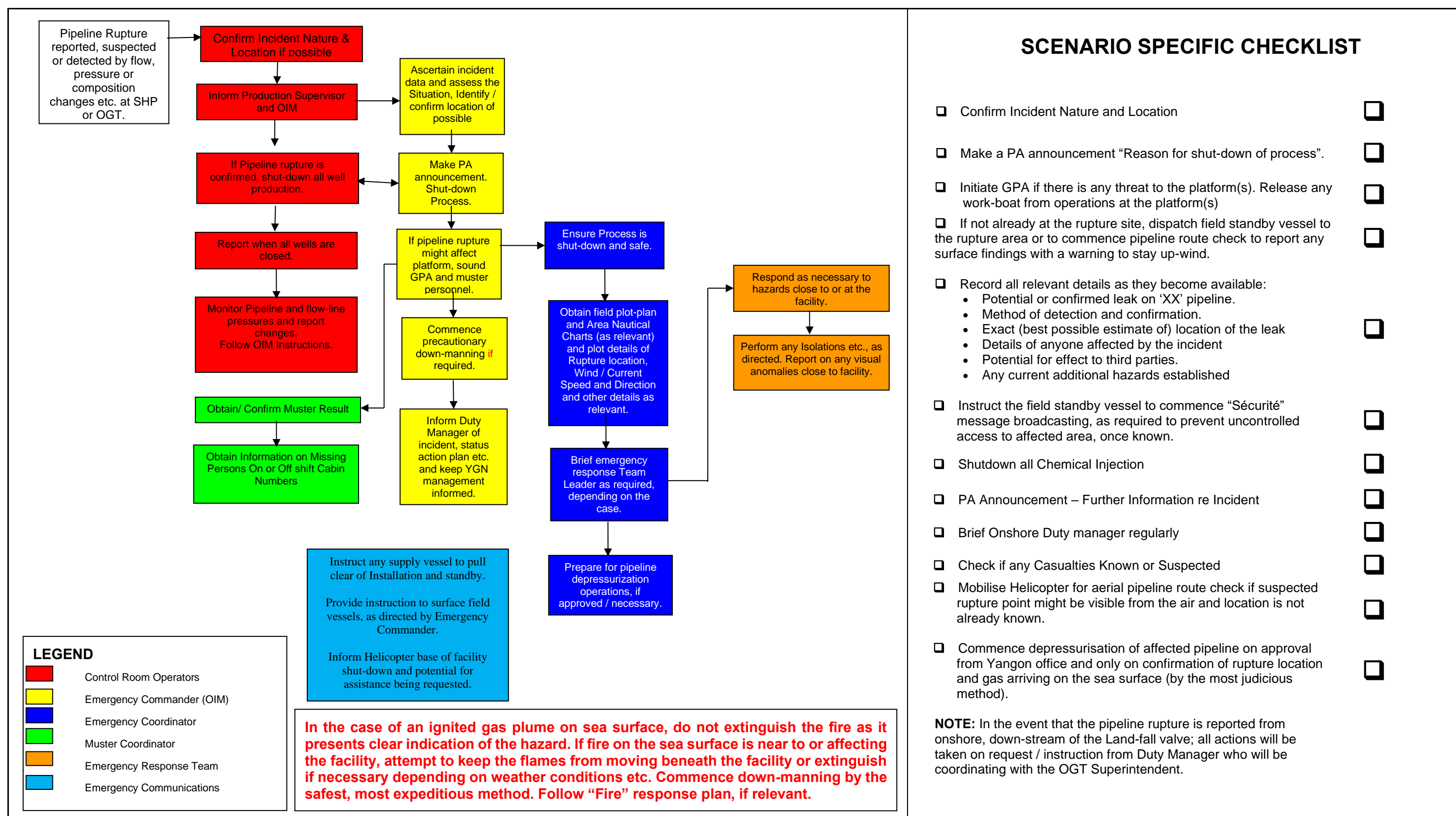
Escalation Potential		Mitigation	
Incident escalation will depend on source activity, if source has been lost and where / if source is located. Escalation also depends on competence of the contractor site personnel and the O&M team to safely deal with the particular circumstances.		Use of specialist contractor with approved emergency recovery procedures & equipment. Working under permit will include risk assessment and action plan. Use of radiation generators rather than radio isotopes. Fixed position nature and anti-tamper securing arrangement of MPFM sources which will only be installed / removed / replaced by metering contractor trained personnel. PIC RPO appointed through Pacific Hi-Tech.	
Environmental Response		Response Strategy and Tactics	
<ul style="list-style-type: none"> Environmental impact only if source lost to sea. (This might require a recovery plan involving ROV spread.) 	Incident Management Team		Emergency Response Team
	<ul style="list-style-type: none"> Mobilise Emergency Response Team Mobilise Safety Officer to Forward Control Point Confirm Isolation of affected area PA Announcement – Incident Location, Advise Site personnel to Listen for Further Announcements Refer to Radioactive Source Containment Plan from Contractors RPO or PIC procedure Contractor work-force to Monitor Dose rate levels in Incident area (Safety Officer to monitor if MPFM incident) Consider adjacent activities (Initiate stoppage of work as appropriate) Activate specialist contractor to assist recovery if necessary 		<ul style="list-style-type: none"> Establish a Forward Control Point Report Back – Physical signs Monitor for contamination levels using Portable Detector Assist contractor team to collect specialised retrieval or containment equipment from their storage area on-board For MPFM SHP ERT will collect Radiation Emergency Equipment from storage Liaise with contractor site supervisor for retrieval plan and safe exposure times. For MPFM, follow PIC procedure Prevent other personnel from entering the Incident Area Monitor contractor personnel as they carry out retrieval attempt or Monitor O&M ERT as they conduct retrieval If unsuccessful or unsafe, adopt containment method and monitor area until specialist assistance is available. For MPFM use lead-shot bags from emergency kit to cover source. Ensure barriers are in place to prevent unauthorized approach and await specialist assistance.

All responses shall be as detailed in the specialist contractor Emergency Response Procedures which are submitted with the Work-scope and task procedures.

17.16 Un-forecasted Severe Weather

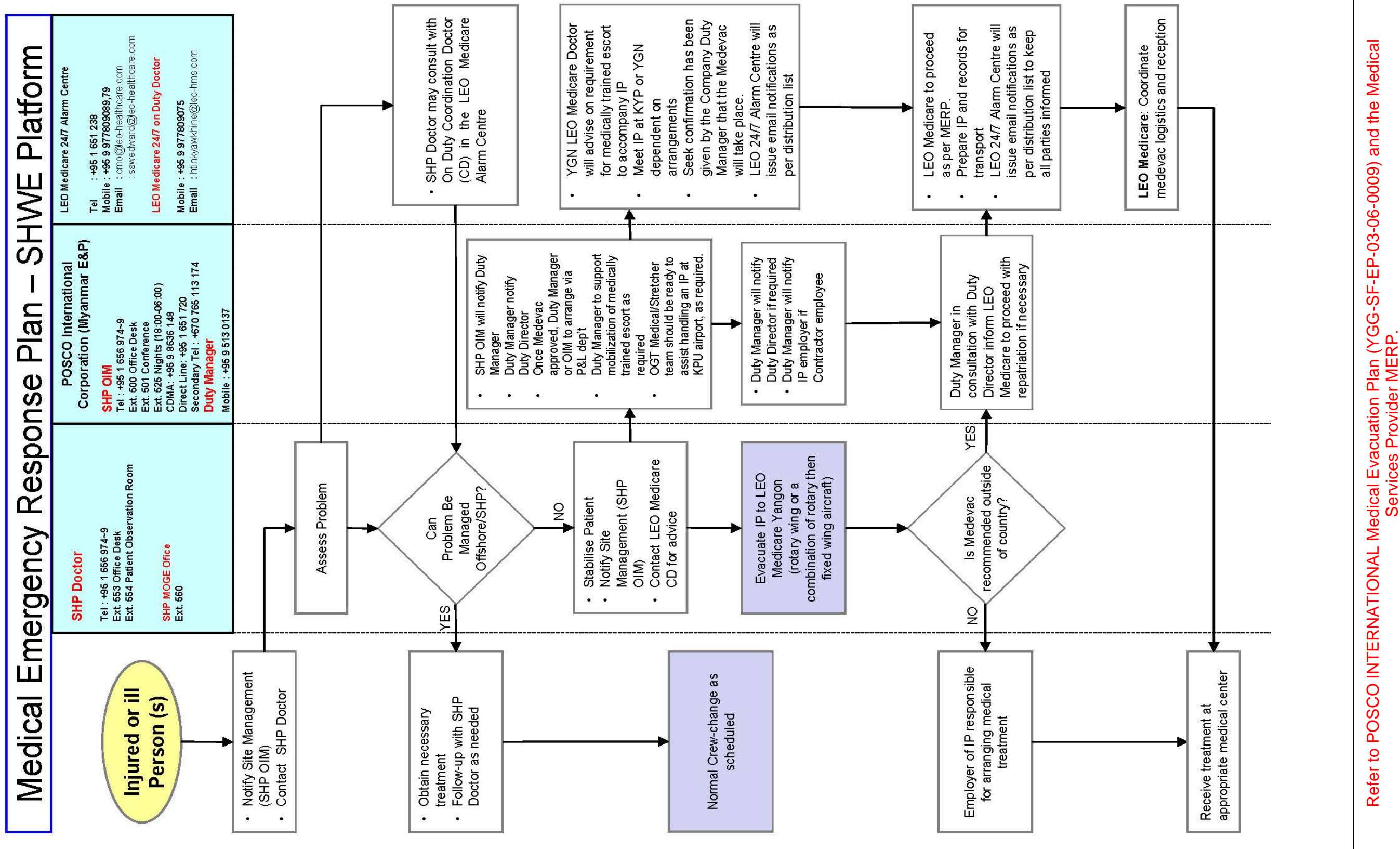


17.17 Pipeline Rupture

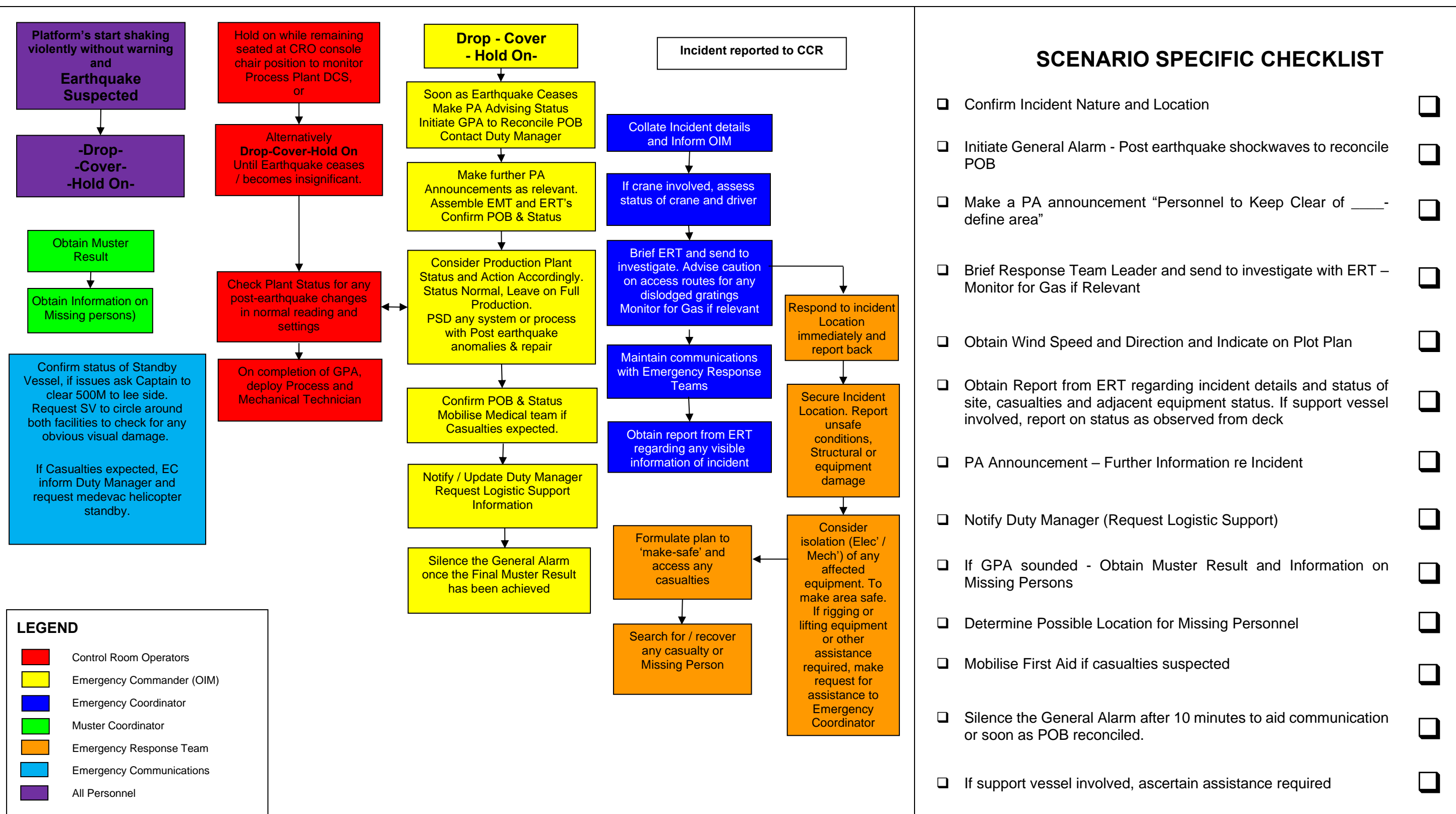


Escalation Potential – MODERATE to HIGH						Mitigation	
Escalation potential is dependent upon location of the rupture / other leak and rate of the leak to sea, composition of fluids arriving on sea surface etc. Escalation would require a large volume gas release from ruptured line affecting the sea surface with ignition or close proximity to surface vessels or platform(s). As a pipeline rupture may be the result of surface vessel unauthorized operations or incident, the escalation potential is considered moderate to high due to potential proximity of the initiating vessel to the rupture point.						Pipeline corrosion rates are monitored as part of the PIC integrity management system. Corrosion inhibitor is used to control corrosion rates and the lines were engineered with appropriate corrosion allowance. The 32” pipeline to shore and SHWE field restricted area is shown on Marine Charts (Admiralty 917) to provide warning to surface vessels. The field standby vessel maintains a radar watch in the field areas for errant vessels etc. In-field vessels control procedure, SIMOPS and MOPO procedures provide guidance on restricting / controlling vessel operations in the field.	
Environmental Response						Response Strategy and Tactics	
<ul style="list-style-type: none">There is a potential for small volumes of Condensate to enter the sea but the risk posed is considered very low due to the composition and very fast dispersion of the light hydrocarbon liquid.Notify Duty Manager if liquid hydrocarbons are reported on the sea surface.In consultation with Duty Manager and onshore Management, consider improved dispersion methods. Normally, condensate would disperse naturally, long before any chance of land-fall but must be accurately estimated and clearly reported, if sighted.Note that gas or condensate arriving on the sea surface will be some distance from the actual pipeline rupture point, due to the water depth and current profiles.						Incident Management Team	Emergency Response Team
						<ul style="list-style-type: none">Actions will be dependent on the circumstances of the case and approved by the Yangon Management Team. If no casualties are involved response to the incident may simply be to depressurise the affected pipeline and then prepare for repairs.	<ul style="list-style-type: none">Act to OIM instructions.Perform any necessary Manual IsolationsIn the event of a threat to the facility, precautionary down-manning will be conducted.Field stand-by vessel may be asked to take up station as a warning vessel while monitoring any surface activity from the rupture.
<u>Approximate Pipeline Capacities</u> (For Information)							
Pipeline	Diameter (inches)	Length (m)	Capacity (m³) At 1 bar a	Capacity (ft³) At 1 bar a	Normal Working Pressure (bar g)	Gas inventory at working pressure (mmscf)	Other details: CGR approx. 0.4 bbl/mmscf. WGR approx. 5.0 bbls/mmscf Mya North Production approx. 280 mmscfd, SHWE Phyu Production approx. 190 mmscfd. SHWE Subsea Production approx. 150 mmscfd.
Flow-line from Mya North to SHP	14”	12,000	875	30,921	90	3.0	Water Depth 186 to 111 meters.
Pipeline from SHP to the Land-fall near Kyauk Phyu	32”	105,000	54,470	1,923,590	116	250.0	Water depth 111 meters to 0 meters.
Pipeline, from SHWE Subsea development to SHP	12”	2,400	144	5,078	80	0.5	Water depth 104 to 111 meters.
Pipeline from Well SHD-M to SHWE Subsea Manifold	6”	9,000	132	4,651	80	0.4	Water depth 105 meters.
Pipeline, from SHWE Phyu Manifold to SHP	14”	20,000	1,460	51,535	85	5.0	Water depth 89 to 111 meters.
Pipeline from Well SPD-D to the SHWE Phyu Manifold	6”	5,500	80	2,842	85	0.3	Water depth 90 meters.
Twelve Jumpers from Well Heads to Manifolds.	6”	max 45	0.5 max each	19 max each	90	-	Various 89 to 105 meters.

17.18 Injury/Medevac



17.19 Earthquake

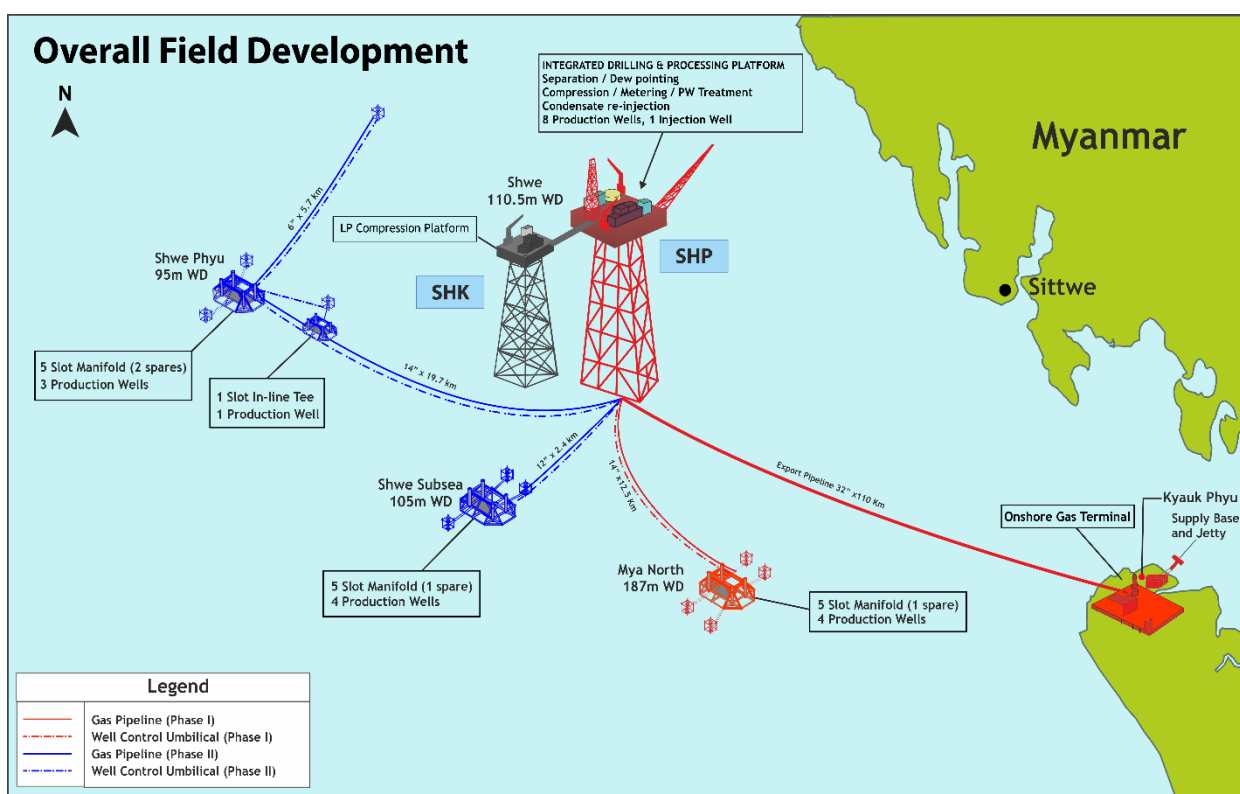


Escalation potential - Moderate	Mitigation	
Possible Damage to piping, Instruments, small bore tubing, equipment or structure resulting in gas release or unsafe conditions.	<p>Platform correctly designed, strongly constructed using correct materials and best engineering techniques.</p> <p>All process pipelines and instrument tubing all built and constructed to international “standards”, ensuring minimal risk of failure during earthquake events.</p> <p>All electrical and instrument equipment to ATEX standard in Hazardous areas preventing risk of source of ignition in event of a severe earthquake of high magnitude lasting several minutes or more</p> <p>A planned maintenance regime to ensure plant and equipment are maintained to the highest standards.</p> <p>Company Policies and associated Procedures</p>	
Environmental response	Response Strategy and Tactics	
<ul style="list-style-type: none"> Potential for process gas leak to atmosphere Activate PSD and / or ESD safety procedures in event automatic ESD failed to operate Depressurise to Flare to minimise environmental impact. 	Incident Management Team	Emergency Response Team
	<ul style="list-style-type: none"> In the event of Gas Release ensure ESD and Blow Down activated to depressurize plant via Flare. Utilise CCTV Systems to identify possible leak points. And/or identify casualties / missing person location If piping, instruments, or process vessels affected Shut-down and blow-down process systems. If confirmed that no casualties are involved response to the incident should reflect this. If casualties are known or suspected HOLD the ERT Teams until Blow down completed, then should prioritise safe access for rescue / recovery. Liaise with EMT regarding structural conditions, advise where suspected leak point, process damage was, if known from instrument indication prior to incident. Action ERT to respond to incident location Consider effective isolations of effected equipment to allow plant re-start. Consider effects of any down-graded systems 	<ul style="list-style-type: none"> Hold ERT Teams at Muster until Blow Down complete and both platforms depressurized. Initiate search for missing persons / casualties Remember to advise ERT teams that Access route grating may have become dislodged due effect of earthquake Minimise the number of personnel in the affected area Assess the risk to personnel from toxic releases Assess area safety and confirm ESD request shut-down of electrical or process equipment Assess stability of any collapsed materials or damaged structure Ensure safe access of rescue team members Rescue and treat casualties Have HLO check helideck for possible arrival medevac flights.

PROJECT / JOB TITLE: SHWE PROJECT

DOCUMENT TITLE: OIL SPILL CONTINGENCY PLAN

DOCUMENT NUMBER: SHP-SF-EP-03-06-0007



4	Issued for Use	Environmental Engineer	Head of HSE	O&M Manager	O&M Director
Revision Number	Description	Prepared	Checked	Checked	Approved

Revision History

Revision Number	Date	Section(s)	Page(s)	Brief Description of Change	Author of Change
1	24-08-15	Various	Various	Various Changes	CWY
2	25-05-19	Various Section 1.1, Section 2.0, Section 4.0, Appendix 5, 6	Various Page 4 Page 5 Page 8 Page 40 and 45	<ul style="list-style-type: none"> Logos and New Company Name Some edit in purpose Updated Reference Document Standards Added Location of Offshore Operations Added New Concession Map for offshore block, and active table from MOEE, and Added Spill Notification Point (Myanmar), and Contingency Plan 	YHW
3	28-01-22	Various, Section 3.0, Section 6.3	Various Page 7 Page 12	Updated Roles and Responsibilities, Three Level or Tier Response System, Revision Number, Added Appendix 8, and Added Citations for Appendixes etc.	YHW
4	18-06-24	Various 4.0, 6.1 Appendix 5 Appendix 7 Appendix 8	Various Page 9, 11 Page 45 & 46 Page 50 Page 54	<ul style="list-style-type: none"> Updated revision number, Deleted DCND and Phase 2 which are not relevant anymore. Oil spill risk at OGT updated to reflect the current Supply vessel and warehouse team transferring to OGT and the Hangar. Added SHK Latitude and Longitude Updated of Status of Offshore Blocks Updated OSRL Notification and Mobilization Form Updated Oil Spill Response Limited (Associate Agreement) 	YHW

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1.0 INTRODUCTION

This procedure is intended for POSCO International Corporation (Myanmar E&P) Operations and lays out the oil spill contingency procedures that should be adhered to by personnel in the event of accidental spillages occurring from POSCO International Corporation (Myanmar E&P) offshore production, marine and drilling operations. Emergency response plans shall be regularly exercised and reviewed to ensure they remain fit-for-purpose.

1.1 Purpose

It is POSCO International Corporation (Myanmar E&P) policy to achieve a high standard of environmental care in conducting its business operations, and to observe relevant national and international legislation. The company has a duty of 'good corporate citizenship', and relies on maintaining the goodwill of the Public, Government, stakeholders, and shareholders.

To achieve this objective POSCO International Corporation (Myanmar E&P) is committed to effective pollution prevention and response, which comprises:

- Providing the resources required to carry out these responsibilities by Complying with the Myanmar National Oil Spill Contingency Plan.
- Measures to eliminate or reduce the chance of a spill occurring (e.g. equipment maintenance programmes, safety systems and ship vetting systems);
- Assessing risks of oil spills and pre-planning of response strategies;
- Understanding of consequences of oil spills, in order to establish priorities for oil spill response, (noting that safety of life will take precedence over counter pollution operations);
- Development of an appropriate response capability through having the right equipment, trained responders, good response procedures, communications and logistics; and
- Comprehensive oil spill contingency plans (OSCP's) which are easy to use, accurate and up to date.

1.2 Scope

The scope of this plan applies to all assets and operations owned or operated by, or on behalf of, POSCO International Corporation (Myanmar E&P). The plan is intended to cover potential offshore hydrocarbon spillages and Kyauk Phyu Jetty spillages from facilities or vessels. Where a spillage is a part of a wider emergency, such as a blow-out, fire or explosion, or vessel collision, then the emergency aspects of the incident must be addressed first and reference should be made to the appropriate emergency procedures. In this case reference should be made to the relevant POSCO International Corporation (Myanmar E&P) Emergency Procedures & Plans.

2.0 REFERENCE DOCUMENT STANDARDS

Standards

IMO Technical Information	International Maritime Organisation
IPIECA	International Petroleum Industry Environmental Conservation Association

International Instruments

REFERENCE	TITLE
UNCLOS	United Nations Convention on the law of the sea, 1982
MARPOL Convention	International Convention for the Prevention of Pollution from ships, 1973/78)
OPRC Convention	International Convention on Oil Pollution Preparedness, Response and Co-operation
NOAA Handbook	National Oceanic and Atmospheric Administration
ASEAN-OSRAP	Oil Spill Response Action Plan (Regional Cooperation for Oil Spill Response)
IPIECA Vol 14	Guide to Tiered Preparedness and Response
IPIECA Vol 11	Oil Spill Responder Safety Guide

National Regulations and Laws

REFERENCE	TITLE
EC Law, 2012	Environmental Conservation Law
NDM Law, 2013	Natural Disaster Management Law
MPA Law, 2015	Myanmar Port Authority Law
NOSCP	National Oil Spill Contingency Plan (Myanmar)
YOSCP	Yangon River Oil Spill Contingency Plan

POSCO International Corporation (Myanmar E&P) Documents

REFERENCE	TITLE
SHP-OM-MP-03-06-0004	SHWE PLATFORM EMERGENCY RESPONSE
YGG-SF-EP-03-06-0015	LEVEL 3 RISK ASSESSMENT: OIL SPILL SCENARIOS and RISK MITIGATION

2.1 Document Control

Regular reviews and updates of this document are the responsibility of the POSCO International Corporation (Myanmar E&P) Operations and Maintenance Director or his designate. The document will be reviewed and updated and re-issued as required and in accordance with the Document Control Procedure.

2.2 Key Abbreviations

cSt.	Kinematic Viscosity Centistokes (Unit)
DMA	Department of Marine Administration
ECD	Environment Conservation Department
ER	Emergency Response
ESC	Yangon Emergency Support Centre
ERT	Emergency Response Team
HFO	Heavy Fuel Oil (<i>Not applicable for SHP and OGT</i>)
IPIECA	International Petroleum Industry Environmental Conservation Agency
IMO	International Maritime Organisation
MOEE	Ministry of Electricity and Energy
MOGE	Myanmar Oil and Gas Enterprise
MSDS	Material Safety Data Sheet
NOSCP	Myanmar National Oil Spill Contingency Plan
OSC/OIM	On-Scene Commander/Offshore Installation Manager
OGT	Onshore Gas Terminal Plant
OGT Supt	Onshore Gas Terminal Superintendent
OSCP	Oil Spill Contingency Plan
OSRL	Oil Spill Response Limited Service
PIC	POSCO INTERNATIONAL CORPORATION (MYANMAR E&P)
SBV	Supply Boat Vessel
SHP	Shwe Production & Process Platform
SHK	Shwe Low Pressure Compression Platform
SOSRC	Singapore Oil Spill Response Centre

2.3 KEY Definitions

TIER I

Operational-type spills that may occur at or near a company's own facilities as a consequence of its own activities, and which can be controlled by company. POSCO International Corporation (Myanmar E&P) would typically respond to this with available site (Tier 1) manpower and resources.

Both SHP and OGT have Oil Spill Response kits and all ERT members should have attended Oil / Chemical spill response training, which is put into practice with two (2) related scenario drills being conducted each year.

TIER II

A larger spill, unlikely to occur but which can be controlled with assistance from contracted Oil Spill Response Limited Service (OSRL). Company will inform MOGE and related government departments, eg. DMA and ECD. Company will additionally comply with notifications as required under future NOSCP regulations. The company may participate in a local cooperative where each member pools their (Tier 1) resources and has access to any equipment that may have been jointly purchased by a cooperative.

TIER III

Larger spills, very unlikely to occur, where substantial further resources will be required and support from national (Tier 3) or international cooperative stockpile may be necessary. It is likely that such operations would be subject to government controls or even direction. (It is important to recognize that a spill which could require a Tier 3 response may be close to, or remote from, company facilities.)

3.0 ROLES AND RESPONSIBILITIES

POSCO INTERNATIONAL CORPORATION (MYANMAR E&P) DEPARTMENT MANAGERS and Heads of Department

Managers or Heads of Department shall ensure that the OSCP procedure has been provided to each contracted company working at POSCO International Corporation (Myanmar E&P) operated sites.

POSCO INTERNATIONAL CORPORATION (MYANMAR E&P) SITE SUPERVISORS

POSCO International Corporation (Myanmar E&P) Site Supervisors are responsible for implementation of this procedure at their respective Work Site.

POSCO INTERNATIONAL CORPORATION (MYANMAR E&P)

As operator of the facilities listed in Section 2.0, and under the requirements of Merchant Shipping (Oil Pollution Preparedness, Response and Cooperation Convention) Regulations 1998, POSCO International Corporation (Myanmar E&P) are required to have in place, maintain and implement oil pollution plans to combat oil pollution of the sea for tier 1 events.

OPERATIONS AND MAINTENANCE WEEKLY DUTY MANAGER FOR OPERATIONAL PHASE

Operations and Maintenance Weekly Duty Manager will lead and co-ordinate onshore based emergency response with the consultation of OSRL to get emergency response services during any Serious or Major to Catastrophic emergency which may take place at any POSCO International Corporation (Myanmar E&P) operated site or installation.

VESSEL OWNERS

In the event of a spillage from one of the chartered supply vessels, when at sea and en-route between ports, then legal responsibility and liability for pollution damage lies with the vessel owners who will implement the appropriate dedicated shipboard oil pollution emergency plan and inform PIC.

4.0 LOCATION OF OFFSHORE OPERATIONS

Location: **Block A-1, Offshore Myanmar;**

SHP (WD-116m)

UTM Easting - 452,115

UTM Northing - 2,175,460.67

Longitude **(92° 32' 35.404" E)**

Latitude **(19° 40' 26.063" N)**

Location: **Block A-1, Offshore Myanmar;**

SHK (WD-116m)

UTM Easting – 452,126.90

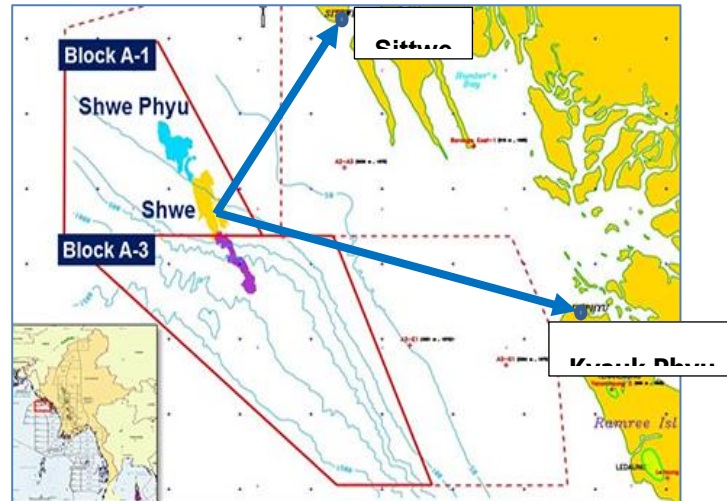
UTM Northing – 2,175,287.30

Longitude (92° 32' 35.9" E)

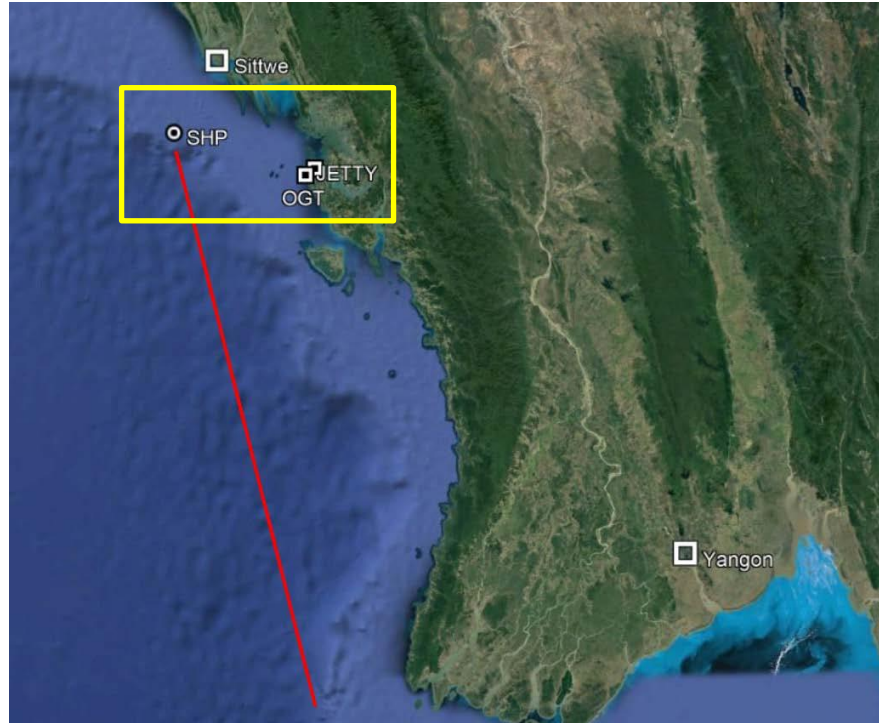
Latitude (19° 40' 20.5" N)

5.0 OFFSHORE OIL SPILL RISKS

This section is a general overview of the areas at risk from possible oil spills at POSCO International Corporation (Myanmar E&P) offshore operations in Blocks A1 and A3.



Overview of Blocks A-1 and A-3.



Normal Supply vessel routes to / from Kyauk Phyu / Singapore shown as red lines.

(Yellow section from above is expanded below.)



It is important to note that there is no Crude Oil production associated with PIC operations and only non-persistent hydrocarbons, Condensate, Diesel fuel (and possibly oil based drilling mud, during drilling operations) are associated with the Shwe Project. The generic term “Oil Pollution” used throughout this document, refers therefore to non-persistent liquid spills from Shwe project.

RISK ASSESSMENT

Risk assessment is an essential part of oil spill contingency planning. POSCO International Corporation (Myanmar E&P) has developed document YGG-SF-EP-03-06-0015; LEVEL 3 RISK ASSESSMENT: OIL SPILL SCENARIOS and RISK MITIGATION, as the key assessment document relating to potential spills.

In the event of a spill, it is unlikely that responders will be able to protect all of the resources at risk from the effects of the oil pollution. Therefore, identifying high-risk areas during contingency planning allows the user to define priorities for protection in the event of a spill and the appropriate response strategies.

EVALUATION OF OIL SPILL RISKS

Evaluating oil spill risks requires consideration of four main factors:

- 1) The potential spill location
- 2) The probability of a spill occurring
- 3) The hydrocarbon types and inventories, and
- 4) The potential consequences for the people, environment, property and the companies' reputation.

5.1 Factors Affecting Oil Spill Risks at SHP and SHK Offshore

Common factors increasing the risk of spills from offshore E&P operations are:

- Maintenance and Operational activities
- Impact of weather conditions, particularly Tropical Cyclones.

- Accidental damage e.g. vessel collisions, equipment failure, and other vessel's oil spillage passing through the SHP and SHK area.
- POSCO International Corporation (Myanmar E&P) contracted Marine Vessels, have in place a series of systems and measures to reduce the risk of oil spills from its offshore operations, including:
 - Spill containment, collection and drainage systems.
 - Tank fluid level and pressure monitoring systems.
 - Fire and explosion prevention.
 - Program of equipment and instrumentation inspections.

6.0 OFFSHORE RESPONSE TECHNIQUES BY OSRL

The available offshore response strategies and techniques (Tier 2 and 3) are:

- Monitor (by air if a larger spill), assess severity, and select appropriate response.
- Apply dispersants, aerial observation to guide the spray operation and assess success.
- Deploy booms to deflect (redirect) oil or to contain oil.
- Use skimmers to recover oil on water.
- Use sorbents to recover oil on deck and prevent secondary contamination.
- Use tanks and containers for temporary storage of recovered oil.
- Shoreline protection and clean-up.
- Disposal of recovered oil and oily waste.

In all oil spills the first response action is to monitor and assess the hazards and potential consequences of the spill. Following the assessment of the spill the oil spill intervention team must take special precautions to identify and counter specific hazards such as potentially harmful or flammable fumes and vapours, potential ignition sources and contamination potential.

6.1 Oil Spill Risk at OGT Jetty

Under normal situations Diesel and other hydrocarbon based fluids are delivered to OGT and the hanger by road from Yangon, but due to the current countries political situation, road transportation from Yangon is no longer an option and diesel, gasoline and jet fuel are delivered to OGT Jetty by supply vessel and then transferred to OGT or the hangar via OGT vehicles or supplier local bowzers, which greatly increases the risk of a spillage. In the event of a significant spillage, this would be immediately reported and the National Oil Spill Contingency Plan (Myanmar), when enacted, will be complied with.

6.2 Command, Control & Communications Arrangements

INCIDENT RESPONSE ARRANGEMENTS FOR SHWE Platform

POSCO International Corporation (Myanmar E&P) has an associate membership with and may rely on call out services from Oil Spill Response Limited. Spill response expertise is provided externally as follows:

TIER 2 & 3 OIL SPILL EMERGENCY CONTACT

To	Duty Manager		
OSRL Base	Southampton, UK	Loyang, Singapore	Fort Lauderdale, USA
Telephone	+44 (0)23 8033 1551	+65 6266 1566	+1 954 983 9880
Emergency Fax	+44 (0)23 8072 4314	+65 6266 2312	+1 954 987 3001
Email	dutymanagers@oilspillresponse.com		

INCIDENT RESPONSE MANAGEMENT TEAM (Yangon ESC Team)

POSCO International Corporation (Myanmar E&P) have an integrated incident response system in place to respond to all emergency incidents.

Incident response is activated via a three tiered incident response system which is centred on the formation of three teams.

The teams and their primary functions in an oil spill incident are defined in the following section.

6.3 Three Level or Tier Response System

LEVEL/TIER	TEAM	TEAM LEADER	TEAM FUNCTIONS
1	On Scene Commander	OIM/OGT Superintendent	<ul style="list-style-type: none"> Overall responsibility for the site oil spill response operation Ensure the safety of installations, personnel and the public by application of barricading and warning signs Decide on the initial response strategy and initiate actions, including the use of the SHP/OGT oil spill response kits Request support/additional procurement of equipment, manpower and services from weekly duty managers

2	Emergency Support Center Team	Weekly Duty Managers (Operational Phase, and Phase 3)	<ul style="list-style-type: none"> Provides support to the offshore response team Provides co-ordination links with external authorities and 3rd party operators during the incident Will mobilise specialist external resource requirements such as contracted OSRL Provides technical expertise to assist in rectification of the incident
3	Crisis Management Team	Duty Directors / Managing Director	<ul style="list-style-type: none"> Addresses strategic issues that affect POSCO International Corporation (Myanmar E&P); Ensures that corporate response to incident is consistent with company policy requirements; Liaison between POSCO International Corporation (Myanmar E&P) Site and Yangon management teams for support and decision making; Decisions regarding media reports and responses, as required for tier 2 and 3 responses

6.4 The Core Emergency Response Team Participants and Key Functions

Core Emergency Response Team will be called and set up by weekly duty managers, and key functions are described as following:

NO.	TEAM PARTICIPANT	KEY FUNCTIONS
1	Weekly Duty Directors and Duty Managers (Operational Phase and Phase 3)	<ul style="list-style-type: none"> Responsible for overall implementation, effectiveness & coordination of the response team for On scene Commander or OIM or OGT Supt; Provide appropriate training for the response to ESC team members such as Major Emergency Management-Initial Response Training (OPITO)

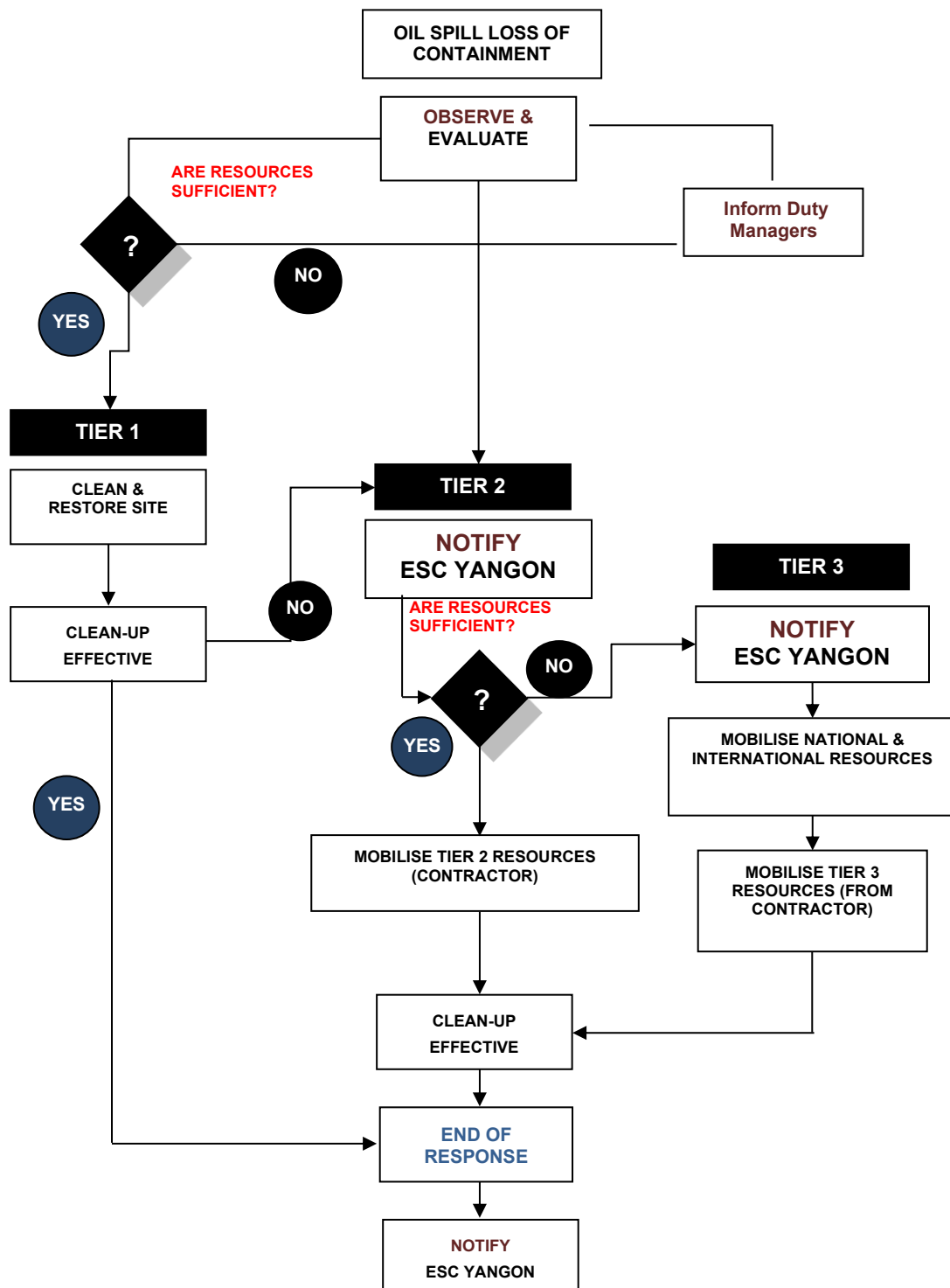
		<ul style="list-style-type: none"> Provides assistance and Co-ordinates response, through relevant employer HR departments to relatives, if injury involved; Coordination with PIC HR & Admin on the Communication for the public, government, and police Departments etc.
2	Weekly Duty Maintenance, Operation, and Production Representatives	<ul style="list-style-type: none"> Establish and maintain contact with affected plant areas, obtain up-to-date status information including weather and sea-state, identify any additional resources required. Assist Weekly duty manager with provision of required information
3	Weekly HSE Duty Representatives	<ul style="list-style-type: none"> Cooperate to advise Duty Manager on safety issues; Assist in implementation of oil spill response plan.
4	Weekly Duty Marine and Aviation Representatives	<ul style="list-style-type: none"> Cooperating with Oil Spill Emergency Response Contractor; Managing vessel or aircraft movements and procurement / deployment of equipment; Organising of surveillance aircraft if required.
5	Duty Event Loggers	<ul style="list-style-type: none"> Maintains events status log throughout the incident response.
6	Administration and Human Resources Representatives	<ul style="list-style-type: none"> Liaise with Duty Director on press statements if requested. Ensures regular updates of information from all groups involved in the incident; Provide assistance with routine problems which might occur, for example, with electrical supply, telecoms, computer systems etc. in the ESC.
7	IT Representatives	<ul style="list-style-type: none"> Ensure effective communication via internet and telecommunication is available throughout the response.

6.5 Emergency Support Centre

YANGON EMERGENCY Support Centre (ESC)

In the event of a Tier 2 and certainly a Tier 3 incident, the office Emergency Support Centre (ESC) will be manned. "The ESC is set up following the decision of the weekly duty manager to mobilise the ESC Team.

6.6 Communications & Response flow-Chart



7.0 ESC ACTION CHECKLISTS

This section outlines, in checklist format, the actions that are to be undertaken at site and supported by the Emergency Support Center Team in response to a hydrocarbon spill from SHP or SHK or Vessels in the offshore field area.

EACH ACTION CHECKLIST HAS BEEN DIVIDED INTO FOUR PARTS:

- 1) Alerting & Mobilising : to be undertaken during spill alert phase of the incident.
- 2) Initial Actions : to be taken at start of incident response.
- 3) Ongoing Actions : to be taken once incident response is initiated and as and when necessary.
- 4) Final Actions : actions required at incident close and on stand down.

ACTION CHECKLISTS ARE GIVEN FOR THE FOLLOWING PERSONNEL

SERIES OF ACTION		ACTION PLAN
1	Initial Response by Site	ALL SPILLS
2	Weekly Duty Managers (Operational Phase, Phase 3)	TIER 1 SPILLS
3	Weekly Duty Managers (Operational Phase, Phase 3)	TIER 2 & 3 SPILLS
4	Weekly Maintenance, Operation, and Production Representatives	If required by duty manager
5	Weekly HSE Duty Representatives	If required by duty manager
6	Weekly Duty Marine and Aviation Representatives	If required by duty manager
7	Administration and Human Resources Representatives	If required by duty manager
8	OFFSHORE OIL SPILL RESPONSE STRATEGY GUIDELINE	If required by duty manager

7.1 Initial Response Guidelines - Site

ACTION	PROCEDURES	FACILITY
Alert / Notify	Report spill immediately. Provide the following: <ul style="list-style-type: none"> Location Size of spill Type of oil (or Chemical) spill Notify POSCO International Corporation (Myanmar E&P) OIM If spill noticed by third party e.g. Helicopter Pilot, facility to be informed. 	Person observing the spill
Incident Log	Open & maintain incident log, which should include: <ul style="list-style-type: none"> Accurate timing of events; Actions taken; Contacts made / received. 	As directed by OIM or OGT Supt
Identify Source of Spill	Determine source of spill. <ul style="list-style-type: none"> Stop any chemical or other liquid transfers. Check storage tanks and vessels for level changes. Check decks, containment bunds and drains. 	As directed by OIM or OGT Supt
Estimate spill size & allocate spill category	Take appropriate action to stop or control spill. Estimate spill size (refer to Appendix 1 for method of estimating based on downloadable spread-sheet in EDMS.). <ul style="list-style-type: none"> Conduct visual estimate of spill. If possible use a helicopter or the standby vessel to estimate area of slick. Estimate direction of movement of spill; inform Weekly Duty Manager (Operational Phase, and Phase 3). Allocate spill into appropriate Tier. Tier 1, Small spill where events are largely controlled by on-site resources. Tier 2, larger infield spills that will require assistance from onshore and may require mobilisation of additional resources. Tier 3, a major loss of containment incident that will require full mobilisation of POSCO International Corporation (Myanmar E&P) resources and may require access to national or international resources. 	As directed by OIM Or OGT Supt
Report Spill	<ul style="list-style-type: none"> Report spill to Weekly Duty Manager (Operational Phase, and Phase 3). 	OIM/OGT Superintendent to request Master of SBV to take sample if safe to do so.
Obtain Sample	<ul style="list-style-type: none"> A sample of the spilt oil should be taken prior to any dispersant spraying response. 	OIM/OGT Superintendent to request Master of

ACTION	PROCEDURES	FACILITY
	<ul style="list-style-type: none"> A sample of any spill witnessed to be passing the facility may also allow 'finger-printing' of the contaminant to establish its origin. 	SBV to respond if safe to do so.
Spill Response	<ul style="list-style-type: none"> For Tier 1 spills initiate response using Tier 1 resources (e.g. Use of Oil Spill Response Kits) If spill is Tier 2 or 3 contact Weekly Duty Manager (Operational Phase, and Phase 3) without delay. 	

7.2 Weekly Duty Managers (Operational Phase and Phase 3) – Tier I Spills

- Key Responsibilities:
- Overall co-ordination of incident response for minor spills.

SERIES OF ACTION	ACTION PLAN	FOLLOW UP FOR ACTION
Alert & Mobilise	<ul style="list-style-type: none"> Obtain all available incident information from the Spill incident report form Contact the incident site to confirm data. Initiate and maintain an Incident Log. 	An oil spill incident report should have been sent from offshore/onshore sites, providing details of spill.
Initial Actions	<ul style="list-style-type: none"> Ensure that offshore have reported the spill to Yangon Management. If advice or assistance is required call out selected response team personnel. Determine requirement to mobilise a helicopter / fixed wing to carry out spill surveillance; If this is required request Duty Logistics Aviation Rep to organise this. 	<ul style="list-style-type: none"> Note: that there is a statutory reporting requirement for all spills of oil to sea. Surveillance of Tier 1 spills may be carried out by the standby vessel, if it is safe for the vessel to do so. Advice on monitoring from the SBV is given in the appropriate offshore plan or procedure.
Ongoing Activities	<ul style="list-style-type: none"> Monitor situation; request site Maintenance, Operations, and Production Representatives to keep informed of the progress of the spill; Request to be advised when spill has dispersed. 	<ul style="list-style-type: none"> Progress Report of response activities has to send to Weekly duty manager.

	<ul style="list-style-type: none"> If it appears that the spill is not dispersing, or has escalated, reclassify the spill. 	
Final Actions	<ul style="list-style-type: none"> When offshore reports confirm that oil has satisfactorily dispersed. Action may be stood down. Close Incident Log. 	<ul style="list-style-type: none"> Ensure that normal operations have been resumed and the affected system is fully restored and operational

7.3 Weekly Duty Managers (Operational Phase and Phase 3) – Tier II & III Spills

Tier 2 and 3 are very unlikely, but not unforeseeable. Key Responsibilities:

- Overall implementation, effectiveness and co-ordination of incident response.

SERIES OF ACTION	ACTION PLAN	FOLLOW UP FOR ACTION
Alert & Mobilise	<ul style="list-style-type: none"> Mobilise duty ESC team and complete log in. Ensure you have a copy of the Oil Spill notification report that has been sent from offshore. Decide on appropriate level of call-out and initiate. Initiate Incident Log. 	Call out ESC Team for action to coordinate the response if required.
Initial Actions	<ul style="list-style-type: none"> Assess status of incident. Confirm incident classification. Inform Weekly Duty Director/Operations & Maintenance Director as appropriate. If spill from a third party operated facility or exploration drilling rig, contact appropriate responsible person and make arrangements for co-operation / co-ordinated response. Approve outline response strategy. Options include: <ul style="list-style-type: none"> Natural Dispersion. Chemical Dispersion. 	For Tier 2 and 3 Response contact OSRL Singapore, and request mobilisation of advisors and prepare for potential mobilisation of available containment or clean up resources.

	<ul style="list-style-type: none"> Monitoring and Reporting. Determine immediate and future equipment requirements. Authorise mobilisation of specialist equipment necessary for implementation of response. 	
Ongoing Activities	<ul style="list-style-type: none"> Hold regular briefings with ESC Team during spill incident response Ensure close co-operation between POSCO International Corporation (Myanmar E&P), oil spill contractor, government agencies and environmental bodies. Advise the release of press statements if being requested by government authority with PIC media response team. Maintain contact with Operations & Maintenance Director/ Weekly Duty Director during incident. 	Maintain Daily Summary report to distribute for Top management and HQ.
Final Actions	<ul style="list-style-type: none"> When offshore reports (from standby vessel or aircraft) confirm that oil has satisfactorily dispersed, action may be stood down. Ensure that normal operations have been resumed and affected system is fully operational. 	Final Incident Record and report to Top Management

NOTES:

- Plan for the worst case.
- Always assume the coastline will be affected when large spills occur.
- Consider using dispersants as soon as possible but only if approved.
- Frequent press statements and public meetings, by PIC authorized media response team, may increase public confidence and reduce negative reaction.
- Inconsistencies in information given to the media lead to negative publicity. (Report only demonstrable facts – do not include conjecture.)
- In the case of a major incident, site personnel must be instructed not to make erroneous reports to anyone except the OIM or OGT Supt and they in turn liaise with the POSCO International Corporation (Myanmar E&P) Media Officer through the Weekly Duty Managers, YGN.

7.4 Offshore Oil Spill Response Strategy Guidelines

SCENARIO	RESPONSE STRATEGY GUIDELINES
Smaller Spill (< 15 bbl)	No shoreline impact predicted and deployment of booms not feasible Report all spills to the POSCO International Corporation (Myanmar E&P) Weekly Duty Manager, stop spill, monitor and assess. Be aware of the greater risk of gas and vapour. Spills of diesel and light hydrocarbons, likely to disperse naturally.
Larger Spill (> 15 bbl)	Large spills of crude oil or HFO may result in shoreline impact. Primary response option is to use dispersants. Deployment of booms and skimmers is feasible and may be appropriate. Note that PIC does not use HFO in any applications relating to Gas production or logistics.
OIL TYPE	GUIDELINES
Oily water Diesel	Sheen. Monitor movement. Do not use dispersant. Fast evaporation. Use fire hose or wash from vessel propulsion to break up the spill and assist natural dispersion, if safe to do so.
Hydraulic, lubricating, or base oil, i.e. utility oils	Minimal loss through evaporation and natural dispersion. Monitor movement. Apply dispersant using eductor system and hose or by boat spray booms.
Avgas or kerosene	Fast evaporation. Monitor movement. Use fire hose to break up the spill and assist natural dispersion. Keep people away from source until evaporated. Do not use dispersant.
Oil based mud	Will sink leaving sheen on the surface. Monitor. Do not use dispersant.
Heavy fuel oil (HFO) or Bunker C	Minimal loss through evaporation and natural dispersion. Monitor movement. Apply dispersant using eductor system and hose or by boat spray. In larger spills: <ul style="list-style-type: none"> • Use helicopter to direct boat sprays, assess success of dispersant spraying and monitor spill movement. • Deploy boom and skimmer if feasible. • If necessary, prepare for shoreline clean-up or river protection where feasible.
Crude oil	Monitor vapour. Keep people away from source of spill until safe. Apply dispersant using eductor system and hose or by boat spray. In larger spills: <ul style="list-style-type: none"> • If oil accumulates near an offshore facility, apply foam to prevent fire hazards, disperse oil using chemical dispersants at a safe distance from the facility. • Use helicopter to direct boat sprays, assess success of dispersant spraying and monitor spill movement. • Deploy boom and skimmer if feasible. • If necessary, prepare for shoreline clean-up.

7.5 Chemical Dispersion

Chemical dispersion is the application of a surfactant chemical onto the oil slick. This results in the oil breaking up into droplets which then disperse in the water column, and which are more easily biodegraded. Dispersant spraying requires trained and experienced personnel to assist in calculating dosages and application rates, provide advice on safety, and to analyse the effectiveness of the spray operation. Details on dispersant spraying operations can be found in:

- IMO/UNEP Guidelines on Oil Spill Dispersant Application including Environmental Considerations. International Maritime Organization / United Nations Environmental Program, 1995.
- Putting Dispersants to Work: Overcoming Obstacles, Issue Paper, International Oil Spill Conference, 1997.

AERIAL MONITORING OF DISPERSANT SPRAYING

The effectiveness of the dispersant on the oil slick must be monitored, and this is best done by observing the sprayed area from the air. The helicopter should fly an observation mission about 30 minutes after the dispersant was applied. Where there is a coffee coloured plume in the water, this generally indicates effective dispersion of the oil. Where the oil has resurfaced there will be black patches.

APPROVAL TO USE DISPERSANTS

The use of dispersants is permitted in Myanmar under the following conditions:

- The use of dispersants is permitted without prior approval in areas where the water depth is more than 20 meters.
- The use of dispersants in shallow waters (depth less than 20 meters) is subject to approval of the Government of Myanmar.
- This approval can be obtained:
 - By submitting a request to MOGE during an incident.
 - Pre-approval requires an oil spill risk assessment with analysis of the likely behaviour of oil spilled, identification of sensitive areas which might be affected, and an analysis of the Net Environmental Benefit.
- Approved dispersants must be used, comprising dispersants authorised for use in South East Asia. Oil Spill Response Contractors will provide the appropriate information on these Products.
- Application of dispersant must be done by trained personnel, using 'state-of-the-art' spraying equipment and following procedures consistent with international guidelines such as those issued by the International Maritime Organization (IMO) or the International Petroleum Industry Environment Conservation Agency (IPIECA).

The following guidelines are recommended for dispersant application.

Where to use dispersants? In water depths greater than 20 metres.

In shallower waters, if authorization has been given by the Government.

Which dispersant to use?

Only dispersants on the list approved for use in Australia, France or the U.S.A. Inipol IP 90 is an approved dispersant.

AMSA approved oil dispersant products currently approved for use in Australia for oil spill clean-up are:

- 1) Corexit EC9527A
- 2) Corexit EC9500A
- 3) Slickgone LTSW
- 4) Slickgone NS
- 5) Slickgone EW
- 6) Ardrex 6120
- **7. Finasol 518. Agma DR 379

DANGERS

Dangers to consider during dispersant operations are:

- Fire or explosion risk.
- Exposure of personnel to dispersant.
- Weather conditions allowing safe operation of vessels and aircraft.
- Ability to control aircraft in the aerial spraying zone.

EFFECT OF DISPERSANTS ON ENVIRONMENT

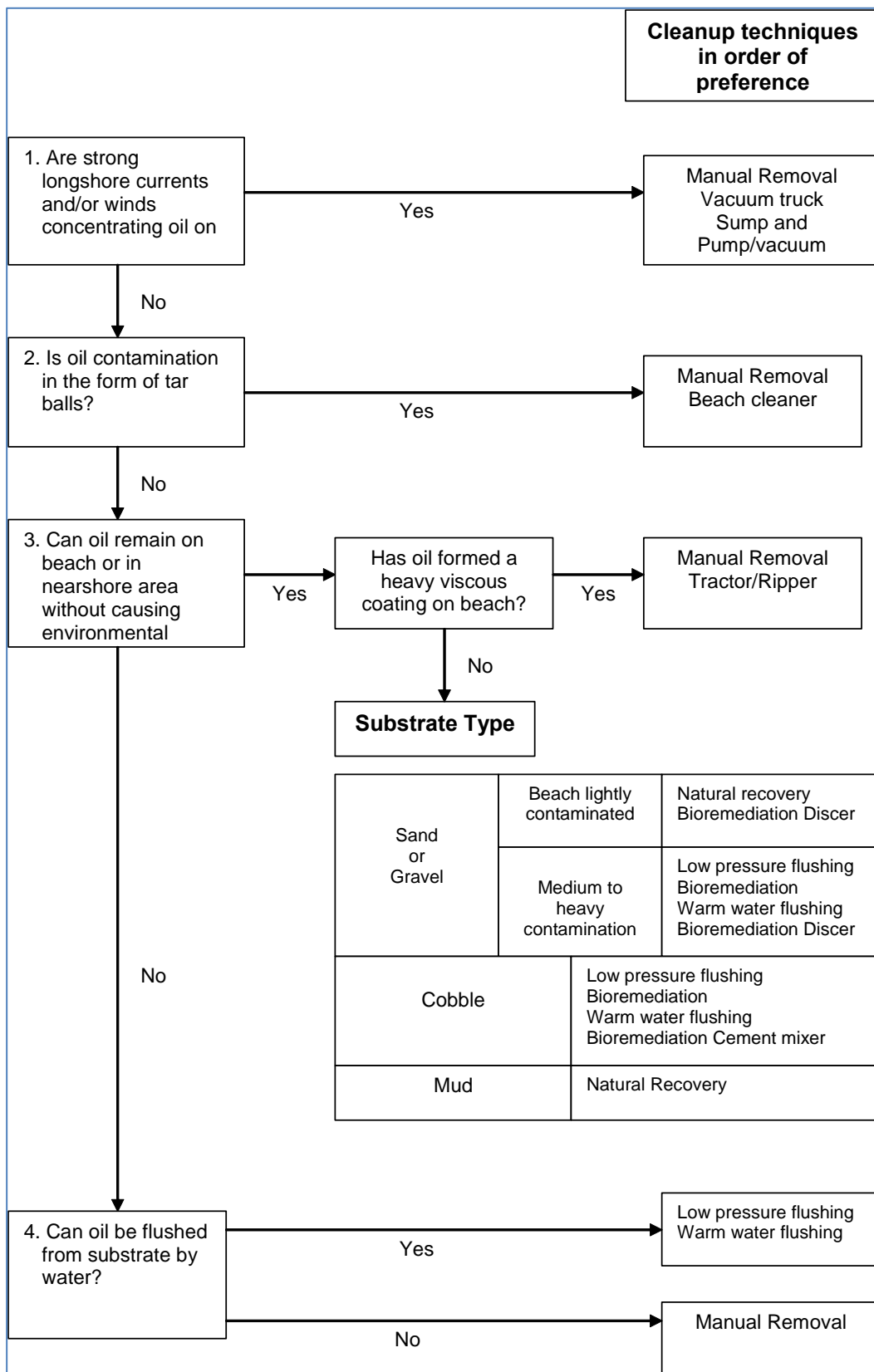
- Dispersant spraying is not likely to have any negative effects if the dispersed oil is rapidly diluted in deep water. There have been no observed kills of free swimming fish in open waters due to chemically dispersed oil. In shallow water the dispersed oil in the water column is more likely to reach concentrations where it may harm or taint (affect the flavour of) fish, particularly young ones. In general, dispersant use is not recommended in shallow-water, particularly in estuaries where fish tend to spawn and feed.
- Dispersant application may affect sea mammals and so should be conducted as far away from their habitats as possible.
- Dispersant use close to shellfish beds could lead to some tainting and is not recommended.
- Dispersants should not be applied over sub-tidal sea grass unless the aim is to prevent the oil reaching higher priority resources such as mangroves. Sensitive sub-tidal areas are often considered no-dispersant-use zones.

WINDOW OF OPPORTUNITY

It cannot be overemphasised that during a spill, assessment of the desirability and practicality of using dispersants must commence as soon as possible. This is because the effectiveness of dispersal decreases as oil weathers.

The ability to apply dispersant effectively is dictated by the physical characteristics of oils, and how these change as the oil weathers. Generally, once oil viscosity is greater than 2,000 cSt, or if the oil has emulsified, it will be more difficult to disperse.

7.6 Clean-Up Techniques for Different Substrate Types



7.7 Shoreline Oil Recovery and Temporary Storage

VACUUM TRUCKS

- Vacuum trucks are a highly effective and rapid means of recovering and transporting liquid oil. They are most effective when there are large volumes of oil contained in a particular location, can be used to recover oil from land or water, but may be limited by difficult access to the spill areas.
- Vacuum skimmers should not to be used with volatile oil.
- Ideally a duckbill or manta ray skimmer head should be fitted to the suction nozzle as these provide the most efficient means of recovering a thin layer of oil.

PORTABLE SKIMMERS AND PUMPS

- Portable skimmers and pumps are used to collect small to moderate concentrations of oil, or to pump larger volumes from areas where trucks are unable to go.
- Hand held vacuum units are ideal for recovering oil that is floating on a very shallow layer of water.
- Weir Skimmers require calm, still water and are good for all low viscosity oils.
- Oleophilic skimmers can be used in 'choppy' water, recover 90% oil to water, and are good for low to medium viscosity oils.
- Oil should be pumped to a temporary storage location (tank, 55-gallon drums, pillow tanks, lined pit, dracone, etc.) which is safe, above flood levels, protected from rain, and sited to allow ease of access for future collection and transfer of the oil.

MANUAL RECOVERY AND ABSORBENTS

Absorbents are produced in a variety of forms (booms, pads, sweeps, snares, granules etc.) for use in specific locations and for specific types of oil spill clean-up. Sorbents are generally best used for absorbing minor spills of oil on hard surfaces, and for final clean-up of spills (e.g. helping to remove sheen or to wipe oily residue off solid objects).

TEMPORARY STORAGE

- Containers used for temporary storage must be tough and resistant to puncturing. Free-standing containers must be adequately strong to contain the weight of oil.
- Excavated pits may be used for storage and should be lined with heavy gauge plastic (PVC) sheeting to minimise soil contamination.

Temporary storage systems are required for oil, which is recovered by skimming devices from within containment booms. Most vessels and recovery devices do not incorporate any significant storage capacity and mobile storage systems must be provided by a towed vessel, floating storage tanks or collapsible tanks.

As most floating storage systems are of limited capacity, it is also necessary to quickly transfer recovered oil or oily emulsions to fixed facilities nearby. Recovered oil can then be stored whilst a decision is made as to its final disposition.

7.8 Waste Management

OBJECTIVES OF WASTE MANAGEMENT ARE

- Safe handling, transportation and storage.
- Prevention of secondary pollution.
- Reduction in volume of waste.
- Reuse of recovered oil.
- Removal of waste from anywhere it could have an adverse effect on people or the natural environment.

OPTIONS FOR MANAGING AND DISPOSING OF USED OIL INCLUDE:

- Burning in approved incinerator.
- Re-introduction to the production line.
- Use as fuel for industrial processes e.g. in a cement kiln.
- Tilling.
- Road oiling.
- Efficient burning of oily waste is the preferred option for final disposal. Oily wastes that cannot be safely treated or burned on site should be transferred to an approved site for disposal.

TILLING

- Tilling will break up thin asphalt layers or light to moderately oiled soil. Tilling exposes a greater surface area of soil to physical, microbial and photochemical degradation processes.
 - Tilling is most effective as a means of cleaning up final traces of oil
- ### BIOREMEDIATION
- Bioremediation is primarily applicable to areas of light or moderate oiling which is unable to be cleaned via other methods. It can be used on many soil types, but is most effective on fine- to medium-grained sediments.
 - Bioremediation involves the application of natural nutrients, or a nitrogen and phosphorous fertiliser to the soil, to accelerate the oil degradation processes.
 - Bioremediation should be avoided near to streams, waterways and other ecologically sensitive areas.
 - A number of commercially produced micro-organism products are available.

APPENDIX 1. OIL SPILL CALCULATOR (MARITIME SAFETY)¹

TO USE THIS CALCULATOR: Add values to the yellow cells (use conversion tables to get appropriate units)
Calculated values will appear in the white cells

SPILL AREA AND OIL VOLUME		Average Slick Length		Km	TOTAL SPILL AREA	0	m ²
		Average Slick Width		Km		0.00	Km ²
OIL TYPE	APPEARANCE	THICKNESS (mm)	LOADING m ³ / Km ²	COVER %	AREA Km ²	VOLUME m ³	
Sheen	Silvery	0.0001	0.1		0.00	0.000	
Sheen	Rainbow	0.0003	0.3		0.00	0.000	
Slick	Yellow/Brown	0.01	10		0.00	0.000	
Crude/Fuel Oil	Black/Brown	0.1	100		0.00	0.000	
Mousse	Brown Orange	1.0	1000		0.00	0.000	
				0%	0.00		
				Should = 100%			
					TOTAL OIL VOLUME	0	L
						0.00	m ³



DISPERSANT REQUIRED		
To treat total oil volume at specified DOR's:		
1:10	1:20	1:50
0	0	0
0.0	0.0	0.0
		L
		m ³

DILUTION & OIL CONC. BENEATH SLICK	
For the area directly below the surface slick:	
Water Depth	100 m
Water Volume =	0 m ³
Maximum Dilution* =	#DIV/0! :1
Average Oil Conc.* =	#DIV/0! ppm
*will only compute if spill volume table is completed	

VISCOSITY AT SPECIFIED TEMPERATURE	
Note: All three yellow cells need to be filled in:	
Known Viscosity	cSt
Known Temperature	°C
Specified Temperature	°C
Viscosity at Specified Temp.	#NUM! cSt

CONVERSION TABLES				
DISTANCE				
1	Nautical Mile =	1.15	Statute Mile	1.85 Kilometre
1	Statute Mile =	1.61	Kilometre	0.87 Nautical Mile
1	Kilometre =	0.54	Nautical Mile	0.62 Statute Mile
AREA				
1	Kilometre ² =	100.00	Hectares	247.11 Acres
			0.39	Statute Miles ²
				0.29 Nautical Miles ²
VOLUME				
1	Metre ³ =	1000	Litres	219.97 UK Gallons
				264.17 US Gallons
				6.2898 Barrels (oil)
MASS				
1	Metre ³ x	1	Specific Gravity =	1000 Kilograms
				1.00 Metric Tonnes
				1.10 Imperial Tons

Acknowledgements and disclaimer

This spill volume calculator was originally developed by Shayne Wilde (AMSA), and has been modified by Leigh Stevens at the Cawthron Institute for the NZ MSA.
The viscosity calculator was sourced from the Marsden Point Refinery, NZ. Thanks are given to both AMSA and the Marsden Point Refinery for their material.
While due care has been taken in the preparation of this calculator, no liability is accepted for its use, accuracy, or otherwise. Anyone using it does so at their own risk.

If you have any queries regarding this calculator, or wish to unprotect the sheets to make modifications please contact:

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¹ ENP > Operations & Maintenance > 05 O&M Documents > Element 3 Implementation and Operation > 03-06 Emergency Preparedness and Response > SHP-SF-03-06-0007 Oil Spill Contingency Plan

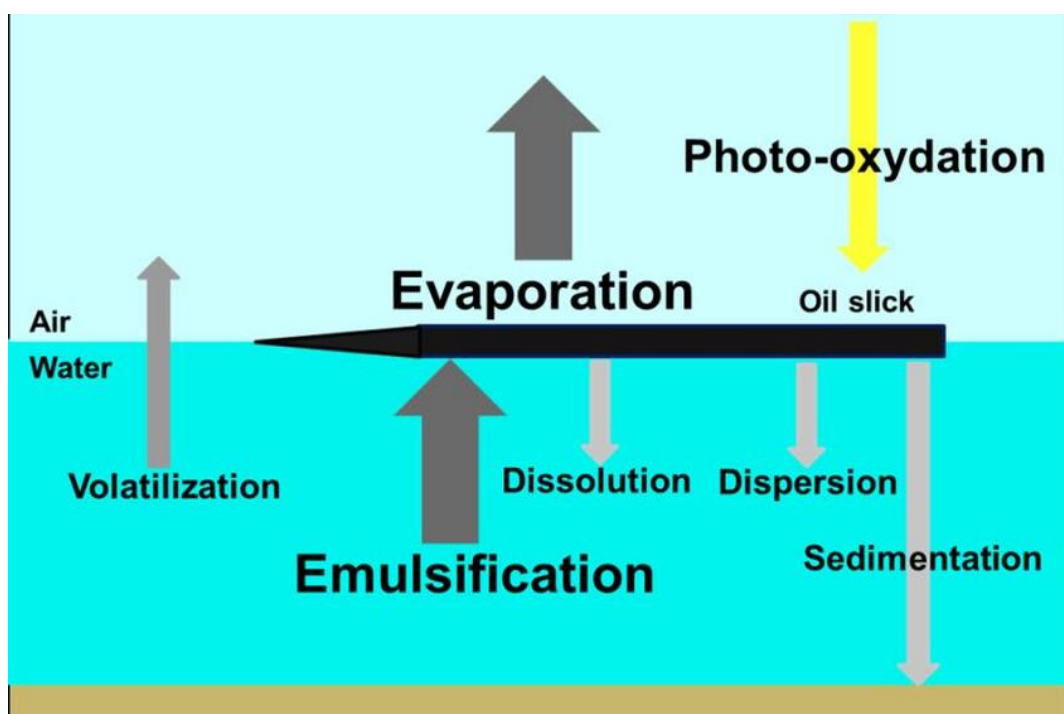
APPENDIX 2. FATE OF SPILLED OIL

Weathering Processes and Time Scales

The physical and chemical characteristics of petroleum change almost immediately when spilled in the marine environment due to evaporation, dispersion, emulsification, dissolution, oxidation, sedimentation, and biodegradation.

All of these processes interact with each other and are collectively referred to as oil weathering.

The table following describes some of the weathering processes and the time scales of those processes important for emergency response.



WEATHERING PROCESSES AND TIME SCALES IMPORTANT FOR EMERGENCY RESPONSE

No .	Weathering Process	What is it?	Why is it important?	Time Scales
1	Evaporation	Conversion of liquid to a gaseous phase. The lighter fractions in the oil are lost first.	Major process that accounts for the loss of oil, particularly light oils. At 15°C, gasoline evaporates completely over a 2-day period, 80% of diesel fuel evaporates, 40% of light crude, 20% of heavy crude, and only about 5-10% of Bunker C	+/- 5 days
2	Emulsification,	Very small water droplets are mixed into the liquid oil. Water content often reaches 50-80%. Occurs on water, needs some wave action	Can increase the amount of pollutant to be recovered by a factor of 2-4. Slows down other mixing processes	Onset can be delayed for days but the emulsification process happens rapidly.

No	Weathering Process	What is it?	Why is it important?	Time Scales
3	Natural dispersion	Breakup of an oil slick into small drop-lets that are mixed into the water by energy.	Removes the oil from the water surface.	+/- 5 days
4	Dissolution	Mixing of the water-soluble components of oil into the water.	The most water-soluble components of oil are most toxic.	+/-5 days
5	Biodegradation	Breakdown of oil by microbes into smaller compounds, eventually to water and carbon dioxide	Rate depends on oil type, temperature, nutrients, oxygen, and amount of oil.	weeks to months
6	Formation of tarballs	Breakup of slicks of heavy crudes and refined oils into small patches that persist for long distances.	Tarballs are hard to detect, so the slick appears to be going away though it is still a threat.	days to weeks

EVAPORATION²

Percent evaporated over time for an instantaneous release of 100 barrels with winds at 10 knots and water temperature at 20°C

	% Evaporated	Hour
Gasoline	94	1
Lago Medio	38	18
Diesel fuel oil	37	18
Prudhoe Bay	28	70

Evaporation can be a major mechanism for removing oil. The amount evaporated depends chiefly on the oil properties, the wind speed, and the water temperature.

Generally, light refined products, like gasoline or jet fuel, evaporate faster than heavier products, such as heavy crude oil.

From the table, you can see that most of the gasoline evaporates within a few hours. Some Crude oils are more persistent in the environment and have much lower evaporation rates, 38% and 28%, respectively.

After 120 hours, much of the Crude product would be expected to remain on the water surface.

² <http://rpitt.eng.ua.edu/Publications/Publications.shtml>

DISPERSION³



Breaking waves can drive small droplets of oil into the water column. If the droplets are small enough (diameters less than 50-70 microns) natural turbulence in the water will prevent the oil from resurfacing, just as turbulence in the air keeps small dust particles afloat.

The smaller droplets that stay in the water column are considered dispersed.

Dispersion can be a mechanism for removing oil from the water surface. The amount dispersed depends on the oil properties (the viscosity and surface tension, in particular) and water conditions.

Oil products with low viscosity, like gasoline or kerosene, are more likely to disperse into the water with breaking waves than high-viscosity oil, like an IFO 380 or Oficina (Venezuelan) heavy crude. Therefore, the dispersed fractions of gasoline or kerosene can be relatively large in heavy seas.

A possible treatment of oil spills is to spray the slick with chemical dispersant. Chemical dispersants enhance natural dispersion by lowering surface tension. This guide does not address subsurface oil movement because of the difficulty in developing a trajectory analysis of dispersed oil.

DISSOLUTION³

Dissolution begins immediately and is likely to continue throughout the weathering process.

- The loss of petroleum product from dissolution is minor when compared to the other weathering processes.

Less than 0.1% (very heavy oil) to 2% (gasoline) of the spilled oil volume actually dissolves into the water column. However, the components of the oil that dissolve into the water column are often more toxic to the environment.

EMULSIFICATION³

For many crude oils and some refined products, weathered oil is likely to reach a stage where water droplets are mixed into the oil, forming a water-in-oil emulsion, or "mousse."

³ https://response.restoration.noaa.gov/sites/default/files/Trajectory_Analysis_Handbook.pdf

The ability to form an emulsion depends on water conditions and the chemical properties of the oil. For example, oils with high wax and Asphaltene content emulsify easily if there are breaking waves. Once the oil has emulsified, the viscosity can increase enormously (see table).

Generally, oils must weather a certain amount before forming an emulsion. Although the onset of emulsification may take several days, the emulsification itself can occur within a few hours.

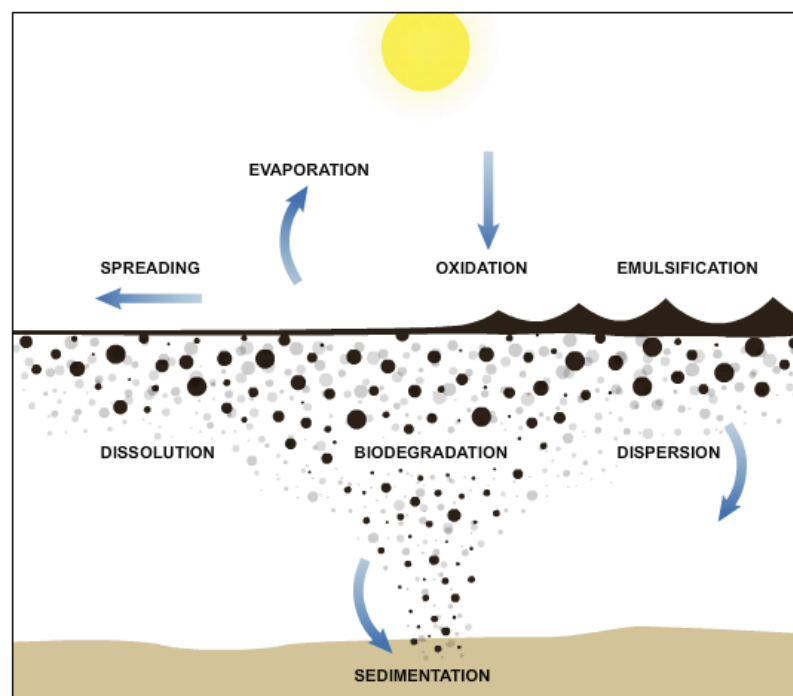
The emulsion can be 70 to 90% water so that the combined volume of oil and water mixture may be much greater than the volume of the original spill.

Emulsions are often classified by their stability. In unstable emulsions, water and oil separate easily under calm conditions with warm temperatures. In stable emulsions, water remains in the oil for weeks to months.

SAMPLE VISCOSITIES³

Product Viscosity at room temperature (cP) Centipoise.

- Water 1
- Diesel fuel 10
- Prudhoe Bay crude 46
- Prudhoe Bay crude after emulsification 250,000
- LagoMedio 20
- Lago Medio after emulsification 300,000
- Honey 10,000
- Peanut butter 1,000,000



SEDIMENTATION³

Sedimentation is defined as the adhesion of oil to solid particles in the water column. Oil can be absorbed onto sediments in the water column and may eventually be found in the bottom sediments.

A few heavier residual oils have specific gravities greater than sea water (more than 1.025), causing them to sink once spilled. Most crude and fuel oils have sufficiently low specific gravities to remain afloat unless they interact with and attach to more dense sediment or organic particles.

Dispersed oil droplets can interact with sediment particles suspended in the water column, thus becoming heavier and sinking. However, adhesion to heavier particles most often takes place when oils strand or become buried on beaches.

On exposed, high energy beaches, large amounts of sediment can be incorporated and the oil can form dense tar mats. Seasonal cycles of sediment build-up and erosion may cause oil layers to be successively buried and uncovered. Even on less exposed sandy beaches, stranded oil can become covered by windblown sand. Once oil has been mixed with beach sediment, it will sink if washed back out to sea by storms, tides or currents.

On sheltered shorelines, where wave action and currents are weak, muddy sediments and marshes are common. If oil becomes incorporated into such fine grained sediments, it is likely to remain there for a considerable time. Shallow coastal areas and the waters of river mouths and estuaries are often laden with suspended solids that can bind with dispersed oil droplets, thereby providing favourable conditions for sedimentation of oily particles to the sea bed.

Like some heavy crudes, most heavy fuel oils and water-in-oil emulsions have specific gravities close to that of sea water, and even minimal interaction with sediment can be sufficient to cause sinking. Fresh water from rivers also lowers the salinity of sea water, and therefore its specific gravity, and can encourage neutrally buoyant droplets to sink. Oil may also be ingested by planktonic organisms and incorporated into faecal pellets, subsequently falling to the seabed.

PHOTO OXIDATION³



Sunlight changes the spilled oil's chemical and physical properties. This process is limited to the surface of the oil and can result in a thin, crusty "skin" on slicks and tar balls.

Hydrocarbons can react with oxygen, which may either lead to the formation of soluble products or persistent tars. Oxidation is promoted by sunlight and although it occurs throughout the existence of a slick, its overall effect on dissipation is minor compared to that of other weathering processes. Even under intense sunlight, thin oil films break down only slowly, and usually less than 0.1% per day.

Thick layers of very viscous oils or water-in-oil emulsions tend to oxidise to persistent residues rather than degrade, as higher molecular weight compounds are formed that create a protective

surface layer. This can be seen in tar balls which sometimes strand on shorelines and which usually consist of a solid outer crust of oxidised oil and sediment particles, surrounding a softer, less weathered interior.

Photograph [right] showing a large patch of weathered oil with a crusty, "skin" layer on the surface. The white spots in the picture are 3-inch by 4-inch drift cards cast into the water to help track the movement of the oil.

Photo-oxidation may increase the ease of emulsification and is considered a long-term weathering process taking weeks to months.

BIODEGRADATION³



The spill is finally removed when the oil biodegrades. The microbes that degrade oil occur naturally in the environment. Sea water contains a range of marine micro-organisms capable of metabolising oil compounds.

They include bacteria, moulds, yeasts, fungi, unicellular algae and protozoa which can utilise oil as a source of carbon and energy.

Such organisms are distributed widely throughout the world's oceans although they tend to be more abundant in chronically polluted coastal waters, such as those with regular vessel traffic or which receive industrial discharges and untreated sewage.

Because the micro-organisms live in the water, from which they obtain oxygen and essential nutrients, biodegradation can only take place at an oil/water interface. At sea, the creation of oil droplets, either through natural or chemical dispersion, increases the interfacial area available for biological activity or so may enhance degradation.

The rate at which the organisms degrade the oil depends on the properties of the water and the oil and microbial activity. This process is thought to occur over time scales of weeks to years.

APPENDIX 3. OPEN WATER OIL SPILL ASSESSMENT JOB AID⁴



This job aid was prepared as a companion field guide for individuals who have completed training in dispersant application observation. It is designed to be a refresher on observing and identifying dispersed and un-dispersed oil, describing their characteristics, and reporting this information to decision-makers. We recommend that this book be used with the Open Water Oil Identification Job Aid for Aerial Observation to help describe both surface oil and dispersed oil.

Photos for this document were provided by Dr. Ron Goodman, Imperial Oil Resources; Mr. Charles Huber, Mobil Oil; Dr. Per Daling, IKU Petroleum Research; and Dr. John Fraser. Allan A. Allen, Spiltec, and Dr. Robert Fiocco, Exxon, provided technical advice

Dispersion: The breaking of an oil slick into small droplets mixed into the water column as a result of breaking waves, other sea surface turbulence, and the action of chemical dispersants.

Emulsification: The formation of a water-in-oil mixture. The tendency for emulsification to occur varies with different oils and is much more likely to occur under high energy conditions (winds and waves, oil well blowouts). This mixture is frequently referred to as mousse.

Sheen: Sheen is a very thin layer of oil (0.0003 mm or less) floating on the water surface and is the most common form of oil seen in the later stages of a spill. Sheens vary in colour according to their thickness, ranging from rainbows for the thicker layers, to greys, silvers, and almost transparent for the thinnest layers.

Slick: Oil spilled on the water that absorbs energy and dampens out the surface waves, making the oil appear smoother or "slicker" than the surrounding water.

⁴ <https://scr.toolsminati.com/document/351975582/Dispersant-Application-Observer-Job-Aid>

OBSERVING DISPERSANT APPLICATIONS:⁵

- The monitoring observer does not make operational decisions (e.g., how much dispersant to apply, when or where to apply it). These decisions are made by operational units.
- Oil surface slicks and plumes look different for many reasons; for example, oil or product characteristics, time of day (different sun angles), weather, sea state, and rate at which oil disperses.
- Low-contrast conditions (e.g., twilight, haze) make observations difficult.
- For best viewing, the sun should be behind you, with the aircraft at an altitude of 500-1000 feet observing the slick at a 30-degree angle.
- Appearances of dispersant action can range from brown to white (cloudy) to no visible plume. The visibility of the dispersed plume will vary according to water clarity. In some cases, remaining surface oil and sheen may mask oil dispersing under the slick and thus interfere with observations of the dispersed oil plume.
- Sometimes other things, such as suspended solids or algal blooms, may resemble dispersed oil.
- Dispersed oil plume formation may not be instantaneous after dispersant application. In some cases, such as when oil is emulsified, it can take several hours and may not show a visible plume at all.
- A change in the appearance of the treated slick versus an untreated slick might indicate that the dispersant is working.
- A visible cloud in the water column indicates that the dispersant is working.
- It is difficult to determine whether the dispersant is working when no cloud is visible in the water column.
- The initial application may have a herding effect on the oil, making the slick appear to be shrinking when, in fact, the dispersant is "pushing" the oil together. This effect may cause the oil slick to visibly disappear from areas of the sea surface for a short time.
- Dispersed oil plumes are often highly irregular in shape and vary in oil thickness. This may lead to errors in estimating dispersant efficiency.
- It might not be possible to determine the thickest area of oil concentration. The actual dispersant application dose will vary according to the oil thickness. This will lead to overdoses and under doses of dispersant and variations in the effectiveness of application. The observer should note these variations.
- Boat wakes through oil may appear to be a successful dispersion of oil. However, this could be just the vessel wave breaking a path through the oil, either physically parting the oil or mechanically dispersing it. Mechanically dispersed oil will re-coalesce and float to the surface.

⁵ <https://www.nrt.org/sites/2/files/SMART.pdf>

- Observers may see colour changes in emulsions due to reduced water content and viscosity, and changes in the shape of the slick due to the demulsification action of the dispersant, which enhances the dispersion.
- Different observers at the same site may reach different conclusions about how much of the slick has been dispersed. This explains the importance of standard reporting criteria and training of individuals with a common set of guidelines.
- Observers need to report the presence of marine mammals, turtles, and birds in the area of dispersant application.

APPENDIX 4. OSRL LOGISTICS REQUIREMENTS IN MYANMAR

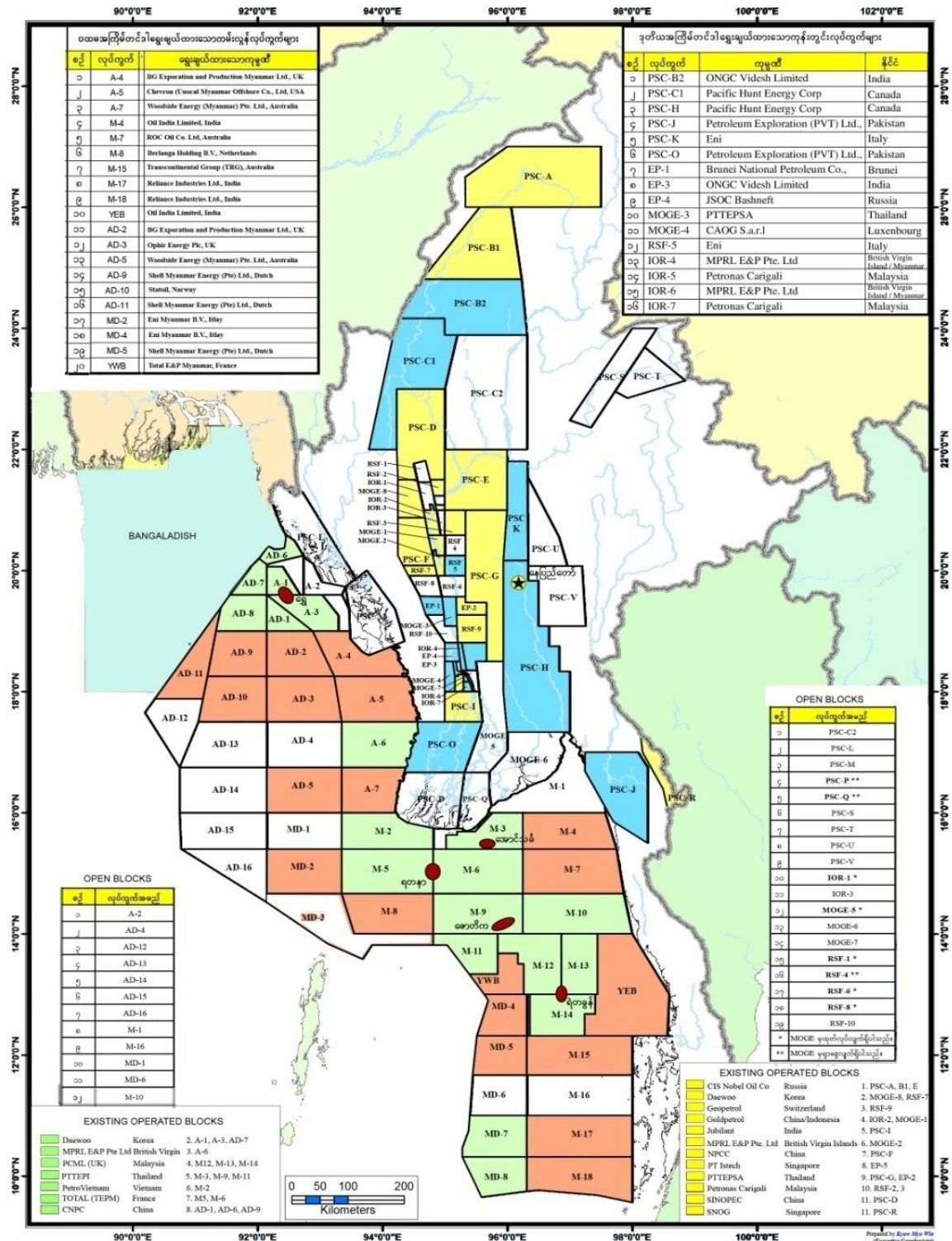
This checklist describes the information and support which POSCO International Corporation (Myanmar E&P) may be expected to provide to OSRL during a Tier 3 response:

REQUIREMENT	NOTES / INFORMATION	TICK
Country profiles / fact	Advise OSRL team before their departure on:	
	<ul style="list-style-type: none"> Climate and any special requirements of the workplace 	
	<ul style="list-style-type: none"> Risks associated with working in Myanmar - advice on personnel safety, political stability, areas to avoid and POSCO International Corporation (Myanmar E&P) security procedures 	
	<ul style="list-style-type: none"> Items which may not be brought into the country (e.g. VHF radios etc.), 	
Translator	<p>Provide someone with a good understanding of English and Myanmar from the moment OSRL land in country.</p> <p>It is vital that someone who speaks English, Myanmar is available on site and anywhere else they are required e.g. airport, purchasing spare parts, hotels, command center.</p>	
Airport: General	Confirm landing rights and over flight clearance.	
	Provide liaison person and translator at the airport to assist OSRL staff and with equipment arrival.	
	<p>Notification to customs covering:</p> <ul style="list-style-type: none"> Immigrations issues \ Visas for OSRL personnel, letters of invitation, work permits Import regulations for equipment Bond money for aircraft (Appropriate currency). 	
	On demobilization, return shipment of OSRL equipment and customs clearance must be organized.	
Airport: Arrival	<p>A company representative should be able to meet OSRL staff upon arrival at the airport and act as a local guide for the duration of the response operation.</p> <p>The representative should provide personnel with</p> <ul style="list-style-type: none"> a detailed up to date summary of the incident site-specific health and safety advice vehicles, road maps and fuel 	
Airport: Equipment offloading	<p>Equipment offloading facilities including :</p> <p>Minimum of 2 forklifts and staff to drive them (available around the clock) capable of lifting typical weights of 2 - 4 tonnes.</p> <p>Flatbed lorries and drivers to take the equipment to its destination (capable of carrying the same weights - again available at short notice 24 hours a day)</p>	

REQUIREMENT	NOTES / INFORMATION	TICK
Security	Make any appropriate arrangements for security, including:	
	<ul style="list-style-type: none"> Meeting staff at the airport, including transporting them and their luggage to destination. 	
	<ul style="list-style-type: none"> Meeting OSRL equipment and ensuring its safe arrival from the airport to its destination (in conjunction with the requirements of the onsite OSRL body responsible for the equipment) 	
	<ul style="list-style-type: none"> Laydown area for the storage of the equipment - preferably inside - security for this purpose should be 24 hour / 7 days a week for the duration of the equipment's stay. 	
Accommodation and drink	<p>food</p> <p>Accommodation should be arranged for all OSRL members of staff before arrival in country (liaise directly with OSRL Duty Secretary once OSRL have been mobilized).</p> <p>Food and drink should be available upon arrival.</p> <p>On site, food and drink should also be catered for during the clean-up operation and made available for all members of the response team.</p>	
Material Safety Data Sheets	The MSDS must be made available to the response team members prior to arrival on site. Provide MSDS for all oils and chemicals likely to be encountered during cleanup operations.	
Charts / maps	Provide up to date charts and maps of the incident area for on-site OSRL personnel, and also ensure copies of all working maps / charts are situated in the OSRL briefing room	
Venue for OSRL staff briefings	This room should be located as close to the Command Centre as possible and should include the following:	
	<ul style="list-style-type: none"> Communication lines (including phones, fax, computers on the company network) 	
	<ul style="list-style-type: none"> Contact lists 	
	<ul style="list-style-type: none"> White boards 	
	<ul style="list-style-type: none"> Up to date charts and maps 	
Personnel resources	<ul style="list-style-type: none"> Any other relevant information associated with the role of OSRL and the command center 	
	<p>If additional 'contract workforce' are required these must be sourced and equipped with the appropriate PPE before they are sent on site.</p> <p>Contractors need to know what their role is and who they report to.</p> <p>On-site response personnel should also be provided with decontamination facilities, food, drinks and toilet facilities.</p>	
PPE	A good supply of PPE should be available for the contract workforce, and for replacement throughout the response	
	Provide mobile phones for appropriate personnel	

REQUIREMENT	NOTES / INFORMATION	TICK
Communications	Provide VHF radios and a working channel	
	Provide contact lists (regularly updated) for everyone involved in the response	
Boats	<p>Depending on the incident the equipment deployed from the vessels will vary. The following list details the requirements for deploying an offshore package of equipment. The details given are 'the ideal'.</p> <p>Sittwe area:</p> <p>For boat work to be carried out inshore, vessels should have a shallow draft for example a Rigid Inflatable (RIB) type vessel.</p>	
	<p>Offshore areas:</p> <p>Boats for deployment of boom and skimmer</p> <p>Good VHF communications - able to speak with towing vessel / aircraft / command center (can also use mobile phones, fax, sat com etc.)</p> <p>Somewhere for crew to take breaks (wheelhouse) - food and drink should also be available</p> <p>Vessel with a metal deck - will require equipment to be welded - will require a local welder to do this</p> <p>Vessel with wooden deck - will require some form of tie down rings and span sets / chain sets</p> <p>Equipment laydown area - 8 meters by 4 meters is the area required to site and deploy equipment (boom reel and then working deck area which needs to be kept clear for boom deployment and movement) - further equipment will also need to be sited on the vessel - e.g. power pack / skimmer</p> <p>Bollards on the side of the vessel for securing the boom once deployed</p> <p>Roller stern to minimize abrasion and tear to the boom 3 to 4 meters freeboard, bollard pull of 8 tons</p> <p>Onboard tanks for temporary storage of recovered oil - alternatively lancer barge or dracone etc. Temporary storage must be sufficient to cover the recovery rate of the oil</p>	
Monies / purchasing	OSRL staff may require local currency or financial arrangements for the purchase of spare parts etc. POSCO International Corporation (Myanmar E&P) may be required to assist in local banking, purchasing and ordering.	
Stores / supplies	During the first days of a response operation OSRL will be self-sufficient, however if the response continues OSRL will need POSCO International Corporation (Myanmar E&P) to organize re-supply, maintenance etc.	
Fuel supplies	OSRL response team members should have access to a regular supply of diesel / unleaded petrol.	

APPENDIX 5. CONCESSION MAP⁶



The Status of Offshore Blocks:⁶

SR. NO	BLOCKS	STATE/REGION	COMPANY	SIGNED DATE
1	YEB	Taninthary Offshore Shallow Water Block	Oil India Limited. Mercator Petroleum Ltd. Oilmax Energy Pvt. Ltd. Oil Star Management Service Co., Ltd.	4-12-2014
2	M-4	Mottama Offshore Shallow Water Block	Oil India Limited. Mercator Petroleum Ltd. Oilmax Energy Pvt. Ltd. Oil Star Management Service Co., Ltd.	4-12-2014
3	M-8	Mottama Offshore Shallow Water Block	Berlanga Myanmar Pte. Ltd. /A1 Mining Co., Ltd	5-12-2014
4	YWB	Taninthary Offshore Deep Water Block	Total E & P Myanmar	25-2-2015
5	AD-3	Rakhine Offshore Deep Water Block	Ophir Myanmar (Block AD-3) Limited /Parami Energy Development Co., Ltd.	4-12-2014
6	AD-9	Rakhine Offshore Deep Water Block	Shell Myanmar Energy Pte. Ltd./ MOECO Oil& Gas Asia Pte. Ltd./PC Myanmar (Hong Kong) Ltd.	5-2-2015
7	AD-11	Rakhine Offshore Deep Water Block	Shell Myanmar Energy Pte. Ltd. / MOECO Asia Offshore Pte. Ltd./PC Myanmar (Hong Kong) Ltd.	5-2-2015
8	MD-5	Taninthary Offshore Deep Water Block	Shell Myanmar Energy Pte. Ltd. /MOECO Asia South Pte.,Ltd.	5-2-2015
9	AD-10	Rakhine Offshore Deep Water Block	Statoil Myanmar Private Limited	30-4-2015
10	MD-2	Mottama Offshore Deep Water Block	Eni Myanmar B.V/ Petrovietnam Exploration Production Corporation Ltd./ Total E&P Myanmar Pte. Ltd.	31-3-2015

11	MD-4	Taninthary Offshore Deep Water Block	Eni Myanmar B.V/ Petrovietnam Exploration Production Corporation Ltd. / Total E&P Myanmar Pte. Ltd.	31-3-2015
12	A-5	Rakhine Offshore Shallow Water Block	Unocal Myanmar Offshore Co., Ltd./ Royal Marine Engineering Co., Ltd.	24-3-2015
13	M-7	Mottama Offshore	TAP Energy (M-7) Pte. Ltd. Smart E&P International Co., Ltd.	26-8-2015
14	M-15	Taninthary Offshore Shallow Water Block	TRG M15 Pte. Ltd./ CFG Energy Pte. Ltd. / Century Bright Gold Co., Ltd.	30-3-2015
15	M-17	Taninthary Offshore Shallow Water Block	Reliance Industries Limited. United National Resources Development Services Co., Ltd	31-3-2015
16	M-18	Taninthary Offshore Shallow Water Block	Reliance Industries Limited. United National Resources Development Services Co., Ltd	31-3-2015
17	A-7	Rakhine Offshore Shallow Water Block	Woodside Energy (Myanmar) Pte. Ltd. BG Exploration & Production Myanmar Pte. Ltd Myanmar Petroleum Exploration & Production Company Limited	20-3-2015
18	AD-5	Rakhine Offshore Deep Water Block	Woodside Energy (Myanmar) Pte. Ltd. BG Exploration & Production Myanmar Pte. Ltd	20-3-2015
19	A-4	Rakhine Offshore Shallow Water Block	BG Exploration & Production Myanmar Pte. Ltd Woodside Energy (Myanmar) Pte. Ltd. / Myanmar Petroleum Exploration & Production Company Limited	20-3-2015
20	AD-2	Rakhine Offshore Deep Water Block	BG Exploration & Production Myanmar Pte. Ltd Woodside Energy (Myanmar) Pte. Ltd.	20-3-2015
21	MD-8	Mottama Offshore Deep Water Block	PTTEP South Asia Ltd.	14-2-2013

22	MD-7	Mottama Offshore Deep Water Block	PTTEP South Asia Ltd. / Total E&P Myanmar Pte. Ltd.	14-2-2013
23	M-2	Mottama Offshore Shallow Water Block	Petrovietnam Exploration Production Corporation/ Eden Group Co., Ltd/ Maurel & Prom Exploration & Production7 MPRL E&P Pte. Ltd.	2-10-2008
24	A-6	Rakhine Offshore Deep Water Block	Woodside Energy (Myanmar) Pte. Ltd. Total E&P Myanmar Pte. Ltd.	18-1-2007
25	AD-1	Rakhine Offshore Deep Water Block	CNPC International Ltd. / Woodside Energy (Myanmar) Pte. Ltd.	15-1-2007
26	AD-6	Rakhine Offshore Deep Water Block	CNPC International Ltd. / Woodside Energy (Myanmar) Pte. Ltd.	15-1-2007
27	AD-8	Rakhine Offshore Deep Water Block	CNPC International Ltd. / Woodside Energy (Myanmar) Pte. Ltd.	15-1-2007
28	M-9	Mottama Offshore Shallow Water Block	PTTEP International Ltd./ MOGE	12-11-2003
29	M-11	Mottama Offshore Shallow Water Block	PTTEP International Ltd./ MOGE	25-7-2005
30	M-3	Mottama Offshore Shallow Water Block	PTTEP International Ltd. / MOECO Asia Pte. Ltd.	7-8-2004
31	AD-7	Rakhine Offshore Deep Water Block	Posco International Corporation/ Woodside Energy (Myanmar) Pte. Ltd.	25-2-2007
32	A-1	Rakhine Offshore Shallow Water Block	Posco International Corporation/ KOGAS/ ONGC Videsh/ GAIL/ MOGE	4-8-2000
33	A-3	Rakhine Offshore Shallow Water Block	Posco International Corporation/ KOGAS/ ONGC Videsh/ GAIL/ MOGE	18-2-2004
34	M-12	Mottama Offshore Shallow Water Block	Gulf Petroleum Myanmar/ MOGE	29-9-1992
35	M-13	Mottama Offshore Shallow Water Block	Gulf Petroleum Myanmar/ MOGE	3-5-1990
36	M-14	Mottama Offshore Shallow Water Block	Gulf Petroleum Myanmar/ MOGE	3-5-1990
37	M-5	Mottama Offshore	PTTEPI Ltd. /MOGE	9-7-1992
38	M-6	Mottama Offshore	PTTEPI Ltd. /MOGE	9-7-1992

APPENDIX 6. SPILL NOTIFICATION POINT (MYANMAR)⁷

⁷ <https://www.itopf.org/knowledge-resources/countries-territories-regions/myanmar/>



COUNTRY & TERRITORY PROFILES

*A Summary of Oil Spill Response Arrangements
& Resources Worldwide*

MYANMAR

SPILL NOTIFICATION POINT

Department of Marine Administration (DMA) (for oil & HNS)	Tel: + 95 1 556 072
Ministry of Transport & Communications	+ 95 1 397640 (24 hr)
363/421 Corner of Theinbyu Road & Marchant Street	Fax: + 95 1 397641
Botataung Township	Web: www.dma-mm.org
Yangon PO Box 194	

COMPETENT NATIONAL AUTHORITY

As above

RESPONSE ARRANGEMENTS

The Department of Marine Administration (DMA) is the designated national authority responsible for the development of oil spill contingency planning, response and cooperation in Myanmar.

The national oil spill contingency plan (NOSCP) is currently being developed with the assistance of the Norwegian Coastal Administration (NCA) under Norway's Oil for Development programme. A national task force has been established under the chairmanship of DMA to draft the NOSCP. The NOSCP will follow IMO guidelines. A plan for the Yangon River Area is also under construction. In 2013 the Myanmar Parliament adopted the "Natural Disaster Management Law" which provides the necessary national legislation in support of the development of the NOSCP.

RESPONSE POLICY

Details of the response policy are being formulated, but some containment and recovery equipment is available and dispersant has been used in previous spills.

EQUIPMENT

Government & Private

Limited equipment is available; this includes boom, pump, buckets and a temporary storage tank.

PREVIOUS SPILL EXPERIENCE

ASEAN LIBERTY (2000), carrying logs, grounded and sank south east of Yangon, spilling some bunker fuel. Clean-up included dispersant spraying, in addition to containment and recovery.

HAZARDOUS AND NOXIOUS SUBSTANCES (HNS)

Myanmar has not yet developed a capability for responding to spills of HNS.



COUNTRY & TERRITORY PROFILES

A Summary of Oil Spill Response Arrangements
& Resources Worldwide

MYANMAR

CONVENTIONS

Prevention & Safety						Spill Response		Compensation						
MARPOL		Annexes				OPRC	OPRC	CLC			Fund	Supp	HNS*	Bunker
73/78	III	IV	V	VI		'90	-HNS	'69	'76	'92	'92	Fund		
✓	✓	✓	✓	✓		✓				✓				

* not yet in force

REGIONAL AND BILATERAL AGREEMENTS

Myanmar is a member of the Association of South East Asian Nations (ASEAN) which supports a Regional Oil Spill Response Action Plan (OSRAP).

Date of issue: April 2017

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APPENDIX 7. OSRL NOTIFICATION AND MOBILIZATION FORM⁸

⁸ <https://www.oilspillresponse.com/globalassets/activate-us/activation-procedure/osrl-oper-for-00173-notification-form.doc>

OSRL Notification Form

(Initial Incident Information)

Warning! Please telephone the Duty Manager before e-mailing or faxing this form

To	Duty Manager		
OSRL Base	Southampton, UK	Loyang, Singapore	Fort Lauderdale, USA
Telephone	+44 (0)23 8033 1551	+65 6266 1566	+1 954 983 9880
Emergency Fax	+44 (0)23 8072 4314	+65 6266 2312	+1 954 987 3001
Email	dutymanagers@oilspillresponse.com		

Guidance: This information will be used to develop and recommend the most appropriate response strategy. If new information should become available, or the situation changes, please inform the Duty Manager as soon as possible.

Section 1 – Contact Details					
Member Company					
Name of Person Notifying OSRL					
Job Title (Designation)					
Direct Phone Number	Country code		Number		
Mobile Number	Country code		Number		
Fax Number					
Email Address					
Command Centre Address					
Date and Time of Notification	Date and Time		Time Zone		

Section 2 – Location					
Country / Region of Spill					
Latitude of spill (north/south)					
Longitude of Spill (east/west)					
Area Affected	<input type="checkbox"/> Offshore	<input type="checkbox"/> Subsea	<input type="checkbox"/> Shoreline	<input type="checkbox"/> Estuary	<input type="checkbox"/> Other
	<input type="checkbox"/> Port	<input type="checkbox"/> Harbour	<input type="checkbox"/> Inland	<input type="checkbox"/> River	
Water Depth (if applicable)					

Section 3 – Spill Details					
Date and Time of Spill				Time Zone	
Source of Spill					
Cause of Spill					
Status of Spill	<input type="checkbox"/> Secured	<input type="checkbox"/> Uncontrolled	<input type="checkbox"/> Unknown		
Product Properties	Product Name / Type				State Units Provide an assay sheet if available. <input type="checkbox"/> Assay sheet provided
	Specific Gravity		API		
	Pour Point				
	Wax Content				
	Asphaltene				
	Sulphur Content				
	Viscosity		Reference Temperature	°C	
Type of Release	Instantaneous Release	<input type="checkbox"/>	Volume		
	OR				
	Continuous Release	<input type="checkbox"/>	Release Rate		

Section 3 – Spill Details continued				
Description of Observed Spill	Estimated Quantity			State Units
	Size			
	Appearance			
	Direction of Travel			
Section 4 – Weather and Modelling				
Weather forecast provided? e.g. Excel/Word	<input type="checkbox"/> Yes	<input type="checkbox"/> No, OSRL to source a weather forecast		
Sea Temperature				State Units
Sea State				
Visibility				
Cloud Base				
Do you require Oil Spill Trajectory Modelling?	<input type="checkbox"/> Surface 2D	<input type="checkbox"/> Sub-surface 3D Additional time and costs apply	<input type="checkbox"/> Not at this time	
Sub-surface 3D Modelling Information if requested	Gas to Oil Ratio	Sm ³ /m ³	Release Hole Diameter	m
Section 5 – Safety and Security				
Highlight any known safety or security risks e.g. high levels of H ₂ S, high risk country				<input type="checkbox"/> Not Applicable
Describe security arrangements for OSRL staff				<input type="checkbox"/> Not Applicable
Section 6 – Resources at Risk (if available)				
Environmental or socio-economic sensitivities that may be impacted. Provide the relevant oil spill contingency plan and sensitivity maps if available.				<input type="checkbox"/> Contingency plan included <input type="checkbox"/> Sensitivity maps included
Section 7 – Equipment (if available)				
Equipment already deployed or being mobilised (other than OSRL resources)				
Section 8 – Further Information				

APPENDIX 8. OIL SPILL RESPONSE LIMITED (ASSOCIATE AGREEMENT)

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OIL SPILL RESPONSE LIMITED

ASSOCIATE AGREEMENT

POSCO INTERNATIONAL CORPORATION
1 December 2023 – 30 November 2024

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APPENDIX 9. NATIONAL CONTINGENCY PLAN FOR MARINE POLLUTION⁹

⁹ National Contingency Plan for Marine Pollution had been submitted to Myanmar Parliament for enforcement, and it is loaded under HSE folder into National Oil Spill Contingency Plan Folder of EDMS. Expected ratification by end of 2019.

An abstract graphic within a black rectangular frame. It features three large, overlapping blue circles. One circle in the upper right contains a smaller orange circle. Two thin lines, one orange and one grey, intersect at the orange circle. A large blue circle is partially visible in the bottom right corner.

National Contingency Plan for Marine Pollution

Final Version

Appendix K Meeting minutes of public consultation

Meeting of Minutes: EMP Stakeholder Consultation for existing Shwe Field Development in Blocks A-1 and A-3

Detail

Project	EMP for Existing Shwe Project	Region / State	Rakhine
Venue	General Administrative Department (Meeting Hall), Kyaukphyu	Township	Kyaukphyu
District	Kyaukphyu		
Objective	Stakeholder Consultation Meeting		
Date	31 st October 2018		
Time	1:00 PM		

- **U Kyaw Zeya, Deputy Director, Offshore, Myanma Oil and Gas Enterprise**, Introduced Greeting to Township Administrator, Township Parliament Member, Township Municipal Officers, CSO, businessmen and other residences and gave his sincere thanks to all attendances.
He mentioned that POSCO Daewoo has started production of gas from SHWE Gas field since 2013. PDC has developed EMP to minimize social and environmental impacts due to the project. Now we are here to hear their comments and concerns related to the projects. He then introduced the participants from PDC, ERM and EQM. He also mentioned that PDC has hired ERM as a third party to develop EMP.
- **U Phore Kyaw (Senior HSE Engineer, POSCO DAEWOO Corporation, PDC)** introduced PDC and explained about the existing Shwe Field Development in Blocks A-1 and A-3 and the Onshore Gas Terminal (OGT) in Rakhine State. He mentioned that PDC has submitted EIA related to the project in 2012 before Environmental Procedure was in acted in 2015. As an existing project and as per EIA Procedure requirements, PDC has to submit EMP incorporating the comments and concerns of the public from the affected areas.
- **U Thapye Myo Oo (Senior Consultant, Environmental Resources Management (ERM))** gave an overview of the Environmental Management Plan (EMP) as per the Myanmar EIA Procedure (2015), U Kyaw Zeya, Deputy Director, Offshore, Myanma Oil and Gas Enterprise, Introduced Greeting to Township Administrator, Township Parliament Member, Township Municipal Officers, CSO, businessmen and other residences and gave his sincere thanks to all attendances. He mentioned that POSCO Daewoo has started production of gas from SHWE Gas field since 2013. PDC has developed EMP to minimize social and environmental impacts due to the project. Now we are here to hear their comments and concerns related to the projects. He then introduced the participants from PDC, ERM and EQM. He also mentioned that PDC has hired ERM as a third party to develop EMP.

Comment from U Ba Shein, MPs of Pyithu Hluttaw

- This region is very under developed in all sectors. The local communities are usually not aware the impacts at the beginning of project. They only know the impacts after they are affected by the Project. The exploration activities are conducted in Shwe Field Blocks A-1 and A-3. When the company start the gas production and transfer the natural gas to the processing plant, the processing of natural gas could generate waste that will damage to environment. The local community knew nothing at all. Thank you for disclosing the information of the Shwe project and conducting this meeting.
- There are enacted environmental laws and regulations in Myanmar. If the project in conducted in line with national laws, the local community or the citizen of Myanmar will not be harmed. However, it is hard to implement in practice.
- When the Onshore Gas Terminal (OGT) discharges waste water into the sea, how will the fishing community and marine fauna be affected? Three years ago, one of the local communities complained that they suffered miscarriage due to waste water discharge. The problem was investigated and reported to government and the government said that it was safe. People did not know whether it is right or wrong. If the waste from the

OGT is hazardous, the local community is going to suffer now or later on. Due to construction activities, the farmland is destroyed because mud and stone are left and dumped into the farmland. The farmers are still not satisfied about this. All the wastewater must be treated before it is discharged. Future potential impacts without hiding in any way is advised to consider, and thanked to PDC team for sharing knowledge on the mitigation measures taken to minimize the impacts to environment and local communities. When EMP is developed, an impact assessment for local community is required.

Comment from U Kyaw Win, villager

- The presentation only presents the positive of project. Many local people do not know the difference between EIA and EMP. It will be good if EIA report is written in Myanmar language and disclosed to local community. Will EIA awareness training be provided from PDC, GAD or other third party?

Response from U Phore Kyaw, Senior HSE Engineer, POSCO DAEWOO Corporation

- The EIA report was prepared in 2013 before the Myanmar EIA procedure (2015) was enacted. At that time, PDC was not instructed to translate EIA report into Myanmar language. Now Myanmar translation of executive summary of EIA report is included according to EIA procedure (2015) and disclosed in the company website. This EMP will include Myanmar translation of the executive summary. Regarding provision of training in environmental related means provision of training to the PDC personnel on their job scope related to environment to minimize the impact to environment by their activities. Awareness to the public is conducted in this public consultation meetings. PDC has no plan to conduct trainings to the public about EIA and EMP.

Comment from U Kyaw Win, villager

- A lot of local do not access the internet so it is not possible to get the EIA report from the website. I want the company to be transparent and disclose the information to villagers.

Response from U Phore Kyaw, Senior HSE Engineer, POSCO DAEWOO Corporation

- A copy of current EMP will be disclosed to the village tract level. What we mean by providing training in the presentation is that we provide training to all offshore and onshore workers in PDC in order to avoid the damage on the environment. PDC do not provide EIA training to local community. The environment impacts and EIA have been explained in this public consultation meeting.

Response from U Ye Hlaing Win, Environmental Engineer, POSCO DAEWOO Corporation

- Regarding the comments about how PDC treat and discharge wastewater from OGT, PDC comply with MONREC national emission guidelines to discharge wastewater. PDC test and treat the wastewater in accordance with national emission guideline.
- PDC will also inform the local community how the hazardous and non-hazardous chemicals are discharged when PDC's Corporate Social Responsibilities (CSR) activities are conducted.

Comment from U Kyaw Win, villager

- If the local community want to complain about the project, there must be the contact telephone number and PDC office in Kyaukphyu. Where do the villagers complain?

Response from U Ye Hlaing Win, Environmental Engineer, POSCO DAEWOO Corporation

- PDC has a local CSR representative. The local people can contact CSR representative, U Arkar Aung who is the deputy director of CSR. His contact information is provided in the handouts.
- When PDC's Corporate Social Responsibilities (CSR) activities are conducted.

Comment from U Han Ko Lin, Centre for Environment and Resource Development in Arakan (CERDA)

- Could PDC confirm if the gas is purified in Shwe Project? He would like to know whether natural gas purification process is carried out at SHP. What are the effects from gas purification process to environment such as emission of other gases into the environment? Does EMP cover these effects? He also would like to know in terms of figure (cubic meter) how much of gas has been emitted into the environment.

Response from U Phore Kyaw, Senior HSE Engineer, POSCO DAEWOO Corporation

- The natural gas from the well is not 100% pure. The purification process is conducted in the OGT. The gas from Shwe Project is the most pure natural gas in Myanmar. Natural gas has also to be processed based on impurity contents such CO₂ and other in the gas from the reservoir. But, the quality of natural gas for SHWE gas field is of high quality. EMP has cover all emission of gases which may contribute to Greenhouse effect. The exact figure will be mentioned in the EMP report which PDC have to submit to ECD on six monthly basis.

Comment from U Han Ko Lin, Centre for Environment and Resource Development in Arakan (CERDA)

- We are concerned that the natural gas purification process contributes to air pollution. How does PDC plan to address air pollution? How is it mentioned in the EMP?

Response from U Phore Kyaw, Senior HSE Engineer, POSCO DAEWOO Corporation

- The natural gas in the well consists of impurified gas such has hydrogen sulphide and carbon monoxide. When the natural gas is purified, the impure gas are removed and emitted to the air as greenhouse gas. However, the emission rate from greenhouse gas is very low. The EMP states that PDC needs to monitor emissions and submit an emission report to the Environmental Conservation Department (ECD) in every six month.

Comment from U Than Lwin, Elderly Group Kyaukphyu

- Local people in Kyaukphyu are rarely hired by PDC. I work for PDC. Some local people are hired as general workers. Man Power Supply Company contracted by PDC fired local people for different reasons. Even though we report the issues to management level of PDC, there is no reply. There are many local skilled workers who wanted to work for Shwe Project. Man Power Company only hire people from other regions. Could the management level of PDC consider this?
- The streetlight in Kyaukphyu is provided by PDC. PDC awarded the tender to one company. The streetlight was provided for the first two or three month. Later on, they are cut off. The same company won the tender for this year again. This company is not accountable and transparent. I want PDC to consider this issue.
- The project produces a lot of solid waste more than the waste produce from local community. Kyaukphyu Town is receiving 2.5 tons of solid waste per day. PDC has donated a waste incinerator. The incinerator consumes 26 gallon of diesel to incinerate 2.5 ton of waste. We inform to PDC and receive no response. We know PDC has built the hospitals and school as a part of CSR program. However, PDC's CSR programs are not included Kyaukphyu town.

Response from U Ye Hlaing Win, Environmental Engineer, POSCO DAEWOO Corporation

- All comments and suggestion will be submitted to PDC's management team. This EMP report will also be submitted to ECD. Now we are not able to answer some question.

Comment from U Htun Nu, Elderly Group Kyaukphyu

- People in Kyaukphyu are poor. Health care facilities are required in Kyaukphyu. Kyaukphyu Aged for Home needs support as well. I would like to request a facility for firefighting in Kyaukphyu.

Response from U Min Kyaw Thu, CSR Coordinator, POSCO DAEWOO Corporation

- PDC provide a fire engine and fire water supply facility for fire fighting purpose in Kyaukphyu.

Comment from U Than Lwin, Elderly Group Kyaukphyu

- This new water storage area is the old well. There is no water in the well.

Response from U Min Kyaw Thu, CSR Coordinator, POSCO DAEWOO Corporation

- PDC was requested by local authority to construct a fire water supply facility in Kyaukpyu downtown area. Design drawings which were prepared by township municipal affairs department were provided thru local authority. Based on provided designs, tendering process had been conducted and successful bidder from Yangon had constructed the facility. The contractor had conducted the necessary renovation works of old well for sustainability purpose.

Comment from U Than Lwin, Elderly Group Kyaukphyu

- PDC awarded a tender to a company. The company didn't communicate with the local community. For example, the company that provide the streetlight don't take full responsibility and maintain the equipment.

Response from U Min Kyaw Thu, CSR Coordinator, POSCO DAEWOO Corporation

- This program also requested by local authority thru Rakhine State Govt.. According to contractual terms, one-year warranty on the performed works has to be given by contractor. In this regards, when we informed the contractor company to replace the non-working street lights, they agreed to replace with good ones even though the warranty period of Phase I Installation was already over and also handed over to the concerned authority. PDC will discuss the current situation with contractor.

Comment from U Than Lwin, Elderly Group Kyaukphyu

- About 310 streetlights are replaced with new one. 210 out of 310 light bulbs are out of order after a month. When I informed to the company about it, they gave us only 10 lights to replace.
- PDC will discuss the current situation with contractor.

Comment from U Htun Nu, Elderly Group Kyaukphyu

- The spare streetlights must be provided because we don't have enough resources especially budget to replace the non-working light in time.

Comment from U Soe Lwin, Kyaukphyu Port Officer

- The waste from a vessel or ship is something new in Myanmar. PDC's supply vessels have been operating in Myanmar for a long time. Our department has not received information on how PDC's supply vessel manage waste. In the past, it is not the case. People are complaining of water pollution recently. Does PDC record the vessel waste management?

Response from U Phore Kyaw, Senior HSE Engineer, POSCO DAEWOO Corporation

- PDC hire the ship or vessel that is certificated by the International Convention for Prevention of Pollution from Ships (MARPOL). The vessels comply with MARPOL guidelines and document all of their activities to avoid pollution. PDC also conduct vessel audits of the waste management system and record all wastes.

Comment from U Soe Lwin, Kyaukphyu Port Officer

- Maybe, the vessel does have waste management but this is not known so we are not sure. PDC needs to provide us the information of vessel waste management.

Response from U Phore Kyaw, Senior HSE Engineer, POSCO DAEWOO Corporation

- PDC will share this information.

Response from U Ye Hlaing Win, Environmental Engineer, POSCO DAEWOO Corporation

- PDC's marine team manage the standby or supply vessel. PDC's vessels travel from Kyaukphyu and Singapore. All vessel waste was previously sent to Singapore for treatment. That is very expensive. There are local companies such as Golden DOWA in Yangon that can do waste treatment in line with International Maritime Organization.

Comment from U Han Ko Lin, Center for Environment and Resource Development in Arakan (CERDA)

- Is it right the hazardous waste is treated at OGT?

Response from U Phore Kyaw, Senior HSE Engineer, POSCO DAEWOO Corporation

- PDC send all hazardous waste to Golden DOWA Company in Yangon. The company treat the waste in accordance with national laws and international standards.

Comment from U Han Ko Lin, Center for Environment and Resource Development in Arakan (CERDA)

- Where is the wastewater discharge line? Could you confirm the location? Does the report mention how to prevent and mitigate oil spills or if something explodes on the platform? Whether natural gas purification process is carried out at SHP?
What are the effects from gas purification process to environment such as emission of other gases into the environment? Does EMP cover these effects? How much of gas has been emitted into the environment in terms of figure (cubic meter)? Where is the wastewater discharge line? Could you confirm the location? Does the report mention how to prevent and mitigate oil spills or if something explodes on the platform?

Response from U Ye Hlaing Win, Environmental Engineer, POSCO DAEWOO Corporation

- The wastewater treatment includes separating oil and water. After that, the sample of treated waste water is collected and sent to the laboratory in offshore platform for a total of 8 parameters on weekly basis. The sample is tested for contaminants in line with national and international standards. Waste water is disposed only when it meets standards of Myanmar National Environmental Quality Emission Guidelines.

Response from U Phore Kyaw, Senior HSE Engineer, POSCO DAEWOO Corporation

- There are two things to explain about oil spill accident. The first thing is that there is a secondary barrier/container to prevent spill through the first layer of the tank. If oil is spilled through the secondary barrier, oil spill response plans would be implemented. If a minor oil spill happens in sea, this is handled by PDC. If it is a major oil spill and emergency case occurs, Oil Spill Response Ltd (OSRL) a third party organization would be requested to help for oil spill control. In order to request help to this organization, PDC have to have annual contract in place. PETONAS, PTTEP, and TOTAL are also the members of the organization. You can search about OSRL on the internet. Natural gas has to be processed based on

impurity contents such CO₂ and other in the gas from the reservoir. But, the quality of natural gas for SHWE gas field is of high quality. EMP has cover all emission of gases which may contribute to Greenhouse effect. The exact figure will be mentioned in the EMP report which PDC have to submit to ECD on six monthly basis.

Comment from U Han Ko Lin, Center for Environment and Resource Development in Arakan (CERDA)

- An oil spill in the sea will lead the negative impacts on the fishermen community. What plan is prepared for the fishermen? I would like to know the secondary consequences (indirect impact on people) rather than oil spill response procedures.

Response from U Ye Hlaing Win, Environmental Engineer, POSCO DAEWOO Corporation

- If there are negative impacts on the fishermen, grievance mechanism is set up for negative impacts.

Response from U Min Kyaw Thu, CSR Coordinator, POSCO DAEWOO Corporation

- If people are negatively impacted by the project, the grievance mechanism is in place. People can communicate via contact details or to the local CSR representative. The grievance forms are distributed to the village nearby the project, Gonechwein village and Maleik Kyun. PDC will investigate the impacts with the communities. If the project results in impact on the locals; negotiation and compensation would be conducted till they are satisfied.

Response from U Thant Sin (Township Development Committee, Kyaukphyu)

- He mentioned that PDC has donated about 400 lamps for FY 2016/17, and more than 300 lamps for FY 2017/2018. He is unsure how PDC control service provider for guarantee of the lamps in the tender. Most of the lamps are gone within months and he is not aware whom to contact for that. He reported to PDC. Kyaukphyu resident mentioned that they got adequate illumination in the past with 4' fluorescent lamps and now they are in the dark with new lamps. As the lamps provided by the PDC's service provider are expensive, Township Development Committee is unable to replace all the lamps. The Municipal Department, GAD and residents are not aware of terms and conditions of the tender between PDC and service provider especially for the guarantee of lamps. PDC and its service provider never informed Township Development Committee on how many lamps will be installed for each year. As the service or donation is carried out within the area of Township Development Committee, PDC and its awarded service provider should inform Township Development Committee in advance.
- He mentioned that domestic waste disposed by PDC's contractors and service providers is more than generated by Kyaukphyu residents.
- PDC donated waste incinerator constructed by local service provider at the township cemetery but it is not functioning. He mentioned Kyaukphyu residents generated a total of 5 tons of domestic waste daily. They have tested the incinerator for burning 2.5 tons of waste and used 20 Gallons of diesel but unsuccessful. He also mentioned that incinerator has not been officially handed over to City Development Committee (Municipal). But in the journal it is mentioned that the incinerator is not operated due to budget limitation of City Development Committee although actual fact is that the incinerator is not functioning. Therefore he would like to advise to solve the problem by coordinating between PDC, Contractor and City Development Committee.
- Regarding to road from Jetty to OGT, Township City Development Committee wish both PDC and CNPC should consider repair of the road as most of the companies' heavy vehicles use the road.
- He mentioned that Township City Development committee would to request PDC to assist with fire truck in the event that condition is uncontrollable with current capacity in Kyaukphyu. He heard that employee

involved in assisting fire truck to Kyaukphyu were actioned by PDC. In the past years PDC mentioned that they are unable to assist as operation has to be prioritized. He mentioned to consider donation a fire truck.

Response from U Ye Hlaing Win, Environmental Engineer, POSCO DAEWOO Corporation

- He mentioned his thanks to U Thant Sin. He replied that all the points will be noted and inform higher management.

Response from U Thant Sin (Township Development Committee, Kyaukphyu)

- He added that the water storage tank donated by PDC has no water as it was aimed water resource from an old well which underground water level is very low especially in summer time. There was no water in the storage tank for the whole previous summer. He also mentioned they prefer to take water source from a tube well but as per discussion with construction contractor it is not included in the scope. He also mentioned that PDC did not get advices from Municipal in early stage of planning to avoid this situation.

Response from U Min Kyaw Thu, CSR Coordinator, POSCO DAEWOO Corporation

- He responded that conceptual design of the water tank, pump house and locations were decided by the Kyaukphyu authorities and PDC decided detail design in coordination with construction contractors. The basic design include upgrading the existing water well. It was not mentioned to drill a tube well in the agreement with Kyaukphyu residents.

Response from U Soe Lwin (Port Authority)

- He would like to know PDC arrangement for control waste from ship as more and more supply vessels are going in and out Kyaukphyu jetty. So far now he has no information about this and PDC need to have record of waste disposal from ship. He also mentioned to share information on class certification and other records to them.

Response from by U Phore Kyaw

- He replied that all the marine vessels hired by PDC comply with MARPOL International convention and all the records are kept with the vessels. PDC can ask the vessel for such records any time or during marine audit.

Response from by U Ye Hlaing Win

- He mentioned that all marine vessels hired by PDC have class certification. For sharing of documents, we will further discuss with marine team in Yangon.

Response from U Htun Nu (Rep of Kyaukphyu Residents)

- He requested PDC to consider CSR programs in child (below 1 year) health care and supports to Retirement Homes (Old People Home) as there are many gaps in the two areas.
- He also mentioned his supports for assisting fire trucks as mentioned by U Thant Sin, City Development Committee.

Response from U Min Kyaw Thu, CSR Coordinator, POSCO DAEWOO Corporation

- He mentioned that PDC has donated a fire truck and constructed a water storage tank in Kyaukphyu as part of CSR Program.

Comment from U Win Thant Oo, Youth Strength Association

- I knew that EMP would be conducted by ERM Company. When would EMP be conducted? In which ways do POSCO DAEWOO allow Civil Society Organisations (CSOs) to participate in EMP preparation? What plans would be prepared this year?

Response from U Thapye Myo Oo, Senior Consultant, ERM

- ERM have prepared EMP report. According to the laws, public consultations meetings are conducted and the project-related information are presented through these meetings. The comments and concerns raised will be reported to MONREC in the EMP. Regarding participation, you can give the required suggestions in this meeting and you can give suggestions via the grievance mechanism.
- All suggestions will be included in the EMP. Therefore, there are many chances for you to participate in EMP and you should take part in it. You will gain knowledge through the presentation in this meeting.
- The EMP includes the commitment to submit an environmental monitoring report every six months to ECD. POSCO DAEWOO will commission other third party to conduct the monitoring programs in accordant with EMP. If you want to read the report, the reports will be sent to the township administrator office and PDC CSR Representative in Kyaukpyu Township for villages.
- In 2010, four EIA reports and sixteen baseline studies were conducted. We are conducting consultations so that you are aware of the reports and I would like you to participate. The communities would have a lot of experience and knowledge by attending the meetings like this. This pamphlet presents about the summary of EMP. It is just like environmental training. In a public consultation meeting of an IFC project, a man said that he knew a lot by attending the meetings. Sometimes, I found that the local communities knew more than me because they faced the project in reality. Attending the meeting and consulting like this is so valuable. Please tell me the ways you will participate and I will include your comments about participation to the report and continue to move forward.

Comment from U Tin Win, Min Gan Village

- I want to know what villages will get access to electricity.

Response from U Ye Hlaing Win, Environmental Engineer, POSCO DAEWOO Corporation

- When natural gas is distributed, Average 15% of the amount is bought by MOGE. About 15% electricity is transmitted to the prioritized area near the project. Kyaukphyu is one of the prioritized areas. It is hard to say which villages. The new government tries to fulfil the requirements as much as they can. This case is considered in CSR programs systematically.

Response from U Min Kyaw Thu, CSR Coordinator, POSCO DAEWOO Corporation

- The distribution of electricity is between the national government and the Ministry. PDC has no authority to make decisions as a private company.

Comment from U Ba Shein, MPs of Pyithu Hluttaw

- The complaint process in Myanmar is a bad mindset. For example, the villagers complain to the township office and then the township officer asks the village administrator to present about that problem. The villager administrator presents something different and the people do not believe it. When the complaint letters are received, the suitable people need to assess the problems on site. Although complaint letters of the local people about that streetlight company are received, this same company was given the tender again and so the local communities are not satisfied.
- If there are resources in that village, the national grid may reach to the village. The national grid does not reach villages where normal Rakhine people live. I would like to request PDC help plans of the government for these areas.
- Who pays for the third party? Does the third party depend on the company or local communities? These questions are for your future consideration. I am just telling you what I know and I am not gossiping. Thank you.

Attendance List

No	Name	Department/ Organization/ Address
1.	U Lin Htin	Thaing Chaung Village
2.	U Khin Oo	Aung Tha Pyay Village
3.	U Than Tun	Doe Ma Taung Village
4	U Aung Than	Sai Chone Village
5	U Kyaw Zan Shwe	Kyaukphyu Township
6	U That Lin Tun	Kyaukphyu Township
7	U Win Thant Oo	Youth Strength Association
8	U Tun Win Shwe	Min Chaung Village
9	U Tun Tun Win	Zin Chaung Village
10	U Han Ko Lin	CERDA
11	U Ba YinSa	Nae Township
12	U Kyaw Mya	Sa Nae Township
13	U Aung Kyaw Khin	Myaw Chaung Village
14	U Maung Maung	Ka Lant Tae Village
15	U Maung Myint Oo	Wa Myay Village
16	U Kyaw Win	Shauk Chaung Village
17	U Hla Thein	Pyar Tae Village
18	U Kyaw Than	East Pike Seik Village
19	U Maung Tun	Ohn Taw Village
20	U Saw Hla Aung	Kyay Village
21	Daw Khin Khin	Kyaukphyu Township
22	U Nyi Lin	Ka Paing Chaung Township
23	U Tun Tun Win	Zin Chaung Village
24	U Hla Thein	Pyar Tae Village
25	U Soe Naing	Kyaukphyu Township

No	Name	Department/ Organization/ Address
26	U Kyaw Win	Kyaukphyu Township
27	U Khin Maung Tun	Pyin Phyu Wal Village
28	U Kyaw Phyu	Kyaukphyu Township
29	U Saw Thiha	Kyaukphyu Township
30	U Than Aung	Aung Yin Su Village
31	U Soe Naing	Kyaukphyu Village
32	U Than Hlaing	Zay Ti Taung Village
33	U Saw Pu Chay	Aung Yin Village

Photo



Meeting of Minutes: EMP Stakeholder Consultation for existing Shwe Field Development in Blocks A-1 and A-3

Detail

Project	EMP for Existing Shwe Project	Region / State	Rakhine
Venue	Gonechwein Village Monastery, Kuaukphyu	Township	Kuaukphyu
District	Kuaukphyu		
Objective	Stakeholder Consultation Meeting.		
Date	1 st Nov 2018		
Time	2:00 PM		

- U Kyaw Zeya, Deputy Director, Offshore, Myanma Oil and Gas Enterprise, Introduced and briefly explained about SHWE Project and the requirement of the public consultation from this project. PDC has complied with existing legal requirement.
- U Phore Kyaw (Senior HSE Engineer, POSCO DAEWOO Corporation, PDC) introduced PDC and explained about the existing Shwe Field Development in Blocks A-1 and A-3 and the Onshore Gas Terminal (OGT) in Rakhine State.
- U Thapye Myo Oo (Senior Consultant, Environmental Resources Management (ERM)) gave an overview of the Environmental Management Plan (EMP) as per the Myanmar EIA Procedure (2015).

Comment from U San U, Ohn Taw Village

- The Onshore Gas Terminal (OGT) hired a driver for 25% of employee in the project. Many local people can drive a backhoe or car. Will PDC employ a driver from Kuaukphyu Township?

Response from U Phore Kyaw, Senior HSE Engineer, POSCO DAEWOO Corporation

- We will inform PDC's relevant department for consideration.

Comment from U San U, Ohn Taw Village

- I am worried for the environmental impacts. We are worried about consequences. If it will be in the ocean, will it affect the fishery workers?

Response from U Ye Hlaing Win, Environmental Engineer, POSCO DAEWOO Corporation

- The impact assessment and results are provided in the EMP which have been reported to ECD.
- This public consultation is to collect the comments and suggestions from local people and include them in the EMP.

Comment from U San U, Ohn Taw Village

- There are community development activities by PDC in Gonechwein village tract. As Gonechwein and Ohn Taw are close to each other, negative impacts are similar, but PDC hasn't provided development activities in Ohn Taw village. I would like to suggest to consider providing development activities in Ohn Taw.

Response from U Ye Hlaing Win, Environmental Engineer, POSCO DAEWOO Corporation

- There is a Corporate Social Responsibility (CSR) team in PDC and this team will come to the village to discuss accordingly.

Comment from U Than Tun, Village leader, Ohn Taw Village

- Oil and gas pipelines pass through our village tract. There are local people who had been compensated for their farmlands, which had been passed through. There is a place called Kyauk Sin near the water outlet. In Kyauk Sin, there are four people who didn't get the compensation for their farmlands. They are U Nga Pyaung, Daw Kyar, U Ba Hla and U Ba Mg. I had submitted this problem to the Township Administrative Department and have not gotten any reply. This is why I am reporting again now PDC is here.
- We have four villages in Ohn Taw village tract. I would like to request to provide a road for religious purpose.

Response from U Phore Kyaw, Senior HSE Engineer, POSCO DAEWOO Corporation

- Which organization didn't pay compensations?

Comment from U Than Tun, Village leader, Ohn Taw Village

- That organization is CNPC.

Response from U Phore Kyaw, Senior HSE Engineer, POSCO DAEWOO Corporation

- Thank you for your concern but that are not concerned with PDC. PDC only manages the OGT site. You can submit your grievances to government organizations. There is one representative from MOGE in OGT and you can submit this case again through the MOGE representative.

Comment from U Than Tun, Village leader, Ohn Taw Village

- We have already submitted to MOGE and township administrative.

Response from U Kyaw Zeya, Deputy Director, Myanmar Oil and Gas Enterprise

- Please submit to MOGE representative at OGT site. If the central office of MOGE receives the letter, they will make instructions to CNPC. Let me know your phone number. There is also one MOGE representative in Malakyun.

Comment from U La Pyae Aung, Ohn Taw Village

- In our Ohn Taw village tract, people are utilizing water for drinking from Kuaukphyu stream. I'd like to request analysis of the stream water to find out if it contains toxins due to the waste from MOGE site.

Response from U Ye Hlaing Win, Environmental Engineer, POSCO DAEWOO Corporation

- I would like to know where the water comes from into Kuaukphyu stream.

Comment from U La Pyae Aung, Ohn Taw Village

- The water comes from the MOGE site, CNPC at the upper part of the stream.

Comment from U Mg Tun, Ohn Taw Village

- The water comes from the place, which is locally called Ka-Law-Khone. That passes from the east of the MOGE site and flows to the ocean through that stream.

Response from U Kyaw Zeya, Deputy Director, Myanmar Oil and Gas Enterprise

- There is a MOGE representative in CNPC site and this can be requested to him. MOGE will instruct to CNPC.

Comment from Daw Kyi Kyi Hnin, Gonechwein Village

- Although the OGT was constructed in 2010, I have never heard about conducting this kind of public consultation meetings by PDC. I think that the project has no impacts on people until now.
- I would like to ask some questions to Daewoo and MOGE. I have experienced the problem about the creek. Although Daewoo said that wastewater from OGT is discharged only after treatment, this wastewater could be hazardous. Despite conducting sixteen EIA/SIA reports, there were also over 20 complaint letters to PDC. Recently, I heard that farmers sued PDC in Korea. I want to know about how the water and soil quality assessment were conducted. I think that Daewoo dug a well and water from this well is supplied to OGT.
- There is a farm at the north side of the OGT site.

Response from U Phore Kyaw, Senior HSE Engineer, POSCO DAEWOO Corporation

- Do you mean the water used for OGT site? Water from tube well is used.

Comment from Daw Kyi Kyi Hnin, Gonechwein Village

- Yes, I mean tube well. I want to know the amount of consumption per day. Not everyone in OhnMonTaw can access groundwater. In Gonechwein village, the wells have to be dug deeper. Is the wastewater treated 100% pure?
- How many litres of wastewater are discharged to the sea per day while one litre of the discharged wastewater consists of 30 milligrams of hazardous waste?
- What magnitude of the earthquake could the gas pipeline resist? PDC prohibited cultivating upon the pipeline for safety reasons. How could the pipeline withstand an earthquake if the pipeline could not resist this vegetation? What plans are prepared by the company for explosion or emergency?
- I noticed that PDC's response to U MG San Nu's question has missed some points. In my understanding, he wanted to ask for the land, which was agreed to give back after the project. The waste produced from CNPC came into our farmland; you can go and see this flood right now. We requested for laboratory analysis. Some members of parliament and staff of MOGE came and checked, but there is no reply yet.

Response from U Ye Hlaing Win, Environmental Engineer, POSCO DAEWOO Corporation

- Your point is EIA/SIA reports are not publicized and you asked about the waste management. Yes, it's right. Before the disposal of the wastes, wastewater from OGT are treated first and Hazardous Waste items such as used oil, batteries, chemicals, and contaminated materials are sent to a "Golden Dowa" company. OGT treated wastewater for laboratory analysis is sent to SHP every month.
- Golden Dowa is a Japanese company, landed in Myanmar, working for waste handling. We perform according to the rules and regulation. Regarding with the lawsuit you mentioned, I didn't understand the point.

Comment from Daw Kyi Kyi Hnin, Gonechwein Village

- PDC has agreed with the farmers to use their land for three years. Then when the lands were not handed to them, some Korean lawyers came Myanmar and filed lawsuit to farmers.

Response from U Min Kyaw Thu, CSR Coordinator, POSCO DAEWOO Corporation

- Temporarily acquired land had been returned to respective owners since May 2014 with additional one year crop compensation. The lawsuit case is on-going in Korea.

Response from U Ye Hlaing Win, Environmental Engineer, POSCO DAEWOO Corporation

- The next point I want to say is that we use underground water, not seawater. The thing you said is that the groundwater level became lower in Ohn Taw and Gonechwein. What is the depth of well to access water before and now. Do you have this kind of information? The ground water level is the same as the water table. Therefore, the well depth is deeper if this well is dug from the higher place. Similarly, the well depth is lower if this well is dig from the lower place.

- There might be a problem if the well could not be dug in the same area where wells have ever been dug before. If this is the case happens, please give us information about it.

Comment from Daw Kyi Kyi Hnin, Gonechwein Village

- As the main livelihood of Kuaukphyu depends on agriculture, our local communities depend on water use. Could you tell me the amount of water used for OGT site?

Response from U Ye Hlaing Win, Environmental Engineer, POSCO DAEWOO Corporation

- There are a total of 35 workers in the OGT site. The water consumption for one person per day is about 20 gallons, including for bath and toilet. Purified drinking water is bought to use for cooking and drinking.

Comment from Daw Kyi Kyi Hnin, Gonechwein Village

- Could you please shut down the tube well if OGT site just need a small amount of water? That will make our doubts easier.

Response from U Thapye Myo Oo, Senior Consultant, ERM

- There are only 35 people in the site. From where will they use water?

Comment from Daw Kyi Kyi Hnin, Gonechwein Village

- I just give suggestion.

Response from U Thapye Myo Oo, Senior Consultant, ERM

- There is the National Emission Guideline Law in Myanmar that states the discharging requirements for wastewater. The run-off from the OGT plant are not be allowed to flow directly into the sea. Only after it is treated.

Comment from Daw Kyi Kyi Hnin, Gonechwein Village

- I want to know the amount of wastewater discharge per day.

Response from U Phore Kyaw, Senior HSE Engineer, POSCO DAEWOO Corporation

- Yes. Our company have daily records for wastewater discharge. I could not remember the value but waste discharge is not much. Did you mean for CNPC or our OGT pipeline?

Comment from Daw Kyi Kyi Hnin, Gonechwein Village

- I mentioned about your OGT pipeline to prevent pipeline rupture due to natural disasters especially earthquake.

Response from U Phore Kyaw, Senior HSE Engineer, POSCO DAEWOO Corporation

- For earthquakes, we have to collect and study one hundred year data sets and then have to consider this data in the design of the Project.

Comment from Daw Kyi Kyi Hnin, Gonechwein Village

- I am worried for the natural disasters like Cyclone Storm Nargis.

Response from U Phore Kyaw, Senior HSE Engineer, POSCO DAEWOO Corporation

- PDC prepared designs after reviewing both conditions caused in the past and the possible conditions. For example, in Japan, earthquakes and tsunami had occurred and industries and buildings had been built based

on the data and records that caused maximum impacts in the past. If gas pipeline vibrates due to earthquake, we have a plan to shut down and there will not be any gas inside the pipe. Few residues may be contained inside the pipe but this could not cause serious explosion.

Comment from Daw Kyi Kyi Hnin, Gonechwein Village

- I would like to ask ERM. Do you have any experience that project had been stopped due to huge negative impacts?

Response from U Thapye Myo Oo, Senior Consultant, ERM

- We always consider in each possible impact whether it may be huge or not. There are some words in this report like 'Negligible' but we do not neglect those impacts. We have to advise how to operate the projects with minimal impacts and collect comments and suggestions to report from public consultation. Local people can talk about their worries, comments, and suggestions in public consultation. ERM continue to perform all EIAs in line with good practice.

Response from U Phore Kyaw, Senior HSE Engineer, POSCO DAEWOO Corporation

- We selected to pipeline route away from villages for safety reasons. In addition, there are many preventive measures like shutting down the gas when there is any natural disaster. We have planned not to affect local community as much as possible.

Comment from Daw Kyi Kyi Hnin, Gonechwein Village

- Although gas lighter has empty gas, it can explode. Please consider about that.

Response from U Phore Kyaw, Senior HSE Engineer, POSCO DAEWOO Corporation

- Your comment is fine and we are ok to respond. If explosion arises due to natural disasters, we will shut down the gas and remove the residues.

Comment from U Aye Kyi, Gonechwein Village

- There are some farmers with agricultural livelihood either side of the gas pipeline in our village. Although farmers want to pass through the pipeline with small car to trade their crops, PDC did not allow access and prevented them through the administrative department. If the gas pipe cannot resist the weight of a car, we are worried about the resistance when there is an earthquake. I would like PDC to explain for the resistance for an earthquake so that local people can know about it.

Response from U Phore Kyaw, Senior HSE Engineer, POSCO DAEWOO Corporation

- Is there any place to pass over the way?

Comment from U Aye Kyi, Gonechwein Village

- There are two places to pass over the pipeline for vehicles but these are not useful for local farmers. The first one is Nat Kyauk beach near a restaurant and the second one is Nga Pyay Taung beach between the villages of Laytarpyin and Ywa Thar Ywar. These are not effective for local farmers. But these are usable for local fishermen and people who come to beach in this area.

Response from U Phore Kyaw, Senior HSE Engineer, POSCO DAEWOO Corporation

- Which place is most suitable according to your suggestion?

Comment from U Aye Kyi, Gonechwein Village

- It is difficult to say and local farmers want to cross near their farmlands if possible.

Response from U Ye Hlaing Win, Environmental Engineer, POSCO DAEWOO Corporation

- It is better to suggest the most appropriate and useful places for local people for agriculture. Because we cannot do in every place for their needs.

Comment from U Aye Kyi, Gonechwein Village

- Would that be okay if local people discuss closely and submit for two places?

Response from U Phore Kyaw, Senior HSE Engineer, POSCO DAEWOO Corporation

- It is more appropriate for you and it was difficult to make decision immediately. We have to inform this to our PDC's management. I'd like to answer about resistance of car upon pipeline. Actually, it can resist for carload but prohibited for safety and strength.

Comment from U Aye Kyi, Gonechwein Village

- I would like to know about the durability of the pipeline in earthquakes; up to in which level of Richter scale can it withstand?

Response from U Phore Kyaw, Senior HSE Engineer, POSCO DAEWOO Corporation

- We cannot say exactly but we had prepared the design, which can withstand according to the one hundred year earthquake data for maximum durability. We have already predicted and calculated the risk assessment if there is an accident. We have chosen the place, which is far from the households.

Attendance List

No	Name	Village
1.	U Soe Myint Thein	Ohn Taw
2.	U Hla Nu Aung	Ohn Taw
3.	U Zaw Win Shein	Ohn Taw
4	U Yaing Nu	Ohn Taw
5	U Mon	Ohn Taw
6	U Ye Myint Aung	Ohn Taw
7	U Saw Aung	Ohn Taw
8	U Hlaing Linn	Ohn Taw
9	U Soe Soe	Ohn Taw
10	Daw Saw Shwe Nyunt	Ohn Taw
11	Daw Khin Saw Nyunt	Ohn Taw
12	U Ye Htet Oo	Gonechwein
13	U Maung Aye Kyi	Gonechwein
14	U Kyaw Htwee	Gonechwein
15	Daw Htwe Htwe	Gonechwein
16	Daw Mi Mi Kyi	Gonechwein
17	Daw Pu May	Gonechwein
18	Daw Cho Myo Win	Gonechwein

No	Name	Village
19	Daw Mu Mu Khaing	Gonechwein
20	U Than Htun	Ohn Taw
21	U Maung Myo	Ohn Taw
22	U Aye Ba Oo	Ohn Taw
23	U Thein Htun Phyu	Ohn Taw
24	U Hla Pyae Aung	Ohn Taw
25	U Win Thein Naing	Ohn Taw
26	U Maung Win	Ohn Taw
27	U Maung Tun	Gonechwein
28	U Maung Thein Shwe	Ohn Taw
29	U Tun Min	Gonechwein
30	U Saw Maung Oo	Gonechwein
31	U Maung Aye Thein	Gonechwein
32	U Khin Maung Myint	Gonechwein
33	U Myint Thu Than	Gonechwein
34	U Myint Thu Than	Gonechwein
35	Daw Kyi Kyi Hnin	Gonechwein
36	Daw Hla Hla Myint	Gonechwein
37	Daw Hla win	Gonechwein
38	U Maung Kyauk Thee	Gonechwein
39	U Maung San Nu	Gonechwein
40	Daw Than Than Yee	Gonechwein
41	Daw Zarchi Min	Gonechwein
42	Daw Khin Yu	Gonechwein
43	Daw Mi Soe	Ohn Taw
44	Daw Wai Thar Ma	Ohn Taw
45	Daw Byaw Nu	Ohn Taw
46	Daw Kyaw Nu Wai	Ohn Taw
47	Daw Khin Nu	Ohn Taw
48	Daw Kyar Ma	Ohn Taw
49	Daw Wai Soe	Ohn Taw

Photo



Meeting of Minutes: EMP Stakeholder Consultation for existing Shwe Field Development in Blocks A-1 and A-3

Detail

Project	EMP for Existing Shwe Project	Region / State	Rakhine
Venue	Malakyun Village	Township	Kyaukpyu
District	Kyaukpyu		
Objective	Stakeholder Consultation Meeting		
Date	1 st Nov 2018		
Time	9:00 AM		

- **U Kyaw Zeya, Deputy Director, Offshore, Myanma Oil and Gas Enterprise**, Introduced and briefly explained about SHWE Project and the requirement of the public consultation from this project. PDC has complied with existing legal requirement.
- **U Phore Kyaw (Senior HSE Engineer, POSCO DAEWOO Corporation, PDC)** introduced PDC and explained about the existing Shwe Field Development in Blocks A-1 and A-3 and the Onshore Gas Terminal (OGT) in Rakhine State.
- **U Thapye Myo Oo (Senior Consultant, Environmental Resources Management (ERM))** gave an overview of the Environmental Management Plan (EMP) as per the Myanmar EIA Procedure (2015).

Comment from U Soe Thwin, Village Leader, Lakekhamaw Village Tract

- I do not understand the negative impacts. I would like to request to support for the whole village tract (not only with our village).

Comment from U Tin Wai, Lakekhamaw Village

- The proposed project will be implemented near the village, and thus many trees can be damaged by the project activities. I would like to know how to replant the trees. If our village would like to plant the tree; do you have a plan to support for nursery plantation?
- I would like to know whether PDC have a plan to upgrade the roads and bridges which needs maintenance or not.

Comment from U Kyaw Thu, Pyin Shae Village

- Will you construct for Mawain Bridge?

Response from U Min Kyaw Thu, CSR Coordinator, POSCO DAEWOO Corporation

- Maw Win Bridge will be constructed in this fiscal year. Currently, tendering process has been conducting and the successful bidder will construct the RCC Bridge.

Comment from U Maw Wai Khin, Malakyun

- I have never heard about EIA in 2009. I am glad to hear that EIA has been conducted since 2015. Sometimes, we got bad smell in the place from where wastewater are discharging. I would like PDC to control that. This PDC Shwe project is not too far from our village, and if there occurs some problem from the project, who will take the responsibility to solve the negative impacts. Villagers are worried about that.

Response from U Phore Kyaw, Senior HSE Engineer, POSCO DAEWOO Corporation

- Related to wastewater discharge, we will inspect and take the necessary action. We understand your concerns regarding the impacts of the project. Before the project start, we have to study the distance of the impacts when the explosion occurs. The project is located far enough away from the villages based on our design studies.

Comment from U Shwe Than, Ywar Thit Village

- I wish that the road access from Lakekhamaw and Malakyun to be in good condition.

Response from U Min Kyaw Thu, CSR Coordinator, POSCO DAEWOO Corporation

- We conduct the corporate social responsibility activities year by year. In Malakyun, there is road access that extends to the bridge as phase (4). We will do CSR activities in this area step by step. The budget is divided into many sectors like education, health, infrastructure, etc. We have to do development programs for the whole Rakhine State. Previously, we supported development activities for the villages where our project is located. Rakhine State government would like us to do development for the whole state and we support for various sectors within the budget. People in Kyaukpyu Township also requested for road construction in the downtown area. As you know, we are giving first priority to our project villages, Gonechwein & Malakyun for implementing the CSR programs.

Comment from U Maw Wai Khin, Malakyun

- Is the pipeline constructed by China Company related with PDC? The village has difficulties in rainy season. We would like you to construct a bridge for passing through the pipeline.

Response from U Ye Hlaing Win, Environmental Engineer, POSCO DAEWOO Corporation

- This is not related with PDC.

Comment from U Thein Maung, Malakyun

- Under the OGT, wastewater discharge is very dirty and have bad odour. It can affect our health. We cannot stand for the air pollution (bad smell) emitted from the factory. How will you manage and control for that issue?
- There is no fence in the Basic Education Middle School constructed by PDC. Do you have a plan to support the school?

Response from U Phore Kyaw, Senior HSE Engineer, POSCO DAEWOO Corporation

- We will manage for the waste as part of the EMP monitoring. We understand the bad smell may be from burning. These will be monitored as part of the EMP commitments.
- We already planned to construct the fence at Malakyun School.

Comment from U Thein Maung, Malakyun

- I would like to request English courses for children.

Response from U Min Kyaw Thu, CSR Coordinator, POSCO DAEWOO Corporation

- We would like you to attend the livelihood training program in Kyaukpyu District. The next Batch of Trainings will be organized in December.

Comment from U San Hla Aung, Pyin Shae Village

- We have difficulties to attend the training in other towns.

Response from U Min Kyaw Thu, CSR Coordinator, POSCO DAEWOO Corporation

- We will report and discuss with our management for other options on this particular issue.

Comment from U Win Myint, Malakyun

- I would like to request to repair Mawwain Bridge and roads.

Response from U Min Kyaw Thu, CSR Coordinator, POSCO DAEWOO Corporation

- We will repair Mawwain Bridge in this fiscal year. We will repair the bridge first then roads will be followed because roads only are useless without bridge for that particular area. We will construct and upgrade roads progressively.

Comment from U Maw Wai Khin, Malakyun

- The people who did not reach Grade 11 do not dare to go to Government Technological University (GTU). Therefore, is it better to train first in our area?

Response from U Min Kyaw Thu, CSR Coordinator, POSCO DAEWOO Corporation

- Last year, we supported a computer-training program. We found out that it was not effective and we understand it is hard to find skilful teachers. In addition, villagers would not like to come and attend the training program here. We would like to have a skilled teacher in the training, and it is hard. If you have any difficulties for children, feel free to ask for that. In vocational trainings, the teachers already have doctoral degree and 30- 40 people can attend in those trainings. Not only children but also adults can attend and it is more effective we believe.

Comment from U Maung Myint, Lakekhamaw Village

- I would like to thank you for performing environmental impact assessment.

Response from U Ye Hlaing Win, Environmental Engineer, POSCO DAEWOO Corporation

- We will also inspect and manage for wastewater. Thank you.

Attendance List

No	Name	Village Name
1	U Maung Aye Htwe	Ywar Thit
2	U Cho Maung	Malakyun
3	U Hla Myint Than	Malakyun
4	U Htun Myint	Malakyun
5	Daw Phwar Khin	Malakyun
6	Daw Shwe Thar Ma	Malakyun
7	U San Myint	Pyin Shay

No	Name	Village Name
8	U Kyaw Win	Lakekhamaw ywar Thit
9	U Soe Lwin	Malakyun
10	U Soe Win	Lakekhamaw Ywar Thit
11	U Kyaw Zaw Aung	Malakyun
12	U Tin Wai	Lakekhamaw
13	U Saw Zarni	Malakyun
14	Daw Pwint Phoo Aung	Malakyun
15	U Soe Thwin	Malakyun
16	U Maung San Nyunt	Malakyun
17	Daw Su Su Htwe	Malakyun
18	U Win Maung	Malakyun
19	U Khaing Hla Aung	Malakyun
20	U Kyaw Thu	Malakyun
21	U Maung Thein Phyu	Malakyun
22	U Kyaw Nyunt	Malakyun
23	U Maung Wai Khin	Malakyun
24	U Win Myint	Malakyun
25	U Thein Maung	Malakyun
26	U San Hla Aung	Pyin Shay
27	U Saw Latt	Malakyun
28	U Hla Win	Malakyun
29	U Chee Thar Aung	Malakyun
30	U Maung Myint	Lakekhamaw

No	Name	Village Name
31	U Htun Yinn	Malakyun
32	U Maung Than Htun	Malakyun
33	U Naing Naing Htun	Malakyun
34	U Thein Nyunt	Malakyun
35	Daw Phyu Yaing Nu	Malakyun
36	Daw Than Mu Oo	Malakyun
37	Daw Phyu Phyu Aye	Malakyun
38	Daw Khin Mar Aye	Malakyun
39	Daw Phyo Thandar	Malakyun
40	Daw A Ngal ma	Malakyun
41	U Sein Aung Kyi	Malakyun
42	Daw Shwe Ma	Malakyun
43	U Ngwe Loon	Malakyun
44	U maung Zaw Min	Malakyun
45	Daw Khin Kyi	Malakyun
46	U Naing Min Soe	Malakyun
47	U Myo Win	Malakyun
48	Daw Aye Saw Nu	Malakyun
49	U Maung Aye Win	Pyin Chay
50	U Hla Maung Oo	Pyin Chay
51	Daw Khin Saw Nu	Malakyun
52	U Than Tin	Malakyun
53	U San Shwe Htun	Malakyun

No	Name	Village Name
54	U Kyaw Soe Aye	Malakyun
55	U Zaw Aung	Lakekhamaw Ywar Thit
56	Daw Khin Zar Win	Malakyun
57	U Maung Hla Pone	Malakyun
58	U Shwe Than	Ywar Thit
59	U Maung Maung Lwin	Ywar Thit

Photo



Appendix L Seawater Quality (OIW) Results for SHWE Offshore (Phase 1) and Collected Location
(100 m and 500 m)

Seawater Quality (OIW) Results for SHWE Offshore (Phase 1)

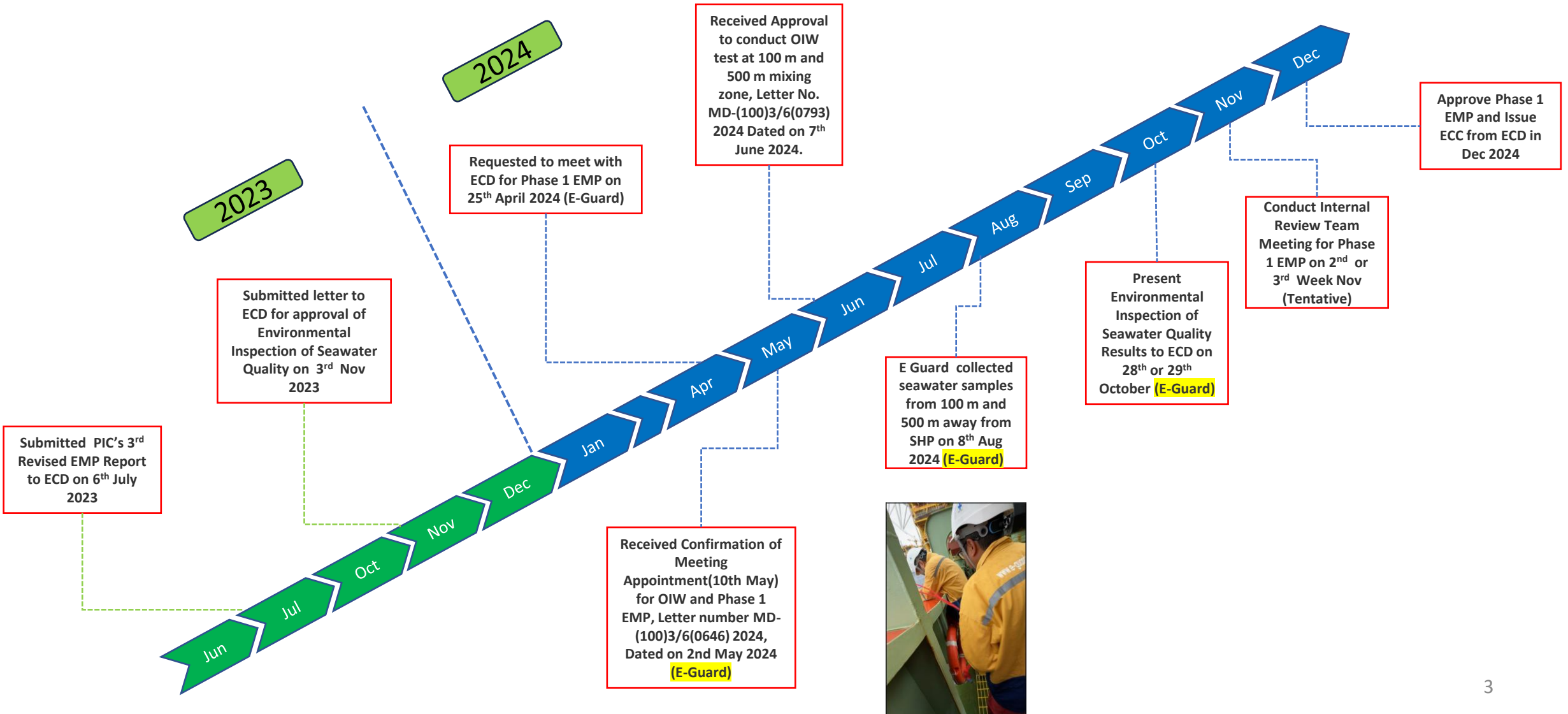
E Guard Environmental Services

Content

1. Background
2. Location of SHWE Project (Phase 1)
3. Seawater Sampling Points for OIW
4. Results and Discussion on Seawater Quality
5. Discussion on seawater quality
6. Other Activities around SHWE Project (Phase 1)
7. Observation of marine animals around SHWE Project (Phase 1)
8. Way Forwards

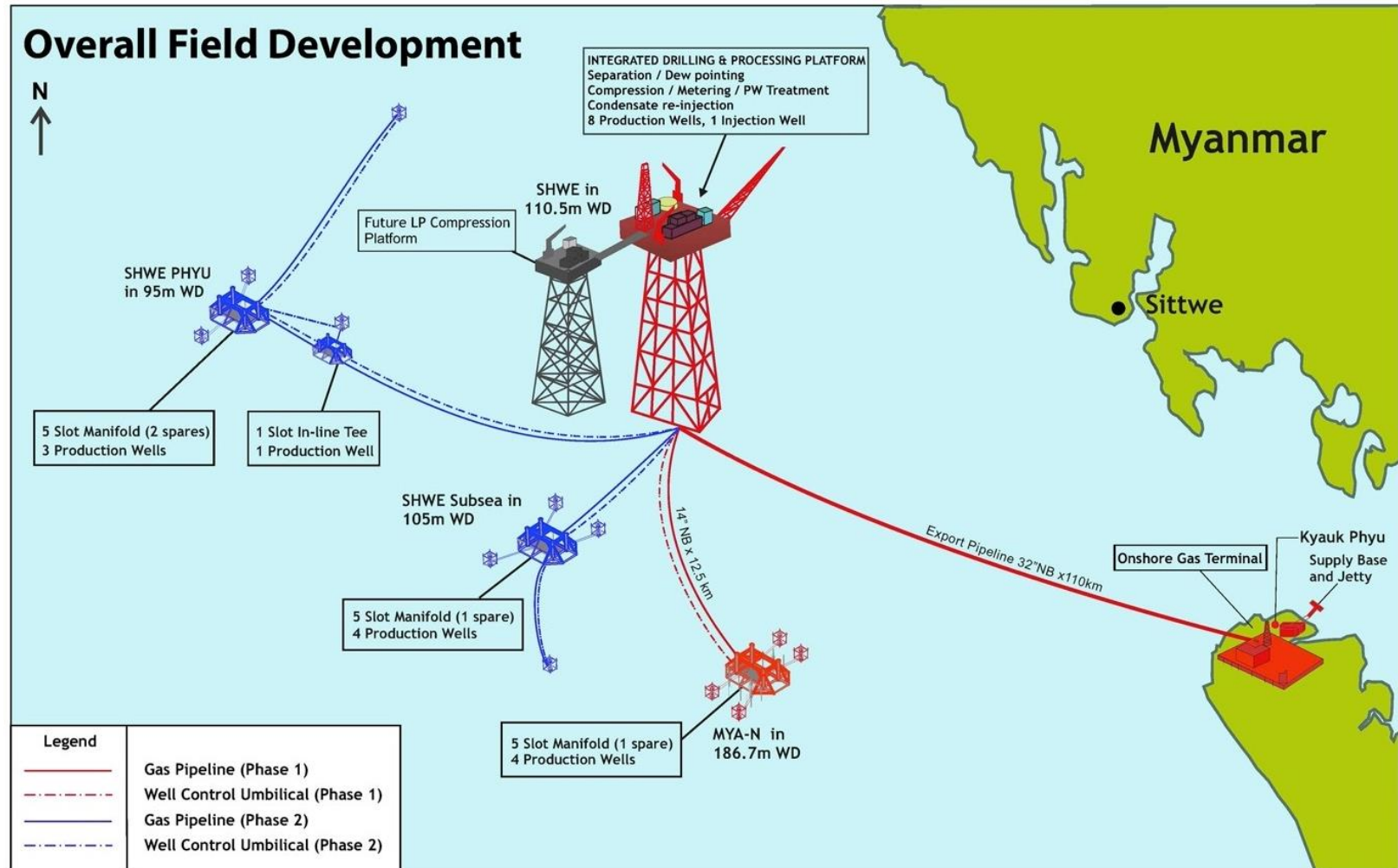
1. Background

Project timeline and involvement of E-Guard



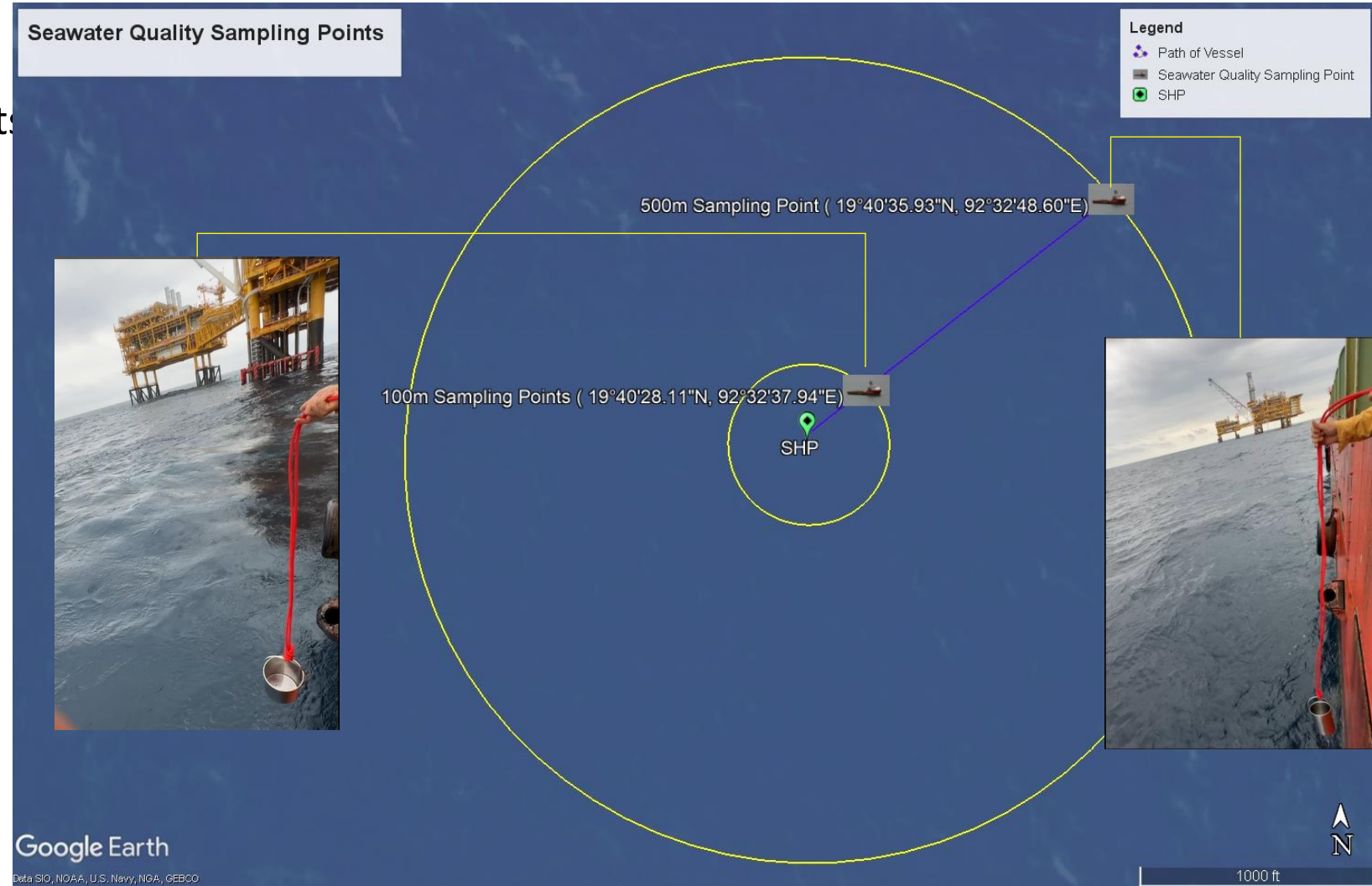
2. Location of SHWE Project (Phase 1)

- **SHWE Project**
 - A multiple gas condensate field integrated development within Block A-1 and A-3
- **Phase 1 Development**
 - Conducted between 2011 and 2013
 - **Shwe Field** – 8 production wells and 1 injection well
 - **Mya North Field** – one subsea manifold with 5 slots, Export pipeline, onshore gas terminal
- **Consortium of 5 Companies:**
 - (1) POSCO INTERNATIONAL Corporation (PIC)(51%)
 - (2) Myanma Oil and Gas Enterprise (MOGE)(15%)
 - (3) Oil and Natural Gas Corporation Videsh Limited (OVL)(17%)
 - (4) Gas Authority of India (GAIL)(8.5%)
 - (5) Korea Gas Corporation (KOGAS) (8.5%).



3. Seawater Sampling Points for OIW

- Seawater sampling at 2 points 2024
 - 100 m
 - 500m



4. Results and Discussion on Seawater Quality

No.	Parameter	Unit	MWQ1 (100 m)	MWQ 2 (500 m)	Guidelines	Method
1	Total Petroleum Hydrocarbon	mg/l	0	0	42 (one day max) 29 (30-day average) (NEQ(E)G)	PIC SHP: Gravimetric Method (EPA method 1664), The InfraCal TOG/TPH Analyzer (Baker Hughes, SHP Platform)
2	Total Petroleum Hydrocarbon	mg/l	0	0		Intergovernmental Oceanographic Commission, Manual for monitoring oil and dissolved/dispersed petroleum hydrocarbon in marine waters and on beaches,1984(REM-UAE Lab, Thailand)
3	Oil and Grease	mg/l	Nil	2	0.14 (Asian Marine Water Quality Management Guideline)	(a) 5520D, Soxhlet Extraction Method (Pro Lab Analytical Laboratory)

Baker Hughes

BAKER HUGHES ASIA PACIFIC PTE. LTD.
BAKER HUGHES ASIA PACIFIC PTE. LTD.
2 Bero Road, Singapore 620676

CERTIFICATE OF QUALITY

DATE RECEIVED : 08 August 2024
DATE TESTED : 08 August 2024
REPRESENTING : POSCO INTERNATIONAL CORPORATION (MYANMAR E&P)
ADDRESS : LEVEL - 3, NO 623, VANTAGE TOWER, PYAY ROAD, KAMAYUT TOWNSHIP (11041), YANGON, MYANMAR.
SAMPLE DESCRIPTION:
Sample Date: 08 August 2024
Location: 100m from SHP

SAMPLE	TEST	METHOD	UNIT	RESULTS
Sea water sample	Oil In Water	Infra Cal method by TOG/TPH analyser	ppm	0.0

Remark:
- The test has performed in accordance with above mentioned method.
- The above reflects our finding at time, date and place above mentioned only and does not refer to any other matters.

For and on behalf of
BAKER HUGHES UPSTREAM CHEMICALS
On SHP Laboratory duty: Kyaw Win Aung
Field Specialist II (Upstream Chemicals) - Baker Hughes

Baker Hughes Upstream Chemicals is a Product Line of Baker Hughes Ltd.
Registered Number: 1386928
Registered Office: Western House, 54 Baker Street London W1U 7BH

Baker Hughes

BAKER HUGHES ASIA PACIFIC PTE. LTD.
BAKER HUGHES ASIA PACIFIC PTE. LTD.
2 Bero Road, Singapore 620676

CERTIFICATE OF QUALITY

DATE RECEIVED : 08 August 2024
DATE TESTED : 08 August 2024
REPRESENTING : POSCO INTERNATIONAL CORPORATION (MYANMAR E&P)
ADDRESS : LEVEL - 3, NO 623, VANTAGE TOWER, PYAY ROAD, KAMAYUT TOWNSHIP (11041), YANGON, MYANMAR.
SAMPLE DESCRIPTION:
Sample Date: 08 August 2024
Location: 500m from SHP

SAMPLE	TEST	METHOD	UNIT	RESULTS
Sea water sample	Oil In Water	Infra Cal method by TOG/TPH analyser	ppm	0.0

Remark:
- The test has performed in accordance with above mentioned method.
- The above reflects our finding at time, date and place above mentioned only and does not refer to any other matters.

For and on behalf of
BAKER HUGHES UPSTREAM CHEMICALS
On SHP Laboratory duty: Kyaw Win Aung
Field Specialist II (Upstream Chemicals) - Baker Hughes

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LAE

United Analyst and Engineering Consultant Co., Ltd.

350 Udomsak 41, Sukhumvit Road, Bangkok, Phrakhanong, Bangkok 10260
Tel: 02-2763 2828 Fax: 02-2763 2880 www.uacconsultant.com E-mail: uac@uacconsultant.com

TESTING
No. 0063

ANALYSIS REPORT

PROJECT NAME : SHIP PROJECT (PHASE 1 DEVELOPMENT)
CUSTOMER NAME : E-GUARD ENVIRONMENTAL SERVICE CO., LTD
ADDRESS : NO.11, AIRPORT AVENUE ROAD YANGON MYANMAR MYANMAR
CONTACT INFORMATION : TEL : +95 97955088 E-mail : contact@em-uacconsultant.com
SAMPLING SOURCE : SHIP FIELD
SAMPLE TYPE : SEAWATER
SAMPLING DATE : AUGUST 8, 2024
SAMPLING TIME : -
SAMPLING METHOD : GRAB
SAMPLING BY : CUSTOMER
ANALYZED BY : MR NANTHAWAT WONGKHAM
RECEIVED DATE : SEPTEMBER 6, 2024
ANALYTICAL DATE : SEPTEMBER 6, 2024
ISSUE DATE : SEPTEMBER 6, 2024
REPORT NO. : 2024-080942
WORK NO. : 2024-08094
ANALYSIS NO. : T24WQ1-0001

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT SEAWATER 1 (500m FROM SHP) T24WQ1-0001	DETECTION LIMIT
PETROLEUM HYDROCARBON ¹	µg/L	INTERGOVERNMENT OCEANOGRAPHIC COMMISSION, MANUAL FOR MONITORING OIL AND DISSOLVED/DISPersed PETROLEUM HYDROCARBONS IN MARINE WATERS AND ON BEACHES, 1984	0.06	0.02

SAMPLE CONDITION
WATER'S COLOUR/TURBID
SEDIMENT
COLOUR/ODG/SM

NO EXTERNAL OPINION
NO INTERNAL OPINION
NO SHIP INTERNAL OPINION

PROHIBITED TO PARTIALLY COPY ANALYSIS REPORT PRIOR TO WRITTEN PERMISSION BY THE LABORATORY.
THIS ANALYSIS REPORT APPROVES ONLY FOR THE SAMPLE AS RECEIVED.

Report S.
(MR POKAN SUTTANAWATWONG)
LABORATORY SUPERVISOR

NO EXTERNAL OPINION
NO INTERNAL OPINION
NO SHIP INTERNAL OPINION

PROHIBITED TO PARTIALLY COPY ANALYSIS REPORT PRIOR TO WRITTEN PERMISSION BY THE LABORATORY.
THIS ANALYSIS REPORT APPROVES ONLY FOR THE SAMPLE AS RECEIVED.

Report S.
(MR POKAN SUTTANAWATWONG)
LABORATORY SUPERVISOR

Baker Hughes Upstream Chemicals is a Product Line of Baker Hughes Ltd.
Registered Number: 1386928
Registered Office: Western House, 54 Baker Street London W1U 7BH

LAE

United Analyst and Engineering Consultant Co., Ltd.

350 Udomsak 41, Sukhumvit Road, Bangkok, Phrakhanong, Bangkok 10260
Tel: 02-2763 2828 Fax: 02-2763 2880 www.uacconsultant.com E-mail: uac@uacconsultant.com

TESTING
No. 0063

ANALYSIS REPORT

PROJECT NAME : SHIP PROJECT (PHASE 1 DEVELOPMENT)
CUSTOMER NAME : E-GUARD ENVIRONMENTAL SERVICE CO., LTD
ADDRESS : NO.11, AIRPORT AVENUE ROAD YANGON MYANMAR MYANMAR
CONTACT INFORMATION : TEL : +95 97955088 E-mail : contact@em-uacconsultant.com
SAMPLING SOURCE : SHIP FIELD
SAMPLE TYPE : SEAWATER
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SAMPLING TIME : -
SAMPLING METHOD : GRAB
SAMPLING BY : CUSTOMER
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RECEIVED DATE : SEPTEMBER 6, 2024
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PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT SEAWATER 1 (500m FROM SHP) T24WQ1-0001	DETECTION LIMIT
PETROLEUM HYDROCARBON ¹	µg/L	INTERGOVERNMENT OCEANOGRAPHIC COMMISSION, MANUAL FOR MONITORING OIL AND DISSOLVED/DISPersed PETROLEUM HYDROCARBONS IN MARINE WATERS AND ON BEACHES, 1984	0.06	0.02

SAMPLE CONDITION
WATER'S COLOUR/TURBID
SEDIMENT
COLOUR/ODG/SM

NO EXTERNAL OPINION
NO INTERNAL OPINION
NO SHIP INTERNAL OPINION

PROHIBITED TO PARTIALLY COPY ANALYSIS REPORT PRIOR TO WRITTEN PERMISSION BY THE LABORATORY.
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Report S.
(MR POKAN SUTTANAWATWONG)
LABORATORY SUPERVISOR

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Registered Number: 1386928
Registered Office: Western House, 54 Baker Street London W1U 7BH

6

5. Discussion on Seawater Quality

- The OIW test results from conducted at both lab show sea water around SHP Platform is free of OIW.
- Test methodology to test OIW of samples applied by both labs are acceptable.
- In future monitoring (e.g. six-monthly monitoring report) PIC will be usings its own lab operated by a third party, Baker Hugues.
- PIC has a well developed waste management plan to manage all wastes at SHP Platform.
- PIC will implement the mitigation measures, management and monitoring plan mentioned in EMP report to compliance with EIA procedure.

6. Other Activities around SHWE Project (Phase 1)

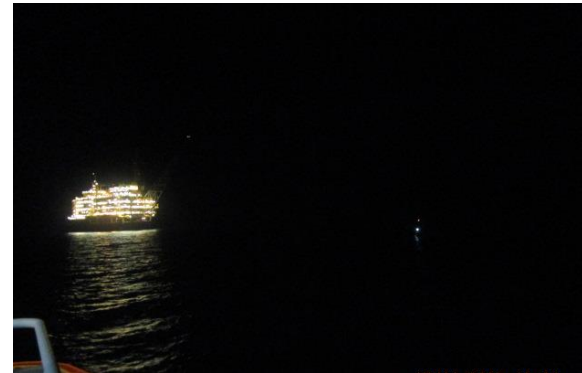
- Numerous fishing boats and other errant vessels are often entering the 5 Nautical Miles restricted zone around SHWE Offshore platform which contributed to pollute seawater quality.



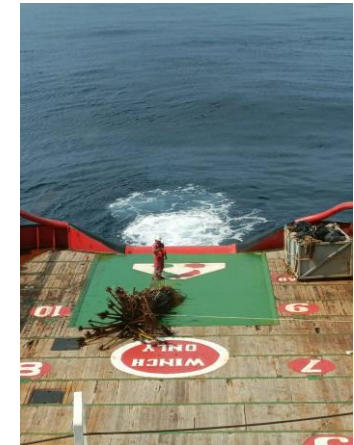
IR-SHP-02-2021
Errant Vessel - MV
Charlene



IR-SHP-14-2022 Errant
Vessel



IR-SHP-14-2022
Errant Vessel



Recover floating
palm tree from the
sea

6. Other Activities around SHWE Project (Phase 1)

- Numerous fishing boats and other errant vessels are often entering the 5 Nautical Miles restricted zone around SHWE Offshore platform which contributed to pollute seawater quality.



IRF-SHP-0326 - Abandoned Fishing Net Drifted inside SHP 500m Zone.1



IRF-SHP-0305 - 2 Fishing vessels infraction into SHWE field Exclusion zone



INF-SHP-06-2020 - Errant Vessel

7. Observation of marine animals around SHWE Project

- The seawater around the SHP and SHK platforms is clean and free from pollution, providing a healthy environment devoid of harmful contaminants as mammal habitats.



Fishes and Manta Ray around SHP Platform in 2023



SHP whale shark_21_June_2017



SHP_Turtle_25_Feb_2016

8. Way Forward

To write what we are doing in sequence:

- Submission the revised EMP report after this meeting
- Approval of PIC's EMP and achievement of ECC
- Conduct regular Environmental Monitoring
- Submission of periodic monitoring report periodically

Appendix M Risk Assessment of Collection of Seawater

Level 2 Risk Assessment Form

Reviewed on 07.Aug 2024

SHWE-L2RA



RA Subject: 100 m and 500 m Seawater Samples Collection at SHP

Notes:

RA Summary: Collecting Seawater Samples from the sea of 100 m & 500 m surrounding of SHP Offshore Platform using bucket and rope from SB Vessel

No:
SHWE-L2RA

Participants: 1. Head of HSE 2. Environmental Engineer 3. SHP Safety Officer 4. Sr HSE Engineer 5. HSE Engineer 6. E Guard Representative

Participants Signatures: [Signatures]

Oil Approval Signature: [Signature]

Item	Event	Hazard	Effect	Initial Risk Rating	Mitigations	Residual Risk Rating
1.	Conducting of Seawater Samples collection at 100 m and 500 m away from SHP Offshore Platform	<ul style="list-style-type: none"> Vessel Collision Man Overboard from Vessel Drop Objects from Vessel 	<ul style="list-style-type: none"> Damage Fatality Injured 	P-A3 E-C3 V-B3 R-B3	<ul style="list-style-type: none"> Maintaining Safe Distance to maneuver Vessel to approach safely at designated distance of 100 m and 500 m from SHP When entering 500m zone of platform, must adhere to SHP-OM-OP-03-07-0028 In-Field Vessels Operations Manual Procedure Standby Man to oversee during collection of Seawater. Wear appropriate personal floating device or Life vest during Collection Secured Rope with Bucket water to collect seawater samples Prepared First Aid Box in case of First Aid emergency 	P-C2 E-D2 V-D2 R-D2

Level 2 Risk Assessment Form

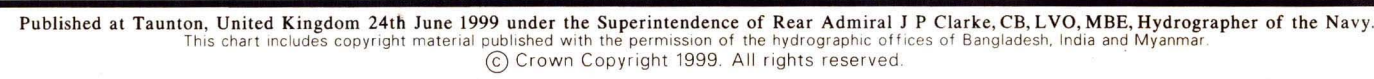
Reviewed on 07.Aug 2024

SHWE-L2RA



Risk Matrix									
Consequences					Likelihood				
					Remote (1)	Unlikely (2)	Possible (3)	Somewhat Likely (4)	Likely (5)
Severity	People	Environment	Value (Loss)	Reputation	Incident is unlikely but not unknown	Incident is credible and has occurred in the industry	Likely to occur sometime in field life	Likely to occur or happen several times	Likely to occur repeatedly
Catastrophic (A)	Fatality(s)	Large Scale Impact (Years) >10 Km2 International Assistance	>\$2M (USD)	Exposure on International & National Media or papers. Major operation severely restricted.				High Risk or Catastrophic Region	
High (B)	LTI or Permanent Disability	Medium Scale Impact (Months) 1-10 Km2 Regional Assistance	\$500K- \$2M (USD)	National TV or papers. Close Scrutiny of operations level/ future proposal.			ALARP Region		
Medium (C)	MTC/RWC	Short Term impact (1 week) <1 km Localised effect	\$50- \$500K (USD)	Local Media interest. Some impact on asset level non- production activities		Low Risk Region			
Low (D)	Slight Injury FAC	Localised- Immediate area Term of impact- 1 day	<\$50K (USD)	No or Slight Impact. Freedom to operate unaffected					

Appendix N Navigation Map



Appendix O Laboratory Results of Seawater Quality (100 m and 500 m)

CERTIFICATE OF QUALITY**DATE RECEIVED** : 08 August 2024**DATE TESTED** : 08 August 2024**REPRESENTING** : POSCO INTERNATIONAL CORPORATION (MYANMAR E&P)**ADDRESS** : LEVEL - 3, NO.623, VANTAGE TOWER, PYAY ROAD, KAMAYUT TOWNSHIP (11041), YANGON, MYANMAR.**SAMPLE DESCRIPTION:****Sample Date: 08 August 2024****Location: 100m from SHP**

SAMPLE	TEST	METHOD	UNIT	RESULTS
Sea water sample	Oil In Water	Infra Cal method by TOG/TPH analyser	ppm	0.0

Remark:

- The test has performed in accordance with above mentioned method.
- The above reflects our finding at time, date and place above mentioned only and does not refer to any other matters.

**For and on behalf of
BAKER HUGHES UPSTREAM CHEMICALS**On SHP Laboratory duty: Kyaw Win Aung
Field Specialist II (Upstream Chemicals) - *Baker Hughes*

CERTIFICATE OF QUALITY**DATE RECEIVED** : 08 August 2024**DATE TESTED** : 08 August 2024**REPRESENTING** : POSCO INTERNATIONAL CORPORATION (MYANMAR E&P)**ADDRESS** : LEVEL - 3, NO.623, VANTAGE TOWER, PYAY ROAD, KAMAYUT TOWNSHIP (11041), YANGON, MYANMAR.**SAMPLE DESCRIPTION:****Sample Date: 08 August 2024****Location: 500m from SHP**

SAMPLE	TEST	METHOD	UNIT	RESULTS
Sea water sample	Oil In Water	Infra Cal method by TOG/TPH analyser	ppm	0.0

Remark:

- The test has performed in accordance with above mentioned method.
- The above reflects our finding at time, date and place above mentioned only and does not refer to any other matters.

**For and on behalf of
BAKER HUGHES UPSTREAM CHEMICALS**On SHP Laboratory duty: Kyaw Win Aung
Field Specialist II (Upstream Chemicals) - *Baker Hughes*

ANALYSIS REPORT

PROJECT NAME : SHWE PROJECT (PHASE I DEVELOPMENT)
CUSTOMER NAME : E-GUARD ENVIRONMENTAL SERVICE CO., LTD
ADDRESS : NO.11, AIRPORT AVENUE ROAD YANGON MYANMAR MYANMAR
CONTACT INFORMATION : TEL : +959 799855808 e-mail : contact@rem-uaeconsultant.com
SAMPLING SOURCE : SHWE FIELD
SAMPLE TYPE : SEAWATER
SAMPLING DATE : AUGUST 8, 2024
SAMPLING TIME : -
SAMPLING METHOD : GRAB
SAMPLING BY : CUSTOMER
ANALYZED BY : MR NANTHAWAT WONGKHAM

RECEIVED DATE : SEPTEMBER 6, 2024
ANALYTICAL DATE : SEPTEMBER 6, 2024
ISSUE DATE : SEPTEMBER 9, 2024
REPORT NO. : 2024-U083042
WORK NO. : 2024-008254
ANALYSIS NO. : T24AU425-0001

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	DETECTION LIMIT
			SEAWATER 1 (100 M FROM SHP) T24AU425-0001	
PETROLEUM HYDROCARBON ^b	µg/L	INTERGOVERNMENT OCEANOGRAPHIC COMMISSION, MANUAL FOR MONITORING OIL AND DISSOLVED/ DISPERSED PETROLEUM HYDROCARBONS IN MARINE WATERS AND ON BEACHES, 1984	0.08	0.02
SAMPLE CONDITION WATER'S COLOUR/TURBID SEDIMENT			COLOURLESS/CLEAR -	

^a : ISO/IEC 17025 ACCREDITED BY THAI INDUSTRIAL STANDARDS INSTITUTE (TISI)

^b : ISO/IEC 17025 ACCREDITED BY DEPARTMENT OF SCIENCE SERVICE (DSS)

^c : VERIFIED BY OWN LABORATORY QUALITY SYSTEM, BUT STILL NOT ACCREDITED

Piyapat S.

(MRS PIYAPAT SUTTAMANUTWONG)
LABORATORY SUPERVISOR



ANALYSIS REPORT

PROJECT NAME : SHWE PROJECT (PHASE I DEVELOPMENT)
CUSTOMER NAME : E-GUARD ENVIRONMENTAL SERVICE CO., LTD
ADDRESS : NO.11, AIRPORT AVENUE ROAD YANGON MYANMAR MYANMAR
CONTACT INFORMATION : TEL : +959 799855808 e-mail : contact@rem-uaeconsultant.com
SAMPLING SOURCE : SHWE FIELD
SAMPLE TYPE : SEAWATER
SAMPLING DATE : AUGUST 8, 2024
SAMPLING TIME : -
SAMPLING METHOD : GRAB
SAMPLING BY : CUSTOMER
ANALYZED BY : MR NANTHAWAT WONGKHAM

RECEIVED DATE : SEPTEMBER 6, 2024
ANALYTICAL DATE : SEPTEMBER 6, 2024
ISSUE DATE : SEPTEMBER 9, 2024
REPORT NO. : 2024-U083043
WORK NO. : 2024-008254
ANALYSIS NO. : T24AU425-0002

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	DETECTION LIMIT
			SEAWATER 2 (500 M FROM SHP) T24AU425-0002	
PETROLEUM HYDROCARBON ^b	µg/L	INTERGOVERNMENT OCEANOGRAPHIC COMMISSION, MANUAL FOR MONITORING OIL AND DISSOLVED/ DISPERSED PETROLEUM HYDROCARBONS IN MARINE WATERS AND ON BEACHES, 1984	0.08	0.02
SAMPLE CONDITION WATER'S COLOUR/TURBID SEDIMENT			COLOURLESS/CLEAR	

^a : ISO/IEC 17025 ACCREDITED BY THAI INDUSTRIAL STANDARDS INSTITUTE (TISI)

^b : ISO/IEC 17025 ACCREDITED BY DEPARTMENT OF SCIENCE SERVICE (DSS)

^c : VERIFIED BY OWN LABORATORY QUALITY SYSTEM, BUT STILL NOT ACCREDITED

Piyapat S.

(MRS PIYAPAT SUTTAMANUTWONG)
LABORATORY SUPERVISOR



LABORATORY ANALYSIS REPORT

- 1 Client Name : Shwe Project (Phase - 1 Development)
2 Location : Kyauk Phyu
3 Type of Sample : Sea Water (100 m)
4 Sample No. : 00971/2024
5 Contact Person : Eguard Environmental Services
6 Phone No. : 09-797005212
7 Date Received : 09.08.2024
8 Date of Test Performed : 09.08.2024
9 Date of Issued : 20.08.2024
10 Result :

No.	Parameter	Result	Unit	WHO STD 2018	Method
1	Oil and Grease	Nil	mg/L	NA	^(a) 5520D, Soxhlet Extraction Method

Remark:

This certificate is issued only for the receipt of the test sample.

^(a) American Public Health Association, Standard Methods for the Examination of Water and Wastewater.

Tested By

Name : SU THANDA BO

Position : Laboratory Technician

Signature :

Approved By

Name : THEMAR WINT

Position : Laboratory Manager

Signature :



LABORATORY ANALYSIS REPORT

- 1 Client Name : Shwe Project (Phase - 1 Development)
2 Location : Kyauk Phyu
3 Type of Sample : Sea Water (500 m)
4 Sample No. : 00972/2024
5 Contact Person : Eguard Environmental Services
6 Phone No. : 09-797005212
7 Date Received : 09.08.2024
8 Date of Test Performed : 09.08.2024
9 Date of Issued : 20.08.2024
10 Result :

No.	Parameter	Result	Unit	WHO STD 2018	Method
1	Oil and Grease	2	mg/L	NA	^(a) 5520D, Soxhlet Extraction Method

Remark:

This certificate is issued only for the receipt of the test sample.

^(a) American Public Health Association, Standard Methods for the Examination of Water and Wastewater.

Tested By

Name : SU THANDA BO
Position : Laboratory Technician
Signature :

Approved By

Name : THEMAR WINT
Position : Laboratory Manager
Signature :



Appendix P Laboratory Method and Type of Equipment, and BH Profile

Baker Hughes Asia Pacific Pte. Ltd (BH), which is based in Vietnam, supplies POSCO International Corporation (PIC) Myanmar with production chemicals such as corrosion inhibitor, kinetic hydrate inhibitor, reverse demulsifier, biocide, oxygen scavenger, defoamer, methanol, monoethylene glycol, anti-scalant and anti-oxidant for its offshore (SHP) and onshore (OGT) operations.

In addition to supplying chemicals, BH also provides technical support service to PIC to operate the lab on SHP. This includes the provision of qualified lab technicians, and procedures to conduct the required tests and analyses. The lab technicians are employees of BH who have been professionally trained to operate the lab equipment to conduct the required laboratory tests and analyses. The procedures used to conduct the lab tests and analyses are provided by BH; these procedures are standard procedures used by BH units worldwide, and have been prepared following international codes and standards. Some examples of tests and analyses conducted in the SHP lab are as follows:

- Water and hydrocarbon dew points of natural gas
- Total sulfur content in natural gas
- Base sediment and water content in diesel
- Water content in monoethylene glycol
- Oil content in water
- Properties of produced water in gas (total dissolved solids, salinity, hardness, alkalinity, calcium/iron/chloride contents)
- Microbiological analysis for water
- Cleanliness level of hydraulic fluid

The SHP lab technicians also ensure that all lab equipment is maintained in good conditions and is re-calibrated either in-house or by certified third party whenever required. The technical support service of BH also includes the provision of a Technical Advisor (based in Perth, Australia) to review the results of lab tests and analyses, and assist in understanding and solving issues related to chemical applications. The global presence of BH and its extensive network of labs worldwide provides further support to chemical-related issues at SHP and OGT whenever required.

IMIST

International Minimum Industry Safety Training

CERTIFICATE OF COMPLETION

This is to certify that

Kyaw Win Aung

has successfully completed the OPITO approved
International Minimum Industry Safety
Reassessment and Refresher Programme

Vantage No. / Date of Birth

13/08/1973

Date of completion

02 August 2018

Certificate ID number

4334531202081888990

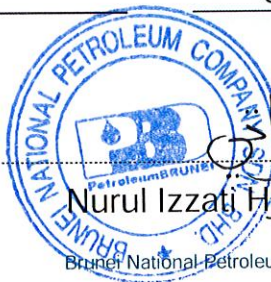
Course ID Code

5312

Expiry date

02 August 2022

Signed




Nurul Izzati Hj Awg Ahmad
Course Invigilator
Brunel National Petroleum Company Sdn. Bhd.

OPITO IMIST delivered in
partnership with Atlas



AtlasTM

Knowledge to perform

www.IMIST-online.com

Certificate of Training



This is to Certify that

Mr. Kyaw Win Aung

of Baker Hughes

Has Successfully Completed

The Installation and Commissioning of TX6000-MCT Sulfur Analyzer &
GM7000 Gas Module Manufactured by TSHR BV

Held at Intermass Fischer-Asia Pte Ltd on April 4th - 6th, 2023

A handwritten signature in black ink, appearing to read 'Joseph Kang'.

Joseph Kang

Technical Specialist

Date : 06/04/2023

A handwritten signature in black ink, appearing to read 'Joe Chua'.

Joe Chua

Technical Manager

Date : 06/04/2023



MEGAMAS

YOUR FIRST CHOICE HSE PARTNER

COURSE CODING : HSPB2
CERT NO.: 0067/2018

CERTIFICATE OF ATTENDANCE

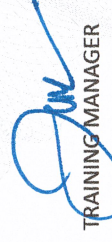
THIS IS TO CERTIFY THAT ON 08TH – 09TH AUGUST 2018

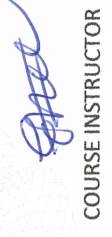
KYAW WIN AUNG
(IC/PASSPORT: MC249926)

HAS ATTENDED & SUCCESSFULLY ACHIEVED AND COMPLETED

PB HSSE PROCESS SAFETY COURSE

CONDUCTED BY MEGAMAS TRAINING COMPANY SDN BHD
BRUNEI DARUSSALAM


TRAINING MANAGER


COURSE INSTRUCTOR

Expiry Date AT COMPANY DISCRETION

Sr.No.	Parameter	Units	SWQ 1 (100 M) 3 Locations	SWQ 2 (500 M) 3 Locations	NEQEG for Offshore Oil and Gas	ASEAN Marine Water Quality Criteria for Aquatic Life Protection	Method	Type of Equipment and Lab Manual
1	Chromium (VI)	mg/l	-	-	-	50 µg/l (0.05 mg/l)	USEPA Standard Method 3500-Cr B (using 1,5-Diphenylcarbohydrazide)	HACH Spectrophotometer DR-3900 HACH Method 8023
2	Temperature	°C	-	-	-	Increase not more than 2°C above the maximum ambient temperature.	it will be measured at seawater sampling location	Temperature Probe
3	Dissolved Oxygen	mg/l	-	-	-	4 µg/l (0.004 mg/l)	Should be measured at seawater sampling location	Portable DO Meter
4	Nitrate (NO ₃ -N)	mg/l	-	-	-	60 µg/l (0.06 mg/l)	Cadmium Reduction Method	HACH Spectrophotometer DR-3900 HACH Method 8039
5	Nitrite (NO ₂ -N)	mg/l	-	-	-	55 µg/l (0.055 mg/l)	Ferrous Sulfate Method	HACH Spectrophotometer DR-3900 HACH Method 8153
6	Oil and Grease	mg/l	-	-	-	0.14 µg/l (0.00014 mg/l)	Substitute for EPA Method 1664 for hexane extraction and gravimetric determination	Wilks Enterprise InfraCal HATR-T2 LR Spec InfraCal TOG/TPH Analyzer, Model HATR-T2
7	Total Suspended Solids	mg/l	-	-	-	Permissible 10% maximum increase over seasonal average concentration.	Photometric Method	HACH Spectrophotometer DR-3900 HACH Method 8006
8	Total Petroleum Hydrocarbon	mg/l	-	-	42 mg/l (One day maximum)	-	Substitute for EPA Method 1664 for hexane extraction and gravimetric determination	Wilks Enterprise InfraCal HATR-T2 LR Spec InfraCal TOG/TPH Analyzer, Model HATR-T2
			-	-	29 mg/l (30 day average)			

⁽¹⁾ American Public Health Association, Standard Methods for the Examination of Water and Wastewater.
ND = Not Detected, Nil = Zero

Certificate of Training



This is to Certify that

Ms. Thiri Nandar

of Baker Hughes

Has Successfully Completed

The Installation and Commissioning of TX6000-MCT Sulfur Analyzer &
GM7000 Gas Module Manufactured by TSHR BV

Held at Intermass Fischer-Asia Pte Ltd on March 7th - 9th, 2023

A handwritten signature in black ink, appearing to read 'Joseph Kang'.

Joseph Kang

Technical Specialist

Date : 09/03/2023

A handwritten signature in black ink, appearing to read 'Joe Chua'.

Joe Chua

Technical Manager

Date : 09/03/2023

Appendix Q Proposed Seawater Quality Location for SHP Offshore Platform

Appendix R Comment Reply of Environmental Conservation Department for the Environmental Management Plan (EMP) Reports Submitted for the Existing Development Phase of Block A-1, A-3

Comments Reply of Environmental Conservation Department for the Environmental Management Plan (EMP) Reports submitted for the Existing Development Phase of Block A-1, A-3

	FIRST ECD's Comments (1 st Revised on 6 January 2023)			Second ECD's Comments (2 nd Revised on 25 April 2023)			Third ECD's Comments (3 rd Revised on 6 July 2023)		
No.	Finding	Suggestion	Response	Finding	Suggestion	Response	Finding	Suggestion	Response
1.	Executive Summary								
	It is found that the executive summary is included in English language and isn't included in Myanmar language.	To include an executive summary with Myanmar language, covering project description, policy & legal framework and international standards, environmental impacts, mitigation measures, public consultation meetings, and information disclosure.	The executive summary has been updated and translated to Myanmar language.						
(a)				It was verified that it is necessary to describe the blocks near by the project area on the map.	<ul style="list-style-type: none"> To clearly show the related area blocks near the project area on the map. 	It is described in Section 1.2.3, Fig 1-2 Block A-1, A-3 and nearby Offshore Blocks	No Comment		

(b)				In the executive summary report, it was verified that it is necessary to include the steps of the process that will be carried out by the project, which is a description of the project content.	<ul style="list-style-type: none"> To describe the stages of the process to be carried out by the project content in the summary report. 	It is described in Section 1.2: Project Description.	No Comment	
	Page (2-2), Section (2.2), Even though Environmental and Social Consultant Study Team, Environmental Resources Management (ERM) as third party consultant, carried out EMP Report, the working experiences and contact details of expert from third party aren't included.	To include work experience, expertise, contact details of the third party consultant, who contributed in developing the EMP.	The information for each consultant is included in Table 2.2. CVs are provided in Appendix E.					
2. Commitment								
(a)	The commitment letter isn't included in the commitment section of	To include the Commitment Letter that stipulates the following:	The commitment letter has been	It is found necessary to state the commitment	<ul style="list-style-type: none"> To state the commitment that the project 	It has been already stated in Section 1.4: Project Developer's	No Comment	

	executive summary in which POSCO DAEWOO Corporation (PDC) and ERM have made commitments to ensure the implementation of EMP, the control and mitigation measures, environment and social impact assessment and the implementation of commitment described in the report.	(a) The project's EMP is accurate and complete. (b) EMP is written in align with Myanmar EIA procedure and related laws. The project will always be followed the commitment of EMP and the environment mitigation plan.	included in Appendix A.	that the project proponent will carry out the environmental impact/mitigation activities included in the environmental management plan.	proponent will carry out the environmental impact/mitigation activities included in the environmental management plan.	Contractual and Commitments for Proposed Project, Table 1.1 and Section 3.7 PIC Commitments in line (7) and Appendix A Commitment Letter of PIC.			
(b)	The commitments aren't listed in Table as per the section in the report.	To describe and list commitments in both Myanmar and English languages in table format.	List of PIC's Commitment s has been included in Table 1.1 and 3.7 in English and translated in Myanmar language.	It has been verified that it is necessary to express the commitment that related law, rules, procedures and international regulations will be followed by the project proponent.	▪ To express a commitment to comply with related law, rules, procedures and international regulations by the project proponent.	It has been already stated in Appendix A Commitment Letter of PIC	No Comment		
(C)				It has been verified that all	▪ To represent that all information	It has been already stated in Section 2.2	It has been verified that all information written	To represent that all information written in	Updating the EMP comment reply is done by

				information written in the report is accurate and complete by Third Party Organization to be described.	written in the report is accurate and complete by Third Party Organization.	Environmental and Social Consultant Study Team and Appendix B Commitment Letter of EnvCC	in the report is accurate and complete by Third Party Organization to be described.	the report is accurate and complete by Third Party Organization.	PIC and the commitment has been already attached in Appendix A.
(d)				It has been verified that it is necessary to state the commitment that it is written in accordance with the relevant law, rules and procedures by Third Party Organization.	<ul style="list-style-type: none"> To include the commitment that it is written in accordance with the relevant law, rules and procedures by Third Party Organization. 	It has been already stated in Appendix B Commitment Letter of EnvCC.	It has been verified that it is necessary to state the commitment that it is written in accordance with the relevant law, rules and procedures by Third Party Organization.	To include the commitment that it is written in accordance with the relevant law, rules and procedures by Third Party Organization.	It has been already stated in Appendix A.
(e)				It has been verified that it is necessary to include the commitment list that the project developer will be responsible for each chapter of the report.	<ul style="list-style-type: none"> To include the list of commitment that the project developer will be responsible for each chapter of the report. 	It has been already stated in Section 1.4 Project Developer's Contractual and Commitments for Proposed Project: Table 1-1 PIC's commitments and Section 3.7: Project Developer's Contractual and Commitments for Proposed Project, Table 3-7 PIC's commitments	No Comment		

3.	Policy, Legislation and Institutional Frameworks								
(a)				It has been verified that the law and regulations related to the project adopted by the company need to be included.	<ul style="list-style-type: none"> To describe the law and regulations related to the project adopted by the company. 	It has been already stated in Section 3.2, Relevant Myanmar Legislation, Table 3-1 Project Relevant Legislation in Myanmar Adopted by PIC	It has been verified that the law and regulations related to the project adopted by the company need to be included.	To describe the law and regulations related to the project adopted by the company.	It is described in Section 3.3, Relevant Myanmar Legislation, Table 3-1 Project Relevant Legislation in Myanmar Adopted by PIC
(b)				In addition to the MARPOL Convention, it was found necessary to comply with international standards related to the project.	<ul style="list-style-type: none"> To comply with international standards relevant to the project in addition to the MARPOL Convention. 	Project Proponent will comply with the regulatory requirements of the host country and adopt the industrial best practices which will suit to the host country context and business purpose. It has already stated in Section 3.3. International Convention Page 3.33.	No Comment		
(c)				It has been verified that it is necessary to state that Offshore Oil and Gas production will be followed in Clause (2.1.5) of the National Environmental	<ul style="list-style-type: none"> To state that Offshore Oil and Gas production will comply with Clause (2.1.5) of the National Environmental Quality (Emissions) Guidelines. 	It has been already Stated in Section 3.5.2 Effluent Discharges.	No Comment		

				Quality (Emissions) Guidelines.				
(d)				It has been verified that it is necessary to describe the Institutional Framework that will be responsible for the project.	<ul style="list-style-type: none"> To describe the Institutional Framework that will be responsible for the project; 	Describe in Section 3.4.5.	No Comment	
4.	Project Description and Alternatives							
(a)	Page (3-1), it is only mentioned in the background information that the project exploration activities were started in 2003 and 2006. Shwe and Shwe Phyu Blocks are located in A-1 and Mya Block in A-3. The overall field development scheme of Shwe Project was implemented in 2009. The Phase 1 was completed in 2013. This EMP covers the existing	<p>To clearly describe ongoing and planned future activities (e.g. project location, accurate maps, detailed information) related to the Shwe Field Existing Development, including the following:</p> <p>(a) Project location (location of project activities)</p> <p>(b) Types of project activities (Drilling, Production, pipeline</p>	The Project location, type of activity, and project schedule is included in Section 4.1, 4.2 and 4.3. This EMP covers existing facilities and activities only, no planned activities are covered in the EMP. Additional activities are covered by future EIA Reports.	It has been verified that it is necessary to include the locations of each component in the project with Latitude and Longitude points.	<ul style="list-style-type: none"> To describe the locations of each component in the project with Latitude and Longitude points. 	The layout plan of the offshore components in Figure 4-4 Schematic of Phase I Development and onshore facilities in Figure 4-6 Location of the Supply Base and Jetty. <i>As the security reason, the GPS points of the location of the project components shall not be described.</i>	No Comment	

	infrastructure / Phase 1 only. Shwe Field Existing Development of EMP Report is confusing about the operational activities that the project description, the location, information and maps are confusing and not clear.	construction) for both ongoing and planned activities Project schedule including ongoing and future activities							
(b)	Page (3-9), Table (3.1) Waste Generation per year from SHP/OGT mentions Count of Waste Weight M/T (SHP) and Count of Waste Weight M/T (OGT). The amount of waste generation in 2013 is more than 2014. In term of amount of waste reduction in 2015 and 2016, there are 1041.8 Count of Waste	To describe in detail waste reduction methods implemented as evident in the significant decrease in number of wastes in 2015 and 2016.	The Waste Management procedure is included in section 7.2 and attached in Appendix F.	Regarding the project area located in the inland part, it has been verified that it is necessary to describe the project area and the status of permits issued by the relevant departments.	<ul style="list-style-type: none"> Regarding the project area located in the inland part, to describe the scope of the project and the status of permits issued by the relevant departments. 	The inland part of project area is as said above, the Layout of the onshore facilities in Figure 4-6 Location of the Supply Base and Jetty. All permits for all project facilities are described in Section 4.3.2.4 Status of Permits issued by relevant Departments and Appendix F. Certificate of Registration for Overseas Corporation	Although it has been added on pages (4-6, 4-11), it has been found that it is necessary to mention the conditions of the permit issued by the relevant departments.	<ul style="list-style-type: none"> To describe the status of issuance of permits by relevant departments (Agricultural Land Management and Accounts Department, Forestry Department). 	It is described in section 1.2.2 Executive Summary (English/ Myanmar Language), Section 4.3.3 and Appendix C.

	Weight M/T (SHP) in 2015 and it is reduced to 593 Count of Waste Weight M/T (SHP) in 2016.					MIC Permit No. 444 (A1 & A3) MIC Permit No. 445 (A1 & A3) MOE Permit (1229) Consumable Chemical			
(C)				It has been verified that it is necessary to fully describe the operation status of each component to be implemented by the project. (Jetty, onshore facilities, pipeline conditions, offshore project components and processes)	<ul style="list-style-type: none"> To fully describe the operation procedure of each component to be implemented by the project; 	It has been already stated in Section 4.3.2 Project Facilities and Activities.	No Comment		
(d)				It has been verified that it is necessary to include the type and number of vessels to be used in the implementation of the proposed	<ul style="list-style-type: none"> To describe the type and number of vessels to be used in the implementation of the proposed work, fuel type with used volume 	The type and numbers of vessel is subjected to operational requirements which vary throughout the entire project life cycle and it is described in Section 4.2.2.4 Vessel used in implementation.	Although it is mentioned on page (4-6), it was verified that it is necessary to include the number of workers to be used.	<ul style="list-style-type: none"> To include the number of workers who will be responsible for the project. 	<ul style="list-style-type: none"> It is described in Section 4.3.4.3: Workforce for Offshore and PIC Yangon and Table (4.5) It is described in Section 4.3.5.4:

				work, fuel type with used volume and the workforce.	and the workforce.				Workforce for OGT and Table 4.6.
(e)				It is stated on page (4-8) that the vessels travel between the offshore block and the inland project area have monthly traffic, but it has been verified that there is no map showing the routes the vessels will travel on.	<ul style="list-style-type: none"> To describe a map showing the routes the vessels will travel on although it is stated on page (4-8) that the vessels travel between the offshore block and the inland project area have monthly traffic. 	It is described in Section 4.2.2.3 Supply, /support and Logistic and Figure 4.6: Normal Supply Vessel Route	It is stated on page (4-8) that the vessels that travel between the offshore block and the inland project area have monthly traffic, but it was found that the map showing the routes the vessels will travel on is not clear.	<ul style="list-style-type: none"> Although it is stated on page (4-8) that the vessels that travel between the offshore block and the inland project area have monthly traffic, the map showing the routes that the vessel will travel on should be clearly stated. 	It is updated the Map in Chapter 4.2.2.3 Figure 4-6. Supply vessel route from Kyauk Phyu/ Singapore.
(f)				The emission from the helicopter was also not mentioned. It has been verified that it is necessary to mention the type and model of Helicopter, type and amount of oil to be used for helicopter, and the number of times a helicopter will be	<ul style="list-style-type: none"> To describe the following: <ul style="list-style-type: none"> - emission from the helicopter; - type and model of helicopter; - Type and volume of Fuel supply; - Frequency of the helicopter 	It is described in Section 4.3.2.4 Helicopter	No Comment		

				used per year. The number of machineries to be used is also required to be described.	used per year; and - Number of Machineries.			
				It has been verified that there is a need to describe the navigational map of the project's related activities and the navigation of seagoing vessels.	<ul style="list-style-type: none"> To describe the project's associated activities and the navigational map of seagoing vessels 	It is described in Section 4.2.2.5: Navigation of seagoing vessels and Figure 4.10: Navigational Map.		
(g)				It has been verified that it is necessary to describe the type and volume of wastewater that will be released from the project;	<ul style="list-style-type: none"> To describe the type and volume of wastewater that will be released from the project. 	It has been already stated in Section 4.3.3 Waste Generation and 4.3.3.1 General Waste	No Comment	
(h)				It has been verified that the type of waste (Hazardous and Non-Hazardous) that will be released from the	<ul style="list-style-type: none"> To describe the type of waste (Hazardous and Non-Hazardous) that will be released from the project and how it 	It has been already stated in Section 4.3.4.1 Waste Collection and Discharge	No Comment	

				project and how it will be disposed of need to be described.	will be disposed of.				
5.	Description of Surrounding Environment								
(a)				It has been verified that it is necessary to develop and describe the specifications of the description of the surrounding environment in Article 63(e) of the Environmental Impact Assessment Procedure.	<ul style="list-style-type: none">To develop and describe the specifications of the description of the surrounding contents in Article 63(e) of the Environmental Impact Assessment Procedure.	The said requirement paragraph 63(e) of the EIA procedure is the requirements for EIA report. The requested information has been included in other EIAs of the Shwe Development Project. Since the submitted report is EMP, the content for description of the surrounding environment is not included as a requirement for EMP in Paragraph 63(h) of EIA Procedure. However, the summary of the description of the surrounding environment is provide in Section 4.3.1: Description of Surrounding Environment.	Although the project is of EIA size, EMP must be written up according to clause (9) of the EIA Procedure.	<ul style="list-style-type: none">Although the project is of EIA size, EMP must be drawn up according to EIA Procedure Clause (9), but to describe the requirements of environmental content description in Clause 63(e) of Environmental Impact Assessment Procedure.	According to the EIA Procedure Clause 63(e), the revised report is fulfilled the requirement of previous version.

(b)				It has been verified that it is necessary to determine the (Area of Influence - AOI) of each (Component) that will be responsible for the project and describe the current environmental situation with their location, collection method and recorded photos.	<ul style="list-style-type: none"> To define the (Area of Influence – AOI) of each (Component) that will be responsible for the project, to describe the current environmental situation and to describe the method of collecting their location and document photos. 	It is described in section 4.3.2.	It has been verified that it is necessary to determine the (Area of Influence - AOI) of each (Component) that will be responsible for the project and describe the current environmental situation with their location, collection method and recorded photos.	To define the (Area of Influence – AOI) of each (Component) that will be responsible for the project, to describe the current environmental situation and to describe the method of collecting their location and document photos.	It is described in Section 5.1 setting the study limit (Area of Influence), 5.2 Methodology and objective, 5.3 Offshore Environment Baseline Survey
6.	Impact Analysis and Mitigation Measures								
(a)				It has been verified that it is necessary to identify the potential risks and to analyze the mitigation measures for the environmental and social impacts of each component of the project in Chapter (5).	<ul style="list-style-type: none"> To identify the potential risks and to analyze the mitigation measures for the environmental and social impacts of each component of the project. 	It has already stated in Section 5.3: Table 5-14. Project Impacts and Mitigation Measures <ul style="list-style-type: none"> - Land Contamination Prevention - Occupational Health and Safety (Risk of injury to facilities personnel) 	No comment		

						<ul style="list-style-type: none">- Unplanned events for offshore, midstream, and onshore facilities<ul style="list-style-type: none">▪ Dropped objects/lost equipment and vessel grounding/ collisions▪ Spills & Leaks from the Drilling Platform▪ Chemical Spills▪ Blowout			
(b)				It has been verified in Chapter (5) that there is necessary to analyze the unplanned events, which represent risks to the environment and people.	<ul style="list-style-type: none">▪ To clarify contingency analysis for unplanned event to strengthen the contingency analysis perspective	It has already stated in Section 5.3: Table 5-14 – UNPLANNED EVENTS FOR OFFSHORE, MIDSTREAM, AND ONSHORE FACILITIES Dropped objects/lost equipment and vessel grounding/ collisions Spills & Leaks from the Drilling Platform Chemical Spills Blowout	No Comment		
(c)				It was found necessary to	<ul style="list-style-type: none">▪ To describe the analysis for the	Since the submitted report is EMP, the	It was found necessary to analyze the	To describe the analysis for the	It is described in Chapter 7.

				analyze the cumulative impacts of the project and other oil and natural gas development activities that are overlapping.	cumulative impacts of the project and other oil and natural gas development activities that are overlapping.	content for cumulative impact assessment is not included as a requirement for EMP in Paragraph 63(h) of EIA Procedure. However, it is described in Chapter 6: Cumulative Impact Assessment.	cumulative impacts of the project and other oil and natural gas development activities that are overlapping.	cumulative impacts of the project and other oil and natural gas development activities that are overlapping.	
(d)	Page (7-5), Section (7.4.2) mentions that PDC will monitor Hydrocarbon content of produced water (mg/1 average over a month)	Regarding produced water, EQEG Guideline stipulates “reject, discharge to sea maximum one day oil and grease discharge should not exceed 42 mg/1; 30-day average should not exceed 29 mg/1”. To describe how much waste will be discharged, daily and monthly. The unit of oil and grease content must be in mg/1.	Produced water amounts are estimated to be 200 bbls per day and provided in Section 3.2.3. The produced water will be monitored to ensure discharges in line with EQEG and data provided in Environmental Monitoring Report (see Section 7.4.2).	On page (14-37), it is mentioned about the Produced Water System, however, it has been verified that it is necessary to state the discharge plan will be disposed of and that they will be disposed of in accordance with the EQEG Guideline. On 6th January 2023, the meeting was held at the meeting room of ECD with responsible officials of the	<ul style="list-style-type: none"> ▪ To describe the process of the Produced water treatment system as said in the meeting held on (6-1-2023) that Oil in Produced water exceeds the EQEG Guideline. ▪ To describe the process that will be done by installing step-by-step treatments such as secondary treatment for Produced water that exceeds the EQEG Guideline. ▪ To describe how to upgrade the 	It is described in Section 4.3.3.2: Produced Water Treatment System and Section 5.3, Table 5-14 Project Impacts and Mitigation Measures for Sea Water Quality.	It was verified that mentioned following points were not prepared and written. <ul style="list-style-type: none"> ▪ To describe the process of the Produced water treatment system as said in the meeting held on (6-1-2023) that Oil in Produced water exceeds the EQEG Guideline. ▪ To describe the process that will be done by installing step-by-step treatments such as secondary treatment for Produced water 	<ul style="list-style-type: none"> ▪ To describe the process of the Produced water treatment system as said in the meeting held on (6-1-2023) that Oil in Produced water exceeds the EQEG Guideline. ▪ To describe the process that will be done by installing step-by-step treatments such as secondary treatment for Produced water that exceeds the EQEG Guideline. ▪ To describe how to upgrade the design 	It has already explained in Section 4.3.4.2 for the process of the produced water treatment system, and Progress status of Phase 1 (Appendix D). Section 5.5.4.4 described the seawater quality results around SHP (100m and 500m) and the results of total petroleum hydrocarbon are within the standard. The monitoring plan for seawater quality is updated as mentioned in Section 9.4.2 and Table 9-2.

				<p>project developer, professional experts from third party organization, officials from the ECD and MOGE, and it was reported that the Produced Water output exceeded the standard of NEQEG guideline. It has been verified to describe the related information, Area of impact and the processes to be reduced need to be expressed in accordance with the opinions of the other side.</p>	<p>design of the Produce Water Treatment System to make it fully functional.</p> <ul style="list-style-type: none"> As the methods have been written in IFC Guidelines on how to treat it, if it is a previous project, to upgrade the current treatment system and discard it only when the desired guideline is reached. In addition, there are other methods instead of the hydro-cyclone method which is not damage the shallow aquifer, seawater, seafloor or seabed as an impact, and to describe a plan to change the 		<p>that exceeds the EQEG Guideline.</p> <ul style="list-style-type: none"> To describe how to upgrade the design of the Produce Water Treatment System to make it fully functional. As the methods have been written in IFC Guidelines on how to treat it, if it is a previous project, to upgrade the current treatment system and discard it only when the desired guideline is reached. In addition, there are other methods instead of the hydro-cyclone method which is not damage the shallow aquifer, seawater, seafloor or seabed as an impact, and to describe a plan to 	<p>of the Produce Water Treatment System to make it fully functional.</p> <ul style="list-style-type: none"> As the methods have been written in IFC Guidelines on how to treat it, if it is a previous project, to upgrade the current treatment system and discard it only when the desired guideline is reached. In addition, there are other methods instead of the hydro-cyclone method which is not damage the shallow aquifer, seawater, seafloor or seabed as an impact, and to describe a plan to change the production system, etc., because the amount of 	
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					production system, etc., because the amount of produced water that is normally released is low, and the treatment does not reach the desired level.		change the production system, etc., because the amount of produced water that is normally released is low, and the treatment does not reach the desired level.	produced water that is normally released is low, and the treatment does not reach the desired level.	
7.	Emergency Response Plan								
(a)				It has been verified that there is a need to include the funds/Budget to be used for the emergency response plan.	<ul style="list-style-type: none"> To describe the funds/ Budget to be used for the emergency response plan. 	The fund for the emergency response plan is under the operation budget which is varies in year by year. It is not viable to allocate the budget based on operational condition.	It has been verified that there is a need to include the funds/Budget to be used for the emergency response plan.	To describe the funds/ Budget to be used for the emergency response plan.	It is described in Section 9.3: PIC mentioned that ERP budget is related to the oil spill incidents and PIC has applied annual membership to OSRL Singapore (Oil Spill Response Limited and link https://www.oilspillresponse.com/about-osrl/) as per MOGE's instruction which is also attached. The annual associated membership fee is 61,500 USD for the site coverage with total cumulative annual production of less than 40 thousand barrels per

									day for the Rig SHP (SHWE Platform) Block A-1 and A-3 in Myanmar.
8.	Environmental Management Plan								
	Environmental Management Plan (EMP) is included waste management plan, Shwe Platform Emergency Response Plan and OGT Emergency Response Plan. But it isn't included the management plan for social and environment issues related to the project activities.	<p>To include in the EMP the management plans for the following:</p> <ul style="list-style-type: none"> • Emergency Response, • Handling and storage of chemicals and hazardous materials (including Oil and Chemical Spills), • Water and wastewater management (Black water, Gray water, Deck water, Blige water, domestic water), • Biodiversity (including Marine Life and Ecology), • Air Quality and Noise (including 	<p>An ERP has been provided in Section 7.6 and 7.7. Chemicals handling, waste water, sweater are already included as part of the Waste Management Plan. A biodiversity plan, air quality plan, community H&S plan, light plan, shipping plan and fisheries plan are not necessary as there are limited impacts during operation. Note that this</p>						

		Underground Sound), <ul style="list-style-type: none"> • Seawater Quality, • Community health and, safety and security, • Grievance management, • Artificial light, • Shipping and Navigation (including marine traffic and vessel collision), Fishing communities and fisheries,	EMP is for the existing facilities, additional activities are covered by future EIA Reports with associated management plans.						
(a)				It has been verified that the environmental management plan needs to be written in accordance with Article 63(h) of the Environmental Impact Assessment Procedure.	<ul style="list-style-type: none"> ▪ The environmental management plan needs to be written in accordance with Article 63(h) of the Environmental Impact Assessment Procedure. 	The submitted EMP report has been revised as per the first feedback from ECD accordance with Article 63(h) of the Environmental Impact Assessment Procedure.	It has been verified that the environmental management plan needs to be written in accordance with Article 63(h) of the Environmental Impact Assessment Procedure.	The environmental management plan needs to be written in accordance with Article 63(h) of the Environmental Impact Assessment Procedure.	It is described detail in Section 9.
	Page (7-8), Section (7.7),	To prepare an ERP which covers	The ERPs are		<ul style="list-style-type: none"> ▪ 				

	PDC prepared ERP.	all offshore assets and activities. ERP prepared by PDC is mostly relevant to Shwe Platform (SHP).	discussed in Section 7.6 and 7.7 and provided in full in in Appendix I. The ERPs cover the platform and the onshore gas terminal.						
9.	Monitoring and Budget								
	It is mentioned the estimated budget for the implementation of the mitigation measures in EMP of Environmental and Social Management Plan. But the budget of implementation of EMP isn't included.	To include the budget for EMP implementation.	The overall budget is around 500,000 USD per year and is included in Section 6.						
(a)				In monitoring and stating the allocation of budget, it has been verified that it is necessary to indicate the	<ul style="list-style-type: none"> To indicate the allocation of funds for each monitoring sub-plan to be monitored. 	For the annual budgeting purpose, apart from providing ball-pack figures for entire environmental management plan, it is not viable to allocate	In monitoring and stating the allocation of budget, it has been verified that it is necessary to indicate the allocation of funds for each monitoring	To indicate the allocation of funds for each monitoring sub-plan to be monitored.	It is described in Section 9.4 and 9.5, Table 9-2 and 9-3.

				allocation of funds for each monitoring sub-plan to be monitored.		the budget for each sub plan as it can vary based on operational condition, thus may lead to over and underutilization of budget in practical. It is described in Chapter 7.	sub-plan to be monitored.		
(b)				It has been verified to compare the quality changes of the water, air and soil of current exposure environment (Ambient) that it is necessary to describe the location of survey point of water, air, soil, noise and vibration were measured, the frequency and Parameters at which these follow-up points will be observed.	<ul style="list-style-type: none"> ▪ To describe the location of sampling point of water, air, soil, noise and vibration were measured, the frequency and Parameters at which these follow-up points will be observed. 	Frequency has been already stated in Section 8.4.1 Air Emissions, Section 8.4.2 Aqueous Discharges, Section 8.4.4 Seabed Sediments & Water Quality	It has been verified to compare the quality changes of the water, air and soil of current exposure environment (Ambient) that it is necessary to describe the location of survey point of water, air, soil, noise and vibration were measured, the frequency and Parameters at which these follow-up points will be observed.	To describe the location of sampling point of water, air, soil, noise and vibration were measured, the frequency and Parameters at which these follow-up points will be observed.	It is described in Table 9-2 and 9-3.

(c)				<p>It has been verified that it is necessary to describe the location of discharge point of wastewater, soil and emission that will be released from the project activities with geographical Locations (Latitude, and longitude by degrees, minutes, seconds), the frequency and Parameters at which these follow-up points will be observed.</p>	<p>▪ To describe the location of discharge point of wastewater, soil and emission that will be released from the project activities with geographical Locations (Latitude, and longitude by degrees, minutes, seconds), the frequency and Parameters at which these follow-up points will be observed.</p>	<p>The location of the discharged point is the same of the platform and the GPS data cannot be described for security concern. There is no discharge for the soil. The monitoring of the parameter of the baseline points is already stated in Section 3.5 Environmental Standards.</p>	<p>It has been verified that it is necessary to describe the location of discharge point of wastewater, soil and emission that will be released from the project activities with geographical Locations (Latitude, and longitude by degrees, minutes, seconds), the frequency and Parameters at which these follow-up points will be observed.</p>	<p>To describe the location of discharge point of wastewater, soil and emission that will be released from the project activities with geographical Locations (Latitude, and longitude by degrees, minutes, seconds), the frequency and Parameters at which these follow-up points will be observed.</p>	<p>The Waste Generation has already described in Section 4.3.4 Waste Generation, and the Waste Management Procedure is described as</p> <ul style="list-style-type: none"> • General Non-Hazardous Wastes to reuse are offered to and collected by MOGE, • General wastes such as Accommodation, Food waste is macerated and disposed overboard at SHP and Food and Kitchen Wastes from the onshore facility are collected by a Third-Party Company. Hazardous wastes are collected, disposed, and treated by certified waste handling company (DOWA) at their onshore treatment facility. <p>It is described in Table 9-2 and 9-3.</p>
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10.	Public Consultation and Information Disclosure								
(a)	Public Consultation Meetings were conducted from 20 – 28 October in Kyauk Phyu and 2 November in Sittwe, 2009.	Two public consultation meetings were conducted. It is been a long time now and the consultation period were short. Therefore, the next round public consultation meeting will need to conduct by inviting the local community representative. Their comments and suggestion need to mention in the report.	Another round of consultation was conducted in October and November 2018. This information is provided in Section 9.2, and the full meeting minutes and materials are provided in Appendix J.	The public consultation meetings were held 2 times and it has been verified to provide the list of attendees for each meeting with the documentary photos, demand of the participants and responsibilities of the Project Developer of each meeting.	<ul style="list-style-type: none"> To describe the list of attendees with the documentary photos, demand of the participants and responsibilities of the Project Developer of conducted two public consultation meetings. 	It is already stated in Appendix J Meeting Minutes of Public Consultation	No Comment		
	Section (10), Figure (10.1) summarises the past spending on CSR programmes. The future CSR programmes aren't included.	To include a CSR program to be implemented in the future.	The CSR is provided in Chapter 10 and approximate annual budget is 7.6 million USD.						
	It isn't described that how to treat different type of waste and the waste reduction	To describe treatment of different types of wastes and waste reduction	1. PIC Waste Management Procedure						

	methods in Annex 1. Waste Management Plan.	methods in the waste management plan.	has already described types of wastes (See PIC Waste management procedure on section 6.1 waste classification and section 6.2.3 Colour Coding and Labelling) 2. Method for Waste reduction (re-use, recycling and recovery) is identified and implemented where practicable for PIC.						
(b)				It was found to describe the	To describe the mitigating measures	As per MOEE Notification No.	It was written that it was mentioned in	To describe the mitigating measures	<ul style="list-style-type: none"> In section 5.8.5 Fishing Operation and

				<p>necessary analysis whether the offshore fishing zone is within or outside of the project area and the mitigation measure for the impact of local fishing activities if any there is.</p>	<p>for the impacts of local fishing activities and procedure of Grievance Mechanism that fall within the Offshore Fishing Zone.</p>	<p>(103/2017) dated in 17th November 2017, the area has been declared as Shwe Gas Field whereby unauthorized activities are prohibited. (Appendix H)</p>	<p>Appendix H, but it was verified that it was not complete.</p>	<p>for the impacts of local fishing activities and procedure of Grievance Mechanism that fall within the Offshore Fishing Zone.</p>	<p>resource, it has been already mentioned that the majority of Rakhine fishermen are fishing in waters within 50 km confirmed by ESIA Study and given that the proposed Project is located 70 km from the Sittwe and 80 km from Kyauk Phyu, there is unlikely to be any significant overlap with local fishing activity.</p> <ul style="list-style-type: none"> For the foreign fishing is also prohibited as per MOEE Notification No. (103/2017) dated in 17th November 2017, the area has been declared as Shwe Gas Field whereby unauthorized activities described in Appendix E (MOEE's notification No. (103/2017) and Marina to Notice
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									<p>described in Appendix F.</p> <ul style="list-style-type: none">▪ Though given the location and nature of the project activities, the Project is not likely to have an impact on local villages or communities in Rakhine State. Therefore, the focus of the impact assessment was on large, offshore fisheries and fishing vessels and described as “Impacts to fisheries and fishing activity either through unplanned collision or from physical displacement of vessels will be limited to within the Project Area;” in Section 5.2.▪ In section 6.4, Impact and Mitigation and Measures, it is also described as Fisheries and Navigation Impact analysis and fisheries
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									<p>and stakeholders in Table 6-13.</p> <ul style="list-style-type: none"> ■ In Cumulative Impact Assessment, section 7.5, it has already stated that fishing activities is a “Possible social impacts arise from the temporary displacement of fishing activity, due to the exclusion zone (500m) for SHK and other vessels for where the Project Area overlaps with potential commercial fishing grounds and explained that impact is negligible in significance. ■ In section 9.9, it has already stated the Community Grievance Mechanism how to collect the any compliance or grievance to solve all problems.
11.	General								
(a)	To always coordinate and communicate with the stakeholders and local community and to take their	Noted.	<ul style="list-style-type: none"> ■ To write series of chapters for EMP report due to the procedure and submit the Table of Content and Abbreviation at the top of the report. 	Table of Content and Abbreviation were already stated at the	To write series of chapters for EMP report due to the procedure and submit the Table of Content and Abbreviation at the top of the report.	It has been updated.			

	comments and suggestion into consideration			commencing of the report.		
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**POSCO International Corporation တင်ပြလာသည့် ကမ်းလွန်လုပ်ကွက် A1 & A3တွင် အကောင်အထည်ဖော်ဆောင်ရွက်မည့် Shwe Field
Existing Development (Phase -I) အတွက် ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်တွင် ထပ်မံပြင်ဆင် ဖြည့်စွက်ရမည့်အချက်များအား
သဘောထားမှတ်ချက်ပြန်ကြားလာမှုအပေါ် ပြန်လည်ဖြေကြားခြင်း**

စဉ်	သုံးသပ်အကြံပြုချက်	ပြန်လည်ဖြေကြားချက်
၁။	စာမျက်နှာ ၄-၁၆တွင် Produced Water Generated Offshore Is Estimated To Be An Average Of 600 Barrels (Bbl.) Per Day (I.E., Around 95 M3 Per Day) ထွက်ရှိမည်ဖြစ်ကြောင်းနှင့် ထွက်ရှိလာ သည့် Produced Water သည် အမျိုးသားပတ်ဝန်းကျင်ဆိုင်ရာ အရည်အသွေး (ထုတ်လွှတ်မှု)ပါ အပိုဒ် ၂.၁.၅ပါ သတ်မှတ်ချက်ထက် ကျော်လွန်ခြင်း ရှိ/မရှိဖော်ပြရန်၊ ကျော်လွန်ပါက ကျော်လွန်ခြင်း မရှိစေ ရန် ဆောင်ရွက်မည့် နည်းပညာနှင့် အမျိုးသားပတ်ဝန်းကျင်ဆိုင်ရာ အရည်အသွေး (ထုတ်လွှတ်မှု)ပါ အပိုဒ် ၂.၁.၅ပါ သတ်မှတ်ချက်ထက် ကျော်လွန်ခြင်း မရှိစေရေး ဆောင်ရွက်သွားမည်ဖြစ်ကြောင်း ကတိကဝတ်ပြုဖော်ပြရန်၊	စာမျက်နှာ ၃-၆၄၊ ဇယား ၃-၁၀ List of PIC's Commitments ရှိ ၄.၃.၅ Waste Generation အပိုင်းတွင် အမျိုးသားပတ်ဝန်းကျင်ဆိုင်ရာ အရည်အသွေး (ထုတ်လွှတ်မှု) ပါ အပိုဒ် ၂.၁.၅ ပါ သတ်မှတ်ချက်ထက် ကျော်လွန်ခြင်းမရှိစေရေး ဆောင်ရွက်သွားမည် ဖြစ်ကြောင်း ကတိကဝတ်ပြု ဖော်ပြထားပါသည်။ စာမျက်နှာ ၄-၁၈၊ ခေါင်းစဉ်ခွဲ ၄.၃.၄.၂ Produced Water Treatment System တွင် အမျိုးသားပတ်ဝန်းကျင်ဆိုင်ရာ အရည်အသွေး (ထုတ်လွှတ်မှု) ပါ အပိုဒ် ၂.၁.၅ ပါ သတ်မှတ်ချက်ထက် ကျော်လွန်ခြင်းမရှိစေရန် ဆောင်ရွက်မည့် နည်းပညာကို ဖော်ပြထားပါသည်။ စာမျက်နှာ ၅-၁၉၊ ၅-၂၀၊ ၅-၂၁ ရှိ ဇယား ၅-၉ တွင်လည်းကောင်း၊ Appendix L တွင်လည်းကောင်း အမျိုးသားပတ်ဝန်းကျင်ဆိုင်ရာ အရည်အသွေး (ထုတ်လွှတ်မှု) ပါ အပိုဒ် ၂.၁.၅ ပါ သတ်မှတ်ချက်ထက် ကျော်လွန်ခြင်း ရှိ/ မရှိကို ဖော်ပြထားပါသည်။
၂။	Seawater အား using the infraCal TOG/TPH Analyzer and the Soxhlet Extraction Method (5520D) အားအသုံးပြု၍ Monitoring Points အား 100 Meters (MWQ1) And 500 Meters (MWQ2) တွင် နှစ်နေရာ 8 th August, 2024တွင် တိုင်းတာခဲ့ကြောင်း အဆိုပါ Result များကို စာမျက်နှာ ၅-၁၅ တွင်ဖော်ပြထားသည်ကို စိစစ်တွေ့ရှိရပါသည်။ Total Petroleum Hydrocarbon အားတိုင်းတာခဲ့သည့် LAB Result အား ဖော်ပြထား သော်လည်း Oil & Grease အား တိုင်းတာခဲ့သည့် LAB Result အား ဖော်ပြထားခြင်း မရှိသည့်အတွက် ဖော်ပြရန်နှင့် တိုင်းတာကောက်ယူခဲ့သည့် ရေအနက် အားဖော်ပြရန်၊	Appendix O Laboratory Results of Seawater Quality (100m and 500m) တွင် ဖြည့်စွက်ဖော်ပြထားပါသည်။ တိုင်းတာကောက်ယူခဲ့သည့် ရေအနက်အား စာမျက်နှာ ၅-၂၁၊ ဇယား ၅-၉ တွင် ဖော်ပြထားပါသည်။



စဉ်	သုံးသပ်အကြံပြုချက်	ပြန်လည်ဖြေကြားချက်
၃။	Sea Water Quality အပေါ် သက်ရောက်မှုအား လျော့ပါးစေရေးနှင့်ပတ်သက်၍ Table 6-14 Project Impacts and Mitigation Measures with Budget Allocation for Monitoring Sub plan တွင် ဖော်ပြထားပြီး သီးခြား Sub-Plan အနေဖြင့် ဖော်ပြထားခြင်း မရှိသည့်အတွက် ဖော်ပြရန်။	စာမျက်နှာ ၉-၃၊ ခေါင်းစဉ်ခွဲ ၉.၄ Seawater Quality Management Plan အား Sub-plan အနေဖြင့် ဖော်ပြထားပါသည်။
၄။	စာမျက်နှာ ၉.၄.၂ Surrounding Seawater Quality တွင် Produced Water, Average Hydrocarbon Content In The Produced Water, Offshore Surrounding Seawater Quality Results Which Shall Be Conducted By Third Party SHP Bh Laboratory For 2 Times Per Six Months For 8 Parameters Which Are Chromium Vi, Temperature, Dissolve O2, Nitrate, Nitrite, Oil & Grease, Total Suspended Solids, Total Petroleum Hydrocarbon At 100 M (2 Locations), 150 M (1 Location) And 500 M (3 Locations) အား စောင့်ကြပ်ကြည့်ရှုစစ်ဆေးမည် ဖြစ်ကြောင်း ဖော်ပြထားသောကြောင့် Effluent နှင့်ပတ်သက်၍ Table 9-2 Summary Of The Monitoring And Record-Keeping For A1 And A3တွင် ထည့်သွင်း ဖော်ပြရန်နှင့် အမျိုးသားပတ်ဝန်းကျင်ဆိုင်ရာ အရည်အသွေး (ထုတ်လွှတ်မှု) ပါ အပိုဒ် ၂.၁.၅ ဖြင့် နှိုင်းယှဉ်ဖော်ပြရန်၊	စာမျက်နှာ ၉-၆၊ ဇယား ၉-၂ တွင် ဖြည့်စွက်ဖော်ပြထားပါသည်။
၅။	Table 9-2 Summary of the Monitoring and Record-Keeping for A1 And A3 တွင် Surrounding Seawater Quality တွင် Quantities of Any Fluids Discharged And Hydrocarbon Content If Measured သာ ဖော်ပြထားသည့်အတွက် တိုင်းတာမည့် Parameter အတိကျအား Table 9-2 Summary of The Monitoring And Record-Keeping For A1 And A3 တွင်ဖော်ပြရန်၊ Seawater Quality အား Marine Water Quality ဖြင့် နှိုင်းယှဉ်ဖော်ပြရန်	စာမျက်နှာ ၉-၆၊ ဇယား ၉-၂ တွင် ဖြည့်စွက်ဖော်ပြထားပါသည်။

စဉ်	သုံးသပ်အကြံပြုချက်	ပြန်လည်ဖြေကြားချက်
၆။	Monitoring တွင် Sediment and Macrobenthos, Zooplankton, Phytoplankton နှင့် Marine Mammals, Marine Biodiversity အား စောင့်ကြပ်ကြည့်ရှုတိုင်းတာစစ်ဆေးရန်၊	စာမျက်နှာ ၉-၈၊ ဇယား ၉-၂ ၏ Marine Organisms အပိုင်းတွင် ဖြည့်စွက်ဖော်ပြထားပါသည်။
၇။	စာမျက်နှာ ၅-၃၈ တွင် Shipping Lanes နှင့်ပတ်သက်၍ Block A1 သည် High Vessel Activity တွင်ပါဝင်ကြောင်း ဖော်ပြချက်အရ မြန်မာ့ဆိပ်ကမ်းအာဏာပိုင်၏ ထုတ်ပြန် ထားသောဥပဒေများ၊ စည်းမျဉ်းများအပြင် နိုင်ငံတကာဥပဒေ နှင့်အညီ ဆောင်ရွက်မည်ဖြစ်ကြောင်း ဖော်ပြ၍ Vessel Traffic အား စောင့်ကြပ်ကြည့်ရှု စစ်ဆေးရန်၊	စာမျက်နှာ ၉-၈၊ ဇယား ၉-၂ တွင် ဖြည့်စွက်ဖော်ပြထားပါသည်။
၈။	Malakyun ရွာတွင် 1st Nov 2018 တွင် ကျင်းပခဲ့သည့် PCM တွင် ဦးသိန်းမောင်မှ OGTမှ ထွက်ရှိသည့် ရေဆိုးနှင့် အနံ့များကြောင့် ကျန်းမာရေးထိခိုက်နိုင်ကြောင်း စိုးရိမ်မှု နှင့်ပတ်သက်၍ OGT မှ ထွက်ရှိသည့် ရေသည် လုံလောက်စွာ သန့်စင်နိုင်ခြင်းမရှိဟု ယူဆရသည့်အတွက် ထွက်ရှိသည့် ရေပမာဏနှင့် အရည်အသွေးအား တိုင်းတာဖော်ပြရန်နှင့် အဆိုပါ ရလဒ်အား အမျိုးသား ပတ်ဝန်းကျင်ဆိုင်ရာ အရည်အသွေး (ထုတ်လွှတ်မှု)ပါ အပိုဒ် ၂.၁.၉ သဘာဝဓာတ်ငွေ့ရည်ထုတ်လုပ်ခြင်း လုပ်ငန်းပါ စွန့်ထုတ်ရည် သတ်မှတ်ချက်များ နှင့်အညီ ဖြစ်စေရေး ဆောင်ရွက်ရန်နှင့် ထွက်ရှိလာသည့် ရေအရည် အသွေးအား စောင့်ကြပ် ကြည့်ရှုတိုင်းတာစစ်ဆေးရန်နှင့် အနံ့အား အမျိုးသား ပတ်ဝန်းကျင်ဆိုင်ရာ အရည်အသွေး (ထုတ်လွှတ်မှု) ပါ အပိုဒ် ၁.၄ အနံ့နှင့်အညီ ဖြစ်စေရေးဆောင်ရွက်ရန်နှင့် စောင့်ကြပ် ကြည့်ရှုတိုင်းတာစစ်ဆေးရန်၊	<p>စာမျက်နှာ ၅-၂၃ ၊ ခေါင်းစဉ်ခွဲ ၅.၅.၆ တွင် OGT မှ ထွက်ရှိသောရေအရည်အသွေးအား တိုင်းတာဖော်ပြထားပါသည်။</p> <p>စာမျက်နှာ ၆-၂၂၊ ၆-၂၃၊ ဇယား ၆-၁၄ ရှိ Air Quality အပိုင်းတွင် အနံ့အား အမျိုးသားပတ်ဝန်းကျင်ဆိုင်ရာ အရည်အသွေး (ထုတ်လွှတ်မှု) ပါ အပိုဒ် ၁.၄ နှင့်အညီ ဖြစ်စေရန် ဆောင်ရွက်ချက်များကို ဖော်ပြထားပါသည်။</p> <p>စာမျက်နှာ ၉-၁၁၊ ဇယား ၉-၃ တွင် အနံ့အား စောင့်ကြပ်ကြည့်ရှု တိုင်းတာစစ်ဆေးရန် ထည့်သွင်းဖော်ပြထားပါသည်။</p>

စဉ်	သုံးသပ်အကြံပြုချက်	ပြန်လည်ဖြေကြားချက်
၉။	စာမျက်နှာ ၃-၅ နှင့် ၃-၄၃ တွင် မူဝါဒများကို Section ဟုသုံးနှုန်းထားပါသဖြင့် Paragraph သို့ Principle ဟု ပြင်ဆင်သုံးနှုန်းရန်၊	Section ဟု သုံးနှုန်းထားသည်များကို Paragraph ဟု ပြန်လည်ပြင်ဆင်ဖော်ပြထားပါသည်။
၁၀။	The Factoreis Act (1951) ၊ The natural Diaster Management Law (2013) ၊ The Industrial Explosive Materials Law (2018) တို့ကို ထပ်မံဖြည့်စွက်ရန်၊	စာမျက်နှာ ၃-၄၄၊ ၃-၄၅ နှင့် ၃-၄၆ တွင် ဖြည့်စွက် ဖော်ပြထားပါသည်။
၁၁။	မြန်မာနိုင်ငံရာသီဥတုပြောင်းလဲမှုဆိုင်ရာ မူဝါဒမျှော်မှန်းချက် (Vision) နှင့် ရည်ရွယ်ချက် (Purpose)များဖော်ပြရန်၊	စာမျက်နှာ ၃-၄၇ တွင် ဖြည့်စွက် ဖော်ပြထားပါသည်။
၁၂။	စီမံကိန်းတည်ရှိရာ မြို့နယ်၏ ရာသီဥတုဆိုင်ရာ အချက်အလက်များအား နှစ် ၃၀ စာ ဖော်ပြရန်၊	စာမျက်နှာ ၅-၈ ၊ ခေါင်းစဉ်ခွဲ ၅.၅.၁ တွင် ဖြည့်စွက်ဖော်ပြထားပါသည်။
၁၃။	စီမံကိန်းလုပ်ငန်းစဉ်အဆင့်ဆင့်မှ ထွက်ရှိလာမည့် မှန်လုံအိမ်ဓာတ်ငွေ့ ပမာဏနှင့် စီမံကိန်းတွင် အသုံးပြုမည့် ယာဉ်ယန္တရားများအတွက် လိုအပ်သော စက်သုံးဆီ ပမာဏ အား ရက်၊ လ ၊နှစ်ဖြင့် ဖော်ပြရန်၊ ၎င်းစက်သုံးဆီများ လောင်ကျွမ်းရာမှ ထွက်ရှိလာမည့် မှန်လုံအိမ်ဓာတ်ငွေ့ ပမာဏအား တွက်ချက်ဖော်ပြရန်နှင့် မှန်လုံအိမ်ဓာတ်ငွေ့ထွက်ရှိမှု အားလျော့နည်းစေရေး အစီအမံများ ဖော်ပြရန်၊	စာမျက်နှာ ၄-၁၅ ၊ ခေါင်းစဉ်ခွဲ ၄.၃.၂.၄ တွင် ဖြည့်စွက်ဖော်ပြထားပါသည်။ မှန်လုံအိမ်ဓာတ်ငွေ့ထွက်ရှိမှုအား လျော့နည်းစေရေးအစီအမံများကိုလည်း စာမျက်နှာ ၆-၁၆၊ ၆-၁၄ ရှိ air quality အပိုင်းတွင် ထပ်မံထည့်သွင်းဖော်ပြထားပါသည်။
၁၄။	ရာသီဥတုပြောင်းလဲမှု တိုက်ဖျက်ရေးအတွက် သစ်ပင်စိုက်ပျိုးခြင်း လုပ်ငန်းများ အလေးထားဆောင်ရွက်ရန်၊	စာမျက်နှာ ၉-၁၅၊ ခေါင်းစဉ်ခွဲ ၉.၁၂ တွင် ရာသီဥတုပြောင်းလဲမှု တိုက်ဖျက်ရေးအတွက် ဆောင်ရွက်ထားသော သစ်ပင်စိုက်ပျိုးခြင်း လုပ်ငန်းဆောင်ရွက်မှုမှတ်တမ်းများကို ဖြည့်စွက်ဖော်ပြထားပါသည်။
၁၅။	လိုအပ်ပါက Carbon Capture and Storage-CCs နှင့် Carbon Capture ၊ Utilization and Storage-CCUS နည်းပညာများ ထည့်သွင်းဆောင်ရွက်ရန်၊	စီမံကိန်းသည် operation လုပ်ဆောင်နေပြီး သဘာဝဓာတ်ငွေ့များ ထုတ်ယူနေပြီ ဖြစ်သောကြောင့် စီမံကိန်းတွင် လက်ရှိအသုံးပြုထားသော ဒီဇိုင်းနှင့် နည်းပညာများ သည် Carbon Capture and Storage-CCs နှင့် Carbon Capture၊ Utilization and Storage-CCUS နည်းပညာများ ထည့်သွင်းဆောင်ရွက်ရန်အတွက် နည်းပညာအရရော၊ ငွေကြေးပိုင်းဆိုင်ရာအရပါ အကန့်အသက်ရှိနေသည်။

စဉ်	သုံးသပ်အကြံပြုချက်	ပြန်လည်ဖြေကြားချက်
၁၆။	စီမံကိန်းတွင် အသုံးပြုမည့် အအေးပေးစက်ပစ္စည်းအမျိုးအစား/ အရေအတွက် ၊ Capacity ၊ ထည့်သွင်းအသုံးပြုမည့် Gas အမျိုးအစား များအား တိကျစွာဖော်ပြရန်နှင့် ၎င်းတို့မှ ထွက်ရှိလာမည့် မှန်လုံအိမ် ဓာတ်ငွေ့ပမာဏအား တွက်ချက်ဖော်ပြရန်နှင့် မှန်လုံအိမ်ဓာတ်ငွေ့ထွက်ရှိမှု လျော့နည်းစေရေး အစီအမံများ ဖော်ပြရန်၊	စီမံကိန်းတွင် အသုံးပြုမည့် အအေးပေးစက်ပစ္စည်းအမျိုးအစား/ အရေအတွက်၊ Capacity၊ ထည့်သွင်းအသုံးပြုမည့် Gas အမျိုးအစားများအား Appendix S နှင့် Appendix T တို့တွင် တွင်လည်းကောင်း၊ စာမျက်နှာ ၄-၁၁၊ ခေါင်းစဉ်ခွဲ ၄.၂.၂.၆ နှင့် စာမျက်နှာ ၄-၁၇၊ ခေါင်းစဉ်ခွဲ ၄.၃.၂.၇ တွင်လည်းကောင်း ထည့်သွင်းဖော်ပြ ထားပါသည်။
၁၇။	Onshore နှင့် Offshore တွင် အသုံးပြုမည့် Chemical အမျိုးအစား တစ်ခုချင်းစီအလိုက် အသုံးပြုမည့် ပမာဏနှင့် အမျိုးအစားများကိုဖော်ပြရန်၊	Onshore နှင့် Offshore တွင် အသုံးပြုမည့် Chemical အမျိုးအစားတစ်ခုချင်းစီအလိုက် အသုံးပြုမည့် ပမာဏနှင့် အမျိုးအစားကို Appendix U: Chemical List and Usage တွင် ဖော်ပြထားပါသည်။
၁၈။	ထွက်ရှိမည့် hazardous Waste အား Guideline နှင့်အညီ ဆောင်ရွက်မည် ဖြစ်ကြောင်း ဖော်ပြချက်အရ အဆိုပါ Guideline အား ဖော်ပြရန်၊	စာမျက်နှာ ၃-၃၇ မှ ၃-၃၉ တွင် ဖော်ပြထားသော Prevention of Hazard from Chemical and Related Substances Law (2013) နှင့် Prevention of Hazard from Chemical and Related Substances Rules (2016) နှင့်အပြင် PIC မှ ရေးဆွဲထားသော Appendix G: PIC's Waste Management Procedure နှင့်အညီ ဆောင်ရွက်မည် ဖြစ်ပါသည်။
၁၉။	သဘာဝဘေးအန္တရာယ်၊ စက်ရုံများမှ မတော်တဆစက်ချို့ယွင်းမှုများကြောင့် ဖြစ်ပေါ်လာနိုင်သည့် Emergency Response Plan အား ထည့်သွင်း ဖော်ပြရန်၊	Appendix J PIC's Emergency Response plan တွင် ဖော်ပြထားပါသည်။
၂၀။	Human Faults ၊ Technical Error များကြောင့် Hazardous Waste များ ယိုဖိတ်နိုင်ခြင်း၊ Explosion ဖြစ်ပေါ်လာပါက ဆောင်ရွက်မည့်အစီအစဉ်အား ဖော်ပြရန်၊	Appendix J PIC's Emergency Response plan တွင် ဖော်ပြထားပါသည်။
၂၁။	စီမံကိန်းမှ လုပ်သားများအား သက်ဆိုင်ရာဌာနများနှင့် ချိတ်ဆက်၍ Awareness Training များ တက်ရောက်စေရေး ဆောင်ရွက်မည်ဖြစ်ကြောင်း ဖော်ပြရန်။	စာမျက်နှာ ၉-၇ နှင့် ၉-၁၁ ရှိ ဇယား ၉-၂ နှင့် ဇယား ၉-၃ တွင် ထည့်သွင်းဖော်ပြထားပါသည်။ Appendix V: Training and Development Manual အား ပူးတွဲဖော်ပြထားပါသည်။

Appendix S: List of HVAC equipment for Offshore and OGT



					<div>SHWE - Detailed Engineering - Field Development Project</div> <div>HVAC Equipment List for Technical Building</div>																						
					N° SHP-HV-EB-301-0001				Rev: 2		Status: AFC		Discipline: HVAC		Document type: LIS			Rev. Date: 22/12/2010									
Location	Class	System	Number	Code	Description	Platform	Deck	Location		Service		Dimensions			Design conditions				Weight		Power		Material		Remark	Ducting & Instr. Diagram (SHP-HV-DS-303-0001)	Piping & Instr. Diagram / Overall Single line diagram
								Room No.	Room Description	Service Type	Service Mode	Width or Dia. (mm)	Height (mm)	Length (mm)	Airflow (m³/h)	Capacity (kW)	Static Pressure (pa)	Air Vel. (m/s)	Install Location (Indoor/Outdoor)	Dry (kg)	Operate (kg)	(Volt, Phase, Hz)	-				
					PACU																						
SHP	HA	71	501	A	PACU TECHNICAL BUILDING(OPERATING)	SHP	L2	T204	HVAC PLANT	All	Normal	3200	3094	7400	52167	491.1	2100	2.0	Indoor	15000	15300	400Vac, 50Hz, 3-phase	SUS316L	SHP-ME-DA-H01-0001, Sheet 2 of 7	SHEET 8 OF 14		
SHP	HA	71	501	B	PACU TECHNICAL BUILDING(STAND-BY)	SHP	L2	T204	HVAC PLANT	All	Normal	3200	3094	7400	52167	491.1	2100	2.0	Indoor	15000	15300	400Vac, 50Hz, 3-phase	SUS316L	SHP-ME-DA-H01-0001, Sheet 5 of 7	SHEET 8 OF 14		








SHWE - Detailed Engineering - Field Development Project
HVAC Equipment List with Tags for Living Quarter









					N° SHQ-HV-EB-301-0001				Rev: 2		Status: AFC		Disciplin:HVAC		Document type: LIS				Rev. Date: 17/01/2011								
Class	Class	System	Number	Code	Description	Platform	Location		Service		Dimensions			Design conditions				Weight		Power	Material	Remarks	Ducting & Instr. Diagram (SHQ-HV-DS-303-0001)	Piping & Instr. Diagram / Overall Single line diagram (SHQ-HV-DP-301-0003)			
							Deck	Room No.	Room Description	Service Type	Service Mode	Width or Dia. (mm)	Height (mm)	Length (mm)	Airflow (m³/h)	Capacity (kW)	Static Pressure (pa)	Air Vel. (m/s)	Install Location (Indoor/Outdoor)	Dry (kg)	Operate (kg)				(kW)	-	
					PACU																						
SHQ	HA	71	101	A	PACU Living Quarter(Normal-Operating)	SHQ	L5	507	HVAC PLANT ROOM		All	Normal	4000	3250	8900	65330	939.2	2600	2.5	Indoor	15000	15300	400Vac, 50Hz, 3-phase	SUS316L	SHQ-ME-DA-H01-0001, SHEET 2 OF 13	SHEET 10 OF 23	SHEET 3 OF 5
SHQ	HA	71	101	B	PACU Living Quarter(Normal-Stand-by)	SHQ	L5	507	HVAC PLANT ROOM		All	Normal	4000	3250	8900	65330	939.2	2600	2.5	Indoor	15000	15300	400Vac, 50Hz, 3-phase	SUS316L	SHQ-ME-DA-H01-0001, SHEET 5 OF 13	SHEET 10 OF 23	SHEET 4 OF 5
SHQ	HA	71	102	A	PACU Living Quarter(Emergency-Operating)	SHQ	L5	507	HVAC PLANT ROOM		All	Emer'cy	2350	2300	6000	21606	269.1	2200	2.5	Indoor	7100	7400	400Vac, 50Hz, 3-phase	SUS316L	SHQ-ME-DA-H01-0001, SHEET 8 OF 13	SHEET 11 OF 23	SHEET 5 OF 5
SHQ	HA	71	102	B	PACU Living Quarter(Emergency-Stand-by)	SHQ	L5	507	HVAC PLANT ROOM		All	Emer'cy	2350	2300	6000	21606	269.1	2200	2.5	Indoor	7100	7400	400Vac, 50Hz, 3-phase	SUS316L	SHQ-ME-DA-H01-0001, SHEET 11 OF 13	SHEET 11 OF 23	SHEET 5 OF 5



					<div>SHWE - Detailed Engineering - Field Development Project</div> <div>HVAC Equipment List for Technical Building</div>																							
					N° SHP-HV-EB-301-0001				Rev: 2		Status: AFC		Discipline HVAC		Document type: LIS			Rev. Date: 22/12/2010										
Location	Class	System	Number	Code	Description	Platform	Deck	Location		Service		Dimensions			Design conditions					Weight		Power		Material		Remark	Ducting & Instr. Diagram (SHP-HV-DS-303-0001)	Piping & Instr. Diagram / Overall Single line diagram
								Room No.	Room Description	Service Type	Service Mode	Width or Dia. (mm)	Height (mm)	Length (mm)	Airflow (m³/h)	Capacity (kW)	Static Pressure (pa)	Air Vel. (m/s)	Install Location (Indoor/Outdoor)	Dry (kg)	Operate (kg)	(Volt, Phase, Hz)	-					
					ACU																							
SHP	HC	71	503	A	ACU TECHNICAL BUILDING	SHP	L2	N/A	ROOF	All	Normal	3700	3880	5000	187420	632	200	3.4	Outdoor	4200	4500	400Vac, 50Hz, 3-phase	Casing:SUS316L Impeller : Al-alloy	SHP-ME-DA-H01-0002, Sheet 2 of 3	SHEET 8 OF 14			
SHP	HC	71	503	B	ACU TECHNICAL BUILDING	SHP	L2	N/A	ROOF	All	Normal	3700	3880	5000	187420	632	200	3.4	Outdoor	4200	4500	400Vac, 50Hz, 3-phase	Casing:SUS316L Impeller : Al-alloy	SHP-ME-DA-H01-0002, Sheet 3 of 3	SHEET 8 OF 14			




					<div><div>SHWE - Detailed Engineering - Field Development Project HVAC Equipment List with Tags for Living Quarter</div></div>																				
					N° SHQ-HV-EB-301-0001				Rev: 2		Status: AFC		Discipline: HVAC		Document type: LIS				Rev. Date: 17/01/2011						
Class	Class	System	Number	Code	Description	Location			Service		Dimensions			Design conditions				Weight		Power		Material	Remarks	Ducting & Instr. Diagram (SHQ-HV-DS-303-0001)	Piping & Instr. Diagram / Overall Single line diagram (SHQ-HV-DP-301-0003)
						Platform	Deck	Room No.	Room Description	Service Type	Service Mode	Width or Dia. (mm)	Height (mm)	Length (mm)	Airflow (m³/h)	Capacity (kW)	Static Pressure (pa)	Air Vel. (m/s)	Install Location (Indoor/Outdoor)	Dry (kg)	Operate (kg)	(kW)			
					ACU																				
SHQ	HC	71	103	A	ACU Living Quarter(Normal-Operating)	SHQ	L5	N/A	ROOF	All	Normal	2550	2420	10100	415172	1400	200	4.6	Outdoor	7000	7400	400Vac, 50Hz, 3-phase	Casing:SUS316L Impeller : Al-alloy SHQ-ME-DA-H01-0002, SHEET 2 OF 5	SHEET 10 OF 23	SHEET 3 OF 5
SHQ	HC	71	103	B	ACU Living Quarter(Normal-Stand-by)	SHQ	L5	N/A	ROOF	All	Normal	2550	2420	10100	415172	1400	200	4.6	Outdoor	7000	7400	400Vac, 50Hz, 3-phase	Casing:SUS316L Impeller : Al-alloy SHQ-ME-DA-H01-0002, SHEET 3 OF 5	SHEET 10 OF 23	SHEET 4 OF 5
SHQ	HC	71	106	A	ACU Living Quarter(Emergency-Operating)	SHQ	L5	N/A	ROOF	All	Emergency	2100	1700	5500	102310	345	200	4.6	Outdoor	2000	2100	400Vac, 50Hz, 3-phase	Casing:SUS316L Impeller : Al-alloy SHQ-ME-DA-H01-0002, SHEET 4 OF 5	SHEET 11 OF 23	SHEET 5 OF 5
SHQ	HC	71	106	B	ACU Living Quarter(Emergency-Stand-by)	SHQ	L5	N/A	ROOF	All	Emergency	2100	1700	5500	102310	345	200	4.6	Outdoor	2000	2100	400Vac, 50Hz, 3-phase	Casing:SUS316L Impeller : Al-alloy SHQ-ME-DA-H01-0002, SHEET 5 OF 5	SHEET 11 OF 23	SHEET 5 OF 5




					<div>SHWE - Detailed Engineering - Field Development Project</div> <div>HVAC Equipment List for Technical Building</div>																						
					N° SHP-HV-EB-301-0001				Rev: 2		Status: AFC		Discipline HVAC		Document type: LIS			Rev. Date: 22/12/2010									
Location	Class	System	Number	Code	Description	Platform	Location		Service		Dimensions			Design conditions				Weight		Power		Material		Remark	Ducting & Instr. Diagram (SHP-HV-DS-303-0001)	Piping & Instr. Diagram / Overall Single line diagram	
							Deck	Room No.	Room Description	Service Type	Service Mode	Width or Dia. (mm)	Height (mm)	Length (mm)	Airflow (m³/h)	Capacity (kW)	Static Pressure (pa)	Air Vel. (m/s)	Install Location (Indoor/Outdoor)	Dry (kg)	Operate (kg)	(Volt, Phase, Hz)	-				
					Fans																						
SHP	HK	71	504	A	LABORATORY EXHAUST FAN(CENTRIFUGAL)	SHP	L2	N/A	L2 ON DECK	M/E	Normal	1016	1225	900	3948	1.5	400	9.9	Outdoor	230	230	400Vac, 50Hz, 3-phase	SUS316L	SHP-ME-DA-H01-0003, Sheet 2 of 7	SHEET 9 OF 14		
SHP	HK	71	504	B	LABORATORY EXHAUST FAN(CENTRIFUGAL)	SHP	L2	N/A	L2 ON DECK	M/E	Normal	1016	1225	900	3948	1.5	400	9.9	Outdoor	230	230	400Vac, 50Hz, 3-phase	SUS316L	SHP-ME-DA-H01-0003, Sheet 2 of 7	SHEET 9 OF 14		




										<div>SHWE - Detailed Engineering - Field Development Project</div> <div>HVAC Equipment List for Technical Building</div>																				
										N° SHP-HV-EB-301-0001 Rev: 2 Status: AFC Discipline: HVAC Document type: LIS Rev. Date: 22/12/2010																				
Location	Class	System	Number	Code	Description	Platform	Deck	Room No.	Room Description	Service Type	Service Mode	Width or Dia. (mm)	Height (mm)	Length (mm)	Airflow (m³/h)	Capacity (kW)	Static Pressure (pa)	Air Vel. (m/s)	Install Location (Indoor/Outdoor)	Dry (kg)	Operate (kg)	Power (Volt, Phase, Hz)	Material -	Remark	Ducting & Instr. Diagram (SHP-HV-DS-303-0001)	Piping & Instr. Diagram / Overall Single line diagram				
					Fans																									
SHP	HK	71	505	A	BATTERY ROOM EXHAUST FAN(CENTRIFUGAL)	SHP	L2	N/A	L2 ON DECK	M/E	Normal	925	1125	895	3168	1.5	400	8.2	Outdoor	200	200	400Vac, 50Hz, 3-phase	SUS316L	SHP-ME-DA-H01-0003, Sheet 3 of 7	SHEET 11 OF 14					
SHP	HK	71	505	B	BATTERY ROOM EXHAUST FAN(CENTRIFUGAL)	SHP	L2	N/A	L2 ON DECK	M/E	Normal	925	1125	895	3168	1.5	400	8.2	Outdoor	200	200	400Vac, 50Hz, 3-phase	SUS316L	SHP-ME-DA-H01-0003, Sheet 3 of 7	SHEET 11 OF 14					




																						SHWE - Detailed Engineering - Field Development Project HVAC Equipment List with Tags for Living Quarter																				
					N° SHQ-HV-EB-301-0001					Rev: 2		Status: AFC		Disciplin: HVAC		Document type: LIS				Rev. Date: 17/01/2011																						
Class	Class	System	Number	Code	Description	Platform	Deck	Room No.	Location		Service		Dimensions			Design conditions				Weight		Power		Material		Remarks	Ducting & Instr. Diagram (SHQ-HV-DS-303-0001)	Piping & Instr. Diagram / Overall Single line diagram (SHQ-HV-DP-301-0003)														
									Room Description	Service Type	Service Mode	Width or Dia. (mm)	Height (mm)	Length (mm)	Airflow (m³/h)	Capacity (kW)	Static Pressure (pa)	Air Vel. (m/s)	Install Location (Indoor/Outdoor)	Dry (kg)	Operate (kg)	(kW)	-																			
					Fans																																					
SHQ	HK	71	103	A	Toilet Exhaust Fan(Centrifugal)	SHQ	L5	N/A	L5 On Deck		M/E	Normal	935	1075	633	2644	1.5	600	4.6	Outdoor	210	210	400Vac, 50Hz, 3-phase		SUS316L		SHEET 23 OF 23															
SHQ	HK	71	103	B	Toilet Exhaust Fan(Centrifugal)	SHQ	L5	N/A	L5 On Deck		M/E	Normal	935	1075	633	2644	1.5	600	4.6	Outdoor	210	210	400Vac, 50Hz, 3-phase		SUS316L		SHEET 23 OF 23															
SHQ	HK	71	104	A	Galley Exhaust Fan(Centrifugal)	SHQ	L1	N/A	L1 On Deck		M/E	Normal	1335	1360	1110	14600	7.5	600	8.0	Outdoor	430	430	400Vac, 50Hz, 3-phase		SUS316L		SHEET 23 OF 23															
SHQ	HK	71	104	B	Galley Exhaust Fan(Centrifugal)	SHQ	L1	N/A	L1 On Deck		M/E	Normal	1335	1360	1110	14600	7.5	600	8.0	Outdoor	430	430	400Vac, 50Hz, 3-phase		SUS316L		SHEET 23 OF 23															
SHQ	HK	71	105	A	General Exhaust Fan(Centrifugal)	SHQ	L5	N/A	L5 On Deck		M/E	Normal	935	1075	633	2424	1.5	600	4.2	Outdoor	210	210	400Vac, 50Hz, 3-phase		SUS316L		SHEET 23 OF 23															
SHQ	HK	71	105	B	General Exhaust Fan(Centrifugal)	SHQ	L5	N/A	L5 On Deck		M/E	Normal	935	1075	633	2424	1.5	600	4.2	Outdoor	210	210	400Vac, 50Hz, 3-phase		SUS316L		SHEET 23 OF 23															
SHQ	HK	71	106	A	Laundry Exhaust Fan(Centrifugal)	SHQ	L0	N/A	L0 On Deck		M/E	Normal	1060	1110	756	5420	3.0	600	7.4	Outdoor	222	222	400Vac, 50Hz, 3-phase		SUS316L		SHEET 23 OF 23															
SHQ	HK	71	106	B	Laundry Exhaust Fan(Centrifugal)	SHQ	L0	N/A	L0 On Deck		M/E	Normal	1060	1110	756	5420	3.0	600	7.4	Outdoor	222	222	400Vac, 50Hz, 3-phase		SUS316L		SHEET 23 OF 23															
SHQ	HK	71	107	-	Clinic Exhaust Fan(Centrifugal)	SHQ	L5	N/A	L5 On Deck		M/E	Normal	850	963	620	1649	1.1	600	2.9	Outdoor	182	182	400Vac, 50Hz, 3-phase		SUS316L		SHEET 23 OF 23															
SHQ	HK	71	108	-	STAIRWAY Supply Fan(Centrifugal)	SHQ	L5	N/A	L5 On Deck		M/S	Pressurization	925	925	695	3200	1.5	400	6.0	Outdoor	200	200	400Vac, 50Hz, 3-phase		SUS316L		SHEET 23 OF 23															




					<div>SHWE - Detailed Engineering - Field Development Project</div> <div>HVAC Equipment List for Technical Building</div>																						
					N° SHP-HV-EB-301-0001				Rev: 2		Status: AFC		Discipline: HVAC		Document type: LIS			Rev. Date: 22/12/2010									
Location	Class	System	Number	Code	Description	Platform	Deck	Location		Service		Dimensions			Design conditions				Weight		Power		Material		Remark	Ducting & Instr. Diagram (SHP-HV-DS-303-0001)	Piping & Instr. Diagram / Overall Single line diagram
								Room No.	Room Description	Service Type	Service Mode	Width or Dia. (mm)	Height (mm)	Length (mm)	Airflow (m³/h)	Capacity (kW)	Static Pressure (pa)	Air Vel. (m/s)	Install Location (Indoor/Outdoor)	Dry (kg)	Operate (kg)	(Volt, Phase, Hz)	-				
					Fans																						
SHP	HK	71	506	A	WORKSHOP EXHAUST FAN(AXIAL)	SHP	L0	N/A	UNDER L2	M/S	Normal	Ø630	1385	3539	2.2	400	2.5	Outdoor	174	174	400Vac, 50Hz, 3-phase	SUS316L	SHP-ME-DA-H01-0003, Sheet 4 of 7	SHEET 12 OF 14			
SHP	HK	71	506	B	WORKSHOP EXHAUST FAN(AXIAL)	SHP	L0	N/A	UNDER L2	M/S	Normal	Ø630	1385	3539	2.2	400	2.5	Outdoor	174	174	400Vac, 50Hz, 3-phase	SUS316L	SHP-ME-DA-H01-0003, Sheet 4 of 7	SHEET 12 OF 14			
SHP	HK	71	507	A	WELDING W/S & STORAGE AREA SUPPLY FAN(AXIAL)	SHP	Upper	N/A	ROOF	M/E	Normal	Ø630	1385	4070	2.2	600	2.8	Outdoor	174	174	400Vac, 50Hz, 3-phase	SUS316L	SHP-ME-DA-H01-0003, Sheet 5 of 7	SHEET 14 OF 14			
SHP	HK	71	507	B	WELDING W/S & STORAGE AREA SUPPLY FAN(AXIAL)	SHP	Upper	N/A	ROOF	M/E	Normal	Ø630	1385	4070	2.2	600	2.8	Outdoor	174	174	400Vac, 50Hz, 3-phase	SUS316L	SHP-ME-DA-H01-0003, Sheet 6 of 7	SHEET 14 OF 14			




					<div><div>SHWE - Detailed Engineering - Field Development Project</div><div>HVAC Equipment List for Technical Building</div></div>																								
					N° SHP-HV-EB-301-0001				Rev: 2		Status: AFC		Discipline: HVAC		Document type: LIS			Rev. Date: 22/12/2010											
Location	Class	System	Number	Code	Description	Platform	Location			Service		Dimensions			Design conditions				Weight		Power	Material	Remark	Ducting & Instr. Diagram (SHP-HV-DS-303-0001)	Piping & Instr. Diagram / Overall Single line diagram				
							Deck	Room No.	Room Description	Service Type	Service Mode	Width or Dia. (mm)	Height (mm)	Length (mm)	Airflow (m³/h)	Capacity (kW)	Static Pressure (pa)	Air Vel. (m/s)	Install Location (Indoor/Outdoor)	Dry (kg)	Operate (kg)					(Volt, Phase, Hz)	-		
					Fire Damper																								
SHP	HF	71	540		HVAC PLANT ROOM	SHP	UPPER	N/A	HVAC PLANT	F/A	Normal A-60	700	1000	300	12008	N/A	N/A	4.8	Indoor	82	82	24Vdc	SUS316L	SHP-ME-DD-H01-0001, Sheet 5 of 9	SHEET 8 OF 14				
SHP	HF	71	503	-	HVAC PLANT ROOM	SHP	L2	T204	HVAC PLANT	R/A	Normal A-60	1000	700	300	14487	N/A	N/A	5.7	Indoor	82	82	24Vdc	SUS316L	SHP-ME-DD-H01-0001, Sheet 5 of 9	SHEET 8 OF 14				
SHP	HF	71	504	-	HVAC PLANT ROOM	SHP	L2	T204	HVAC PLANT	R/A	Normal A-60	1000	700	300	14490	N/A	N/A	5.8	Indoor	82	82	24Vdc	SUS316L	SHP-ME-DD-H01-0001, Sheet 5 of 9	SHEET 8 OF 14				
SHP	HF	71	505	-	HVAC PLANT ROOM	SHP	L2	T204	HVAC PLANT	S/A	Normal A-0	700	300	300	4022	N/A	N/A	5.3	Indoor	49	49	24Vdc	SUS316L	SHP-ME-DD-H01-0001, Sheet 4 of 9	SHEET 8 OF 14				
SHP	HF	71	506	-	HVAC PLANT ROOM	SHP	L2	T204	HVAC PLANT	S/A	Normal A-60	400	300	300	3168	N/A	N/A	7.3	Indoor	41	41	24Vdc	SUS316L	SHP-ME-DD-H01-0001, Sheet 4 of 9	SHEET 8 OF 14				
SHP	HF	71	507	-	HVAC PLANT ROOM	SHP	L2	T204	HVAC PLANT	S/A	Normal A-60	900	700	300	14773	N/A	N/A	6.5	Indoor	78	78	24Vdc	SUS316L	SHP-ME-DD-H01-0001, Sheet 5 of 9	SHEET 8 OF 14				
SHP	HF	71	508	-	HVAC PLANT ROOM	SHP	L2	T204	HVAC PLANT	S/A	Normal A-60	700	600	300	10828	N/A	N/A	7.2	Indoor	62	62	24Vdc	SUS316L	SHP-ME-DD-H01-0001, Sheet 5 of 9	SHEET 8 OF 14				
SHP	HF	71	509	-	HVAC PLANT ROOM	SHP	L2	T204	HVAC PLANT	N/E	Normal A-60	300	300	300	484	N/A	N/A	1.5	Indoor	39	39	24Vdc	SUS316L	SHP-ME-DD-H01-0001, Sheet 4 of 9	SHEET 8 OF 14				
SHP	HF	71	514	-	LABORATORY	SHP	L2	T205	LABORATORY	M/E	Normal A-60	500	400	300	3948	N/A	N/A	5.5	Indoor	49	49	24Vdc	SUS316L	SHP-ME-DD-H01-0001, Sheet 4 of 9	SHEET 8 OF 14				
SHP	HF	71	515	-	LABORATORY AIR LOCK	SHP	L2	T206	AL. LABORATORY	N/E	Normal A-60	200	200	300	74	N/A	N/A	0.5	Indoor	33	33	24Vdc	SUS316L	SHP-ME-DD-H01-0001, Sheet 4 of 9	SHEET 8 OF 14				
SHP	HF	71	518		HVAC PLANT ROOM	SHP	L2	T204	HVAC PLANT	S/A	Normal A-60	900	700	300	14766	N/A	N/A	6.5	Indoor	78	78	24Vdc	SUS316L	SHP-ME-DD-H01-0001, Sheet 5 of 9	SHEET 8 OF 14				
SHP	HF	71	519		AIR CONDITIONED STORE AIR LOCK	SHP	L2	T203	AIR LOCK	N/E	Normal A-60	200	200	300	56	N/A	N/A	0.4	Indoor	33	33	24Vdc	SUS316L	SHP-ME-DD-H01-0001, Sheet 4 of 9	SHEET 8 OF 14				
SHP	HF	71	520		HVAC PLANT ROOM	SHP	L2	T204	HVAC PLANT	R/A	Normal A-60	600	500	300	7112	N/A	N/A	6.6	Indoor	56	56	24Vdc	SUS316L	SHP-ME-DD-H01-0001, Sheet 4 of 9	SHEET 8 OF 14				
SHP	HF	71	522	-	BATTERY ROOM	SHP	L1	T103	BATTERY ROOM	M/E	Normal A-60	400	400	300	3168	N/A	N/A	5.5	Indoor	45	45	24Vdc	SUS316L	SHP-ME-DD-H01-0001, Sheet 4 of 9	SHEET 11 OF 14				
SHP	HF	71	524	-	MECHANICAL WORKSHOP AIR LOCK	SHP	L0	T002	AL. MECH. W/SHOP	N/E	Normal A-60	200	200	300	49	N/A	N/A	0.3	Indoor	33	33	24Vdc	SUS316L	SHP-ME-DD-H01-0001, Sheet 4 of 9	SHEET 12 OF 14				
SHP	HF	71	525	-	E/I WORKSHOP	SHP	L0	T003	E/I W/SHOP	S/A	Normal A-60	500	300	300	3637	N/A	N/A	6.7	Indoor	44	44	24Vdc	SUS316L	SHP-ME-DD-H01-0001, Sheet 4 of 9	SHEET 12 OF 14				
SHP	HF	71	526	-	E/I WORKSHOP	SHP	L0	T003	E/I W/SHOP	S/A	Normal A-0	300	300	300	2166	N/A	N/A	6.7	Indoor	39	39	24Vdc	SUS316L	SHP-ME-DD-H01-0001, Sheet 4 of 9	SHEET 12 OF 14				
SHP	HF	71	527	-	MECHANICAL WORKSHOP	SHP	L0	T001	MECH. W/SHOP	M/E	Normal A-60	400	400	300	3539	N/A	N/A	6.1	Indoor	45	45	24Vdc	SUS316L	SHP-ME-DD-H01-0001, Sheet 4 of 9	SHEET 12 OF 14				
SHP	HF	71	528	-	E/I WORKSHOP AIR LOCK	SHP	L0	T004	AL. E/I WORKSHOP	N/E	Normal A-60	200	200	300	49	N/A	N/A	0.3	Indoor	33	33	24Vdc	SUS316L	SHP-ME-DD-H01-0001, Sheet 4 of 9	SHEET 12 OF 14				
SHP	HF	71	529	-	ETR AIR LOCK	SHP	L1	T102	AL. ETR	N/E	Normal A-60	200	200	300	49	N/A	N/A	0.3	Indoor	33	33	24Vdc	SUS316L	SHP-ME-DD-H01-0001, Sheet 4 of 9	SHEET 10 OF 14				
SHP	HF	71	530	-	ETR AIR LOCK	SHP	L1	T102	AL. ETR	N/E	Normal A-60	200	200	300	49	N/A	N/A	0.3	Indoor	33	33	24Vdc	SUS316L	SHP-ME-DD-H01-0001, Sheet 4 of 9	SHEET 10 OF 14				
SHP	HF	71	531	-	INSTRUMENT EQUIPMENT ROOM	SHP	L0	T005	IER	S/A	Normal A-60	600	500	300	7191	N/A	N/A	6.7	Indoor	56	56	24Vdc	SUS316L	SHP-ME-DD-H01-0001, Sheet 4 of 9	SHEET 13 OF 14				
SHP	HF	71	532	-	AIR LOCK	SHP	L0	T006	AIR LOCK	N/E	Normal A-60	200	200	300	46	N/A	N/A	0.3	Indoor	33	33	24Vdc	SUS316L	SHP-ME-DD-H01-0001, Sheet 4 of 9	SHEET 13 OF 14				
SHP	HF	71	533		INSTRUMENT EQUIPMENT ROOM	SHP	L0	T005	IER	R/A	Normal A-60	600	500	300	7112	N/A	N/A	6.6	Indoor	56	56	24Vdc	SUS316L	SHP-ME-DD-H01-0001, Sheet 4 of 9	SHEET 13 OF 14				
SHP	HF	71	536	-	WELDING WORKSHOP	SHP	UPPER	T301	WELD. W/SHOP	N/E	Normal A-60	500	500	300	1792	N/A	N/A	2.0	Indoor	53	53	24Vdc	SUS316L	SHP-ME-DD-H01-0001, Sheet 4 of 9	SHEET 14 OF 14				
SHP	HF	71	537	-	WELDING WORKSHOP	SHP	UPPER	T301	WELD. W/SHOP	S/A	Normal A-60	500	300	300	4070	N/A	N/A	7.5	Indoor	44	44	24Vdc	SUS316L	SHP-ME-DD-H01-0001, Sheet 4 of 9	SHEET 14 OF 14				
SHP	HF	71	538	-	WELDING WORKSHOP	SHP	UPPER	T301	WELD. W/SHOP	S/A	Normal A-0	300	200	300	1179	N/A	N/A	5.5	Indoor	36	36	24Vdc	SUS316L	SHP-ME-DD-H01-0001, Sheet 4 of 9	SHEET 14 OF 14				
SHP	HF	71	539	-	HEAVY DUTY EQUIPMENT STORAGE	SHP	UPPER	T302	HEAVY STO.	S/A	Normal A-0	200	200	300	715	N/A	N/A	5.0	Indoor	33	33	24Vdc	SUS316L	SHP-ME-DD-H01-0001, Sheet 4 of 9	SHEET 14 OF 14				
SHP	HF	71	544	-	ELECTRICAL TECHNICAL ROOM(RAISED FLOOR)	SHP	L1	T101	ETR	N/E	Normal A-60	300	300	300	464	N/A	N/A	1.4	Indoor	36	36	24Vdc	SUS316L	SHP-ME-DD-H01-0001, Sheet 4 of 9	SHEET 10 OF 14				
SHP	HF	71	541	-	HEAVY DUTY EQUIPMENT STORAGE	SHP	UPPER	T302	HEAVY DUTY	N/E	Normal A-60	300	300	300	464	N/A	N/A	1.4	Indoor	36	36	24Vdc	SUS316L	SHP-ME-DD-H01-0001, Sheet 4 of 9	SHEET 14 OF 14				
SHP	HF	71	542	-	STORAGE AREA	SHP	UPPER	T303	STORAGE AREA	N/E	Normal A-60	300	300	300	715	N/A	N/A	2.2	Indoor	36	36	24Vdc	SUS316L	SHP-ME-DD-H01-0001, Sheet 4 of 9	SHEET 14 OF 14				
SHP	HF	71	543	-	STORE FOR RADIOACTIVE SOURCE	SHP	UPPER	T304	STORE FOR RADIOACTIVE SOURCE	N/E	Normal A-60	200	200	300	231	N/A	N/A	1.6	Indoor	33	33	24Vdc	SUS316L	SHP-ME-DD-H01-0001, Sheet 4 of 9	SHEET 14 OF 14				




					<div><div>SHWE - Detailed Engineering - Field Development Project HVAC Equipment List with Tags for Living Quarter</div></div>																							
					N° SHQ-HV-EB-301-0001				Rev: 2		Status: AFC		Discipline: HVAC		Document type: LIS				Rev. Date: 17/01/2011									
Class	Class	System	Number	Code	Description	Platform	Deck	Room No.	Location		Service		Dimensions			Design conditions					Weight		Power		Material	Remarks	Ducting & Instr. Diagram (SHQ-HV-DS-303-0001)	Piping & Instr. Diagram / Overall Single line diagram (SHQ-HV-DP-301-0003)
									Room Description	Service Type	Service Mode	Width or Dia. (mm)	Height (mm)	Length (mm)	Airflow (m³/h)	Capacity (kW)	Static Pressure (pa)	Air Vel. (m/s)	Install Location (Indoor/Outdoor)	Dry (kg)	Operate (kg)	(kW)	-					
					Fire Damper																							
SHQ	HF	71	001	-	AIR LOCK	SHQ	L0	011	AIR LOCK	N/E	Normal A-60	200	200	300	37	N/A	N/A	0.3	Indoor	32	32	24Vdc	SUS316L	SHQ-ME-DD-H01-0001, SHEET 4 OF 14	SHEET 21 OF 23			
SHQ	HF	71	002	-	NORMAL SUPPLY AIR	SHQ	L0	006	HVAC SHAFT	S/A	Normal A-60	800	600	300	11576	N/A	N/A	6.7	Indoor	67	67	24Vdc	SUS316L	SHQ-ME-DD-H01-0001, SHEET 6 OF 14	SHEET 21 OF 23			
SHQ	HF	71	003	-	GENERAL EXHAUST AIR	SHQ	L0	008	POOL ROOM	M/E	Normal A-60	400	300	300	2424	N/A	N/A	5.6	Indoor	41	41	24Vdc	SUS316L	SHQ-ME-DD-H01-0001, SHEET 4 OF 14	SHEET 21 OF 23			
SHQ	HF	71	004	-	AIR LOCK	SHQ	L0	025	AIR LOCK	N/E	Normal A-60	200	200	300	37	N/A	N/A	0.3	Indoor	32	32	24Vdc	SUS316L	SHQ-ME-DD-H01-0001, SHEET 4 OF 14	SHEET 21 OF 23			
SHQ	HF	71	005	-	LAUNDRY EXHAUST AIR	SHQ	L0	015	LAUNDRY	M/E	Normal A-60	500	600	300	5420	N/A	N/A	5.0	Indoor	57	57	24Vdc	SUS316L	SHQ-ME-DD-H01-0001, SHEET 6 OF 14	SHEET 21 OF 23			
SHQ	HF	71	006	-	NORMAL RETURN AIR	SHQ	L0	019	GYMNASIUM	R/A	Normal A-60	400	300	300	2897	N/A	N/A	6.7	Indoor	41	41	24Vdc	SUS316L	SHQ-ME-DD-H01-0001, SHEET 4 OF 14	SHEET 21 OF 23			
SHQ	HF	71	007	-	NORMAL SUPPLY AIR	SHQ	L0	019	GYMNASIUM	S/A	Normal A-60	700	400	300	6489	N/A	N/A	6.4	Indoor	65	65	24Vdc	SUS316L	SHQ-ME-DD-H01-0001, SHEET 4 OF 14	SHEET 21 OF 23			
SHQ	HF	71	008	-	NORMAL RETURN AIR	SHQ	L0	019	GYMNASIUM	R/A	Normal A-60	300	300	300	1712	N/A	N/A	5.3	Indoor	36	36	24Vdc	SUS316L	SHQ-ME-DD-H01-0001, SHEET 4 OF 14	SHEET 21 OF 23			
SHQ	HF	71	009	-	NORMAL SUPPLY AIR	SHQ	L0	017	T.V ROOM(1)	S/A	Normal A-60	700	400	300	6276	N/A	N/A	6.2	Indoor	65	65	24Vdc	SUS316L	SHQ-ME-DD-H01-0001, SHEET 4 OF 14	SHEET 21 OF 23			
SHQ	HF	71	052	-	EMERGENCY SUPPLY AIR	SHQ	L0	006	HVAC PLANT ROOM	S/A	Emercy A-60	600	500	300	6721	N/A	N/A	6.2	Indoor	56	56	24Vdc	SUS316L	SHQ-ME-DD-H01-0001, SHEET 4 OF 14	SHEET 22 OF 23			
SHQ	HF	71	053	-	EMERGENCY RETURN AIR	SHQ	L0	018	T.V ROOM(2)	R/A	Emercy A-60	500	300	300	3836	N/A	N/A	7.1	Indoor	44	44	24Vdc	SUS316L	SHQ-ME-DD-H01-0001, SHEET 4 OF 14	SHEET 22 OF 23			
SHQ	HF	71	054	-	GYMNASIUM EXHAUST AIR	SHQ	L0	019	GYMNASIUM	N/E	Emercy A-60	500	300	300	1278	N/A	N/A	2.4	Indoor	44	44	24Vdc	SUS316L	SHQ-ME-DD-H01-0001, SHEET 4 OF 14	SHEET 22 OF 23			
SHQ	HF	71	055	-	T.V ROOM(2)	SHQ	L0	013	CORRIDOR	S/A	Emercy A-60	300	300	300	1918	N/A	N/A	5.9	Indoor	36	36	24Vdc	SUS316L	SHQ-ME-DD-H01-0001, SHEET 4 OF 14	SHEET 22 OF 23			
SHQ	HF	71	056	-	T.V ROOM(1)	SHQ	L0	013	CORRIDOR	S/A	Emercy A-60	300	300	300	1918	N/A	N/A	5.9	Indoor	36	36	24Vdc	SUS316L	SHQ-ME-DD-H01-0001, SHEET 4 OF 14	SHEET 22 OF 23			
SHQ	HF	71	101	-	AIR LOCK	SHQ	L1	112	AIR LOCK	N/E	Normal A-60	200	200	300	43	N/A	N/A	0.3	Indoor	32	32	24Vdc	SUS316L	SHQ-ME-DD-H01-0001, SHEET 4 OF 14	SHEET 20 OF 23			
SHQ	HF	71	102	-	NORMAL SUPPLY AIR	SHQ	L1	108	CATERING CHANGING ROOM	S/A	Normal A-60	400	300	300	1768	N/A	N/A	4.1	Indoor	41	41	24Vdc	SUS316L	SHQ-ME-DD-H01-0001, SHEET 4 OF 14	SHEET 20 OF 23			
SHQ	HF	71	103	-	NORMAL SUPPLY AIR	SHQ	L1	117	DINING ROOM	S/A	Normal A-60	900	600	300	11808	N/A	N/A	6.1	Indoor	71	71	24Vdc	SUS316L	SHQ-ME-DD-H01-0001, SHEET 6 OF 14	SHEET 20 OF 23			
SHQ	HF	71	104	-	GALLEY SUPPLY AIR	SHQ	L1	118	GALLEY / DISH WASH	S/A	Normal A-60	600	400	300	4538	N/A	N/A	5.3	Indoor	53	53	24Vdc	SUS316L	SHQ-ME-DD-H01-0001, SHEET 4 OF 14	SHEET 20 OF 23			
SHQ	HF	71	105	-	AIR LOCK	SHQ	L1	115	AIR LOCK	N/E	Normal A-60	200	200	300	35	N/A	N/A	0.2	Indoor	32	32	24Vdc	SUS316L	SHQ-ME-DD-H01-0001, SHEET 4 OF 14	SHEET 20 OF 23			
SHQ	HF	71	106	-	DINING ROOM TRANS. AIR	SHQ	L1	117	DINING ROOM	R/A	Normal A-0	800	800	300	5031	N/A	N/A	2.5	Indoor	70	70	24Vdc	SUS316L	SHQ-ME-DD-H01-0001, SHEET 6 OF 14	SHEET 20 OF 23			
SHQ	HF	71	107	-	NORMAL RETURN AIR	SHQ	L1	117	DINING ROOM	R/A	Normal A-60	400	400	300	3030	N/A	N/A	5.3	Indoor	45	45	24Vdc	SUS316L	SHQ-ME-DD-H01-0001, SHEET 4 OF 14	SHEET 20 OF 23			
SHQ	HF	71	108	-	GALLEY EXHAUST AIR	SHQ	L1	119	GALLEY / DISH WASH	M/E	Normal A-60	1200	700	300	14600	N/A	N/A	4.8	Indoor	87	87	24Vdc	SUS316L	SHQ-ME-DD-H01-0001, SHEET 6 OF 14	SHEET 20 OF 23			
SHQ	HF	71	109	-	DINING ROOM TRANS. AIR	SHQ	L1	117	DINING ROOM	R/A	Normal A-0	800	800	300	5031	N/A	N/A	2.5	Indoor	70	70	24Vdc	SUS316L	SHQ-ME-DD-H01-0001, SHEET 6 OF 14	SHEET 20 OF 23			
SHQ	HF	71	110	-	GARBAGE ROOM	SHQ	L1	120	GARBAGE ROOM	N/E	Normal A-60	200	200	300	83	N/A	N/A	0.6	Indoor	32	32	24Vdc	SUS316L	SHQ-ME-DD-H01-0001, SHEET 4 OF 14	SHEET 20 OF 23			
SHQ	HF	71	112	-	NORMAL SUPPLY AIR	SHQ	L1	113	CORRIDOR	S/A	Normal A-60	1400	600	300	16346	N/A	N/A	5.4	Indoor	90	90	24Vdc	SUS316L	SHQ-ME-DD-H01-0001, SHEET 8 OF 14	SHEET 20 OF 23			
SHQ	HF	71	201	-	AIR LOCK	SHQ	L2	215	AIR LOCK	N/E	Normal A-60	200	200	300	80	N/A	N/A	0.6	Indoor	32	32	24Vdc	SUS316L	SHQ-ME-DD-H01-0001, SHEET 4 OF 14	SHEET 18 OF 23			
SHQ	HF	71	202	-	NORMAL SUPPLY AIR	SHQ	L2	217	CORRIDOR	S/A	Normal A-60	700	500	300	7047	N/A	N/A	5.6	Indoor	65	65	24Vdc	SUS316L	SHQ-ME-DD-H01-0001, SHEET 4 OF 14	SHEET 18 OF 23			
SHQ	HF	71	204	-	AIR LOCK	SHQ	L2	219	AIR LOCK	N/E	Normal A-60	200	200	300	37	N/A	N/A	0.3	Indoor	32	32	24Vdc	SUS316L	SHQ-ME-DD-H01-0001, SHEET 4 OF 14	SHEET 18 OF 23			
SHQ	HF	71	205	-	NORMAL RETURN AIR	SHQ	L2	224	SAFETY OFFICER OFFICE	R/A	Normal A-60	600	500	300	6778	N/A	N/A	6.3	Indoor	56	56	24Vdc	SUS316L	SHQ-ME-DD-H01-0001, SHEET 4 OF 14	SHEET 18 OF 23			
SHQ	HF	71	251	-	EMERGENCY SUPPLY AIR	SHQ	L2	202	STORE & JANITOR	S/A	Emercy A-60	700	500	300	8535	N/A	N/A	6.8	Indoor	65	65	24Vdc	SUS316L	SHQ-ME-DD-H01-0001, SHEET 4 OF 14	SHEET 19 OF 23			
SHQ	HF	71	252	-	TELECOM EQUIPMENT ROOM	SHQ	L2	212	TELECOM EQUIPMENT ROOM	R/A	Emercy A-60	500	400	300	4971	N/A	N/A	6.9	Indoor	58	58	24Vdc	SUS316L	SHQ-ME-DD-H01-0001, SHEET 4 OF 14	SHEET 19 OF 23			
SHQ	HF	71	253	-	CENTRAL CONTROL ROOM	SHQ	L2	213	CENTRAL CONTROL ROOM	S/A	Emercy A-60	6																



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					N° SHQ-HV-EB-301-0001				Rev: 2		Status: AFC		Discipline: HVAC		Document type: LIS		Rev. Date: 17/01/2011									
Class	Class	System	Number	Code	Description	Platform	Deck	Room No.	Location	Service		Dimensions			Design conditions				Weight		Power		Material	Remarks	Ducting & Instr. Diagram (SHQ-HV-DS-303-0001)	Piping & Instr. Diagram / Overall Single line diagram (SHQ-HV-DP-301-0003)
									Room Description	Service Type	Service Mode	Width or Dia. (mm)	Height (mm)	Length (mm)	Airflow (m³/h)	Capacity (kW)	Static Pressure (pa)	Air Vel. (m/s)	Install Location (Indoor/Outdoor)	Dry (kg)	Operate (kg)	(kW)	-			
Fire Damper																										
SHQ	HF	71	405	-	CORRIDOR	SHQ	L4	436	CORRIDOR	N/E	Normal A-60	200	200	300	154	N/A	N/A	1.1	Indoor	32	32	24Vdc	SUS316L	SHQ-ME-DD-H01-0001, SHEET 4 OF 14	SHEET 14 OF 23	
SHQ	HF	71	406	-	NORMAL RETURN AIR	SHQ	L4	443	4 MAN(26)	R/A	Normal A-60	800	600	300	12771	N/A	N/A	7.4	Indoor	67	67	24Vdc	SUS316L	SHQ-ME-DD-H01-0001, SHEET 6 OF 14	SHEET 14 OF 23	
SHQ	HF	71	407	-	CORRIDOR	SHQ	L4	437	CORRIDOR	N/E	Normal A-60	200	200	300	178	N/A	N/A	1.2	Indoor	32	32	24Vdc	SUS316L	SHQ-ME-DD-H01-0001, SHEET 4 OF 14	SHEET 15 OF 23	
SHQ	HF	71	501	-	GOODS LIFT	SHQ	L5	502	GOODS LIFT	N/E	Normal A-60	300	300	300	493	N/A	N/A	1.5	Indoor	36	36	24Vdc	SUS316L	SHQ-ME-DD-H01-0001, SHEET 4 OF 14	SHEET 12 OF 23	
SHQ	HF	71	504	-	TOILET EXHAUST AIR	SHQ	L5	505	FIREMEN'S CHANGE RM.	M/E	Normal A-60	500	300	300	2668	N/A	N/A	5.0	Indoor	44	44	24Vdc	SUS316L	SHQ-ME-DD-H01-0001, SHEET 4 OF 14	SHEET 12 OF 23	
SHQ	HF	71	505	-	FIREMEN'S CHANGE RM.	SHQ	L5	505	FIREMEN'S CHANGE RM.	N/E	Normal A-60	300	300	300	296	N/A	N/A	0.9	Indoor	36	36	24Vdc	SUS316L	SHQ-ME-DD-H01-0001, SHEET 4 OF 14	SHEET 12 OF 23	
SHQ	HF	71	506	-	PACU SUPPLY AIR	SHQ	L5	507	HVAC PLANT	S/A	Normal A-60	1500	1600	300	65330	N/A	N/A	7.6	Indoor	212	212	24Vdc	SUS316L	SHQ-ME-DD-H01-0001, SHEET 10 OF 14	SHEET 12 OF 23	
SHQ	HF	71	507	-	PACU RETURN AIR	SHQ	L5	507	HVAC PLANT	R/A	Normal A-60	1600	900	300	36796	N/A	N/A	7.1	Indoor	150	150	24Vdc	SUS316L	SHQ-ME-DD-H01-0001, SHEET 8 OF 14	SHEET 12 OF 23	
SHQ	HF	71	508	-	FRESH AIR INLET	SHQ	L5	507	HVAC PLANT	F/A	ALL A-60	1600	1300	300	36162	N/A	N/A	4.8	Indoor	190	190	24Vdc	SUS316L	SHQ-ME-DD-H01-0001, SHEET 10 OF 14	SHEET 12 OF 23	
SHQ	HF	71	509	-	FRESH AIR INLET	SHQ	L5	507	HVAC PLANT	F/A	ALL A-60	1600	1300	300	36162	N/A	N/A	4.8	Indoor	190	190	24Vdc	SUS316L	SHQ-ME-DD-H01-0001, SHEET 10 OF 14	SHEET 12 OF 23	
SHQ	HF	71	511	-	FIREMEN'S CHANGE RM.	SHQ	L5	505	FIREMEN'S CHANGE RM.	S/A	Normal A-60	200	200	300	296	N/A	N/A	2.1	Indoor	32	32	24Vdc	SUS316L	SHQ-ME-DD-H01-0001, SHEET 4 OF 14	SHEET 12 OF 23	
SHQ	HF	71	512	-	TOILET EXHAUST AIR	SHQ	L5	505	FIREMEN'S CHANGE RM.	M/E	Normal A-60	500	300	300	2668	N/A	N/A	5.0	Indoor	44	44	24Vdc	SUS316L	SHQ-ME-DD-H01-0001, SHEET 4 OF 14	SHEET 12 OF 23	
SHQ	HF	71	551	-	STAIR	SHQ	L5	501	STAIR	R/A	Emercy A-60	300	300	300	1607	N/A	N/A	5.0	Indoor	36	36	24Vdc	SUS316L	SHQ-ME-DD-H01-0001, SHEET 4 OF 14	SHEET 13 OF 23	
SHQ	HF	71	552	-	EMERGENCY SUPPLY AIR	SHQ	L5	507	HVAC PLANT	S/A	Emercy A-60	1000	700	300	15294	N/A	N/A	6.1	Indoor	84	84	24Vdc	SUS316L	SHQ-ME-DD-H01-0001, SHEET 6 OF 14	SHEET 13 OF 23	
SHQ	HF	71	553	-	EMERGENCY RETURN AIR	SHQ	L5	507	HVAC PLANT	R/A	Emercy A-60	1000	700	300	12499	N/A	N/A	5.0	Indoor	81	81	24Vdc	SUS316L	SHQ-ME-DD-H01-0001, SHEET 6 OF 14	SHEET 13 OF 23	
SHQ	HF	71	554	-	HVAC PLANT ROOM	SHQ	L5	507	HVAC PLANT	N/E	Emercy A-60	900	600	300	6312	N/A	N/A	3.2	Indoor	71	71	24Vdc	SUS316L	SHQ-ME-DD-H01-0001, SHEET 6 OF 14	SHEET 13 OF 23	
SHQ	HF	71	555	-	STAIR	SHQ	L5	501	STAIR	M/S	Pressurization A-60	500	300	300	3220	N/A	N/A	6.0	Indoor	44	44	24Vdc	SUS316L	SHQ-ME-DD-H01-0001, SHEET 4 OF 14	SHEET 13 OF 23	
SHQ	HF	71	556	-	AIR LOCK	SHQ	L5	508	AIR LOCK	N/E	Emercy A-60	200	200	300	38	N/A	N/A	0.3	Indoor	32	32	24Vdc	SUS316L	SHQ-ME-DD-H01-0001, SHEET 4 OF 14	SHEET 13 OF 23	
SHQ	HF	71	557	-	AIR LOCK	SHQ	L5	508	AIR LOCK	S/A	Emercy A-60	200	200	300	38	N/A	N/A	0.3	Indoor	32	32	24Vdc	SUS316L	SHQ-ME-DD-H01-0001, SHEET 4 OF 14	SHEET 13 OF 23	




					<div><div>SHWE - Detailed Engineering - Field Development Project</div><div>HVAC Equipment List for Technical Building</div></div>																					
					N° SHP-HV-EB-301-0001				Rev: 2		Status: AFC		Discipline: HVAC		Document type: LIS			Rev. Date: 22/12/2010								
Location	Class	System	Number	Code	Description	Location			Service		Dimensions			Design conditions				Weight		Power	Material	Remark	Ducting & Instr. Diagram (SHP-HV-DS-303-0001)	Piping & Instr. Diagram / Overall Single line diagram		
						Platform	Deck	Room No.	Room Description	Service Type	Service Mode	Width or Dia. (mm)	Height (mm)	Length (mm)	Airflow (m³/h)	Capacity (kW)	Static Pressure (pa)	Air Vel. (m/s)	Install Location (Indoor/Outdoor)	Dry (kg)	Operate (kg)				(Volt, Phase, Hz)	-
					Gas Damper																					
SHP	HG	71	501	-	PACU(SHP-HA-71501A) FRESH AIR(GAS SHUT-OFF DAMPER)	SHP	Roof	N/A	HVAC PLANT	F/A	Normal A-60	1000	700	300	12008	N/A	N/A	4.8	Outdoor	80	80	24Vdc	SUS316L	SHP-ME-DD-H01-0001, Sheet 8 of 9	SHEET 8 OF 14	
SHP	HG	71	502	-	PACU(SHP-HA-71501B) FRESH AIR(GAS SHUT-OFF DAMPER)	SHP	Roof	N/A	HVAC PLANT	F/A	Normal A-60	1000	700	300	12008	N/A	N/A	4.8	Outdoor	80	80	24Vdc	SUS316L	SHP-ME-DD-H01-0001, Sheet 8 of 9	SHEET 8 OF 14	



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					N° SHQ-HV-EB-301-0001				Rev: 2		Status: AFC		Discipline: HVAC		Document type: LIS			Rev. Date: 17/01/2011														
Class	Class	System	Number	Code	Description				Platform	Deck	Room No.	Room Description		Service Type	Service Mode	Width or Dia. (mm)	Height (mm)	Length (mm)	Airflow (m³/h)	Capacity (kW)	Static Pressure (pa)	Air Vel. (m/s)	Install Location (Indoor/Outdoor)	Dry (kg)	Operate (kg)	Power (kW)	Material	Remarks	Ducting & Instr. Diagram (SHQ-HV-DS-303-0001)	Piping & Instr. Diagram / Overall Single line diagram (SHQ-HV-DP-301-0003)		
					Gas Dampers																											
SHQ	HG	71	151	-	FRESH AIR INLET				SHQ	ROOF	N/A	CELLAR DECK		F/A	ALL A-60	1800	1300	300	36162	N/A	N/A	4.3	Outdoor	190	190	24Vdc	SUS316L	SHQ-ME-DD-H01-0001, SHEET 13 OF 14		SHEET 10 OF 23		
SHQ	HG	71	152	-	FRESH AIR INLET				SHQ	L0	N/A	ROOF		F/A	ALL A-60	1800	1300	300	36162	N/A	N/A	4.3	Outdoor	190	190	24Vdc	SUS316L	SHQ-ME-DD-H01-0001, SHEET 13 OF 14		SHEET 11 OF 23		




					<div><div></div><div>SHWE - Detailed Engineering - Field Development Project</div><div>HVAC Equipment List for Technical Building</div></div>																					
					N° SHP-HV-EB-301-0001				Rev: 2		Status: AFC		Discipline: HVAC		Document type: LIS				Rev. Date: 22/12/2010							
Location	Class	System	Number	Code	Description	Location			Service		Dimensions			Design conditions				Weight		Power		Material		Remark	Ducting & Instr. Diagram (SHP-HV-DS-303-0001)	Piping & Instr. Diagram / Overall Single line diagram
						Platform	Deck	Room No.	Room Description	Service Type	Service Mode	Width or Dia. (mm)	Height (mm)	Length (mm)	Airflow (m³/h)	Capacity (kW)	Static Pressure (pa)	Air Vel. (m/s)	Install Location (Indoor/Outdoor)	Dry (kg)	Operate (kg)	(Volt, Phase, Hz)	-			
					Electric Balancing Dampers																					
SHP	HD	71	501	-	PACU(SHP-HA-71501A) RETURN AIR	SHP	L2	T204	HVAC PLANT	R/A	Normal	1650	1100	200	40159	N/A	N/A	6.1	Assembled PACU	129	129	24Vdc	SUS316L	SHP-ME-DD-H01-0002, Sheet 3 of 8	SHEET 8 OF 14	
SHP	HD	71	502	-	PACU(SHP-HA-71501B) RETURN AIR	SHP	L2	T204	HVAC PLANT	R/A	Normal	1650	1100	200	40159	N/A	N/A	6.1	Assembled PACU	129	129	24Vdc	SUS316L	SHP-ME-DD-H01-0002, Sheet 3 of 8	SHEET 8 OF 14	
SHP	HD	71	503	-	PACU(SHP-HA-71501A) FRESH AIR	SHP	L2	T204	HVAC PLANT	F/A	Normal	550	1100	200	12008	N/A	N/A	5.5	Assembled PACU	68	68	24Vdc	SUS316L	SHP-ME-DD-H01-0002, Sheet 3 of 8	SHEET 8 OF 14	
SHP	HD	71	504	-	PACU(SHP-HA-71501B) FRESH AIR	SHP	L2	T204	HVAC PLANT	F/A	Normal	550	1100	200	12008	N/A	N/A	5.5	Assembled PACU	68	68	24Vdc	SUS316L	SHP-ME-DD-H01-0002, Sheet 3 of 8	SHEET 8 OF 14	




																						SHWE - Detailed Engineering - Field Development Project HVAC Equipment List with Tags for Living Quarter													
					N° SHQ-HV-EB-301-0001					Rev: 2		Status: AFC		Discipline:HVAC		Document type: LIS			Rev. Date: 17/01/2011																
Class	Class	System	Number	Code	Description	Platform	Deck	Room No.	Location Room Description	Service		Dimensions			Design conditions				Weight		Power		Material	Remarks	Ducting & Instr. Diagram (SHQ-HV-DS-303-0001)	Piping & Instr. Diagram / Overall Single line diagram (SHQ-HV-DP-301-0003)									
										Service Type	Service Mode	Width or Dia. (mm)	Height (mm)	Length (mm)	Airflow (m³/h)	Capacity (kW)	Static Pressure (pa)	Air Vel. (m/s)	Install Location (Indoor/Outdoor)	Dry (kg)	Operate (kg)	(kW)													
					Electric Modulating Dampers																														
SHQ	HD	71	103	-	PACU(SHQ-HA-71102A) Return Air	SHQ	L5	507	HVAC PLANT	R/A	Emergency	1000	650	200	13978	N/A	N/A	6.0	Indoor	63	63	24Vdc	SUS316L	SHQ-ME-DD-H01-0002, SHEET 3 OF 7	SHEET 11 OF 23										
SHQ	HD	71	104	-	PACU(SHQ-HA-71102A) Fresh Air	SHQ	L5	507	HVAC PLANT	F/A	Emergency	450	650	200	7628	N/A	N/A	7.2	Indoor	43	43	24Vdc	SUS316L	SHQ-ME-DD-H01-0002, SHEET 3 OF 7	SHEET 11 OF 23										
SHQ	HD	71	105	-	PACU(SHQ-HA-71102B) Return Air	SHQ	L5	507	HVAC PLANT	R/A	Emergency	1000	650	200	13978	N/A	N/A	6.0	Indoor	63	63	24Vdc	SUS316L	SHQ-ME-DD-H01-0002, SHEET 3 OF 7	SHEET 11 OF 23										
SHQ	HD	71	106	-	PACU(SHQ-HA-71102B) Fresh Air	SHQ	L5	507	HVAC PLANT	F/A	Emergency	450	650	200	7628	N/A	N/A	7.2	Indoor	43	43	24Vdc	SUS316L	SHQ-ME-DD-H01-0002, SHEET 3 OF 7	SHEET 11 OF 23										
SHQ	HD	71	107	-	PACU(SHQ-HA-71101A) Return Air	SHQ	L5	507	HVAC PLANT	R/A	Normal	1600	900	200	36796	N/A	N/A	7.4	Indoor	110	110	24Vdc	SUS316L	SHQ-ME-DD-H01-0002, SHEET 3 OF 7	SHEET 10 OF 23										
SHQ	HD	71	108	-	PACU(SHQ-HA-71101A) Fresh Air	SHQ	L5	507	HVAC PLANT	F/A	Normal	1600	900	200	28534	N/A	N/A	5.7	Indoor	110	110	24Vdc	SUS316L	SHQ-ME-DD-H01-0002, SHEET 3 OF 7	SHEET 10 OF 23										
SHQ	HD	71	109	-	PACU(SHQ-HA-71101B) Return Air	SHQ	L5	507	HVAC PLANT	R/A	Normal	1600	900	200	36796	N/A	N/A	7.4	Indoor	110	110	24Vdc	SUS316L	SHQ-ME-DD-H01-0002, SHEET 3 OF 7	SHEET 10 OF 23										
SHQ	HD	71	110	-	PACU(SHQ-HA-71101B) Fresh Air	SHQ	L5	507	HVAC PLANT	F/A	Normal	1600	900	200	28534	N/A	N/A	5.7	Indoor	110	110	24Vdc	SUS316L	SHQ-ME-DD-H01-0002, SHEET 3 OF 7	SHEET 10 OF 23										




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					N° SHP-HV-EB-301-0001				Rev: 2		Status: AFC		Discipline: HVAC		Document type: LIS				Rev. Date: 22/12/2010																						
Location	Class	System	Number	Code	Description	Platform	Deck	Room No.	Room Description	Service Type	Service Mode	Width or Dia. (mm)	Height (mm)	Length (mm)	Airflow (m³/h)	Capacity (kW)	Static Pressure (pa)	Air Vel. (m/s)	Install Location (Indoor/Outdoor)	Dry (kg)	Operate (kg)	(Volt, Phase, Hz)	-	Remark	Ducting & Instr. Diagram (SHP-HV-DS-303-0001)	Piping & Instr. Diagram / Overall Single line diagram															
																											Location		Service		Dimensions			Design conditions					Weight		Power
					Shut -Off Dampers (Elec. Actuator)																																				
SHP	HQ	71	501	-	PACU(SHP-HA-71501A) SUPPLY AIR	SHP	L2	T204	HVAC PLANT	S/A	Normal	1000	1000	200	52167	N/A	N/A	14.5	Assembled PACU	83	83	24Vdc	SUS316L	SHP-ME-DA-H01-0001, Sheet 2 of 7	SHEET 8 OF 14																
SHP	HQ	71	502	-	PACU(SHP-HA-71501B) SUPPLY AIR	SHP	L2	T204	HVAC PLANT	S/A	Normal	1000	1000	200	52167	N/A	N/A	14.5	Assembled PACU	83	83	24Vdc	SUS316L	SHP-ME-DA-H01-0001, Sheet 5 of 7	SHEET 8 OF 14																
SHP	HQ	71	503	-	LABORATORY EXHAUST FAN(SHP-HK-71504A) INLET	SHP	L2	N/A	L2 ON DECK	M/E	Normal	400	400	200	3948	N/A	N/A	6.9	Outdoor	32	32	24Vdc	SUS316L	SHP-ME-DD-H01-0002, Sheet 7 of 8	SHEET 9 OF 14																
SHP	HQ	71	504	-	LABORATORY EXHAUST FAN(SHP-HK-71504B) INLET	SHP	L2	N/A	L2 ON DECK	M/E	Normal	400	400	200	3948	N/A	N/A	6.9	Outdoor	32	32	24Vdc	SUS316L	SHP-ME-DD-H01-0002, Sheet 7 of 8	SHEET 9 OF 14																
SHP	HQ	71	505	-	L2, AIR CONDITIONED STORE BLOWN AIR DUCTWORK	SHP	L0	T202	A/C STORE	S/A	Normal	300	200	200	1583	N/A	N/A	7.3	Indoor	22	22	24Vdc	SUS316L	SHP-ME-DD-H01-0002, Sheet 6 of 8	SHEET 9 OF 14																
SHP	HQ	71	506	-	BATTERY ROOM EXHAUST FAN(SHP-HK-71505A) INLET	SHP	L2	N/A	L2 ON DECK	M/E	Normal	400	400	200	3168	N/A	N/A	5.5	Outdoor	32	32	24Vdc	SUS316L	SHP-ME-DD-H01-0002, Sheet 7 of 8	SHEET 11 OF 14																
SHP	HQ	71	507	-	BATTERY ROOM EXHAUST FAN(SHP-HK-71505B) INLET	SHP	L2	N/A	L2 ON DECK	M/E	Normal	400	400	200	3168	N/A	N/A	5.5	Outdoor	32	32	24Vdc	SUS316L	SHP-ME-DD-H01-0002, Sheet 7 of 8	SHEET 11 OF 14																
SHP	HQ	71	508	-	WORKSHOP EXHAUST FAN(SHP-HK-71506A) INLET	SHP	L2	N/A	UNDER L2	M/E	Normal	630	630	200	3539	N/A	N/A	2.5	Outdoor	49	49	24Vdc	SUS316L	SHP-ME-DD-H01-0002, Sheet 7 of 8	SHEET 12 OF 14																
SHP	HQ	71	509	-	WORKSHOP EXHAUST FAN(SHP-HK-71506B) INLET	SHP	L2	N/A	UNDER L2	M/E	Normal	630	630	200	3539	N/A	N/A	2.5	Outdoor	49	49	24Vdc	SUS316L	SHP-ME-DD-H01-0002, Sheet 7 of 8	SHEET 12 OF 14																
SHP	HQ	71	510	-	E&I WORKSHOP BLOWN AIR DUCTWORK	SHP	L0	T003	E&I WORKSHOP	S/A	Normal	500	300	200	3637	N/A	N/A	6.7	Indoor	31	31	24Vdc	SUS316L	SHP-ME-DD-H01-0002, Sheet 6 of 8	SHEET 12 OF 14																
SHP	HQ	71	511	-	WELDING W/S & STORAGE AREA SUPPLY FAN (SHP-HK-71507A) INLET	SHP	ROOF	N/A	ROOF	M/E	Normal	630	630	200	4070	N/A	N/A	2.8	Outdoor	49	49	24Vdc	SUS316L	SHP-ME-DD-H01-0002, Sheet 7 of 8	SHEET 14 OF 14																
SHP	HQ	71	512	-	WELDING W/S & STORAGE AREA SUPPLY FAN (SHP-HK-71507B) INLET	SHP	ROOF	N/A	ROOF	M/E	Normal	630	630	200	4070	N/A	N/A	2.8	Outdoor	49	49	24Vdc	SUS316L	SHP-ME-DD-H01-0002, Sheet 7 of 8	SHEET 14 OF 14																
SHP	HQ	71	514	-	PACU(SHP-HA-71501A) FRESH AIR	SHP	ROOF	N/A	HVAC PLANT	F/A	Normal	1000	700	200	12008	N/A	N/A	4.8	Outdoor	66	66	24Vdc	SUS316L	SHP-ME-DD-H01-0002, Sheet 6 of 8	SHEET 8 OF 14																
SHP	HQ	71	515	-	PACU(SHP-HA-71501B) FRESH AIR	SHP	ROOF	N/A	HVAC PLANT	F/A	Normal	1000	700	200	12008	N/A	N/A	4.8	Outdoor	66	66	24Vdc	SUS316L	SHP-ME-DD-H01-0002, Sheet 6 of 8	SHEET 8 OF 14																




																						<div>SHWE - Detailed Engineering - Field Development Project</div> <div>HVAC Equipment List with Tags for Living Quarter</div>																			
						N° SHQ-HV-EB-301-0001						Rev: 2		Status: AFC		Discipline: HVAC		Document type: LIS				Rev. Date: 17/01/2011																			
Class	Class	System	Number	Code	Description	Platform	Location			Service		Dimensions			Design conditions				Weight		Power		Material	Remarks	Ducting & Instr. Diagram (SHQ-HV-DS-303-0001)	Piping & Instr. Diagram / Overall Single line diagram (SHQ-HV-DP-301-0003)															
							Room No.	Room Description		Service Type	Service Mode	Width or Dia. (mm)	Height (mm)	Length (mm)	Airflow (m³/h)	Capacity (kW)	Static Pressure (pa)	Air Vel. (m/s)	Install Location (Indoor/Outdoor)	Dry (Kg)	Operate (kg)	(kW)					-														
Shut-Off Dampers (Elec. Actuator)																																									
SHQ	HQ	71	101	-	TOILET EXHAUST FAN(SHQ-HK-71103A) INLET	SHQ	L5	N/A	L5 On Deck	M/E	Normal	400	400	200	2668	N/A	N/A	4.6	Outdoor	38	38	24Vdc	SUS316L	SHQ-ME-DD-H01-0002, SHEET 6 OF 7	SHEET 23 OF 23																
SHQ	HQ	71	102	-	TOILET EXHAUST FAN(SHQ-HK-71103B) INLET	SHQ	L5	N/A	L5 On Deck	M/E	Normal	400	400	200	2668	N/A	N/A	4.6	Outdoor	38	38	24Vdc	SUS316L	SHQ-ME-DD-H01-0002, SHEET 6 OF 7	SHEET 23 OF 23																
SHQ	HQ	71	103	-	GALLEY EXHAUST FAN(SHQ-HK-71104A) INLET	SHQ	L1	N/A	L1 On Deck	M/E	Normal	710	710	200	14600	N/A	N/A	8.0	Outdoor	52	52	24Vdc	SUS316L	SHQ-ME-DD-H01-0002, SHEET 6 OF 7	SHEET 23 OF 23																
SHQ	HQ	71	104	-	GALLEY EXHAUST FAN(SHQ-HK-71104B) INLET	SHQ	L1	N/A	L1 On Deck	M/E	Normal	710	710	200	14600	N/A	N/A	8.0	Outdoor	52	52	24Vdc	SUS316L	SHQ-ME-DD-H01-0002, SHEET 6 OF 7	SHEET 23 OF 23																
SHQ	HQ	71	105	-	GENERAL EXHAUST FAN(SHQ-HK-71105A) INLET	SHQ	L5	N/A	L5 On Deck	M/E	Normal	400	400	200	2424	N/A	N/A	4.2	Outdoor	38	38	24Vdc	SUS316L	SHQ-ME-DD-H01-0002, SHEET 6 OF 7	SHEET 23 OF 23																
SHQ	HQ	71	106	-	GENERAL EXHAUST FAN(SHQ-HK-71105B) INLET	SHQ	L5	N/A	L5 On Deck	M/E	Normal	400	400	200	2424	N/A	N/A	4.2	Outdoor	38	38	24Vdc	SUS316L	SHQ-ME-DD-H01-0002, SHEET 6 OF 7	SHEET 23 OF 23																
SHQ	HQ	71	107	-	LAUNDRY EXHAUST FAN(SHQ-HK-71106A) INLET	SHQ	L0	N/A	L0 On Deck	M/E	Normal	450	450	200	5420	N/A	N/A	7.4	Outdoor	42	42	24Vdc	SUS316L	SHQ-ME-DD-H01-0002, SHEET 6 OF 7	SHEET 23 OF 23																
SHQ	HQ	71	108	-	LAUNDRY EXHAUST FAN(SHQ-HK-71106B) INLET	SHQ	L0	N/A	L0 On Deck	M/E	Normal	450	450	200	5420	N/A	N/A	7.4	Outdoor	42	42	24Vdc	SUS316L	SHQ-ME-DD-H01-0002, SHEET 6 OF 7	SHEET 23 OF 23																
SHQ	HQ	71	109	-	CLINIC EXHAUST FAN(SHQ-HK-71107) INLET	SHQ	L5	N/A	L5 On Deck	M/E	Normal	500	300	200	1649	N/A	N/A	3.1	Outdoor	36	36	24Vdc	SUS316L	SHQ-ME-DD-H01-0002, SHEET 6 OF 7	SHEET 23 OF 23																
SHQ	HQ	71	110	-	STAIRWAY SUPPLY FAN(SHQ-HK-71108) INLET	SHQ	L5	N/A	L5 On Deck	M/E	Pressurization	400	400	200	3220	N/A	N/A	5.6	Outdoor	38	38	24Vdc	SUS316L	SHQ-ME-DD-H01-0002, SHEET 6 OF 7	SHEET 23 OF 23																
SHQ	HQ	71	111	-	PACU(SHQ-HA-71101A,101B,102A,102B) Fresh Air	SHQ	L5	507	HVAC PLANT	F/A	ALL	1600	1300	200	36699	N/A	N/A	4.8	Indoor	110	110	24Vdc	SUS316L	SHQ-ME-DD-H01-0002, SHEET 6 OF 7	SHEET 12 OF 23																
SHQ	HQ	71	112	-	PACU(SHQ-HA-71101A,101B,102A,102B) Fresh Air	SHQ	L5	507	HVAC PLANT	F/A	ALL	1600	1300	200	36699	N/A	N/A	4.8	Indoor	110	110	24Vdc	SUS316L	SHQ-ME-DD-H01-0002, SHEET 6 OF 7	SHEET 12 OF 23																
SHQ	HQ	71	113	-	PACU(SHQ-HA-71102A) Supply Air	SHQ	L5	507	HVAC PLANT	S/A	Emer'cy	1400	700	200	21606	N/A	N/A	6.1	Indoor	84	84	24Vdc	SUS316L	SHQ-ME-DD-H01-0002, SHEET 6 OF 7	SHEET 11 OF 23																
SHQ	HQ	71	114	-	PACU(SHQ-HA-71102B) Supply Air	SHQ	L5	507	HVAC PLANT	S/A	Emer'cy	1400	700	200	21606	N/A	N/A	6.1	Indoor	84	84	24Vdc	SUS316L	SHQ-ME-DD-H01-0002, SHEET 6 OF 7	SHEET 11 OF 23																
SHQ	HQ	71	115	-	PACU(SHQ-HA-71101A) Supply Air	SHQ	L5	507	HVAC PLANT	S/A	Normal	2300	1200	200	67672	N/A	N/A	6.8	Indoor	210	210	24Vdc	SUS316L	SHQ-ME-DD-H01-0002, SHEET 6 OF 7	SHEET 10 OF 23																
SHQ	HQ	71	116	-	PACU(SHQ-HA-71101B) Supply Air	SHQ	L5	507	HVAC PLANT	S/A	Normal	2300	1200	200	67672	N/A	N/A	6.8	Indoor	210	210	24Vdc	SUS316L	SHQ-ME-DD-H01-0002, SHEET 6 OF 7	SHEET 10 OF 23																
SHQ	HQ	71	117	-	PACU(SHQ-HA-71101A,101B) Supply Air	SHQ	L5	N/A	HVAC PLANT	S/A	Normal By-pass	400	600	200	N/A	N/A	N/A	N/A	Indoor	38	38	24Vdc	SUS316L	SHQ-ME-DD-H01-0002, SHEET 6 OF 7	SHEET 12 OF 23																




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					N° SHP-HV-EB-301-0001				Rev: 2		Status: AFC		Discipline HVAC		Document type: LIS			Rev. Date: 22/12/2010										
Location	Class	System	Number	Code	Description	Platform	Location			Service		Dimensions			Design conditions					Weight		Power		Material	Remark	Ducting & Instr. Diagram (SHP-HV-DS-303-0001)	Piping & Instr. Diagram / Overall Single line diagram	
							Deck	Room No.	Room Description	Service Type	Service Mode	Width or Dia. (mm)	Height (mm)	Length (mm)	Airflow (m³/h)	Capacity (kW)	Static Pressure (pa)	Air Vel. (m/s)	Install Location (Indoor/Outdoor)	Dry (kg)	Operate (kg)	(Volt, Phase, Hz)	-					
					Balancing Dampers																							
SHP	HN	71	501	-	PACU(SHP-HA-71501A) SUPPLY AIR	SHP	L2	T204	HVAC PLANT	S/A	Normal	1200	1400	200	52167	N/A	N/A	8.6	Indoor	118	118	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 5 of 14	SHEET 8 OF 14			
SHP	HN	71	502	-	PACU(SHP-HA-71501B) SUPPLY AIR	SHP	L2	T204	HVAC PLANT	S/A	Normal	1200	1400	200	52167	N/A	N/A	8.6	Indoor	118	118	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 5 of 14	SHEET 8 OF 14			
SHP	HN	71	503	-	HVAC PLANT ROOM	SHP	L2	T204	HVAC PLANT	S/A	Normal	900	700	200	14773	N/A	N/A	6.5	Indoor	57	57	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 5 of 14	SHEET 9 OF 14			
SHP	HN	71	504	-	HVAC PLANT ROOM	SHP	L2	T204	HVAC PLANT	S/A	Normal	700	600	200	10828	N/A	N/A	7.2	Indoor	45	45	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 5 of 14	SHEET 9 OF 14			
SHP	HN	71	505	-	HVAC PLANT ROOM	SHP	L2	T204	HVAC PLANT	S/A	Normal	400	300	200	3168	N/A	N/A	7.3	Indoor	24	24	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 5 of 14	SHEET 9 OF 14			
SHP	HN	71	506	-	HVAC PLANT ROOM	SHP	L2	T204	HVAC PLANT	S/A	Normal	500	400	200	4022	N/A	N/A	5.6	Indoor	30	30	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 5 of 14	SHEET 9 OF 14			
SHP	HN	71	507	-	HVAC PLANT ROOM	SHP	L2	T204	HVAC PLANT	S/A	Normal	400	300	200	3027	N/A	N/A	7.0	Indoor	24	24	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 5 of 14	SHEET 9 OF 14			
SHP	HN	71	508	-	HVAC PLANT ROOM	SHP	L2	T204	HVAC PLANT	R/A	Normal	600	500	200	7112	N/A	N/A	6.6	Indoor	37	37	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 5 of 14	SHEET 9 OF 14			
SHP	HN	71	509	-	HVAC PLANT ROOM	SHP	L2	T204	HVAC PLANT	R/A	Normal	500	400	200	4070	N/A	N/A	5.7	Indoor	30	30	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 5 of 14	SHEET 9 OF 14			
SHP	HN	71	510	-	HVAC PLANT ROOM	SHP	L2	T204	HVAC PLANT	R/A	Normal	1000	700	200	14487	N/A	N/A	5.7	Indoor	61	61	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 5 of 14	SHEET 9 OF 14			
SHP	HN	71	511	-	HVAC PLANT ROOM	SHP	L2	T204	HVAC PLANT	R/A	Normal	1000	700	200	14490	N/A	N/A	5.8	Indoor	61	61	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 5 of 14	SHEET 9 OF 14			
SHP	HN	71	512	-	AIR CONDITIONED STORE	SHP	L2	T202	A/C STORE	S/A	Normal	300	200	200	1583	N/A	N/A	7.3	Indoor	18	18	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 5 of 14	SHEET 9 OF 14			
SHP	HN	71	513	-	HVAC PLANT ROOM	SHP	L2	T204	HVAC PLANT	R/A	Normal	400	300	200	2543	N/A	N/A	5.9	Indoor	24	24	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 5 of 14	SHEET 9 OF 14			
SHP	HN	71	514	-	AIR CONDITIONED STORE	SHP	L2	T202	A/C STORE	R/A	Normal	300	200	200	1218	N/A	N/A	5.6	Indoor	18	18	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 5 of 14	SHEET 9 OF 14			
SHP	HN	71	515	-	AIR CONDITIONED OFFICE	SHP	L2	T202	OFFICE	S/A	Normal	200	100	200	309	N/A	N/A	4.3	Indoor	13	13	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 5 of 14	SHEET 9 OF 14			
SHP	HN	71	516	-	AIR CONDITIONED STORE AIR LOCK	SHP	L2	T202	AL. A/C STORE	S/A	Normal	100	100	200	56	N/A	N/A	1.6	Indoor	11	11	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 5 of 14	SHEET 9 OF 14			
SHP	HN	71	517	-	LABORATORY	SHP	L2	T205	LABORATORY	S/A	Normal	300	200	200	987	N/A	N/A	4.6	Indoor	18	18	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 5 of 14	SHEET 9 OF 14			
SHP	HN	71	518	-	LABORATORY	SHP	L2	T205	LABORATORY	S/A	Normal	300	200	200	987	N/A	N/A	4.6	Indoor	18	18	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 5 of 14	SHEET 9 OF 14			
SHP	HN	71	519	-	LABORATORY AIR LOCK	SHP	L2	T206	AL. LABORATORY	S/A	Normal	100	100	200	74	N/A	N/A	2.1	Indoor	11	11	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 5 of 14	SHEET 9 OF 14			
SHP	HN	71	520	-	LABORATORY	SHP	L2	T205	LABORATORY	M/E	Normal	300	300	200	1500	N/A	N/A	4.6	Indoor	21	21	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 5 of 14	SHEET 9 OF 14			
SHP	HN	71	521	-	LABORATORY	SHP	L2	T205	LABORATORY	M/E	Normal	400	300	200	2448	N/A	N/A	5.7	Indoor	24	24	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 5 of 14	SHEET 9 OF 14			
SHP	HN	71	522	-	ELECTRICAL TECHNICAL ROOM AIR LOCK	SHP	L1	T101	ETR	S/A	Normal	100	100	200	49	N/A	N/A	1.5	Indoor	11	11	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 5 of 14	SHEET 10 OF 14			
SHP	HN	71	523	-	ELECTRICAL TECHNICAL ROOM	SHP	L1	T101	ETR	S/A	Normal	600	300	200	4905	N/A	N/A	7.6	Indoor	28	28	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 5 of 14	SHEET 10 OF 14			
SHP	HN	71	524	-	ELECTRICAL TECHNICAL ROOM	SHP	L1	T101	ETR	S/A	Normal	600	300	200	4906	N/A	N/A	7.6	Indoor	28	28	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 5 of 14	SHEET 10 OF 14			
SHP	HN	71	525	-	AIR CONDITIONED STORE	SHP	L2	T202	A/C STORE	S/A	Normal	200	100	200	486	N/A	N/A	6.8	Indoor	13	13	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 5 of 14	SHEET 9 OF 14			
SHP	HN	71	526	-	HVAC PLANT ROOM	SHP	L2	T204	HVAC PLANT	S/A	Normal	900	700	200	14766	N/A	N/A	6.5	Indoor	57	57	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 5 of 14	SHEET 9 OF 14			
SHP	HN	71	527	-	LABORATORY	SHP	L2	T205	LABORATORY	S/A	Normal	300	200	200	987	N/A	N/A	4.6	Indoor	18	18	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 5 of 14	SHEET 9 OF 14			
SHP	HN	71	528	-	LABORATORY	SHP	L2	T205	LABORATORY	S/A	Normal	300	200	200	987	N/A	N/A	4.6	Indoor	18	18	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 5 of 14	SHEET 9 OF 14			
SHP	HN	71	531	-	ELECTRICAL TECHNICAL ROOM	SHP	L1	T101	ETR	S/A	Normal	600	300	200	4908	N/A	N/A	7.6	Indoor	28	28	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 5 of 14	SHEET 10 OF 14			
SHP	HN	71	532	-	ELECTRICAL TECHNICAL ROOM	SHP	L1	T101	ETR	S/A	Normal	600	300	200	4957	N/A	N/A	7.6	Indoor	28	28	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 5 of 14	SHEET 10 OF 14			
SHP	HN	71	533	-	ELECTRICAL TECHNICAL ROOM	SHP	L1	T101	ETR	S/A	Normal	600	300	200	4908	N/A	N/A	7.6	Indoor	28	28	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 5 of 14	SHEET 10 OF 14			
SHP	HN	71	537	-	ELECTRICAL TECHNICAL ROOM	SHP	L1	T101	ETR	S/A	Normal	600	300	200	4906	N/A	N/A	7.6	Indoor	28	28	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 5 of 14	SHEET 10 OF 14			
SHP	HN	71	538	-	ELECTRICAL TECHNICAL ROOM AIR LOCK	SHP	L1	T101	AL. ETR	S/A	Normal	100	100	200	49	N/A	N/A	1.5	Indoor	11	11	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 5 of 14	SHEET 10 OF 14			
SHP	HN	71	539	-	ELECTRICAL TECHNICAL ROOM	SHP	L1	T101	ETR	R/A	Normal	700	400	200	7245	N/A	N/A	7.2	Indoor	36	36	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 5 of 14	SHEET 10 OF 14			
SHP	HN	71	540	-	ELECTRICAL TECHNICAL ROOM	SHP	L1	T101	ETR	R/A	Normal	700	400	200	7245	N/A	N/A	7.2	Indoor	36	36	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 5 of 14	SHEET 10 OF 14			
SHP	HN	71	542	-	ELECTRICAL TECHNICAL ROOM	SHP	L1	T101	ETR	R/A	Normal	700	400	200	7244	N/A	N/A	7.2	Indoor	36	36	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 5 of 14	SHEET 10 OF 14			
SHP	HN	71	543	-	ELECTRICAL TECHNICAL ROOM	SHP	L1	T101	ETR	R/A	Normal	700	400	200	7243	N/A	N/A	7.2	Indoor	36	36	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 5 of 14	SHEET 10 OF 14			
SHP	HN	71	545	-	BATTERY ROOM	SHP	L1	T103	BATTERY	S/A	Normal	400	300	200	1584	N/A	N/A	3.4	Indoor	24	24	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 5 of 14	SHEET 11 OF 14			
SHP	HN	71	546	-	BATTERY ROOM	SHP	L1	T103	BATTERY	S/A	Normal	400	300	200	1584	N/A	N/A	3.4	Indoor	24	24	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 5 of 14				




					<div></div> <div>SHWE - Detailed Engineering - Field Development Project</div> <div>HVAC Equipment List for Technical Building</div>																								
					N° SHP-HV-EB-301-0001				Rev: 2		Status: AFC		Discipline HVAC		Document type: LIS		Rev. Date: 22/12/2010												
Location	Class	System	Number	Code	Description	Platform	Location			Service		Dimensions			Design conditions				Weight		Power		Material	Remark	Ducting & Instr. Diagram (SHP-HV-DS-303-0001)	Piping & Instr. Diagram / Overall Single line diagram			
							Deck	Room No.	Room Description	Service Type	Service Mode	Width or Dia. (mm)	Height (mm)	Length (mm)	Airflow (m³/h)	Capacity (kW)	Static Pressure (pa)	Air Vel. (m/s)	Install Location (Indoor/Outdoor)	Dry (kg)	Operate (kg)	(Volt, Phase, Hz)					-		
					Balancing Dampers																								
SHP	HN	71	553	-	E/I WORKSHOP	SHP	L0	T003	E/I W/SHOP	S/A	Normal	200	100	200	355	N/A	N/A	4.9	Indoor	13	13	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 5 of 14	SHEET 12 OF 14				
SHP	HN	71	554	-	E/I WORKSHOP AIR LOCK	SHP	L0	T003	AL. E/I WORKSHOP	S/A	Normal	100	100	200	49	N/A	N/A	1.4	Indoor	11	11	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 5 of 14	SHEET 12 OF 14				
SHP	HN	71	555	-	E/I WORKSHOP	SHP	L0	T003	E/I W/SHOP	R/A	Normal	200	200	200	711	N/A	N/A	4.9	Indoor	16	16	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 5 of 14	SHEET 12 OF 14				
SHP	HN	71	556	-	E/I WORKSHOP	SHP	L0	T003	E/I W/SHOP	R/A	Normal	200	200	200	711	N/A	N/A	4.9	Indoor	16	16	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 5 of 14	SHEET 12 OF 14				
SHP	HN	71	557	-	MECH. WORKSHOP	SHP	L0	T001	MECH. W/SHOP	S/A	Normal	300	300	200	2166	N/A	N/A	6.7	Indoor	21	21	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 5 of 14	SHEET 12 OF 14				
SHP	HN	71	558	-	MECH. WORKSHOP	SHP	L0	T001	MECH. W/SHOP	S/A	Normal	300	200	200	706	N/A	N/A	3.3	Indoor	26	26	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 5 of 14	SHEET 12 OF 14				
SHP	HN	71	559	-	MECH. WORKSHOP	SHP	L0	T001	MECH. W/SHOP	S/A	Normal	300	200	200	705	N/A	N/A	3.3	Indoor	26	26	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 5 of 14	SHEET 12 OF 14				
SHP	HN	71	560	-	MECH. WORKSHOP	SHP	L0	T001	MECH. W/SHOP	S/A	Normal	100	100	200	49	N/A	N/A	1.4	Indoor	18	18	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 5 of 14	SHEET 12 OF 14				
SHP	HN	71	561	-	E/I WORKSHOP	SHP	L0	T001	E/I W/SHOP	R/A	Normal	200	200	200	706	N/A	N/A	4.9	Indoor	23	23	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 5 of 14	SHEET 12 OF 14				
SHP	HN	71	562	-	E/I WORKSHOP	SHP	L0	T001	E/I W/SHOP	R/A	Normal	200	200	200	706	N/A	N/A	4.9	Indoor	23	23	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 5 of 14	SHEET 12 OF 14				
SHP	HN	71	563	-	INSTRUMENT EQUIPMENT ROOM	SHP	L0	T005	IER	S/A	Normal	600	500	200	7191	N/A	N/A	6.7	Indoor	49	49	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 5 of 14	SHEET 13 OF 14				
SHP	HN	71	564	-	INSTRUMENT EQUIPMENT ROOM	SHP	L0	T005	IER	S/A	Normal	500	300	200	3602	N/A	N/A	6.7	Indoor	36	36	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 5 of 14	SHEET 13 OF 14				
SHP	HN	71	565	-	INSTRUMENT EQUIPMENT ROOM	SHP	L0	T005	IER	S/A	Normal	500	300	200	3589	N/A	N/A	3.3	Indoor	36	36	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 5 of 14	SHEET 13 OF 14				
SHP	HN	71	569	-	INSTRUMENT EQUIPMENT ROOM	SHP	L0	T005	IER	R/A	Normal	600	500	200	7112	N/A	N/A	6.6	Indoor	49	49	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 5 of 14	SHEET 13 OF 14				
SHP	HN	71	572	-	INSTRUMENT EQUIPMENT ROOM(RAISED FLOOR)	SHP	L0	T005	IER	S/A	Normal	100	100	200	33	N/A	N/A	0.9	Indoor	18	18	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 5 of 14	SHEET 13 OF 14				
SHP	HN	71	575	-	WELDING WORKSHOP	SHP	UPPER	T301	WELD. W/SHOP	S/A	Normal	300	300	200	1330	N/A	N/A	4.1	Indoor	30	30	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 5 of 14	SHEET 14 OF 14				
SHP	HN	71	576	-	WELDING WORKSHOP	SHP	UPPER	T301	WELD. W/SHOP	S/A	Normal	300	300	200	1330	N/A	N/A	4.1	Indoor	30	30	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 5 of 14	SHEET 14 OF 14				
SHP	HN	71	577	-	HEAVY DUTY EQUIPMENT STORAGE	SHP	UPPER	T302	HEAVY DUTY	S/A	Normal	200	100	200	232	N/A	N/A	3.2	Indoor	20	20	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 5 of 14	SHEET 14 OF 14				
SHP	HN	71	578	-	STORAGE AREA	SHP	UPPER	T303	STORAGE AREA	S/A	Normal	200	100	200	238	N/A	N/A	3.3	Indoor	20	20	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 5 of 14	SHEET 14 OF 14				
SHP	HN	71	579	-	MECH. WORKSHOP	SHP	L0	T001	MECH. W/SHOP	S/A	Normal	300	200	200	706	N/A	N/A	3.3	Indoor	26	26	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 5 of 14	SHEET 12 OF 14				
SHP	HN	71	580	-	MECH. WORKSHOP	SHP	L0	T001	MECH. W/SHOP	R/A	Normal	200	200	200	705	N/A	N/A	4.9	Indoor	23	23	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 5 of 14	SHEET 12 OF 14				
SHP	HN	71	582	-	STORE FOR RADIOACTIVE SOURCE	SHP	UPPER	T301	WELD. W/SHOP	S/A	Normal	100	100	200	231	N/A	N/A	6.4	Indoor	18	18	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 5 of 14	SHEET 14 OF 14				
SHP	HN	71	583	-	HEAVY DUTY EQUIPMENT STORAGE	SHP	UPPER	T302	HEAVY DUTY	S/A	Normal	200	100	200	232	N/A	N/A	3.2	Indoor	20	20	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 5 of 14	SHEET 14 OF 14				
SHP	HN	71	584	-	STORAGE AREA	SHP	UPPER	T303	STORAGE AREA	S/A	Normal	200	100	200	238	N/A	N/A	3.3	Indoor	20	20	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 5 of 14	SHEET 14 OF 14				
SHP	HN	71	585	-	STORAGE AREA	SHP	UPPER	T303	STORAGE AREA	S/A	Normal	200	100	200	239	N/A	N/A	3.3	Indoor	20	20	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 5 of 14	SHEET 14 OF 14				
SHP	HN	71	586	-	E/I WORKSHOP	SHP	L0	T003	E/I W/SHOP	S/A	Normal	300	200	200	1472	N/A	N/A	6.8	Indoor	26	26	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 5 of 14	SHEET 12 OF 14				
SHP	HN	71	587	-	E/I WORKSHOP	SHP	L0	T003	E/I W/SHOP	S/A	Normal	200	100	200	356	N/A	N/A	4.9	Indoor	20	20	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 5 of 14	SHEET 12 OF 14				
SHP	HN	71	588	-	E/I WORKSHOP	SHP	L0	T003	E/I W/SHOP	S/A	Normal	200	100	200	355	N/A	N/A	4.9	Indoor	20	20	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 5 of 14	SHEET 12 OF 14				
SHP	HN	71	589	-	LABORATORY	SHP	L2	T205	LABORATORY	M/E	Normal	100	100	200	TBC	N/A	N/A	TBC	Indoor	18	18	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 5 of 14	SHEET 9 OF 14				



					<div><div>SHWE - Detailed Engineering - Field Development Project HVAC Equipment List with Tags for Living Quarter</div></div>																					
					N° SHQ-HV-EB-301-0001				Rev: 2		Status: AFC	Discipline: HVAC		Document type: LIS			Rev. Date: 17/01/2011									
Class	Class	System	Number	Code	Description	Platform	Deck	Room No.	Room Description	Service Type	Service Mode	Dimensions			Design conditions				Weight		Power	Material	Remarks	Ducting & Instr. Diagram (SHQ-HV-DS-303-0001)	Piping & Instr. Diagram / Overall Single line diagram (SHQ-HV-DP-301-0003)	
												Width or Dia. (mm)	Height (mm)	Length (mm)	Airflow (m³/h)	Capacity (kW)	Static Pressure (pa)	Air Vel. (m/s)	Install Location (Indoor/Outdoor)	Dry (kg)	Operate (kg)	(kW)				-
Balancing Dampers																										
SHQ	HN	71	003	-	NORMAL SUPPLY AIR	SHQ	L0	019	GYMNASIUM	S/A	Normal	700	400	200	6489	N/A	N/A	6.4	Indoor	44	44	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 21 OF 23	
SHQ	HN	71	004	-	NORMAL SUPPLY AIR	SHQ	L0	014	CORRIDOR	S/A	Normal	500	400	200	4441	N/A	N/A	6.2	Indoor	35	35	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 21 OF 23	
SHQ	HN	71	005	-	NORMAL RETURN AIR	SHQ	L0	019	GYMNASIUM	R/A	Normal	300	200	200	1185	N/A	N/A	5.5	Indoor	22	22	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 21 OF 23	
SHQ	HN	71	006	-	TOILET EXHAUST AIR	SHQ	L0	007	CARD ROOM	M/E	Normal	200	200	200	268	N/A	N/A	1.9	Indoor	17	17	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 21 OF 23	
SHQ	HN	71	007	-	GENERAL EXHAUST AIR	SHQ	L0	008	POOL ROOM	M/E	Normal	400	300	200	2424	N/A	N/A	5.6	Indoor	29	29	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 21 OF 23	
SHQ	HN	71	008	-	COMPUTER GAME ROOM	SHQ	L0	014	CORRIDOR	S/A	Normal	ø160		220	373	N/A	N/A	5.2	Indoor	1.3	1.3	N/A	GAL'V	SHQ-ME-DD-H01-0003, SHEET 15 OF 15	SHEET 21 OF 23	
SHQ	HN	71	009	-	LAUNDRY	SHQ	L0	015	LAUNDRY	M/E	Normal	500	600	200	5420	N/A	N/A	5.0	Indoor	37	37	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 21 OF 23	
SHQ	HN	71	010	-	LAUNDRY	SHQ	L0	015	LAUNDRY	S/A	Normal	600	400	200	5420	N/A	N/A	6.3	Indoor	42	42	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 21 OF 23	
SHQ	HN	71	011	-	NORMAL RETURN AIR	SHQ	L0	019	GYMNASIUM	R/A	Normal	400	300	200	2897	N/A	N/A	6.7	Indoor	29	29	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 21 OF 23	
SHQ	HN	71	012	-	TOILET	SHQ	L0	020	TOILET	M/E	Normal	ø100		200	84	N/A	N/A	3.0	Indoor	0.7	0.7	N/A	GAL'V	SHQ-ME-DD-H01-0003, SHEET 15 OF 15	SHEET 21 OF 23	
SHQ	HN	71	013	-	GENERAL EXHAUST AIR	SHQ	L0	024	FEMALE CHANGING ROOM	M/E	Normal	ø100		200	142	N/A	N/A	5.0	Indoor	0.7	0.7	N/A	GAL'V	SHQ-ME-DD-H01-0003, SHEET 15 OF 15	SHEET 21 OF 23	
SHQ	HN	71	014	-	TOILET & SHOWER	SHQ	L0	022	CHANGING ROOM	S/A	Normal	ø160		200	268	N/A	N/A	3.7	Indoor	1.3	1.3	N/A	GAL'V	SHQ-ME-DD-H01-0003, SHEET 15 OF 15	SHEET 21 OF 23	
SHQ	HN	71	015	-	CHANGING ROOM & TOILET	SHQ	L0	022	CHANGING ROOM	S/A	Normal	ø100		200	142	N/A	N/A	5.0	Indoor	0.7	0.7	N/A	GAL'V	SHQ-ME-DD-H01-0003, SHEET 15 OF 15	SHEET 21 OF 23	
SHQ	HN	71	016	-	CHANGING ROOM	SHQ	L0	022	CHANGING ROOM	S/A	Normal	200	200	200	884	N/A	N/A	6.1	Indoor	20	20	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 21 OF 23	
SHQ	HN	71	017	-	SMOKING ROOM	SHQ	L0	010	SMOKING ROOM	S/A	Normal	300	200	200	1398	N/A	N/A	6.5	Indoor	22	22	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 21 OF 23	
SHQ	HN	71	018	-	NORMAL SUPPLY AIR	SHQ	L0	006	HVAC SHAFT	S/A	Normal	200	200	200	493	N/A	N/A	3.4	Indoor	17	17	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 21 OF 23	
SHQ	HN	71	019	-	CHANGING ROOM	SHQ	L0	022	CHANGING ROOM	M/E	Normal	300	200	200	1398	N/A	N/A	6.5	Indoor	22	22	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 21 OF 23	
SHQ	HN	71	024	-	CORRIDOR & GOODS LIFT	SHQ	L0	013	CORRIDOR	S/A	Normal	200	200	200	646	N/A	N/A	3.4	Indoor	17	17	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 21 OF 23	
SHQ	HN	71	025	-	CORRIDOR	SHQ	L0	014	CORRIDOR	S/A	Normal	ø100		200	110	N/A	N/A	3.9	Indoor	0.7	0.7	N/A	GAL'V	SHQ-ME-DD-H01-0003, SHEET 15 OF 15	SHEET 21 OF 23	
SHQ	HN	71	026	-	CARD ROOM	SHQ	L0	014	CORRIDOR	S/A	Normal	200	200	200	745	N/A	N/A	5.2	Indoor	17	17	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 21 OF 23	
SHQ	HN	71	031	-	STAIR	SHQ	L0	004	STAIR	S/A	Emergency	300	240	200	1607	N/A	N/A	6.2	Indoor	23	23	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 22 OF 23	
SHQ	HN	71	032	-	T.V. ROOM(1)	SHQ	L0	017	T.V. ROOM(1)	S/A	Emergency	300	300	200	1918	N/A	N/A	5.9	Indoor	25	25	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 22 OF 23	
SHQ	HN	71	033	-	T.V. ROOM(2)	SHQ	L0	018	T.V. ROOM(2)	S/A	Emergency	300	300	200	1918	N/A	N/A	5.9	Indoor	25	25	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 22 OF 23	
SHQ	HN	71	034	-	GYMNASIUM	SHQ	L0	019	GYMNASIUM	S/A	Emergency	300	200	200	1278	N/A	N/A	5.9	Indoor	22	22	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 22 OF 23	
SHQ	HN	71	035	-	T.V. ROOM(2)	SHQ	L0	018	T.V. ROOM(2)	R/A	Emergency	200	300	200	960	N/A	N/A	4.4	Indoor	22	22	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 22 OF 23	
SHQ	HN	71	036	-	T.V. ROOM(2)	SHQ	L0	018	T.V. ROOM(2)	R/A	Emergency	200	300	200	968	N/A	N/A	4.4	Indoor	22	22	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 22 OF 23	
SHQ	HN	71	037	-	T.V. ROOM(2)	SHQ	L0	018	T.V. ROOM(2)	R/A	Emergency	300	300	200	1920	N/A	N/A	5.9	Indoor	25	25	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 22 OF 23	
SHQ	HN	71	038	-	EMERGENCY RETURN AIR	SHQ	L0	018	T.V. ROOM(2)	R/A	Emergency	500	300	200	3836	N/A	N/A	7.1	Indoor	31	31	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 22 OF 23	
SHQ	HN	71	040	-	EMERGENCY SUPPLY AIR	SHQ	L0	013	CORRIDOR	S/A	Emergency	600	500	200	6721	N/A	N/A	6.2	Indoor	42	42	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 22 OF 23	
SHQ	HN	71	051	-	DINING ROOM	SHQ	L1	117	DINING ROOM	S/A	Normal	400	200	200	1746	N/A	N/A	6.1	Indoor	27	27	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 20 OF 23	
SHQ	HN	71	053	-	DINING ROOM	SHQ	L1	117	DINING ROOM	S/A	Normal	900	600	200	11808	N/A	N/A	6.1	Indoor	57	57	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 20 OF 23	
SHQ	HN	71	054	-	NORMAL SUPPLY AIR	SHQ	L1	108	CATERING CHANGING ROOM	S/A	Normal	400	300	200	1768	N/A	N/A	4.1	Indoor	29	29	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 20 OF 23	
SHQ	HN	71	055	-	TOILET EXHAUST AIR	SHQ	L1	108	CATERING CHANGING ROOM	M/E	Normal	200	200	200	323	N/A	N/A	2.4	Indoor	20	20	N/A	SUS3			




					<div><div>SHWE - Detailed Engineering - Field Development Project HVAC Equipment List with Tags for Living Quarter</div></div>																								
					N° SHQ-HV-EB-301-0001				Rev: 2		Status: AFC	Discipline: HVAC		Document type: LIS			Rev. Date: 17/01/2011												
Class	Class	System	Number	Code	Description	Platform	Deck	Room No.	Room Description	Service		Dimensions			Design conditions				Weight		Power	Material	Remarks	Ducting & Instr. Diagram (SHQ-HV-DS-303-0001)	Piping & Instr. Diagram / Overall Single line diagram (SHQ-HV-DP-301-0003)				
										Service Type	Service Mode	Width or Dia. (mm)	Height (mm)	Length (mm)	Airflow (m³/h)	Capacity (kW)	Static Pressure (pa)	Air Vel. (m/s)	Install Location (Indoor/Outdoor)	Dry (kg)	Operate (kg)	(kW)				-			
					Balancing Dampers																								
SHQ	HN	71	086	-	NORMAL SUPPLY AIR	SHQ	L2	207	MALE TOILET	S/A	Normal	400	300	200	2574	N/A	N/A	6.0	Indoor	29	29	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 18 OF 23				
SHQ	HN	71	087	-	NORMAL SUPPLY AIR	SHQ	L2	217	CORRIDOR	S/A	Normal	700	500	200	7047	N/A	N/A	5.6	Indoor	45	45	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 18 OF 23				
SHQ	HN	71	088	-	TOILET EXHAUST AIR	SHQ	L2	217	CORRIDOR	M/E	Normal	200	200	200	152	N/A	N/A	1.1	Indoor	20	20	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 18 OF 23				
SHQ	HN	71	089	-	NORMAL SUPPLY AIR	SHQ	L2	223	DRILL. SUPERVISOR OFFICE	S/A	Normal	300	300	200	1539	N/A	N/A	4.8	Indoor	25	25	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 18 OF 23				
SHQ	HN	71	090	-	NORMAL RETURN AIR	SHQ	L2	224	SAFETY OFFICER OFFICE	R/A	Normal	400	300	200	2134	N/A	N/A	4.9	Indoor	29	29	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 18 OF 23				
SHQ	HN	71	091	-	TECHNICAL LIBRARY	SHQ	L2	220	TECH. LIBRARY	S/A	Normal	200	200	200	932	N/A	N/A	6.5	Indoor	20	20	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 18 OF 23				
SHQ	HN	71	092	-	NORMAL RETURN AIR	SHQ	L2	224	SAFETY OFFICER OFFICE	R/A	Normal	300	300	200	1703	N/A	N/A	5.3	Indoor	25	25	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 18 OF 23				
SHQ	HN	71	094	-	NORMAL RETURN AIR	SHQ	L2	224	SAFETY OFFICER OFFICE	R/A	Normal	600	500	200	6778	N/A	N/A	6.3	Indoor	42	42	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 18 OF 23				
SHQ	HN	71	095	-	CORRIDOR	SHQ	L2	217	CORRIDOR	S/A	Normal	200	200	200	334	N/A	N/A	2.3	Indoor	23	23	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 18 OF 23				
SHQ	HN	71	096	-	NORMAL SUPPLY AIR	SHQ	L2	223	DRILL. SUPERVISOR OFFICE	S/A	Normal	400	300	200	2450	N/A	N/A	5.7	Indoor	29	29	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 18 OF 23				
SHQ	HN	71	111	-	STORE & JANITOR	SHQ	L2	202	STORE & JANITOR	S/A	Emergency	200	100	200	226	N/A	N/A	3.1	Indoor	17	17	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 19 OF 23				
SHQ	HN	71	112	-	TELECOM EQUIPMENT ROOM	SHQ	L2	212	TELECOM EQUIP. ROOM	S/A	Emergency	500	400	200	4947	N/A	N/A	6.9	Indoor	35	35	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 19 OF 23				
SHQ	HN	71	113	-	CENTRAL CONTROL ROOM	SHQ	L2	213	CENTRAL CONT. ROOM	S/A	Emergency	300	250	200	1560	N/A	N/A	5.8	Indoor	25	25	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 19 OF 23				
SHQ	HN	71	114	-	EMERGENCY COMMAND CENTRE	SHQ	L2	214	EMERGENCY COMM. CENTRE	S/A	Emergency	200	200	200	581	N/A	N/A	4.0	Indoor	20	20	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 19 OF 23				
SHQ	HN	71	115	-	CORRIDOR	SHQ	L2	217	CORRIDOR	R/A	Emergency	200	100	200	226	N/A	N/A	3.1	Indoor	17	17	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 19 OF 23				
SHQ	HN	71	116	-	TELECOM EQUIPMENT ROOM	SHQ	L2	212	TELECOM EQUIPMENT ROOM	R/A	Emergency	500	250	200	3105	N/A	N/A	6.9	Indoor	30	30	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 19 OF 23				
SHQ	HN	71	117	-	CENTRAL CONTROL ROOM	SHQ	L2	213	CENTRAL CONT. ROOM	R/A	Emergency	300	250	200	1560	N/A	N/A	5.8	Indoor	24	24	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 19 OF 23				
SHQ	HN	71	118	-	EMERGENCY COMMAND CENTRE	SHQ	L2	214	EMERGENCY COMM. CENTRE	R/A	Emergency	200	200	200	581	N/A	N/A	4.0	Indoor	20	20	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 19 OF 23				
SHQ	HN	71	119	-	EMERGENCY RETURN AIR	SHQ	L2	224	DRILLING SUP. OFFICE	R/A	Emergency	700	500	200	8535	N/A	N/A	6.8	Indoor	45	45	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 19 OF 23				
SHQ	HN	71	120	-	RADIO ROOM	SHQ	L2	229	RADIO ROOM	S/A	Emergency	300	200	200	1197	N/A	N/A	5.5	Indoor	22	22	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 19 OF 23				
SHQ	HN	71	121	-	EMERGENCY SUPPLY AIR	SHQ	L2	202	STORE & JANITOR	S/A	Emergency	700	500	200	8535	N/A	N/A	6.8	Indoor	45	45	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 19 OF 23				
SHQ	HN	71	122	-	EMERGENCY SUPPLY AIR	SHQ	L2	212	TELECOM EQUIPMENT ROOM	R/A	Emergency	300	300	200	1866	N/A	N/A	5.8	Indoor	25	25	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 19 OF 23				
SHQ	HN	71	142	-	NORMAL SUPPLY AIR	SHQ	L3	324	4-MAN(20)	S/A	Normal	900	400	200	7911	N/A	N/A	6.1	Indoor	51	51	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 16 OF 23				
SHQ	HN	71	144	-	NORMAL SUPPLY AIR	SHQ	L3	309	EXAM. ROOM	S/A	Normal	ø160		200	457	N/A	N/A	6.3	Indoor	1.3	1.3	N/A	GAL'V	SHQ-ME-DD-H01-0003, SHEET 15 OF 15	SHEET 17 OF 23				
SHQ	HN	71	145	-	TOILET EXHAUST AIR	SHQ	L3	319	CORRIDOR	M/E	Normal	200	200	200	735	N/A	N/A	5.1	Indoor	20	20	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 16 OF 23				
SHQ	HN	71	147	-	OBSERVATION ROOM	SHQ	L3	310	OBSERV. ROOM	M/E	Normal	200	200	200	587	N/A	N/A	4.1	Indoor	20	20	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 17 OF 23				
SHQ	HN	71	148	-	BAGGAGE STORE	SHQ	L3	310	OBSERV. ROOM	S/A	Normal	200	200	200	413	N/A	N/A	2.9	Indoor	20	20	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 17 OF 23				
SHQ	HN	71	149	-	TRANSIT ROOM	SHQ	L3	315	TRANSIT ROOM	S/A	Normal	400	250	200	2329	N/A	N/A	6.5	Indoor	27	27	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 17 OF 23				
SHQ	HN	71	150	-	4 MAN	SHQ	L3	324	4-MAN(20)	S/A	Normal	200	200	200	746	N/A	N/A	5.2	Indoor	1.3	1.3	N/A	GAL'V	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 17 OF 23				
SHQ	HN	71	152	-	TOILET EXHAUST AIR	SHQ	L3	323	4-MAN(19)	M/E	Normal	ø100		200	175	N/A	N/A	6.2	Indoor	0.7	0.7	N/A	GAL'V	SHQ-ME-DD-H01-0003, SHEET 15 OF 15	SHEET 16 OF 23				
SHQ	HN	71	153	-	NORMAL RETURN AIR	SHQ	L3	319	CORRIDOR	R/A	Normal	300	300	200	2191	N/A	N/A	6.8	Indoor	35	35	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 16 OF 23				
SHQ	HN	71	154	-	4 MAN & STORE	SHQ	L3	319	CORRIDOR	R/A	Normal	200	200	200	747	N/A	N/A	5.2	Indoor	20	20	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 16 OF 23				
SHQ	HN	71	155	-	STORE	SHQ	L3	313	STORE	R/A	Normal																		




																											
					N° SHQ-HV-EB-301-0001				Rev: 2		Status: AFC		Discipline: HVAC		Document type: LIS		Rev. Date: 17/01/2011										
Class	Class	System	Number	Code	Description	Platform	Deck	Room No.	Location		Service		Dimensions			Design conditions				Weight		Power	Material	Remarks	Ducting & Instr. Diagram (SHQ-HV-DS-303-0001)	Piping & Instr. Diagram / Overall Single line diagram (SHQ-HV-DP-301-0003)	
									Room Description	Service Type	Service Mode	Width or Dia. (mm)	Height (mm)	Length (mm)	Airflow (m³/h)	Capacity (kW)	Static Pressure (pa)	Air Vel. (m/s)	Install Location (Indoor/Outdoor)	Dry (kg)	Operate (kg)	(kW)	-				
Balancing Dampers																											
SHQ	HN	71	192	-	NORMAL SUPPLY AIR	SHQ	L4	414		CORRIDOR	S/A	Normal	600	500	200	6085	N/A	N/A	5.6	Indoor	45	45	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 14 OF 23	
SHQ	HN	71	193	-	NORMAL SUPPLY AIR	SHQ	L4	407		4-MAN(49)	S/A	Normal	900	700	200	14395	N/A	N/A	6.3	Indoor	58	58	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 14 OF 23	
SHQ	HN	71	194	-	NORMAL SUPPLY AIR	SHQ	L4	422		4-MAN(43)	S/A	Normal	300	200	200	1492	N/A	N/A	6.9	Indoor	22	22	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 14 OF 23	
SHQ	HN	71	195	-	TOILET EXHAUST AIR	SHQ	L4	414		CORRIDOR	M/E	Normal	300	200	200	1190	N/A	N/A	5.5	Indoor	20	20	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 14 OF 23	
SHQ	HN	71	198	-	NORMAL RETURN AIR	SHQ	L4	420		4-MAN(42)	R/A	Normal	400	300	200	2411	N/A	N/A	5.6	Indoor	29	29	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 14 OF 23	
SHQ	HN	71	200	-	NORMAL SUPPLY AIR	SHQ	L4	422		4-MAN(43)	S/A	Normal	300	200	200	1492	N/A	N/A	6.9	Indoor	22	22	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 14 OF 23	
SHQ	HN	71	201	-	NORMAL SUPPLY AIR	SHQ	L4	431		4-MAN(34)	S/A	Normal	100	100	200	147	N/A	N/A	4.7	Indoor	17	17	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 14 OF 23	
SHQ	HN	71	202	-	NORMAL SUPPLY AIR	SHQ	L4	431		4-MAN(34)	S/A	Normal	400	300	200	2803	N/A	N/A	6.5	Indoor	29	29	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 14 OF 23	
SHQ	HN	71	203	-	NORMAL RETURN AIR	SHQ	L4	414		CORRIDOR	R/A	Normal	400	300	200	2747	N/A	N/A	6.4	Indoor	29	29	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 14 OF 23	
SHQ	HN	71	204	-	NORMAL RETURN AIR	SHQ	L4	443		4-MAN(26)	R/A	Normal	400	300	200	2668	N/A	N/A	6.2	Indoor	29	29	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 14 OF 23	
SHQ	HN	71	206	-	NORMAL RETURN AIR	SHQ	L4	414		CORRIDOR	R/A	Normal	300	200	200	1395	N/A	N/A	6.5	Indoor	20	20	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 14 OF 23	
SHQ	HN	71	207	-	NORMAL RETURN AIR	SHQ	L4	443		4-MAN(26)	R/A	Normal	300	300	200	1945	N/A	N/A	6.0	Indoor	25	25	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 14 OF 23	
SHQ	HN	71	208	-	NORMAL SUPPLY AIR	SHQ	L4	444		4-MAN(27)	S/A	Normal	200	200	200	416	N/A	N/A	2.9	Indoor	20	20	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 14 OF 23	
SHQ	HN	71	210	-	NORMAL RETURN AIR	SHQ	L4	443		4-MAN(26)	R/A	Normal	800	600	200	12771	N/A	N/A	7.4	Indoor	56	56	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 14 OF 23	
SHQ	HN	71	212	-	NORMAL SUPPLY AIR	SHQ	L4	414		CORRIDOR	S/A	Normal	400	300	200	2984	N/A	N/A	6.9	Indoor	29	29	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 14 OF 23	
SHQ	HN	71	213	-	NORMAL SUPPLY AIR	SHQ	L4	414		CORRIDOR	S/A	Normal	300	300	200	1646	N/A	N/A	5.1	Indoor	25	25	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 14 OF 23	
SHQ	HN	71	214	-	NORMAL SUPPLY AIR	SHQ	L4	414		CORRIDOR	S/A	Normal	ø160		200	310	N/A	N/A	4.3	Indoor	1.3	1.3	N/A	GALV	SHQ-ME-DD-H01-0003, SHEET 15 OF 15	SHEET 14 OF 23	
SHQ	HN	71	237	-	PACU(SHQ-HA-71101A) Supply Air	SHQ	L5	507		HVAC PLANT	S/A	Normal	2300	1200	200	65330	N/A	N/A	6.6	Indoor	250	250	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 12 OF 23	
SHQ	HN	71	238	-	PACU(SHQ-HA-71101B) Supply Air	SHQ	L5	507		HVAC PLANT	S/A	Normal	2300	1200	200	65330	N/A	N/A	6.6	Indoor	250	250	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 12 OF 23	
SHQ	HN	71	239	-	PACU(SHQ-HA-71101A) RETURN AIR	SHQ	L5	507		HVAC PLANT	R/A	Normal	1600	900	200	36796	N/A	N/A	7.1	Indoor	110	110	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 12 OF 23	
SHQ	HN	71	240	-	PACU(SHQ-HA-71101A) FRESH AIR	SHQ	L5	507		HVAC PLANT	F/A	Normal	1600	900	200	28534	N/A	N/A	5.5	Indoor	110	110	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 12 OF 23	
SHQ	HN	71	241	-	PACU(SHQ-HA-71101B) RETURN AIR	SHQ	L5	507		HVAC PLANT	R/A	Normal	1600	900	200	36796	N/A	N/A	7.1	Indoor	110	110	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 12 OF 23	
SHQ	HN	71	242	-	PACU(SHQ-HA-71101B) FRESH AIR	SHQ	L5	507		HVAC PLANT	F/A	Normal	1600	900	200	28534	N/A	N/A	5.5	Indoor	110	110	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 12 OF 23	
SHQ	HN	71	251	-	STAIR	SHQ	L5	501		STAIR	R/A	Emer'cy	300	300	200	1607	N/A	N/A	5.0	Indoor	25	25	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 13 OF 23	
SHQ	HN	71	252	-	HVAC PLANT ROOM	SHQ	L5	507		HVAC PLANT	S/A	Emer'cy	300	300	200	2104	N/A	N/A	6.5	Indoor	25	25	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 13 OF 23	
SHQ	HN	71	253	-	EMERGENCY PACU(HK-71-104A) SUPPLY AIR	SHQ	L5	507		HVAC PLANT	S/A	Emer'cy	1400	700	200	21606	N/A	N/A	6.1	Indoor	98	98	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 13 OF 23	
SHQ	HN	71	254	-	EMERGENCY PACU(HK-71-154B) SUPPLY AIR	SHQ	L5	507		HVAC PLANT	S/A	Emer'cy	1400	700	200	21606	N/A	N/A	6.1	Indoor	98	98	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 13 OF 23	
SHQ	HN	71	255	-	EMERGENCY PACU(HK-71-104A) RETURN AIR	SHQ	L5	507		HVAC PLANT	R/A	Emer'cy	1000	650	200	13978	N/A	N/A	6.0	Indoor	68	68	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 13 OF 23	
SHQ	HN	71	256	-	EMERGENCY PACU(HK-71-154B) FRESH AIR	SHQ	L5	507		HVAC PLANT	F/A	Emer'cy	450	650	200	7628	N/A	N/A	7.2	Indoor	42	42	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 13 OF 23	
SHQ	HN	71	257	-	EMERGENCY PACU(HK-71-104A) RETURN AIR	SHQ	L5	507		HVAC PLANT	R/A	Emer'cy	1000	650	200	13978	N/A	N/A	6.0	Indoor	68	68	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 13 OF 23	
SHQ	HN	71	258	-	EMERGENCY PACU(HK-71-154B) FRESH AIR	SHQ	L5	507		HVAC PLANT	F/A	Emer'cy	450	650	200	7628	N/A	N/A	7.2	Indoor	42	42	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 13 OF 23	
SHQ	HN	71	260	-	HVAC PLANT ROOM	SHQ	L5	507		HVAC PLANT	S/A	Emer'cy	600	300	200	4208	N/A	N/A	6.5	Indoor	34	34	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 13 OF 23	
SHQ	HN	71	261	-	PACU(SHQ-HA-71102A,B) Fresh Air	SHQ	L5	507		HVAC PLANT	F/A	ALL	650	450	200	7628	N/A	N/A	7.2	Indoor	42	42	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 12 OF 23	
SHQ	HN	71	262	-	PACU(SHQ-HA-71101A,B) Fresh Air	SHQ	L5	507		HVAC PLANT	F/A	ALL	1700	1000	200	28534	N/A	N/A	4.7	Indoor	124	124	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 11 OF 23	
SHQ	HN	71	263	-	FIREMEN'S CHANGE RM.	SHQ	L5	505		FIREMEN'S CHANGE RM.	S/A	Normal	200	200	200	296	N/A	N/A	2.1	Indoor	20	20	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 12 OF 23	
SHQ	HN	71	264	-	AIR LOCK	SHQ	L5	508		AIR LOCK	S/A	Emer'cy	200	200	200	38	N/A	N/A	0.3	Indoor	20	20	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 13 OF 23	
SHQ	HN	71	265	-	HVAC PLANT ROOM	SHQ	L5	507		HVAC PLANT ROOM	S/A	Emer'cy	300	300	200	2104	N/A	N/A	6.5	Indoor	25	25	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 13 OF 23	
SHQ	HN	71	266	-	HVAC PLANT ROOM	SHQ	L5	507		HVAC PLANT ROOM	S/A	Emer'cy	300	300	200	2104	N/A	N/A	6.5	Indoor	25	25	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 13 OF 15	SHEET 13 OF 23	




					<div><div></div><div>SHWE - Detailed Engineering - Field Development Project</div><div>HVAC Equipment List for Technical Building</div></div>																								
					N° SHP-HV-EB-301-0001				Rev: 2		Status: AFC		Discipline: HVAC		Document type: LIS				Rev. Date: 22/12/2010										
Location	Class	System	Number	Code	Description	Platform	Location			Service		Dimensions			Design conditions				Weight		Power		Material		Remark	Ducting & Instr. Diagram (SHP-HV-DS-303-0001)	Piping & Instr. Diagram / Overall Single line diagram		
							Deck	Room No.	Room Description	Service Type	Service Mode	Width or Dia. (mm)	Height (mm)	Length (mm)	Airflow (m³/h)	Capacity (kW)	Static Pressure (pa)	Air Vel. (m/s)	Install Location (Indoor/Outdoor)	Dry (kg)	Operate (kg)	(Volt, Phase, Hz)	-						
					Shut -Off Dampers (Manual)																								
SHP	HO	71	501	-	LABORATORY EXHAUST FAN(SHP-HK-71504A) OUTLET	SHP	L2	N/A	L2 ON DECK	M/E	Normal	500	400	200	3948	N/A	N/A	5.5	Outdoor	38	38	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 7 of 14	SHEET 9 OF 14				
SHP	HO	71	502	-	LABORATORY EXHAUST FAN(SHP-HK-71504B) OUTLET	SHP	L2	N/A	L2 ON DECK	M/E	Normal	500	400	200	3948	N/A	N/A	5.5	Outdoor	38	38	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 7 of 14	SHEET 9 OF 14				
SHP	HO	71	503	-	BATTERY ROOM EXHAUST FAN(SHP-HK-71505A) OUTLET	SHP	L2	N/A	L2 ON DECK	M/E	Normal	400	400	200	3168	N/A	N/A	5.5	Outdoor	34	34	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 7 of 14	SHEET 11 OF 14				
SHP	HO	71	504	-	BATTERY ROOM EXHAUST FAN(SHP-HK-71505B) OUTLET	SHP	L2	N/A	L2 ON DECK	M/E	Normal	400	400	200	3168	N/A	N/A	5.5	Outdoor	34	34	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 7 of 14	SHEET 11 OF 14				
SHP	HO	71	505	-	WORKSHOP EXHAUST FAN(SHP-HK-71506A) OUTLET	SHP	L2	N/A	UNDER L2	M/E	Normal	630	630	200	3539	N/A	N/A	2.5	Outdoor	57	57	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 8 of 14	SHEET 12 OF 14				
SHP	HO	71	506	-	WORKSHOP EXHAUST FAN(SHP-HK-71506B) OUTLET	SHP	L2	N/A	UNDER L2	M/E	Normal	630	630	200	3539	N/A	N/A	2.5	Outdoor	57	57	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 8 of 14	SHEET 12 OF 14				
SHP	HO	71	507	-	WELDING W/S & STORAGE AREA SUPPLY FAN(SHP-HK-71507A) OUTLET	SHP	ROOF	N/A	ROOF	M/E	Normal	630	630	200	4070	N/A	N/A	2.8	Outdoor	57	57	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 8 of 14	SHEET 14 OF 14				
SHP	HO	71	508	-	WELDING W/S & STORAGE AREA SUPPLY FAN(SHP-HK-71507B) OUTLET	SHP	ROOF	N/A	ROOF	M/E	Normal	630	630	200	4070	N/A	N/A	2.8	Outdoor	57	57	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 8 of 14	SHEET 14 OF 14				




					<div><div>SHWE - Detailed Engineering - Field Development Project HVAC Equipment List with Tags for Living Quarter</div></div>																					
					N° SHQ-HV-EB-301-0001				Rev: 2		Status: AFC		Disciplin: HVAC		Document type: LIS				Rev. Date: 17/01/2011							
Class	Class	System	Number	Code	Description	Platform	Deck	Room No.	Room Description	Service		Dimensions			Design conditions				Weight		Power	Material	Remarks	Ducting & Instr. Diagram (SHQ-HV-DS-303-0001)	Piping & Instr. Diagram / Overall Single line diagram (SHQ-HV-DP-301-0003)	
										Service Type	Service Mode	Width or Dia. (mm)	Height (mm)	Length (mm)	Airflow (m³/h)	Capacity (kW)	Static Pressure (pa)	Air Vel. (m/s)	Install Location (Indoor/Outdoor)	Dry (kg)	Operate (kg)					(kW)
					Shut -Off Dampers (Manual)																					
SHQ	HO	71	101	-	TOILET EXHAUST FAN(SHQ-HK-71103A) OUTLET	SHQ	L5	N/A	L5 On Deck	M/E	Normal	400	400	200	2688	N/A	N/A	4.6	Outdoor	26	26	N/A	SUS316L	SHQ-ME-DD-H01-0002, SHEET 3 OF 15	SHEET 23 OF 23	
SHQ	HO	71	102	-	TOILET EXHAUST FAN(SHQ-HK-71103B) OUTLET	SHQ	L5	N/A	L5 On Deck	M/E	Normal	400	400	200	2688	N/A	N/A	4.6	Outdoor	26	26	N/A	SUS316L	SHQ-ME-DD-H01-0002, SHEET 3 OF 15	SHEET 23 OF 23	
SHQ	HO	71	103	-	GALLEY EXHAUST FAN(SHQ-HK-71104A) OUTLET	SHQ	L1	N/A	L1 On Deck	M/E	Normal	710	710	200	14600	N/A	N/A	8.0	Outdoor	81	81	N/A	SUS316L	SHQ-ME-DD-H01-0002, SHEET 3 OF 15	SHEET 23 OF 23	
SHQ	HO	71	104	-	GALLEY EXHAUST FAN(SHQ-HK-71104B) OUTLET	SHQ	L1	N/A	L1 On Deck	M/E	Normal	710	710	200	14600	N/A	N/A	8.0	Outdoor	81	81	N/A	SUS316L	SHQ-ME-DD-H01-0002, SHEET 3 OF 15	SHEET 23 OF 23	
SHQ	HO	71	105	-	GENERAL EXHAUST FAN(SHQ-HK-71105A) OUTLET	SHQ	L5	N/A	L5 On Deck	M/E	Normal	400	400	200	2424	N/A	N/A	4.2	Outdoor	26	26	N/A	SUS316L	SHQ-ME-DD-H01-0002, SHEET 3 OF 15	SHEET 23 OF 23	
SHQ	HO	71	106	-	GENERAL EXHAUST FAN(SHQ-HK-71105B) OUTLET	SHQ	L5	N/A	L5 On Deck	M/E	Normal	400	400	200	2424	N/A	N/A	4.2	Outdoor	26	26	N/A	SUS316L	SHQ-ME-DD-H01-0002, SHEET 3 OF 15	SHEET 23 OF 23	
SHQ	HO	71	107	-	LAUNDRY EXHAUST FAN(SHQ-HK-71106A) OUTLET	SHQ	L0	N/A	L0 On Deck	M/E	Normal	450	450	200	5420	N/A	N/A	7.4	Outdoor	32	32	N/A	SUS316L	SHQ-ME-DD-H01-0002, SHEET 3 OF 15	SHEET 23 OF 23	
SHQ	HO	71	108	-	LAUNDRY EXHAUST FAN(SHQ-HK-71106B) OUTLET	SHQ	L0	N/A	L0 On Deck	M/E	Normal	450	450	200	5420	N/A	N/A	7.4	Outdoor	32	32	N/A	SUS316L	SHQ-ME-DD-H01-0002, SHEET 3 OF 15	SHEET 23 OF 23	




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					N° SHP-HV-EB-301-0001				Rev: 2		Status: AFC		Discipline: HVAC		Document type: LIS			Rev. Date: 22/12/2010										
Location	Class	System	Number	Code	Description	Platform	Deck	Room No.	Room Description	Service		Dimensions			Design conditions					Weight		Power		Material		Remark	Ducting & Instr. Diagram (SHP-HV-DS-303-0001)	Piping & Instr. Diagram / Overall Single line diagram
										Service Type	Service Mode	Width or Dia. (mm)	Height (mm)	Length (mm)	Airflow (m³/h)	Capacity (kW)	Static Pressure (pa)	Air Vel. (m/s)	Install Location (Indoor/Outdoor)	Dry (kg)	Operate (kg)	(Volt, Phase, Hz)	-					
					Pressure Relief																							
SHP	HR	71	507	-	BATTERY ROOM (Non-Return)	SHP	L1	T103	BATTERY	S/A	Normal	400	300	200	3168	N/A	N/A	7.3	Indoor	21	21	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 14 of 14	SHEET 11 OF 14			
SHP	HR	71	518	-	LABORATORY (Non-Return)	SHP	L2	T205	LABORATORY	M/E	Normal	400	200	200	1224	N/A	N/A	4.3	Indoor	15	15	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 13 of 14	SHEET 9 OF 14			
SHP	HR	71	519	-	WELDING WORKSHOP (Non-Return)	SHP	L0	T304	WELDING WORKSHOP	N/E	Normal	200	200	200	868	N/A	N/A	6.0	Indoor	14	14	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 14 of 14	SHEET 14 OF 14			
SHP	HR	71	520	-	WELDING WORKSHOP (Non-Return)	SHP	L0	T304	WELDING WORKSHOP	N/E	Normal	200	200	200	868	N/A	N/A	6.0	Indoor	14	14	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 13 of 14	SHEET 14 OF 14			




					 <div>SHWE - Detailed Engineering - Field Development Project HVAC Equipment List with Tags for Living Quarter</div>																							
					N° SHQ-HV-EB-301-0001					Rev: 2		Status: AFC		Disciplin: HVAC		Document type: LIS			Rev. Date: 17/01/2011									
Class	Class	System	Number	Code	Description	Platform	Deck	Room No.	Room Description	Service		Dimensions			Design conditions				Weight		Power	Material	Remarks	Ducting & Instr. Diagram (SHQ-HV-DS-303-0001)	Piping & Instr. Diagram / Overall Single line diagram (SHQ-HV-DP-301-0003)			
										Service Type	Service Mode	Width or Dia. (mm)	Height (mm)	Length (mm)	Airflow (m³/h)	Capacity (kW)	Static Pressure (pa)	Air Vel. (m/s)	Install Location (Indoor/Outdoor)	Dry (kg)	Operate (kg)					(kW)		
Pressure Relief / Non Return Dampers																												
SHQ	HR	71	003	-	LAUNDRY (Non Return)	SHQ	L0	015	LAUNDRY	M/E	Normal	500	600	200	5420	N/A	N/A	5.0	Indoor	21	21	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 5 OF 15	SHEET 21 OF 23			
SHQ	HR	71	004	-	LAUNDRY (Non Return)	SHQ	L0	015	LAUNDRY	M/E	Normal	100	100	200	N/A	N/A	N/A	N/A	Indoor	6.0	6.0	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 5 OF 15	SHEET 21 OF 23			
SHQ	HR	71	005	-	LAUNDRY (Non Return)	SHQ	L0	015	LAUNDRY	M/E	Normal	100	100	200	N/A	N/A	N/A	N/A	Indoor	6.0	6.0	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 5 OF 15	SHEET 21 OF 23			
SHQ	HR	71	006	-	LAUNDRY (Non Return)	SHQ	L0	015	LAUNDRY	M/E	Normal	200	200	200	N/A	N/A	N/A	N/A	Indoor	11	11	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 5 OF 15	SHEET 21 OF 23			
SHQ	HR	71	007	-	LAUNDRY (Non Return)	SHQ	L0	015	LAUNDRY	M/E	Normal	200	200	200	N/A	N/A	N/A	N/A	Indoor	11	11	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 5 OF 15	SHEET 21 OF 23			
SHQ	HR	71	008	-	LAUNDRY (Non Return)	SHQ	L0	015	LAUNDRY	M/E	Normal	200	200	200	N/A	N/A	N/A	N/A	Indoor	11	11	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 5 OF 15	SHEET 21 OF 23			
SHQ	HR	71	009	-	LAUNDRY (Non Return)	SHQ	L0	015	LAUNDRY	M/E	Normal	200	200	200	N/A	N/A	N/A	N/A	Indoor	11	11	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 5 OF 15	SHEET 21 OF 23			
SHQ	HR	71	010	-	CHANGING ROOM (Non Return)	SHQ	L0	022	CHANGING ROOM	M/E	Normal	400	300	200	2282	N/A	N/A	5.3	Indoor	13	13	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 7 OF 15	SHEET 21 OF 23			




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					N° SHP-HV-EB-301-0001				Rev: 2		Status: AFC		Discipline HVAC		Document type: LIS		Rev. Date: 22/12/2010									
Location	Class	System	Number	Code	Description	Platform	Location			Service		Dimensions			Design conditions				Weight		Power	Material	Remark	Ducting & Instr. Diagram (SHP-HV-DS-303-0001)	Piping & Instr. Diagram / Overall Single line diagram	
							Deck	Room No.	Room Description	Service Type	Service Mode	Width or Dia. (mm)	Height (mm)	Length (mm)	Airflow (m³/h)	Capacity (kW)	Static Pressure (pa)	Air Vel. (m/s)	Install Location (Indoor/Outdoor)	Dry (kg)	Operate (kg)	(Volt, Phase, Hz)				-
					Pressure Relief																					
SHP	HR	71	501	-	HVAC PLANT ROOM	SHP	L2	T204	HVAC PLANT	N/E	Normal	300	300	200	484	N/A	N/A	1.5	Indoor	18	18	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 10 of 14	SHEET 9 OF 14	
SHP	HR	71	502	-	LABORATORY AIR LOCK	SHP	L2	T206	AL. LABORATORY	N/E	Normal	200	200	200	74	N/A	N/A	0.5	Indoor	14	14	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 10 of 14	SHEET 9 OF 14	
SHP	HR	71	503	-	LABORATORY	SHP	L2	T205	LABORATORY	N/E	Normal	400	300	200	2448	N/A	N/A	5.7	Indoor	21	21	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 10 of 14	SHEET 9 OF 14	
SHP	HR	71	504	-	LABORATORY	SHP	L2	T205	LABORATORY	S/A	Normal	700	300	200	4022	N/A	N/A	5.3	Indoor	26	26	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 10 of 14	SHEET 9 OF 14	
SHP	HR	71	505	-	AIR CONDITIONED STORE AIR LOCK	SHP	L2	T203	AL. A.C STORE	S/A	Normal	200	200	200	56	N/A	N/A	0.4	Indoor	14	14	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 10 of 14	SHEET 9 OF 14	
SHP	HR	71	506	-	ELECTRICAL TECHNICAL ROOM AIR LOCK	SHP	L1	T102	AL. ETR	N/E	Normal	200	200	200	49	N/A	N/A	0.3	Indoor	14	14	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 11 of 14	SHEET 10 OF 14	
SHP	HR	71	508	-	MECHANICAL WORKSHOP AIR LOCK	SHP	L0	T002	AL. MECH. WORKSHOP	N/E	Normal	200	200	200	49	N/A	N/A	0.3	Indoor	16	16	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 10 of 14	SHEET 12 OF 14	
SHP	HR	71	509	-	E/I WORKSHOP AIR LOCK	SHP	L0	T004	AL. E/I WORKSHOP	N/E	Normal	200	200	200	49	N/A	N/A	0.3	Indoor	14	14	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 11 of 14	SHEET 12 OF 14	
SHP	HR	71	510	-	IER AIR LOCK	SHP	L0	T006	AL. IER	S/A	Normal	200	200	200	46	N/A	N/A	0.3	Indoor	14	14	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 10 of 14	SHEET 13 OF 14	
SHP	HR	71	511	-	WELDING WORKSHOP	SHP	UPPER	T301	WELDING WORKSHOP	N/E	Normal	500	500	200	1792	N/A	N/A	2.0	Indoor	28	28	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 11 of 14	SHEET 14 OF 14	
SHP	HR	71	512	-	WELDING WORKSHOP	SHP	UPPER	T301	WELDING WORKSHOP	N/E	Normal	300	300	200	868	N/A	N/A	2.7	Indoor	18	18	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 10 of 14	SHEET 14 OF 14	
SHP	HR	71	513	-	ELECTRICAL TECHNICAL ROOM AIR LOCK	SHP	L1	T102	AL. ETR	N/E	Normal	200	200	200	49	N/A	N/A	0.3	Indoor	14	14	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 10 of 14	SHEET 10 OF 14	
SHP	HR	71	514	-	ELECTRICAL TECHNICAL ROOM(RAISED FLOOR)	SHP	L1	T101	ETR	N/E	Normal	300	300	200	464	N/A	N/A	1.4	Indoor	18	18	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 10 of 14	SHEET 10 OF 14	
SHP	HR	71	515	-	HEAVY DUTY EQUIPMENT STORAGE	SHP	L0	T302	HEAVY DUTY	N/E	Normal	300	300	200	464	N/A	N/A	1.4	Indoor	18	18	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 10 of 14	SHEET 14 OF 14	
SHP	HR	71	516	-	STORAGE AREA	SHP	L0	T303	STORAGE AREA	N/E	Normal	300	300	200	715	N/A	N/A	2.2	Indoor	18	18	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 10 of 14	SHEET 14 OF 14	
SHP	HR	71	517	-	STORE FOR RADIOACTIVE SOURCE	SHP	L0	T304	STORE FOR RADIOACTIVE SOURCE	N/E	Normal	200	200	200	231	N/A	N/A	1.6	Indoor	14	14	N/A	SUS316L	SHP-ME-DD-H01-0003, Sheet 11 of 14	SHEET 14 OF 14	




					<div><div>SHWE - Detailed Engineering - Field Development Project HVAC Equipment List with Tags for Living Quarter</div></div>																					
					N° SHQ-HV-EB-301-0001				Rev: 2		Status: AFC		Disciplin: HVAC		Document type: LIS				Rev. Date: 17/01/2011							
Class	Class	System	Number	Code	Description	Location			Service		Dimensions			Design conditions				Weight		Power		Material	Remarks	Ducting & Instr. Diagram (SHQ-HV-DS-303-0001)	Piping & Instr. Diagram / Overall Single line diagram (SHQ-HV-DP-301-0003)	
						Platform	Deck	Room No.	Room Description	Service Type	Service Mode	Width or Dia. (mm)	Height (mm)	Length (mm)	Airflow (m³/h)	Capacity (kW)	Static Pressure (pa)	Air Vel. (m/s)	Install Location (Indoor/Outdoor)	Dry (kg)	Operate (kg)					(kW)
					Pressure Relief / Non Return Dampers																					
SHQ	HR	71	001	-	AIR LOCK	SHQ	L0	011	AIR LOCK	N/E	Normal	200	200	200	37	N/A	N/A	0.3	Indoor	11	11	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 7 OF 15	SHEET 21 OF 23	
SHQ	HR	71	012	-	AIR LOCK	SHQ	L0	025	AIR LOCK	N/E	Normal	200	200	200	37	N/A	N/A	0.3	Indoor	11	11	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 7 OF 15	SHEET 21 OF 23	
SHQ	HR	71	021	-	GYMNASIUM	SHQ	L0	019	GYMNASIUM	N/E	Emergency	500	300	200	1278	N/A	N/A	2.4	Indoor	19	19	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 7 OF 15	SHEET 22 OF 23	
SHQ	HR	71	031	-	AIR LOCK	SHQ	L1	112	AIR LOCK	N/E	Normal	200	200	200	43	N/A	N/A	0.3	Indoor	11	11	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 7 OF 15	SHEET 20 OF 23	
SHQ	HR	71	032	-	AIR LOCK	SHQ	L1	115	AIR LOCK	N/E	Normal	200	200	200	35	N/A	N/A	0.2	Indoor	11	11	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 7 OF 15	SHEET 20 OF 23	
SHQ	HR	71	033	-	GARBAGE ROOM	SHQ	L1	120	GARBAGE ROOM	N/E	Normal	200	200	200	83	N/A	N/A	0.6	Indoor	11	11	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 7 OF 15	SHEET 20 OF 21	
SHQ	HR	71	051	-	AIR LOCK	SHQ	L2	215	AIR LOCK	N/E	Normal	200	200	200	80	N/A	N/A	0.6	Indoor	11	11	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 7 OF 15	SHEET 18 OF 23	
SHQ	HR	71	052	-	AIR LOCK	SHQ	L2	219	AIR LOCK	N/E	Normal	200	200	200	37	N/A	N/A	0.3	Indoor	11	11	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 7 OF 15	SHEET 18 OF 23	
SHQ	HR	71	071	-	AIR LOCK	SHQ	L3	317	AIR LOCK	N/E	Normal	200	200	200	45	N/A	N/A	0.3	Indoor	11	11	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 7 OF 15	SHEET 16 OF 23	
SHQ	HR	71	072	-	AIR LOCK	SHQ	L3	332	AIR LOCK	N/E	Normal	200	200	200	36	N/A	N/A	0.3	Indoor	11	11	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 7 OF 15	SHEET 17 OF 23	
SHQ	HR	71	073	-	CORRIDOR	SHQ	L3	330	CORRIDOR	N/E	Normal	200	200	200	119	N/A	N/A	0.8	Indoor	11	11	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 7 OF 15	SHEET 16 OF 23	
SHQ	HR	71	091	-	AIR LOCK	SHQ	L4	412	AIR LOCK	N/E	Normal	200	200	200	51	N/A	N/A	0.4	Indoor	11	11	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 7 OF 15	SHEET 14 OF 23	
SHQ	HR	71	092	-	AIR LOCK	SHQ	L4	416	AIR LOCK	N/E	Normal	200	200	200	51	N/A	N/A	0.4	Indoor	11	11	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 7 OF 15	SHEET 15 OF 23	
SHQ	HR	71	093	-	CORRIDOR	SHQ	L4	436	CORRIDOR	N/E	Normal	200	200	200	154	N/A	N/A	1.1	Indoor	11	11	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 7 OF 15	SHEET 14 OF 21	
SHQ	HR	71	094	-	CORRIDOR	SHQ	L4	437	CORRIDOR	N/E	Normal	200	200	200	178	N/A	N/A	1.2	Indoor	11	11	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 7 OF 15	SHEET 14 OF 21	
SHQ	HR	71	111	-	GOODS LIFT	SHQ	L5	502	GOODS LIFT	N/E	Normal	300	300	200	493	N/A	N/A	1.5	Indoor	13	13	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 7 OF 15	SHEET 12 OF 23	
SHQ	HR	71	112	-	FIREMEN'S CHANGE RM.	SHQ	L5	505	FIREMEN'S CHANGE RM.	N/E	Normal	300	300	200	296	N/A	N/A	0.9	Indoor	13	13	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 7 OF 15	SHEET 12 OF 23	
SHQ	HR	71	121	-	HVAC PLANT ROOM	SHQ	L5	507	HVAC PLANT	N/E	Emergency	900	600	200	6312	N/A	N/A	3.2	Indoor	32	32	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 7 OF 15	SHEET 13 OF 23	
SHQ	HR	71	122	-	AIR LOCK	SHQ	L5	508	AIR LOCK	N/E	Emergency	200	200	200	38	N/A	N/A	0.3	Indoor	9.0	9.0	N/A	SUS316L	SHQ-ME-DD-H01-0003, SHEET 7 OF 15	SHEET 13 OF 23	




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					N° SHP-HV-EB-301-0001				Rev: 2		Status: AFC		Discipline: HVAC		Document type: LIS				Rev. Date: 22/12/2010										
Location	Class	System	Number	Code	Description	Platform	Location			Service		Dimensions			Design conditions				Weight		Power		Material		Remark	Ducting & Instr. Diagram (SHP-HV-DS-303-0001)	Piping & Instr. Diagram / Overall Single line diagram		
							Deck	Room No.	Room Description	Service Type	Service Mode	Width or Dia. (mm)	Height (mm)	Length (mm)	Airflow (m³/h)	Capacity (kW)	Static Pressure (pa)	Air Vel. (m/s)	Install Location (Indoor/Outdoor)	Dry (kg)	Operate (kg)	(Volt, Phase, Hz)	-						
					Filter Coalesces / Filter & Moisture Eliminator																								
SHP	HB	71	501	A	PACU(SHP-HA-71501A) FRESH AIR	SHP	Roof	N/A	ON ROOF	F/A	Normal	1500	1500	330	12008	N/A	140 (Clean)	1.5	Outdoor	315	315	N/A	SUS316L	SHP-ME-DD-H01-0006, Sheet 2 of 3	SHEET 8 OF 14				
SHP	HB	71	501	B	PACU(SHP-HA-71501B) FRESH AIR	SHP	Roof	N/A	ON ROOF	F/A	Normal	1500	1500	330	12008	N/A	140 (Clean)	1.5	Outdoor	315	315	N/A	SUS316L	SHP-ME-DD-H01-0006, Sheet 2 of 3	SHEET 8 OF 14				
SHP	HB	71	502	-	WELDING W/SHOP & STORAGE AREA SUPPLY FAN (MOISTURE ELIMINATOR)	SHP	Roof	N/A	ON ROOF	F/A	Normal	750	750	230	4070	N/A	208 (Clean)	2.0	Outdoor	98	98	N/A	SUS316L	SHP-ME-DD-H01-0006, Sheet 3 of 3	SHEET 14 OF 14				




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Class	Class	System	Number	Code	Description	Platform	Deck	Room No.	Room Description	Service Type	Service Mode	Width or Dia. (mm)	Height (mm)	Length (mm)	Airflow (m³/h)	Capacity (kW)	Static Pressure (pa)	Air Vel. (m/s)	Install Location (Indoor/Outdoor)	Dry (kg)	Operate (kg)	Power (kW)	Material	Remarks	Ducting & Instr. Diagram (SHQ-HV-DS-303-0001)	Piping & Instr. Diagram / Overall Single line diagram (SHQ-HV-DP-301-0003)	
Filter Coalescers / Filter & Moisture Eliminator Louver																											
SHQ	HB	71	101	-	PACU(SHQ-HA-71101A, 101B, 102A, 102B) Fresh Air	SHQ	Roof	N/A	On Roof	F/A	Nor.+Emercy	2600	1800	330	36162	N/A	194(Clean)	2.9	Outdoor	630	630	N/A	SUS316L	SHQ-ME-DD-H01-0006, SHEET 2 OF 3	SHEET 10 OF 23		
SHQ	HB	71	102	-	PACU(SHQ-HA-71101A, 101B, 102A, 102B) Fresh Air	SHQ	Cellar	N/A	On Cellar Deck	F/A	Nor.+Emercy	2600	1800	330	36162	N/A	194(Clean)	2.9	Outdoor	630	630	N/A	SUS316L	SHQ-ME-DD-H01-0006, SHEET 2 OF 3	SHEET 11 OF 23		
SHQ	HL	71	103	-	STAIRWAY Supply	SHQ	Roof	N/A	On Roof	M/S	Emercy	600	600	330	3220	N/A	198(Clean)	2.5	Outdoor	98	98	N/A	SUS316L	SHQ-ME-DD-H01-0006, SHEET 3 OF 3	SHEET 13 OF 23		




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Location	Class	System	Number	Code	Description	Platform	Deck	Room No.	Room Description	Service Type	Service Mode	Width or Dia. (mm)	Height (mm)	Length (mm)	Airflow (m³/h)	Capacity (kW)	Static Pressure (pa)	Air Vel. (m/s)	Install Location (Indoor/Outdoor)	Weight		Power		Material	Remark	Ducting & Instr. Diagram (SHP-HV-DS-303-0001)	Piping & Instr. Diagram / Overall Single line diagram
																				Dry (kg)	Operate (kg)	(Volt, Phase, Hz)	-				
					Electrical Heater (Duct Heater)																						
SHP	HE	71	501	-	LABORATORY & AIR LOCK	SHP	L2	T204	HVAC PLANT	S/A	Normal	500	400	350	4022	12.8	N/A	5.3	Indoor	78	78	400Vac, 50Hz, 3-phase	SUS316L	SHP-ME-DD-H01-0004, Sheet 2 of 3	SHEET 9 OF 14		
SHP	HE	71	502	-	HVAC PLANT ROOM	SHP	L2	T204	HVAC PLANT	S/A	Normal	400	300	350	3027	7.8	N/A	7.0	Indoor	64	64	400Vac, 50Hz, 3-phase	SUS316L	SHP-ME-DD-H01-0004, Sheet 3 of 3	SHEET 9 OF 14		
SHP	HE	71	503	-	ELECTRICAL TECHNICAL ROOM	SHP	L2	T204	HVAC PLANT	S/A	Normal	900	700	350	14773	37.7	N/A	6.5	Indoor	133	133	400Vac, 50Hz, 3-phase	SUS316L	SHP-ME-DD-H01-0004, Sheet 3 of 3	SHEET 10 OF 14		
SHP	HE	71	504	-	ELECTRICAL TECHNICAL ROOM	SHP	L2	T204	HVAC PLANT	S/A	Normal	900	700	350	14766	37.7	N/A	6.5	Indoor	133	133	400Vac, 50Hz, 3-phase	SUS316L	SHP-ME-DD-H01-0004, Sheet 2 of 3	SHEET 10 OF 14		
SHP	HE	71	505	-	BATTERY ROOM	SHP	L2	T204	HVAC PLANT	S/A	Normal	400	300	350	3168	7.6	N/A	7.3	Indoor	64	64	400Vac, 50Hz, 3-phase	SUS316L	SHP-ME-DD-H01-0004, Sheet 3 of 3	SHEET 11 OF 14		
SHP	HE	71	506	-	IER & AIR LOCK	SHP	L0	T005	IER	S/A	Normal	600	500	350	7191	18.4	N/A	6.7	Indoor	98	98	400Vac, 50Hz, 3-phase	SUS316L	SHP-ME-DD-H01-0004, Sheet 2 of 3	SHEET 12 OF 14		
SHP	HE	71	507	-	AIR CONDITIONED STORE	SHP	L2	T202	A/C STORE	S/A	Normal	300	200	350	1583	4.2	N/A	7.3	Indoor	49	49	400Vac, 50Hz, 3-phase	SUS316L	SHP-ME-DD-H01-0004, Sheet 3 of 3	SHEET 9 OF 14		
SHP	HE	71	508	-	MECHANICAL WORKSHOP	SHP	L0	T001	MECH. W/SHOP	S/A	Normal	300	300	350	2166	5.6	N/A	6.7	Indoor	58	58	400Vac, 50Hz, 3-phase	SUS316L	SHP-ME-DD-H01-0004, Sheet 3 of 3	SHEET 12 OF 14		
SHP	HE	71	509	-	E/I WORKSHOP	SHP	L0	T003	E/I W/SHOP	S/A	Normal	300	200	350	1472	3.8	N/A	6.8	Indoor	49	49	400Vac, 50Hz, 3-phase	SUS316L	SHP-ME-DD-H01-0004, Sheet 2 of 3	SHEET 12 OF 14		




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Class	Class	System	Number	Code	Description	Platform	Deck	Room No.	Location Room Description	Service		Dimensions			Design conditions				Weight		Power	Material	Remarks	Ducting & Instr. Diagram (SHQ-HV-DS-303-0001)	Piping & Instr. Diagram / Overall Single line diagram (SHQ-HV-DP-301-0003)			
										Service Type	Service Mode	Width or Dia. (mm)	Height (mm)	Length (mm)	Airflow (m³/h)	Capacity (kW)	Static Pressure (pa)	Air Vel. (m/s)	Install Location (Indoor/Outdoor)	Dry (kg)	Operate (kg)	(kW)				-		
					Electrical Heater (Duct Heater)																							
SHQ	HE	71	002	-	GOODS LIFT (R)	SHQ	L0	006	HVAC PLANT ROOM	S/A	Normal	200	200	350	493	2.4	N/A	3.4	Indoor	17	17	400Vac, 50Hz, 3-phase	SUS316L	SHQ-ME-DD-H01-0004, SHEET 2 OF 4	SHEET 21 OF 23			
SHQ	HE	71	003	-	CARD ROOM (L)	SHQ	L0	014	CORRIDOR	S/A	Normal	200	200	350	745	2.5	N/A	5.2	Indoor	17	17	400Vac, 50Hz, 3-phase	SUS316L	SHQ-ME-DD-H01-0004, SHEET 2 OF 4	SHEET 21 OF 23			
SHQ	HE	71	005	-	SMOKING ROOM (R)	SHQ	L0	010	SMOKING ROOM	S/A	Normal	300	200	450	1398	4.5	N/A	6.5	Indoor	25	25	400Vac, 50Hz, 3-phase	SUS316L	SHQ-ME-DD-H01-0004, SHEET 3 OF 4	SHEET 21 OF 23			
SHQ	HE	71	006	-	LAUNDRY (L)	SHQ	L0	015	LAUNDRY	S/A	Normal	600	400	400	5420	20	N/A	7.5	Indoor	40	40	400Vac, 50Hz, 3-phase	SUS316L	SHQ-ME-DD-H01-0004, SHEET 4 OF 4	SHEET 21 OF 23			
SHQ	HE	71	007	-	CHANGING ROOM (R)	SHQ	L0	022	CHANGING ROOM	S/A	Normal	200	200	350	884	2.9	N/A	6.1	Indoor	17	17	400Vac, 50Hz, 3-phase	SUS316L	SHQ-ME-DD-H01-0004, SHEET 2 OF 4	SHEET 21 OF 23			
SHQ	HE	71	010	-	STAIR (L)	SHQ	L0	004	STAIR	S/A	Emer'cy	300	240	450	1607	4.9	N/A	6.2	Indoor	27	27	400Vac, 50Hz, 3-phase	SUS316L	SHQ-ME-DD-H01-0004, SHEET 3 OF 4	SHEET 22 OF 23			
SHQ	HE	71	011	-	T.V. ROOM(1) (L)	SHQ	L0	017	T.V. ROOM(1)	S/A	Emer'cy	300	300	350	1918	6.7	N/A	5.9	Indoor	23	23	400Vac, 50Hz, 3-phase	SUS316L	SHQ-ME-DD-H01-0004, SHEET 2 OF 4	SHEET 22 OF 23			
SHQ	HE	71	012	-	T.V. ROOM(2) (R)	SHQ	L0	018	T.V. ROOM(2)	S/A	Emer'cy	300	300	350	1918	6.7	N/A	5.9	Indoor	23	23	400Vac, 50Hz, 3-phase	SUS316L	SHQ-ME-DD-H01-0004, SHEET 2 OF 4	SHEET 22 OF 23			
SHQ	HE	71	013	-	GYMNASIUM (L)	SHQ	L0	019	GYMNASIUM	S/A	Emer'cy	300	200	450	1278	3.8	N/A	5.9	Indoor	25	25	400Vac, 50Hz, 3-phase	SUS316L	SHQ-ME-DD-H01-0004, SHEET 3 OF 4	SHEET 22 OF 23			
SHQ	HE	71	052	-	RECEPTION LOUNGE (L)	SHQ	L1	116	RECEPTION LOUNGE	S/A	Normal	300	200	450	1016	3.3	N/A	4.7	Indoor	25	25	400Vac, 50Hz, 3-phase	SUS316L	SHQ-ME-DD-H01-0004, SHEET 3 OF 4	SHEET 20 OF 23			
SHQ	HE	71	053	-	DINING ROOM (R)	SHQ	L1	117	DINING ROOM	S/A	Normal	800	500	400	10062	32.0	N/A	7.0	Indoor	48	48	400Vac, 50Hz, 3-phase	SUS316L	SHQ-ME-DD-H01-0004, SHEET 4 OF 4	SHEET 20 OF 23			
SHQ	HE	71	054	-	GALLEY / DISH WASH (R)	SHQ	L1	118	GALLEY / DISH WASH	S/A	Normal	400	300	350	1816	5.8	N/A	4.2	Indoor	26	26	400Vac, 50Hz, 3-phase	SUS316L	SHQ-ME-DD-H01-0004, SHEET 2 OF 4	SHEET 20 OF 23			
SHQ	HE	71	055	-	GALLEY / DISH WASH (L)	SHQ	L1	118	GALLEY / DISH WASH	S/A	Normal	400	300	350	2722	8.6	N/A	6.3	Indoor	26	26	400Vac, 50Hz, 3-phase	SUS316L	SHQ-ME-DD-H01-0004, SHEET 2 OF 4	SHEET 20 OF 23			
SHQ	HE	71	082	-	MEETING ROOM (R)	SHQ	L2	209	SERVICE ENGR OFFICE	S/A	Normal	300	200	450	1491	4.8	N/A	6.9	Indoor	25	25	400Vac, 50Hz, 3-phase	SUS316L	SHQ-ME-DD-H01-0004, SHEET 3 OF 4	SHEET 18 OF 23			
SHQ	HE	71	083	-	TECHNICAL LIBRARY (L)	SHQ	L2	220	TECHNICAL LIBRARY	S/A	Normal	200	200	350	932	3.0	N/A	6.5	Indoor	17	17	400Vac, 50Hz, 3-phase	SUS316L	SHQ-ME-DD-H01-0004, SHEET 2 OF 4	SHEET 18 OF 23			
SHQ	HE	71	131	-	TELECOM EQUIPMENT ROOM (R)	SHQ	L2	212	TELECOM EQUIPMENT ROOM	S/A	Emer'cy	500	400	350	4971	14.5	N/A	6.9	Indoor	32	32	400Vac, 50Hz, 3-phase	SUS316L	SHQ-ME-DD-H01-0004, SHEET 2 OF 4	SHEET 19 OF 23			
SHQ	HE	71	132	-	CENTRAL CONTROL ROOM (L)	SHQ	L2	213	CENTRAL CONTROL ROOM	S/A	Emer'cy	300	250	350	1560	5.4	N/A	5.8	Indoor	20	20	400Vac, 50Hz, 3-phase	SUS316L	SHQ-ME-DD-H01-0004, SHEET 2 OF 4	SHEET 19 OF 23			
SHQ	HE	71	134	-	RADIO ROOM (R)	SHQ	L2	229	RADIO ROOM	S/A	Emer'cy	300	200	450	1197	4.2	N/A	5.5	Indoor	25	25	400Vac, 50Hz, 3-phase	SUS316L	SHQ-ME-DD-H01-0004, SHEET 3 OF 4	SHEET 19 OF 23			
SHQ	HE	71	152	-	TRANSIT ROOM (R)	SHQ	L3	315	TRANSIT ROOM	S/A	Normal	400	250	350	2329	7.4	N/A	6.5	Indoor	24	24	400Vac, 50Hz, 3-phase	SUS316L	SHQ-ME-DD-H01-0004, SHEET 2 OF 4	SHEET 17 OF 23			
SHQ	HE	71	371	-	HVAC PLANT ROOM (L)	SHQ	L5	507	HVAC PLANT ROOM	S/A	Emer'cy	300	300	350	2104	7.1	N/A	6.5	Indoor	23	23	400Vac, 50Hz, 3-phase	SUS316L	SHQ-ME-DD-H01-0004, SHEET 2 OF 4	SHEET 13 OF 23			
SHQ	HE	71	372	-	HVAC PLANT ROOM (L)	SHQ	L5	507	HVAC PLANT ROOM	S/A	Emer'cy	600	300	350	4208	14.2	N/A	6.5	Indoor	36	36	400Vac, 50Hz, 3-phase	SUS316L	SHQ-ME-DD-H01-0004, SHEET 2 OF 4	SHEET 13 OF 23			




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								Room No.	Room Description	Service Type	Service Mode	Width or Dia. (mm)	Height (mm)	Length (mm)	Airflow (m³/h)	Capacity (kW)	Static Pressure (pa)	Air Vel. (m/s)	Install Location (Indoor/Outdoor)	Dry (kg)	Operate (kg)	(Volt, Phase, Hz)			
					ROOM UNIT & GRILLE																				
SHP	HU	71	501	-	AIR CONDITIONED STORE OFFICE	SHP	L2	T201	OFFICE	S/A	Normal	ø100	600	154	N/A	N/A	5.4	Indoor	8.3	8.3	N/A	ALUMINIUM	SHP-ME-DD-H01-0005, Sheet 3 of 7	SHEET 9 OF 14	
SHP	HU	71	502	-	AIR CONDITIONED STORE OFFICE	SHP	L2	T201	OFFICE	S/A	Normal	ø100	600	155	N/A	N/A	5.4	Indoor	8.3	8.3	N/A	ALUMINIUM	SHP-ME-DD-H01-0005, Sheet 3 of 7	SHEET 9 OF 14	
SHP	HU	71	503	-	AIR CONDITIONED STORE	SHP	L2	T202	A/C STORE	S/A	Normal	ø100	600	243	N/A	N/A	5.4	Indoor	8.3	8.3	N/A	ALUMINIUM	SHP-ME-DD-H01-0005, Sheet 3 of 7	SHEET 9 OF 14	
SHP	HU	71	504	-	AIR CONDITIONED STORE	SHP	L2	T202	A/C STORE	S/A	Normal	ø100	600	243	N/A	N/A	5.4	Indoor	8.3	8.3	N/A	ALUMINIUM	SHP-ME-DD-H01-0005, Sheet 3 of 7	SHEET 9 OF 14	
SHP	HU	71	505	-	AIR CONDITIONED STORE	SHP	L2	T202	A/C STORE	S/A	Normal	ø100	600	244	N/A	N/A	5.4	Indoor	8.3	8.3	N/A	ALUMINIUM	SHP-ME-DD-H01-0005, Sheet 3 of 7	SHEET 9 OF 14	
SHP	HU	71	506	-	AIR CONDITIONED STORE	SHP	L2	T202	A/C STORE	S/A	Normal	ø100	600	244	N/A	N/A	5.4	Indoor	8.3	8.3	N/A	ALUMINIUM	SHP-ME-DD-H01-0005, Sheet 3 of 7	SHEET 9 OF 14	
SHP	HU	71	507	-	AIR CONDITIONED STORE	SHP	L2	T202	A/C STORE	S/A	Normal	ø100	600	244	N/A	N/A	5.4	Indoor	8.3	8.3	N/A	ALUMINIUM	SHP-ME-DD-H01-0005, Sheet 3 of 7	SHEET 9 OF 14	
SHP	HU	71	508	-	AIR LOCK	SHP	L2	T203	AIR LOCK	S/A	Normal	ø100	600	56	N/A	N/A	2.0	Indoor	8.3	8.3	N/A	ALUMINIUM	SHP-ME-DD-H01-0005, Sheet 3 of 7	SHEET 9 OF 14	
SHP	HU	71	509	-	AIR LOCK	SHP	L2	T206	AIR LOCK	S/A	Normal	ø100	600	74	N/A	N/A	2.6	Indoor	8.3	8.3	N/A	ALUMINIUM	SHP-ME-DD-H01-0005, Sheet 3 of 7	SHEET 9 OF 14	
SHP	HU	71	511	-	ELECTRICAL TECHNICAL ROOM AIR LOCK	SHP	L1	T102	AIR LOCK	S/A	Normal	ø100	600	49	N/A	N/A	1.7	Indoor	8.3	8.3	N/A	ALUMINIUM	SHP-ME-DD-H01-0005, Sheet 3 of 7	SHEET 10 OF 14	
SHP	HU	71	512	-	ELECTRICAL TECHNICAL ROOM AIR LOCK	SHP	L1	T102	AIR LOCK	S/A	Normal	ø100	600	49	N/A	N/A	1.7	Indoor	8.3	8.3	N/A	ALUMINIUM	SHP-ME-DD-H01-0005, Sheet 3 of 7	SHEET 10 OF 14	
SHP	HU	71	515	-	MECHANICAL WORKSHOP AIR LOCK	SHP	L0	T002	AIR LOCK	S/A	Normal	ø100	600	49	N/A	N/A	1.7	Indoor	8.3	8.3	N/A	ALUMINIUM	SHP-ME-DD-H01-0005, Sheet 3 of 7	SHEET 12 OF 14	
SHP	HU	71	516	-	INSTRUM. AND ELECTRICAL WORKSHOP AIR LOCK	SHP	L0	T004	AIR LOCK	S/A	Normal	ø100	600	49	N/A	N/A	1.7	Indoor	8.3	8.3	N/A	ALUMINIUM	SHP-ME-DD-H01-0005, Sheet 3 of 7	SHEET 12 OF 14	
SHP	HU	71	519	-	INSTRUM EQUIPMENT AIR LOCK	SHP	L0	T006	AIR LOCK	S/A	Normal	ø100	600	46	N/A	N/A	1.3	Indoor	8.3	8.3	N/A	ALUMINIUM	SHP-ME-DD-H01-0005, Sheet 3 of 7	SHEET 13 OF 14	
SHP	HU	71	525	-	STORE FOR RADIOACTIVE SOURCE	SHP	UPPER	T304	P/SOURCE	S/A	Normal	ø100	600	231	N/A	N/A	8.2	Indoor	8.3	8.3	N/A	ALUMINIUM	SHP-ME-DD-H01-0005, Sheet 3 of 7	SHEET 14 OF 14	
SHP	HU	71	526	-	HEAVY DUTY EQUIPMENT STORAGE	SHP	UPPER	T302	HEAVY DUTY	S/A	Normal	ø100	600	232	N/A	N/A	8.2	Indoor	8.3	8.3	N/A	ALUMINIUM	SHP-ME-DD-H01-0005, Sheet 3 of 7	SHEET 14 OF 14	
SHP	HU	71	527	-	HEAVY DUTY EQUIPMENT STORAGE	SHP	UPPER	T302	HEAVY DUTY	S/A	Normal	ø100	600	232	N/A	N/A	8.2	Indoor	8.3	8.3	N/A	ALUMINIUM	SHP-ME-DD-H01-0005, Sheet 3 of 7	SHEET 14 OF 14	
SHP	HU	71	528	-	STORAGE AREA	SHP	UPPER	T303	STORAGE AREA	S/A	Normal	ø100	600	238	N/A	N/A	8.4	Indoor	8.3	8.3	N/A	ALUMINIUM	SHP-ME-DD-H01-0005, Sheet 3 of 7	SHEET 14 OF 14	
SHP	HU	71	529	-	STORAGE AREA	SHP	UPPER	T303	STORAGE AREA	S/A	Normal	ø100	600	238	N/A	N/A	8.4	Indoor	8.3	8.3	N/A	ALUMINIUM	SHP-ME-DD-H01-0005, Sheet 3 of 7	SHEET 14 OF 14	
SHP	HU	71	530	-	STORAGE AREA	SHP	UPPER	T303	STORAGE AREA	S/A	Normal	ø100	600	239	N/A	N/A	8.4	Indoor	8.3	8.3	N/A	ALUMINIUM	SHP-ME-DD-H01-0005, Sheet 3 of 7	SHEET 14 OF 14	




					<div><div>SHWE - Detailed Engineering - Field Development Project</div><div>HVAC Equipment List for Technical Building</div></div>																							
					N° SHP-HV-EB-301-0001				Rev: 2		Status: AFC		Discipline: HVAC		Document type: LIS				Rev. Date: 22/12/2010									
Location	Class	System	Number	Code	Description	Platform	Location			Service		Dimensions			Design conditions					Weight		Power		Material	Remark	Ducting & Instr. Diagram (SHP-HV-DS-303-0001)	Piping & Instr. Diagram / Overall Single line diagram	
							Deck	Room No.	Room Description	Service Type	Service Mode	Width or Dia. (mm)	Height (mm)	Length (mm)	Airflow (m³/h)	Capacity (kW)	Static Pressure (pa)	Air Vel. (m/s)	Install Location (Indoor/Outdoor)	Dry (kg)	Operate (kg)	(Volt, Phase, Hz)	-					
					ROOM UNIT & GRILLE																							
SHP	HU	71	520	-	PASSAGE TO LQ	SHP	L0	T007	PASSAGE TO LQ	S/A	Normal	150	150	TBC	33	N/A	N/A	0.4	Indoor	3	3	N/A	SUS316L	SHP-ME-DD-H01-0005, Sheet 7 of 7	SHEET 13 OF 14			
SHP	HU	71	551	-	AIR CONDITIONED STORE OFFICE	SHP	L2	T201	OFFICE	R/A	Normal	200	300	TBC	309	N/A	N/A	1.4	Indoor	7	7	N/A	SUS316L	SHP-ME-DD-H01-0005, Sheet 4 of 7	SHEET 9 OF 14			
SHP	HU	71	552	-	AIR CONDITIONED STORE	SHP	L2	T202	AIR CONDITIONED STORE	R/A	Normal	300	300	TBC	609	N/A	N/A	1.9	Indoor	9	9	N/A	SUS316L	SHP-ME-DD-H01-0005, Sheet 4 of 7	SHEET 9 OF 14			
SHP	HU	71	553	-	AIR CONDITIONED STORE	SHP	L2	T202	AIR CONDITIONED STORE	R/A	Normal	300	300	TBC	609	N/A	N/A	1.9	Indoor	9	9	N/A	SUS316L	SHP-ME-DD-H01-0005, Sheet 4 of 7	SHEET 9 OF 14			
SHP	HU	71	554	-	AIR LOCK	SHP	L2	T203	AIR LOCK	N/E	Normal	200	200	TBC	56	N/A	N/A	0.4	Indoor	5	5	N/A	SUS316L	SHP-ME-DD-H01-0005, Sheet 4 of 7	SHEET 9 OF 14			
SHP	HU	71	555	-	HVAC PLANT ROOM	SHP	L2	T204	HVAC PLANT ROOM	R/A	Normal	400	400	TBC	1271	N/A	N/A	2.2	Indoor	13	13	N/A	SUS316L	SHP-ME-DD-H01-0005, Sheet 4 of 7	SHEET 9 OF 14			
SHP	HU	71	556	-	HVAC PLANT ROOM	SHP	L2	T204	HVAC PLANT ROOM	R/A	Normal	400	400	TBC	1272	N/A	N/A	2.2	Indoor	13	13	N/A	SUS316L	SHP-ME-DD-H01-0005, Sheet 4 of 7	SHEET 9 OF 14			
SHP	HU	71	557	-	HVAC PLANT ROOM	SHP	L2	T204	HVAC PLANT ROOM	R/A	Normal	400	400	TBC	1513	N/A	N/A	2.6	Indoor	13	13	N/A	SUS316L	SHP-ME-DD-H01-0005, Sheet 4 of 7	SHEET 9 OF 14			
SHP	HU	71	558	-	HVAC PLANT ROOM	SHP	L2	T204	HVAC PLANT ROOM	R/A	Normal	400	400	TBC	1514	N/A	N/A	2.6	Indoor	13	13	N/A	SUS316L	SHP-ME-DD-H01-0005, Sheet 4 of 7	SHEET 9 OF 14			
SHP	HU	71	559	-	HVAC PLANT ROOM	SHP	L2	T204	HVAC PLANT ROOM	N/E	Normal	300	300	TBC	484	N/A	N/A	1.5	Indoor	9	9	N/A	SUS316L	SHP-ME-DD-H01-0005, Sheet 4 of 7	SHEET 9 OF 14			
SHP	HU	71	560	-	LABORATORY	SHP	L2	T205	LABORATORY	R/A	Normal	400	300	TBC	987	N/A	N/A	2.3	Indoor	11	11	N/A	SUS316L	SHP-ME-DD-H01-0005, Sheet 4 of 7	SHEET 9 OF 14			
SHP	HU	71	561	-	LABORATORY	SHP	L2	T205	LABORATORY	R/A	Normal	400	300	TBC	987	N/A	N/A	2.3	Indoor	11	11	N/A	SUS316L	SHP-ME-DD-H01-0005, Sheet 4 of 7	SHEET 9 OF 14			
SHP	HU	71	562	-	LABORATORY	SHP	L2	T205	LABORATORY	R/A	Normal	400	300	TBC	987	N/A	N/A	2.3	Indoor	11	11	N/A	SUS316L	SHP-ME-DD-H01-0005, Sheet 4 of 7	SHEET 9 OF 14			
SHP	HU	71	563	-	LABORATORY	SHP	L2	T205	LABORATORY	R/A	Normal	400	300	TBC	987	N/A	N/A	2.3	Indoor	11	11	N/A	SUS316L	SHP-ME-DD-H01-0005, Sheet 4 of 7	SHEET 9 OF 14			
SHP	HU	71	564	-	LABORATORY	SHP	L2	T205	LABORATORY	M/E	Normal	400	300	TBC	1224	N/A	N/A	2.8	Indoor	11	11	N/A	SUS316L	SHP-ME-DD-H01-0005, Sheet 4 of 7	SHEET 9 OF 14			
SHP	HU	71	565	-	LABORATORY	SHP	L2	T205	LABORATORY	M/E	Normal	400	300	TBC	1224	N/A	N/A	2.8	Indoor	11	11	N/A	SUS316L	SHP-ME-DD-H01-0005, Sheet 4 of 7	SHEET 9 OF 14			
SHP	HU	71	566	-	LABORATORY AIR LOCK	SHP	L2	T206	AIR LOCK	N/E	Normal	200	200	TBC	74	N/A	N/A	0.5	Indoor	5	5	N/A	SUS316L	SHP-ME-DD-H01-0005, Sheet 4 of 7	SHEET 9 OF 14			
SHP	HU	71	570	-	ELECTRICAL TECHNICAL ROOM(RAISED FLOOR)	SHP	L1	T101	ETR	S/A	Normal	500	500	TBC	2454	N/A	N/A	2.7	Indoor	18	18	N/A	SUS316L	SHP-ME-DD-H01-0005, Sheet 4 of 7	SHEET 10 OF 14			
SHP	HU	71	571	-	ELECTRICAL TECHNICAL ROOM(RAISED FLOOR)	SHP	L1	T101	ETR	S/A	Normal	500	500	TBC	2454	N/A	N/A	2.7	Indoor	18	18	N/A	SUS316L	SHP-ME-DD-H01-0005, Sheet 4 of 7	SHEET 10 OF 14			
SHP	HU	71	572	-	ELECTRICAL TECHNICAL ROOM(RAISED FLOOR)	SHP	L1	T101	ETR	S/A	Normal	500	500	TBC	2454	N/A	N/A	2.7	Indoor	18	18	N/A	SUS316L	SHP-ME-DD-H01-0005, Sheet 4 of 7	SHEET 10 OF 14			
SHP	HU	71	573	-	ELECTRICAL TECHNICAL ROOM(RAISED FLOOR)	SHP	L1	T101	ETR	S/A	Normal	500	500	TBC	2454	N/A	N/A	2.7	Indoor	18	18	N/A	SUS316L	SHP-ME-DD-H01-0005, Sheet 4 of 7	SHEET 10 OF 14			
SHP	HU	71	574	-	ELECTRICAL TECHNICAL ROOM(RAISED FLOOR)	SHP	L1	T101	ETR	S/A	Normal	500	500	TBC	2454	N/A	N/A	2.7	Indoor	18	18	N/A	SUS316L	SHP-ME-DD-H01-0005, Sheet 5 of 7	SHEET 10 OF 14			
SHP	HU	71	575	-	ELECTRICAL TECHNICAL ROOM(RAISED FLOOR)	SHP	L1	T101	ETR	S/A	Normal	500	500	TBC	2454	N/A	N/A	2.7	Indoor	18	18	N/A	SUS316L	SHP-ME-DD-H01-0005, Sheet 5 of 7	SHEET 10 OF 14			
SHP	HU	71	576	-	ELECTRICAL TECHNICAL ROOM(RAISED FLOOR)	SHP	L1	T101	ETR	S/A	Normal	500	500	TBC	2453	N/A	N/A	2.7	Indoor	18	18	N/A	SUS316L	SHP-ME-DD-H01-0005, Sheet 5 of 7	SHEET 10 OF 14			
SHP	HU	71	577	-	ELECTRICAL TECHNICAL ROOM(RAISED FLOOR)	SHP	L1	T101	ETR	S/A	Normal	500	500	TBC	2452	N/A	N/A	2.7	Indoor	18	18	N/A	SUS316L	SHP-ME-DD-H01-0005, Sheet 5 of 7	SHEET 10 OF 14			
SHP	HU	71	578	-	ELECTRICAL TECHNICAL ROOM(RAISED FLOOR)	SHP	L1	T101	ETR	S/A	Normal	500	500	TBC	2453	N/A	N/A	2.7	Indoor	18	18	N/A	SUS316L	SHP-ME-DD-H01-0005, Sheet 5 of 7	SHEET 10 OF 14			
SHP	HU	71	579	-	ELECTRICAL TECHNICAL ROOM(RAISED FLOOR)	SHP	L1	T101	ETR	S/A	Normal	500	500	TBC	2453	N/A	N/A	2.7	Indoor	18	18	N/A	SUS316L	SHP-ME-DD-H01-0005, Sheet 5 of 7	SHEET 10 OF 14			
SHP	HU	71	580	-	ELECTRICAL TECHNICAL ROOM(RAISED FLOOR)	SHP	L1	T101	ETR	S/A	Normal	500	500	TBC	2453	N/A	N/A	2.7	Indoor	18	18	N/A	SUS316L	SHP-ME-DD-H01-0005, Sheet 5 of 7	SHEET 10 OF 14			
SHP	HU	71	581	-	ELECTRICAL TECHNICAL ROOM(RAISED FLOOR)	SHP	L1	T101	ETR	S/A	Normal	500	500	TBC	2453	N/A	N/A	2.7	Indoor	18	18	N/A	SUS316L	SHP-ME-DD-H01-0005, Sheet 5 of 7	SHEET 10 OF 14			
SHP	HU	71	582	-	ELECTRICAL TECHNICAL ROOM(RAISED FLOOR)	SHP	L1	T101	ETR	R/A	Normal	600	600	TBC	3622	N/A	N/A	2.8	Indoor	24	24	N/A	SUS316L	SHP-ME-DD-H01-0005, Sheet 5 of 7	SHEET 10 OF 14			
SHP	HU	71	583	-	ELECTRICAL TECHNICAL ROOM(RAISED FLOOR)	SHP	L1	T101	ETR	R/A	Normal	600	600	TBC	3622	N/A	N/A	2.8	Indoor	24	24	N/A	SUS316L	SHP-ME-DD-H01-0005, Sheet 5 of 7	SHEET 10 OF 14			
SHP	HU	71	584	-	ELECTRICAL TECHNICAL ROOM(RAISED FLOOR)	SHP	L1	T101	ETR	R/A	Normal	600	600	TBC	3621	N/A	N/A	2.8	Indoor	24	24	N/A	SUS316L	SHP-ME-DD-H01-0005, Sheet 5 of 7	SHEET 10 OF 14			
SHP	HU	71	585	-	ELECTRICAL TECHNICAL ROOM(RAISED FLOOR)	SHP	L1	T101	ETR	R/A	Normal	600	600	TBC	3622	N/A	N/A	2.8	Indoor	24	24	N/A	SUS316L	SHP-ME-DD-H01-0005, Sheet 5 of 7	SHEET 10 OF 14			
SHP	HU	71	586	-	ELECTRICAL TECHNICAL ROOM(RAISED FLOOR)	SHP	L1	T101	ETR	R/A	Normal	600	600	TBC	3623	N/A	N/A	2.8	Indoor	24	24	N/A	SUS316L	SHP-ME-DD-H01-0005, Sheet 5 of 7	SHEET 10 OF 14			
SHP	HU	71	587	-	ELECTRICAL TECHNICAL ROOM(RAISED FLOOR)	SHP	L1	T101	ETR	R/A	Normal	600	600	TBC	3622	N/A	N/A	2.8	Indoor	24	24	N/A	SUS316L	SHP-ME-DD-H01-0005, Sheet 5 of 7	SHEET 10 OF 14			
SHP	HU	71	588	-	ELECTRICAL TECHNICAL ROOM(RAISED FLOOR)	SHP	L1	T101	ETR	R/A	Normal	600	600	TBC	3622	N/A	N/A	2.8	Indoor	24	24	N/A	SUS316L	SHP-ME-DD-H01-0005, Sheet 5 of 7	SHEET 10 OF 14			
SHP	HU	71	589	-	ELECTRICAL TECHNICAL ROOM(RAISED FLOOR)	SHP	L1	T101	ETR	R/A	Normal	600	600	TBC	3623	N/A	N/A	2.8	Indoor	24	24	N/A	SUS316L	SHP-ME-DD-H01-0005, Sheet 5 of 7	SHEET 10 OF 14			
SHP	HU	71	590	-	ELECTRICAL TECHNICAL ROOM(RAISED FLOOR) AIR LOCK	SHP	L1	T102	AIR LCOK	N/E	Normal	200	200	TBC	49	N/A	N/A	0.3	Indoor	5	5	N/A	SUS316L	SHP-ME-DD-H01-0005, Sheet 5 of 7	SHEET 10 OF 14			
SHP	HU	71	591	-	ELECTRICAL TECHNICAL ROOM(RAISED FLOOR) AIR LOCK	SHP	L1	T102	AIR LCOK	N/E	Normal	200	200	TBC	49	N/A	N/A	0.3	Indoor	5	5	N/A	SUS316L	SHP-ME-DD-H01-0005, Sheet 5 of 7	SHEET 10 OF 14			
SHP	HU	71	592	-	ELECTRICAL TECHNICAL ROOM(RAISED FLOOR)	SHP	L1	T102	ETR	N/E	Normal																	




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Location	Class	System	Number	Code	Description	Platform	Deck	Room No.	Room Description	Service Type	Service Mode	Width or Dia. (mm)	Height (mm)	Length (mm)	Airflow (m³/h)	Capacity (kW)	Static Pressure (pa)	Air Vel. (m/s)	Install Location (Indoor/Outdoor)	Dry (kg)	Operate (kg)	Power (Volt, Phase, Hz)	Material -	Remark	Ducting & Instr. Diagram (SHP-HV-DS-303-0001)	Piping & Instr. Diagram / Overall Single line diagram	
					ROOM UNIT & GRILLE																						
SHP	HU	71	603	-	BATTERY ROOM	SHP	L1	T103	BATTERY ROOM	M/E	Normal	300	300	TBC	792	N/A	N/A	2.4	Indoor	9	9	N/A	SUS316L	SHP-ME-DD-H01-0005, Sheet 6 of 7	SHEET 11 OF 14		
SHP	HU	71	604	-	BATTERY ROOM	SHP	L1	T103	BATTERY ROOM	M/E	Normal	300	300	TBC	792	N/A	N/A	2.4	Indoor	9	9	N/A	SUS316L	SHP-ME-DD-H01-0005, Sheet 6 of 7	SHEET 11 OF 14		
SHP	HU	71	605	-	BATTERY ROOM	SHP	L1	T103	BATTERY ROOM	M/E	Normal	300	300	TBC	792	N/A	N/A	2.4	Indoor	9	9	N/A	SUS316L	SHP-ME-DD-H01-0005, Sheet 6 of 7	SHEET 11 OF 14		
SHP	HU	71	610	-	MECHANICAL WORKSHOP	SHP	L0	T001	MECH. WORKSHOP	S/A	Normal	300	300	TBC	706	N/A	N/A	2.2	Indoor	9	9	N/A	SUS316L	SHP-ME-DD-H01-0005, Sheet 6 of 7	SHEET 12 OF 14		
SHP	HU	71	611	-	MECHANICAL WORKSHOP	SHP	L0	T001	MECH. WORKSHOP	S/A	Normal	300	300	TBC	706	N/A	N/A	2.2	Indoor	9	9	N/A	SUS316L	SHP-ME-DD-H01-0005, Sheet 6 of 7	SHEET 12 OF 14		
SHP	HU	71	612	-	MECHANICAL WORKSHOP	SHP	L0	T001	MECH. WORKSHOP	S/A	Normal	300	300	TBC	705	N/A	N/A	2.2	Indoor	9	9	N/A	SUS316L	SHP-ME-DD-H01-0005, Sheet 6 of 7	SHEET 12 OF 14		
SHP	HU	71	613	-	MECHANICAL WORKSHOP	SHP	L0	T001	MECH. WORKSHOP	M/E	Normal	300	300	TBC	706	N/A	N/A	2.2	Indoor	9	9	N/A	SUS316L	SHP-ME-DD-H01-0005, Sheet 6 of 7	SHEET 12 OF 14		
SHP	HU	71	614	-	MECHANICAL WORKSHOP	SHP	L0	T001	MECH. WORKSHOP	M/E	Normal	300	300	TBC	706	N/A	N/A	2.2	Indoor	9	9	N/A	SUS316L	SHP-ME-DD-H01-0005, Sheet 6 of 7	SHEET 12 OF 14		
SHP	HU	71	615	-	MECHANICAL WORKSHOP	SHP	L0	T001	MECH. WORKSHOP	M/E	Normal	300	300	TBC	705	N/A	N/A	2.2	Indoor	9	9	N/A	SUS316L	SHP-ME-DD-H01-0005, Sheet 6 of 7	SHEET 12 OF 14		
SHP	HU	71	616	-	MECHANICAL WORKSHOP AIR LOCK	SHP	L0	T001	AIR LOCK	N/E	Normal	200	200	TBC	49	N/A	N/A	0.3	Indoor	5	5	N/A	SUS316L	SHP-ME-DD-H01-0005, Sheet 6 of 7	SHEET 12 OF 14		
SHP	HU	71	617	-	INSTRUM. AND ELECTRICAL WORKSHOP	SHP	L0	T001	E/I W/SHOP	S/A	Normal	200	200	TBC	356	N/A	N/A	2.5	Indoor	5	5	N/A	SUS316L	SHP-ME-DD-H01-0005, Sheet 6 of 7	SHEET 12 OF 14		
SHP	HU	71	618	-	INSTRUM. AND ELECTRICAL WORKSHOP	SHP	L0	T001	E/I W/SHOP	S/A	Normal	200	200	TBC	355	N/A	N/A	2.5	Indoor	5	5	N/A	SUS316L	SHP-ME-DD-H01-0005, Sheet 6 of 7	SHEET 12 OF 14		
SHP	HU	71	619	-	INSTRUM. AND ELECTRICAL WORKSHOP	SHP	L0	T001	E/I W/SHOP	S/A	Normal	200	200	TBC	356	N/A	N/A	2.5	Indoor	5	5	N/A	SUS316L	SHP-ME-DD-H01-0005, Sheet 6 of 7	SHEET 12 OF 14		
SHP	HU	71	620	-	INSTRUM. AND ELECTRICAL WORKSHOP	SHP	L0	T001	E/I W/SHOP	S/A	Normal	200	200	TBC	355	N/A	N/A	2.5	Indoor	5	5	N/A	SUS316L	SHP-ME-DD-H01-0005, Sheet 6 of 7	SHEET 12 OF 14		
SHP	HU	71	621	-	INSTRUM. AND ELECTRICAL WORKSHOP	SHP	L0	T001	E/I W/SHOP	M/E	Normal	300	300	TBC	711	N/A	N/A	2.2	Indoor	9	9	N/A	SUS316L	SHP-ME-DD-H01-0005, Sheet 6 of 7	SHEET 12 OF 14		
SHP	HU	71	622	-	INSTRUM. AND ELECTRICAL WORKSHOP	SHP	L0	T001	E/I W/SHOP	M/E	Normal	300	300	TBC	711	N/A	N/A	2.2	Indoor	9	9	N/A	SUS316L	SHP-ME-DD-H01-0005, Sheet 6 of 7	SHEET 12 OF 14		
SHP	HU	71	623	-	INSTRUM. AND ELECTRICAL WORKSHOP AIR LOCK	SHP	L0	T001	AIR LOCK	N/E	Normal	200	200	TBC	49	N/A	N/A	0.3	Indoor	5	5	N/A	SUS316L	SHP-ME-DD-H01-0005, Sheet 6 of 7	SHEET 12 OF 14		
SHP	HU	71	630	-	INSTRUMENT EQUIPMENT ROOM(RAISED FLOOR)	SHP	L0	T005	IER	S/A	Normal	400	300	TBC	1185	N/A	N/A	2.7	Indoor	11	11	N/A	SUS316L	SHP-ME-DD-H01-0005, Sheet 6 of 7	SHEET 13 OF 14		
SHP	HU	71	631	-	INSTRUMENT EQUIPMENT ROOM(RAISED FLOOR)	SHP	L0	T005	IER	S/A	Normal	400	300	TBC	1185	N/A	N/A	2.7	Indoor	11	11	N/A	SUS316L	SHP-ME-DD-H01-0005, Sheet 7 of 7	SHEET 13 OF 14		
SHP	HU	71	632	-	INSTRUMENT EQUIPMENT ROOM(RAISED FLOOR)	SHP	L0	T005	IER	S/A	Normal	400	300	TBC	1186	N/A	N/A	2.7	Indoor	11	11	N/A	SUS316L	SHP-ME-DD-H01-0005, Sheet 7 of 7	SHEET 13 OF 14		
SHP	HU	71	633	-	INSTRUMENT EQUIPMENT ROOM(RAISED FLOOR)	SHP	L0	T005	IER	S/A	Normal	400	300	TBC	1185	N/A	N/A	2.7	Indoor	11	11	N/A	SUS316L	SHP-ME-DD-H01-0005, Sheet 7 of 7	SHEET 13 OF 14		
SHP	HU	71	634	-	INSTRUMENT EQUIPMENT ROOM(RAISED FLOOR)	SHP	L0	T005	IER	S/A	Normal	400	300	TBC	1185	N/A	N/A	2.7	Indoor	11	11	N/A	SUS316L	SHP-ME-DD-H01-0005, Sheet 7 of 7	SHEET 13 OF 14		
SHP	HU	71	635	-	INSTRUMENT EQUIPMENT ROOM(RAISED FLOOR)	SHP	L0	T005	IER	S/A	Normal	400	300	TBC	1186	N/A	N/A	2.7	Indoor	11	11	N/A	SUS316L	SHP-ME-DD-H01-0005, Sheet 7 of 7	SHEET 13 OF 14		
SHP	HU	71	636	-	INSTRUMENT EQUIPMENT ROOM(RAISED FLOOR)	SHP	L0	T005	IER	R/A	Normal	500	500	TBC	1778	N/A	N/A	2.0	Indoor	18	18	N/A	SUS316L	SHP-ME-DD-H01-0005, Sheet 7 of 7	SHEET 13 OF 14		
SHP	HU	71	637	-	INSTRUMENT EQUIPMENT ROOM(RAISED FLOOR)	SHP	L0	T005	IER	R/A	Normal	500	500	TBC	1778	N/A	N/A	2.0	Indoor	18	18	N/A	SUS316L	SHP-ME-DD-H01-0005, Sheet 7 of 7	SHEET 13 OF 14		
SHP	HU	71	638	-	INSTRUMENT EQUIPMENT ROOM(RAISED FLOOR)	SHP	L0	T005	IER	R/A	Normal	500	500	TBC	1778	N/A	N/A	2.0	Indoor	18	18	N/A	SUS316L	SHP-ME-DD-H01-0005, Sheet 7 of 7	SHEET 13 OF 14		
SHP	HU	71	639	-	INSTRUMENT EQUIPMENT ROOM(RAISED FLOOR)	SHP	L0	T005	IER	R/A	Normal	500	500	TBC	1778	N/A	N/A	2.0	Indoor	18	18	N/A	SUS316L	SHP-ME-DD-H01-0005, Sheet 7 of 7	SHEET 13 OF 14		
SHP	HU	71	640	-	INSTRUM. AND ELECTRICAL WORKSHOP AIR LOCK	SHP	L0	T006	AIR LOCK	N/E	Normal	200	200	TBC	46	N/A	N/A	0.3	Indoor	5	5	N/A	SUS316L	SHP-ME-DD-H01-0005, Sheet 7 of 7	SHEET 12 OF 14		
SHP	HU	71	650	-	WELDING WORKSHOP	SHP	UPPER	T301	WELD. W/SHOP	S/A	Normal	400	400	TBC	1330	N/A	N/A	2.3	Indoor	13	13	N/A	SUS316L	SHP-ME-DD-H01-0005, Sheet 7 of 7	SHEET 14 OF 14		
SHP	HU	71	651	-	WELDING WORKSHOP	SHP	UPPER	T301	WELD. W/SHOP	S/A	Normal	400	400	TBC	1330	N/A	N/A	2.3	Indoor	13	13	N/A	SUS316L	SHP-ME-DD-H01-0005, Sheet 7 of 7	SHEET 14 OF 14		
SHP	HU	71	652	-	WELDING WORKSHOP	SHP	UPPER	T301	WELD. W/SHOP	N/E	Normal	500	500	TBC	1792	N/A	N/A	2.0	Indoor	18	18	N/A	SUS316L	SHP-ME-DD-H01-0005, Sheet 7 of 7	SHEET 14 OF 14		
SHP	HU	71	653	-	HEAVY DUTY EQUIPMENT STORAGE	SHP	UPPER	T302	HEAVY DUTY	N/E	Normal	300	300	TBC	464	N/A	N/A	1.4	Indoor	9	9	N/A	SUS316L	SHP-ME-DD-H01-0005, Sheet 7 of 7	SHEET 14 OF 14		
SHP	HU	71	654	-	STORAGE AREA	SHP	UPPER	T303	STORAGE AREA	N/E	Normal	300	300	TBC	715	N/A	N/A	2.2	Indoor	9	9	N/A	SUS316L	SHP-ME-DD-H01-0005, Sheet 7 of 7	SHEET 14 OF 14		
SHP	HU	71	655	-	STORE FOR RADIOACTIVE SOURCE	SHP	UPPER	T304	STORE FOR RADIOACTIVE SOURCE	N/E	Normal	200	200	TBC	231	N/A	N/A	1.6	Indoor	5	5	N/A	SUS316L	SHP-ME-DD-H01-0005, Sheet 7 of 7	SHEET 14 OF 14		




					 <div>SHWE - Detailed Engineering - Field Development Project HVAC Equipment List with Tags for Living Quarter</div>																					
					N° SHQ-HV-EB-301-0001				Rev: 2		Status: AFC		Disciplint HVAC		Document type: LIS				Rev. Date: 17/01/2011							
Class	Class	System	Number	Code	Description	Platform	Deck	Room No.	Room Description	Service Type	Service Mode	Width or Dia. (mm)	Height (mm)	Length (mm)	Airflow (m³/h)	Capacity (kW)	Static Pressure (pa)	Air Vel. (m/s)	Install Location (Indoor/Outdoor)	Dry (kg)	Operate (kg)	Power (kW)	Material	Remarks	Ducting & Instr. Diagram (SHQ-HV-DS-303-0001)	Piping & Instr. Diagram / Overall Single line diagram (SHQ-HV-DP-301-0003)
					Supply Diffuser (Electrical Heater)																					
SHQ	HE	71	021	-	FIREMEN'S EQ ROOM (L)	SHQ	L0	001	FIREMEN'S	S/A	Normal	550	175	740	196	0.8	N/A	6.9	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 8 OF 34	SHEET 21 OF 23	
SHQ	HE	71	022	-	E&I TELECOM SHAFT (L)	SHQ	L0	003	E&I TELECOM SHAFT	S/A	Normal	550	175	740	213	0.8	N/A	7.5	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 8 OF 34	SHEET 21 OF 23	
SHQ	HE	71	023	-	STORE & JANITOR (L)	SHQ	L0	002	STORE & JANITOR	S/A	Normal	550	175	740	132	0.4	N/A	4.7	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 8 OF 34	SHEET 21 OF 23	
SHQ	HE	71	024	-	POOL ROOM (R)	SHQ	L0	008	POOL ROOM	S/A	Normal	550	175	740	186	0.8	N/A	6.6	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 9 OF 34	SHEET 21 OF 23	
SHQ	HE	71	025	-	POOL ROOM (R)	SHQ	L0	008	POOL ROOM	S/A	Normal	550	175	740	186	0.8	N/A	6.6	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 9 OF 34	SHEET 21 OF 23	
SHQ	HE	71	026	-	AIR LOCK (R)	SHQ	L0	011	AIR LOCK	S/A	Normal	550	175	740	37	0.4	N/A	1.3	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 9 OF 34	SHEET 21 OF 23	
SHQ	HE	71	027	-	CORRIDOR (L)	SHQ	L0	012	CORRIDOR	S/A	Normal	550	175	740	169	0.4	N/A	4.7	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 8 OF 34	SHEET 21 OF 23	
SHQ	HE	71	028	-	CORRIDOR (L)	SHQ	L0	012	CORRIDOR	S/A	Normal	550	175	740	191	0.8	N/A	2.6	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 8 OF 34	SHEET 21 OF 23	
SHQ	HE	71	029	-	CORRIDOR (R)	SHQ	L0	013	CORRIDOR	S/A	Normal	550	175	740	153	0.8	N/A	5.4	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 9 OF 34	SHEET 21 OF 23	
SHQ	HE	71	030	-	CORRIDOR (R)	SHQ	L0	014	CORRIDOR	S/A	Normal	550	175	740	110	0.4	N/A	3.9	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 9 OF 34	SHEET 21 OF 23	
SHQ	HE	71	031	-	CORRICOR (R)	SHQ	L0	014	CORRIDOR	S/A	Normal	550	175	740	111	0.4	N/A	3.9	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 9 OF 34	SHEET 21 OF 23	
SHQ	HE	71	032	-	TOILET (R)	SHQ	L0	020	TOILET	S/A	Normal	550	175	740	55	0.4	N/A	1.9	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 9 OF 34	SHEET 21 OF 23	
SHQ	HE	71	033	-	SHOWER (R)	SHQ	L0	021	SHOWER	S/A	Normal	550	175	740	213	0.8	N/A	7.5	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 9 OF 34	SHEET 21 OF 23	
SHQ	HE	71	034	-	TOILET / SHOWER (L)	SHQ	L0	023	TOILET & SHOWER	S/A	Normal	550	175	740	67	0.4	N/A	2.4	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 8 OF 34	SHEET 21 OF 23	
SHQ	HE	71	035	-	FEMALE CHANGING ROOM (R)	SHQ	L0	024	FEMALE CHANGING ROOM	S/A	Normal	550	175	740	75	0.4	N/A	2.7	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 9 OF 34	SHEET 21 OF 23	
SHQ	HE	71	036	-	AIR LOCK (L)	SHQ	L0	025	AIR LOCK	S/A	Normal	550	175	740	37	0.4	N/A	1.3	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 8 OF 34	SHEET 21 OF 23	
SHQ	HE	71	038	-	COMPUTER GAME ROOM (R)	SHQ	L0	009	COMPUTER G/R	S/A	Normal	550	175	740	186	0.4	N/A	6.6	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 9 OF 34	SHEET 21 OF 23	
SHQ	HE	71	039	-	COMPUTER GAME ROOM (L)	SHQ	L0	009	COMPUTER G/R	S/A	Normal	550	175	740	186	0.8	N/A	6.6	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 8 OF 34	SHEET 21 OF 23	
SHQ	HE	71	040	-	LINEN STORE (L)	SHQ	L0	016	LINEN STORE	S/A	Normal	550	175	740	109	0.4	N/A	3.9	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 8 OF 34	SHEET 21 OF 23	
SHQ	HE	71	056	-	FEMALE TOILET (L)	SHQ	L1	102	FEMALE TOILET	S/A	Normal	550	175	740	54	0.4	N/A	1.9	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 8 OF 34	SHEET 20 OF 23	
SHQ	HE	71	057	-	MALE TOILET (R)	SHQ	L1	107	MALE TOILET	S/A	Normal	550	175	740	92	0.4	N/A	3.3	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 9 OF 34	SHEET 20 OF 23	
SHQ	HE	71	058	-	CATERING CHANGING ROOM (R)	SHQ	L1	108	CATERING CHANGING ROOM	S/A	Normal	550	175	740	177	0.8	N/A	6.3	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 9 OF 34	SHEET 20 OF 23	
SHQ	HE	71	059	-	CAMP BOSS OFFICE (R)	SHQ	L1	109	CAMP BOSS OFFICE	S/A	Normal	550	175	740	224	0.8	N/A	7.9	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 9 OF 34	SHEET 20 OF 23	
SHQ	HE	71	060	-	AIR LOCK (R)	SHQ	L1	112	AIR LOCK	S/A	Normal	550	175	740	43	0.4	N/A	1.5	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 9 OF 34	SHEET 20 OF 23	
SHQ	HE	71	061	-	STORE & JANITOR (L)	SHQ	L1	101	STORE & JANITOR	S/A	Normal	550	175	740	117	0.4	N/A	4.1	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 8 OF 34	SHEET 20 OF 23	
SHQ	HE	71	065	-	AIR LOCK (L)	SHQ	L1	115	AIR LOCK	S/A	Normal	550	175	740	35	0.4	N/A	1.2	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 8 OF 34	SHEET 20 OF 23	
SHQ	HE	71	066	-	DRY GOODS STORE (R)	SHQ	L1	125	DRY GOODS STORE	S/A	Normal	550	175	740	248	0.8	N/A	8.8	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 9 OF 34	SHEET 20 OF 23	
SHQ	HE	71	067	-	DRY GOODS STORE (R)	SHQ	L1	125	DRY GOODS STORE	S/A	Normal	550	175	740	249	0.8	N/A	8.8	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 9 OF 34	SHEET 20 OF 23	
SHQ	HE	71	069	-	E&I TELECOM SHAFT (L)	SHQ	L1	103	E&I TELECOM SHAFT	S/A	Normal	550	175	740	196	0.8	N/A	6.9	Indoor	14</						




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					N° SHQ-HV-EB-301-0001				Rev: 2		Status: AFC		Disciplint HVAC		Document type: LIS				Rev. Date: 17/01/2011							
Class	Class	System	Number	Code	Description	Platform	Deck	Room No.	Room Description	Service Type	Service Mode	Width or Dia. (mm)	Height (mm)	Length (mm)	Airflow (m³/h)	Capacity (kW)	Static Pressure (pa)	Air Vel. (m/s)	Install Location (Indoor/Outdoor)	Dry (kg)	Operate (kg)	Power (kW)	Material	Remarks	Ducting & Instr. Diagram (SHQ-HV-DS-303-0001)	Piping & Instr. Diagram / Overall Single line diagram (SHQ-HV-DP-301-0003)
					Supply Diffuser (Electrical Heater)																					
SHQ	HE	71	105	-	DRILLING SUPERVISOR OFFICE (R)	SHQ	L2	224	SAFETY OFFICER OFFICE	S/A	Normal	550	175	740	152	0.8	N/A	5.4	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 9 OF 34	SHEET 18 OF 23	
SHQ	HE	71	106	-	OIM ROOM (R)	SHQ	L2	225	OIM ROOM	S/A	Normal	550	175	740	186	0.4	N/A	6.6	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 9 OF 34	SHEET 18 OF 23	
SHQ	HE	71	107	-	OIM ROOM (L)	SHQ	L2	225	OIM ROOM	S/A	Normal	550	175	740	187	0.8	N/A	6.6	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 8 OF 34	SHEET 18 OF 23	
SHQ	HE	71	108	-	OIM OFFICE (R)	SHQ	L2	226	OIM OFFICE	S/A	Normal	550	175	740	220	0.8	N/A	7.8	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 9 OF 34	SHEET 18 OF 23	
SHQ	HE	71	109	-	OIM OFFICE (L)	SHQ	L2	226	OIM OFFICE	S/A	Normal	550	175	740	220	0.8	N/A	7.8	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 8 OF 34	SHEET 18 OF 23	
SHQ	HE	71	110	-	MAINTENANCE OFFICE (R)	SHQ	L2	227	MAINTENANCE OFFICE	S/A	Normal	550	175	740	186	0.4	N/A	6.6	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 9 OF 34	SHEET 18 OF 23	
SHQ	HE	71	111	-	MAINTENANCE OFFICE (L)	SHQ	L2	227	MAINTENANCE OFFICE	S/A	Normal	550	175	740	187	0.8	N/A	6.6	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 8 OF 34	SHEET 18 OF 23	
SHQ	HE	71	112	-	PRODUCTION SUPERVISOR OFFICE (R)	SHQ	L2	228	PRODUCTION SUP. OFFICE	S/A	Normal	550	175	740	186	0.4	N/A	6.6	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 9 OF 34	SHEET 18 OF 23	
SHQ	HE	71	113	-	PRODUCTION SUPERVISOR OFFICE (L)	SHQ	L2	228	PRODUCTION SUP. OFFICE	S/A	Normal	550	175	740	186	0.8	N/A	6.6	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 8 OF 34	SHEET 18 OF 23	
SHQ	HE	71	114	-	E&I TELECOM SHAFT (R)	SHQ	L2	203	E&I TELECOM SHAFT	S/A	Normal	550	175	740	220	0.8	N/A	7.8	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 9 OF 34	SHEET 18 OF 23	
SHQ	HE	71	115	-	CORRIDOR (R)	SHQ	L2	217	CORRIDOR	S/A	Normal	550	175	740	112	0.4	N/A	3.9	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 9 OF 34	SHEET 18 OF 23	
SHQ	HE	71	116	-	CORRIDOR (R)	SHQ	L2	217	CORRIDOR	S/A	Normal	550	175	740	111	0.4	N/A	3.9	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 9 OF 34	SHEET 18 OF 23	
SHQ	HE	71	117	-	CORRIDOR (L)	SHQ	L2	217	CORRIDOR	S/A	Normal	550	175	740	111	0.4	N/A	3.9	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 8 OF 34	SHEET 18 OF 23	
SHQ	HE	71	135	-	TELECOM WORKSHOP (R)	SHQ	L2	211	TELECOM WORKSHOP	S/A	Emer'cy	550	175	740	226	0.8	N/A	8.0	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 9 OF 34	SHEET 19 OF 23	
SHQ	HE	71	136	-	EMERGENCY COMMAND CENTRE (R)	SHQ	L2	214	EMERGENCY COMM. CENTRE	S/A	Emer'cy	550	175	740	193	0.4	N/A	6.8	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 9 OF 34	SHEET 19 OF 23	
SHQ	HE	71	137	-	EMERGENCY COMMAND CENTRE (R)	SHQ	L2	214	EMERGENCY COMM. CENTRE	S/A	Emer'cy	550	175	740	194	0.8	N/A	6.9	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 9 OF 34	SHEET 19 OF 23	
SHQ	HE	71	138	-	EMERGENCY COMMAND CENTRE (L)	SHQ	L2	214	EMERGENCY COMM. CENTRE	S/A	Emer'cy	550	175	740	194	0.8	N/A	6.9	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 8 OF 34	SHEET 19 OF 23	
SHQ	HE	71	154	-	4-MAN (R)	SHQ	L3	301	4-MAN	S/A	Normal	550	175	740	186	0.4	N/A	6.6	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 9 OF 34	SHEET 16 OF 23	
SHQ	HE	71	155	-	4-MAN (R)	SHQ	L3	301	4-MAN	S/A	Normal	550	175	740	187	0.8	N/A	6.6	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 8 OF 34	SHEET 16 OF 23	
SHQ	HE	71	156	-	STORE & JANITOR (R)	SHQ	L3	302	STORE & JANITOR	S/A	Normal	550	175	740	120	0.4	N/A	4.2	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 9 OF 34	SHEET 16 OF 23	
SHQ	HE	71	159	-	STORE (R)	SHQ	L3	313	STORE	S/A	Normal	550	175	740	71	0.4	N/A	2.5	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 9 OF 34	SHEET 16 OF 23	
SHQ	HE	71	160	-	TOILET & BATH ROOM (R)	SHQ	L3	312	TOILET & BATH ROOM	S/A	Normal	550	175	740	41	0.4	N/A	1.5	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 9 OF 34	SHEET 17 OF 23	
SHQ	HE	71	161	-	MEDICAL STORE (L)	SHQ	L3	311	MEDICAL STORE	S/A	Normal	550	175	740	121	0.4	N/A	4.3	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 8 OF 34	SHEET 17 OF 23	
SHQ	HE	71	162	-	AIR LOCK (L)	SHQ	L3	317	AIR LOCK	S/A	Normal	550	175	740	43	0.4	N/A	1.5	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 9 OF 34	SHEET 16 OF 23	
SHQ	HE	71	163	-	CORRIDOR (R)	SHQ	L3	318	CORRIDOR	S/A	Normal	550	175	740	114	0.4	N/A	4.0	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 9 OF 34	SHEET 16 OF 23	
SHQ	HE	71	166	-	4-MAN (L)	SHQ	L3	320	4-MAN	S/A	Normal	550	175	740	186	0.4	N/A	6.6	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 8 OF 34	SHEET 16 OF 23	
SHQ	HE	71	167	-	4-MAN (L)	SHQ	L3	320	4-MAN	S/A	Normal	550	175	740	187	0.8	N/A	6.6	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 9 OF 34	SHEET 16 OF 23	
SHQ	HE	71	168	-	4-MAN (L)	SHQ	L3	321	4-MAN	S/A	Normal	550	175	740	186	0.4	N/A	6.6	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 8 OF 34	SHEET 16 OF 23	
SHQ</																										




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Class	Class	System	Number	Code	Description	Platform	Deck	Room No.	Room Description	Service Type	Service Mode	Width or Dia. (mm)	Height (mm)	Length (mm)	Airflow (m³/h)	Capacity (kW)	Static Pressure (pa)	Air Vel. (m/s)	Install Location (Indoor/Outdoor)	Dry (kg)	Operate (kg)	Power (kW)	Material	Remarks	Ducting & Instr. Diagram (SHQ-HV-DS-303-0001)	Piping & Instr. Diagram / Overall Single line diagram (SHQ-HV-DP-301-0003)
					Supply Diffuser (Electrical Heater)																					
SHQ	HE	71	199	-	AIR LOCK (R)	SHQ	L3	332	AIR LOCK	S/A	Normal	550	175	740	36	0.4	N/A	1.3	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 9 OF 34	SHEET 17 OF 23	
SHQ	HE	71	200	-	4-MAN (L)	SHQ	L3	333	4-MAN	S/A	Normal	550	175	740	186	0.4	N/A	6.6	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 8 OF 34	SHEET 16 OF 23	
SHQ	HE	71	201	-	4-MAN (R)	SHQ	L3	333	4-MAN	S/A	Normal	550	175	740	187	0.8	N/A	6.6	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 9 OF 34	SHEET 16 OF 23	
SHQ	HE	71	202	-	4-MAN (L)	SHQ	L3	334	4-MAN	S/A	Normal	550	175	740	186	0.4	N/A	6.6	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 8 OF 34	SHEET 16 OF 23	
SHQ	HE	71	203	-	4-MAN (R)	SHQ	L3	334	4-MAN	S/A	Normal	550	175	740	187	0.8	N/A	6.6	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 9 OF 34	SHEET 16 OF 23	
SHQ	HE	71	204	-	4-MAN (L)	SHQ	L3	335	4-MAN	S/A	Normal	550	175	740	186	0.4	N/A	6.6	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 8 OF 34	SHEET 16 OF 23	
SHQ	HE	71	205	-	4-MAN (R)	SHQ	L3	335	4-MAN	S/A	Normal	550	175	740	187	0.8	N/A	6.6	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 9 OF 34	SHEET 16 OF 23	
SHQ	HE	71	206	-	4-MAN (L)	SHQ	L3	336	4-MAN	S/A	Normal	550	175	740	186	0.4	N/A	6.6	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 8 OF 34	SHEET 16 OF 23	
SHQ	HE	71	207	-	4-MAN (R)	SHQ	L3	336	4-MAN	S/A	Normal	550	175	740	187	0.8	N/A	6.6	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 9 OF 34	SHEET 16 OF 23	
SHQ	HE	71	208	-	LINEN STORE (L)	SHQ	L3	337	LINEN STORE	S/A	Normal	550	175	740	42	0.4	N/A	1.5	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 8 OF 34	SHEET 16 OF 23	
SHQ	HE	71	209	-	4-MAN (L)	SHQ	L3	338	4-MAN	S/A	Normal	550	175	740	186	0.4	N/A	6.6	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 8 OF 34	SHEET 16 OF 23	
SHQ	HE	71	210	-	4-MAN (R)	SHQ	L3	338	4-MAN	S/A	Normal	550	175	740	187	0.8	N/A	6.6	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 9 OF 34	SHEET 16 OF 23	
SHQ	HE	71	211	-	4-MAN (L)	SHQ	L3	339	4-MAN	S/A	Normal	550	175	740	186	0.4	N/A	6.6	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 8 OF 34	SHEET 17 OF 23	
SHQ	HE	71	212	-	4-MAN (R)	SHQ	L3	339	4-MAN	S/A	Normal	550	175	740	187	0.8	N/A	6.6	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 9 OF 34	SHEET 17 OF 23	
SHQ	HE	71	213	-	4-MAN (L)	SHQ	L3	340	4-MAN	S/A	Normal	550	175	740	186	0.4	N/A	6.6	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 8 OF 34	SHEET 17 OF 23	
SHQ	HE	71	214	-	4-MAN (R)	SHQ	L3	340	4-MAN	S/A	Normal	550	175	740	187	0.8	N/A	6.6	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 9 OF 34	SHEET 17 OF 23	
SHQ	HE	71	215	-	4-MAN (L)	SHQ	L3	341	4-MAN	S/A	Normal	550	175	740	186	0.4	N/A	6.6	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 8 OF 34	SHEET 17 OF 23	
SHQ	HE	71	216	-	4-MAN (R)	SHQ	L3	341	4-MAN	S/A	Normal	550	175	740	187	0.8	N/A	6.6	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 9 OF 34	SHEET 17 OF 23	
SHQ	HE	71	217	-	4-MAN (L)	SHQ	L3	342	4-MAN	S/A	Normal	550	175	740	186	0.4	N/A	6.6	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 8 OF 34	SHEET 17 OF 23	
SHQ	HE	71	218	-	4-MAN (R)	SHQ	L3	342	4-MAN	S/A	Normal	550	175	740	187	0.8	N/A	6.6	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 9 OF 34	SHEET 17 OF 23	
SHQ	HE	71	219	-	4-MAN (L)	SHQ	L3	343	4-MAN	S/A	Normal	550	175	740	186	0.4	N/A	6.6	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 8 OF 34	SHEET 17 OF 23	
SHQ	HE	71	220	-	4-MAN (R)	SHQ	L3	343	4-MAN	S/A	Normal	550	175	740	187	0.8	N/A	6.6	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 9 OF 34	SHEET 17 OF 23	
SHQ	HE	71	221	-	E&I TELECOM SHAFT (L)	SHQ	L3	303	E&I TELECOM SHAFT	S/A	Normal	550	175	740	267	0.8	N/A	9.4	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 8 OF 34	SHEET 16 OF 23	
SHQ	HE	71	222	-	CORRIDOR (R)	SHQ	L3	319	CORRIDOR	S/A	Normal	550	175	740	146	0.4	N/A	5.2	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 9 OF 34	SHEET 16 OF 23	
SHQ	HE	71	223	-	CORRIDOR (R)	SHQ	L3	319	CORRIDOR	S/A	Normal	550	175	740	146	0.4	N/A	5.2	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 9 OF 34	SHEET 16 OF 23	
SHQ	HE	71	225	-	EXAMINATION ROOM (L)	SHQ	L3	309	EXAM. ROOM	S/A	Normal	550	175	740	282	0.8	N/A	10.0	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 8 OF 34	SHEET 17 OF 23	
SHQ	HE	71	226	-	EXAMINATION ROOM (L)	SHQ	L3	309	EXAM. ROOM	S/A	Normal	550	175	740	282	1.2	N/A	10.0	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 8 OF 34	SHEET 17 OF 23	
SHQ	HE	71	227	-	OBSERVATION ROOM (L)	SHQ	L3	310	OBSERV. ROOM	S/A	Normal	550	175	740	195	0.4	N/A	6.9	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 9 OF 34	SHEET 17 OF 23	
SHQ	HE	71	228	-	OBSERVATION ROOM (R)	SHQ	L3	310	OBSERV. ROOM	S																




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Class	Class	System	Number	Code	Description	Platform	Deck	Room No.	Room Description	Service Type	Service Mode	Width or Dia. (mm)	Height (mm)	Length (mm)	Airflow (m³/h)	Capacity (kW)	Static Pressure (pa)	Air Vel. (m/s)	Install Location (Indoor/Outdoor)	Dry (kg)	Operate (kg)	Power (kW)	Material	Remarks	Ducting & Instr. Diagram (SHQ-HV-DS-303-0001)	Piping & Instr. Diagram / Overall Single line diagram (SHQ-HV-DP-301-0003)
					Supply Diffuser (Electrical Heater)																					
SHQ	HE	71	265	-	4-MAN (L)	SHQ	L4	418	4-MAN	S/A	Normal	550	175	740	187	0.4	N/A	6.6	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 8 OF 34	SHEET 14 OF 23	
SHQ	HE	71	266	-	4-MAN (R)	SHQ	L4	418	4-MAN	S/A	Normal	550	175	740	186	0.8	N/A	6.6	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 9 OF 34	SHEET 14 OF 23	
SHQ	HE	71	267	-	4-MAN (L)	SHQ	L4	419	4-MAN	S/A	Normal	550	175	740	187	0.4	N/A	6.6	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 8 OF 34	SHEET 14 OF 23	
SHQ	HE	71	268	-	4-MAN (R)	SHQ	L4	419	4-MAN	S/A	Normal	550	175	740	186	0.8	N/A	6.6	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 9 OF 34	SHEET 14 OF 23	
SHQ	HE	71	269	-	4-MAN (L)	SHQ	L4	420	4-MAN	S/A	Normal	550	175	740	187	0.4	N/A	6.6	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 8 OF 34	SHEET 14 OF 23	
SHQ	HE	71	270	-	4-MAN (R)	SHQ	L4	420	4-MAN	S/A	Normal	550	175	740	186	0.8	N/A	6.6	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 9 OF 34	SHEET 14 OF 23	
SHQ	HE	71	271	-	LINEN STORE (R)	SHQ	L4	421	LINEN STORE	S/A	Normal	550	175	740	147	0.4	N/A	5.2	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 9 OF 34	SHEET 14 OF 23	
SHQ	HE	71	272	-	4-MAN (L)	SHQ	L4	422	4-MAN	S/A	Normal	550	175	740	186	0.4	N/A	6.6	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 8 OF 34	SHEET 15 OF 23	
SHQ	HE	71	273	-	4-MAN (L)	SHQ	L4	422	4-MAN	S/A	Normal	550	175	740	187	0.8	N/A	6.6	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 9 OF 34	SHEET 15 OF 23	
SHQ	HE	71	274	-	4-MAN (L)	SHQ	L4	423	4-MAN	S/A	Normal	550	175	740	186	0.4	N/A	6.6	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 8 OF 34	SHEET 15 OF 23	
SHQ	HE	71	275	-	4-MAN (R)	SHQ	L4	423	4-MAN	S/A	Normal	550	175	740	187	0.8	N/A	6.6	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 9 OF 34	SHEET 15 OF 23	
SHQ	HE	71	276	-	4-MAN (L)	SHQ	L4	424	4-MAN	S/A	Normal	550	175	740	186	0.4	N/A	6.6	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 8 OF 34	SHEET 15 OF 23	
SHQ	HE	71	277	-	4-MAN (R)	SHQ	L4	424	4-MAN	S/A	Normal	550	175	740	187	0.8	N/A	6.6	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 9 OF 34	SHEET 15 OF 23	
SHQ	HE	71	278	-	4-MAN (L)	SHQ	L4	425	4-MAN	S/A	Normal	550	175	740	186	0.4	N/A	6.6	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 8 OF 34	SHEET 15 OF 23	
SHQ	HE	71	279	-	4-MAN (R)	SHQ	L4	425	4-MAN	S/A	Normal	550	175	740	187	0.8	N/A	6.6	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 9 OF 34	SHEET 15 OF 23	
SHQ	HE	71	280	-	4-MAN (R)	SHQ	L4	426	4-MAN	S/A	Normal	550	175	740	186	0.4	N/A	6.6	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 9 OF 34	SHEET 15 OF 23	
SHQ	HE	71	281	-	4-MAN (R)	SHQ	L4	426	4-MAN	S/A	Normal	550	175	740	187	0.8	N/A	6.6	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 8 OF 34	SHEET 15 OF 23	
SHQ	HE	71	282	-	4-MAN (R)	SHQ	L4	427	4-MAN	S/A	Normal	550	175	740	187	0.4	N/A	6.6	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 9 OF 34	SHEET 14 OF 23	
SHQ	HE	71	283	-	4-MAN (L)	SHQ	L4	427	4-MAN	S/A	Normal	550	175	740	186	0.8	N/A	6.6	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 8 OF 34	SHEET 14 OF 23	
SHQ	HE	71	284	-	4-MAN (R)	SHQ	L4	428	4-MAN	S/A	Normal	550	175	740	187	0.4	N/A	6.6	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 9 OF 34	SHEET 14 OF 23	
SHQ	HE	71	285	-	4-MAN (L)	SHQ	L4	428	4-MAN	S/A	Normal	550	175	740	186	0.8	N/A	6.6	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 8 OF 34	SHEET 14 OF 23	
SHQ	HE	71	286	-	4-MAN (R)	SHQ	L4	429	4-MAN	S/A	Normal	550	175	740	187	0.4	N/A	6.6	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 9 OF 34	SHEET 14 OF 23	
SHQ	HE	71	287	-	4-MAN (L)	SHQ	L4	429	4-MAN	S/A	Normal	550	175	740	186	0.8	N/A	6.6	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 8 OF 34	SHEET 14 OF 23	
SHQ	HE	71	288	-	4-MAN (R)	SHQ	L4	430	4-MAN	S/A	Normal	550	175	740	187	0.4	N/A	6.6	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 9 OF 34	SHEET 14 OF 23	
SHQ	HE	71	289	-	4-MAN (L)	SHQ	L4	430	4-MAN	S/A	Normal	550	175	740	186	0.8	N/A	6.6	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 8 OF 34	SHEET 14 OF 23	
SHQ	HE	71	290	-	4-MAN (R)	SHQ	L4	431	4-MAN	S/A	Normal	550	175	740	186	0.4	N/A	6.6	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 9 OF 34	SHEET 15 OF 23	
SHQ	HE	71	291	-	4-MAN (R)	SHQ	L4	431	4-MAN	S/A	Normal	550	175	740	187	0.8	N/A	6.6	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 8 OF 34	SHEET 15 OF 23	
SHQ	HE	71	292	-	4-MAN (R)	SHQ	L4	432	4-MAN	S/A	Normal	550	175	740	186	0.4	N/A	6.6	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 8 OF 34	SHEET 15 OF 23	
SHQ	HE	71	293	-	4-MAN (R)	SHQ	L4	432	4-MAN	S/A	Normal	550	175	740	187	0.8	N/A	6.6	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-00		


																																		
SHWE - Detailed Engineering - Field Development Project HVAC Equipment List with Tags for Living Quarter																																		
					N° SHQ-HV-EB-301-0001					Rev: 2		Status: AFC		Discipline HVAC		Document type: LIS				Rev. Date: 17/01/2011														
Class	Class	System	Number	Code	Description	Platform	Deck	Room No.	Room Description	Service Type	Service Mode	Width or Dia. (mm)	Height (mm)	Length (mm)	Airflow (m³/h)	Capacity (kW)	Static Pressure (pa)	Air Vel. (m/s)	Install Location (Indoor/Outdoor)	Dry (kg)	Operate (kg)	Power (kW)	Material	Remarks	Ducting & Instr. Diagram (SHQ-HV-DS-303-0001)	Piping & Instr. Diagram / Overall Single line diagram (SHQ-HV-DP-301-0003)								
					Supply Diffuser (Electrical Heater)																													
SHQ	HE	71	319	-	4-MAN (R)	SHQ	L4	445	4-MAN	S/A	Normal	550	175	740	187	0.8	N/A	6.6	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 9 OF 34	SHEET 15 OF 23									
SHQ	HE	71	320	-	4-MAN (L)	SHQ	L4	446	4-MAN	S/A	Normal	550	175	740	186	0.4	N/A	6.6	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 8 OF 34	SHEET 15 OF 23									
SHQ	HE	71	321	-	4-MAN (R)	SHQ	L4	446	4-MAN	S/A	Normal	550	175	740	186	0.8	N/A	6.6	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 9 OF 34	SHEET 15 OF 23									
SHQ	HE	71	322	-	4-MAN (R)	SHQ	L4	447	4-MAN	S/A	Normal	550	175	740	232	0.8	N/A	8.2	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 9 OF 34	SHEET 15 OF 23									
SHQ	HE	71	324	-	4-MAN (R)	SHQ	L4	448	4-MAN	S/A	Normal	550	175	740	275	1.2	N/A	9.7	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 9 OF 34	SHEET 15 OF 23									
SHQ	HE	71	326	-	E&I TELECOM SHAFT (R)	SHQ	L4	403	E&I TELECOM SHAFT	S/A	Normal	550	175	740	177	0.4	N/A	6.3	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 9 OF 34	SHEET 14 OF 23									
SHQ	HE	71	327	-	E&I TELECOM SHAFT (L)	SHQ	L4	403	E&I TELECOM SHAFT	S/A	Normal	550	175	740	177	0.8	N/A	6.3	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 8 OF 34	SHEET 14 OF 23									
SHQ	HE	71	328	-	CORRIDOR (R)	SHQ	L4	414	CORRIDOR	S/A	Normal	550	175	740	156	0.4	N/A	5.5	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 9 OF 34	SHEET 14 OF 23									
SHQ	HE	71	329	-	CORRIDOR (R)	SHQ	L4	414	CORRIDOR	S/A	Normal	550	175	740	155	0.8	N/A	5.5	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 9 OF 34	SHEET 14 OF 23									
SHQ	HE	71	330	-	CORRIDOR (L)	SHQ	L4	414	CORRIDOR	S/A	Normal	550	175	740	155	0.4	N/A	5.5	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 8 OF 34	SHEET 14 OF 23									
SHQ	HE	71	351	-	FIREMEN'S CHANGE ROOM (L)	SHQ	L5	505	FIREMEN'S CHANGE ROOM	S/A	Normal	550	175	740	148	0.8	N/A	5.2	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 8 OF 34	SHEET 12 OF 23									
SHQ	HE	71	352	-	FIREMEN'S CHANGE ROOM (R)	SHQ	L5	505	FIREMEN'S CHANGE ROOM	S/A	Normal	550	175	740	148	0.4	N/A	5.2	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 9 OF 34	SHEET 12 OF 23									
SHQ	HE	71	355	-	AIR LOCK (L)	SHQ	L5	508	AIR LOCK	S/A	Emer'cy	550	175	740	38	0.4	N/A	0.3	Indoor	14	14	230Vac, 50Hz, 1-phase	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 8 OF 34	SHEET 13 OF 23									




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						N° SHQ-HV-EB-301-0001			Rev: 2		Status: AFC		Discipline:HVAC		Document type: LIS		Rev. Date: 17/01/2011									
Class	Class	System	Number	Code	Description	Platform	Location			Service		Dimensions			Design conditions				Weight		Power	Material	Remarks	Ducting & Instr. Diagram (SHQ-HV-DS-303-0001)	Piping & Instr. Diagram / Overall Single line diagram (SHQ-HV-DP-301-0003)	
							Room No.	Room Description	Service Type	Service Mode	Width or Dia. (mm)	Height (mm)	Length (mm)	Airflow (m³/h)	Capacity (kW)	Static Pressure (pa)	Air Vel. (m/s)	Install Location (Indoor/Outdoor)	Dry (kg)	Operate (kg)	(kW)	-				
					Room Unit (MS-3S TYPE)																					
SHQ	HU	71	001	-	CARD ROOM	SHQ	L0	007	CARD ROOM	S/A	Normal	450	650	272	248	N/A	N/A	8.8	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 21 OF 23	
SHQ	HU	71	002	-	CARD ROOM	SHQ	L0	007	CARD ROOM	S/A	Normal	450	650	272	248	N/A	N/A	8.8	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 21 OF 23	
SHQ	HU	71	003	-	CARD ROOM	SHQ	L0	007	CARD ROOM	S/A	Normal	450	650	272	249	N/A	N/A	8.8	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 21 OF 23	
SHQ	HU	71	006	-	SMOKING ROOM	SHQ	L0	010	SMOKING ROOM	S/A	Normal	450	650	272	279	N/A	N/A	9.9	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 21 OF 23	
SHQ	HU	71	007	-	SMOKING ROOM	SHQ	L0	010	SMOKING ROOM	S/A	Normal	450	650	272	279	N/A	N/A	9.9	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 21 OF 23	
SHQ	HU	71	008	-	SMOKING ROOM	SHQ	L0	010	SMOKING ROOM	S/A	Normal	450	650	272	280	N/A	N/A	9.9	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 21 OF 23	
SHQ	HU	71	009	-	SMOKING ROOM	SHQ	L0	010	SMOKING ROOM	S/A	Normal	450	650	272	280	N/A	N/A	9.9	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 21 OF 23	
SHQ	HU	71	010	-	SMOKING ROOM	SHQ	L0	010	SMOKING ROOM	S/A	Normal	450	650	272	280	N/A	N/A	9.9	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 21 OF 23	
SHQ	HU	71	012	-	CHANGING ROOM	SHQ	L0	022	CHANGING ROOM	S/A	Normal	450	650	272	221	N/A	N/A	7.8	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 21 OF 23	
SHQ	HU	71	013	-	CHANGING ROOM	SHQ	L0	022	CHANGING ROOM	S/A	Normal	450	650	272	221	N/A	N/A	7.8	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 21 OF 23	
SHQ	HU	71	014	-	CHANGING ROOM	SHQ	L0	022	CHANGING ROOM	S/A	Normal	450	650	272	221	N/A	N/A	7.8	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 21 OF 23	
SHQ	HU	71	015	-	CHANGING ROOM	SHQ	L0	022	CHANGING ROOM	S/A	Normal	450	650	272	221	N/A	N/A	7.8	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 21 OF 23	
SHQ	HU	71	037	-	GYMNASIUM	SHQ	L0	019	GYMNASIUM	S/A	Emer'cy	450	650	272	213	N/A	N/A	7.5	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 22 OF 23	
SHQ	HU	71	038	-	GYMNASIUM	SHQ	L0	019	GYMNASIUM	S/A	Emer'cy	450	650	272	213	N/A	N/A	7.5	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 22 OF 23	
SHQ	HU	71	039	-	GYMNASIUM	SHQ	L0	019	GYMNASIUM	S/A	Emer'cy	450	650	272	213	N/A	N/A	7.5	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 22 OF 23	
SHQ	HU	71	040	-	GYMNASIUM	SHQ	L0	019	GYMNASIUM	S/A	Emer'cy	450	650	272	213	N/A	N/A	7.5	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 22 OF 23	
SHQ	HU	71	041	-	GYMNASIUM	SHQ	L0	019	GYMNASIUM	S/A	Emer'cy	450	650	272	213	N/A	N/A	7.5	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 22 OF 23	
SHQ	HU	71	042	-	GYMNASIUM	SHQ	L0	019	GYMNASIUM	S/A	Emer'cy	450	650	272	213	N/A	N/A	7.5	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 22 OF 23	
SHQ	HU	71	057	-	RECEPTION LOUNGE	SHQ	L1	116	RECEPTION LOUNGE	S/A	Normal	450	650	272	169	N/A	N/A	6.0	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 20 OF 23	
SHQ	HU	71	058	-	RECEPTION LOUNGE	SHQ	L1	116	RECEPTION LOUNGE	S/A	Normal	450	650	272	169	N/A	N/A	6.0	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 20 OF 23	
SHQ	HU	71	059	-	RECEPTION LOUNGE	SHQ	L1	116	RECEPTION LOUNGE	S/A	Normal	450	650	272	170	N/A	N/A	6.0	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 20 OF 23	
SHQ	HU	71	060	-	RECEPTION LOUNGE	SHQ	L1	116	RECEPTION LOUNGE	S/A	Normal	450	650	272	169	N/A	N/A	6.0	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 20 OF 23	
SHQ	HU	71	061	-	RECEPTION LOUNGE	SHQ	L1	116	RECEPTION LOUNGE	S/A	Normal	450	650	272	169	N/A	N/A	6.0	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 20 OF 23	
SHQ	HU	71	062	-	RECEPTION LOUNGE	SHQ	L1	116	RECEPTION LOUNGE	S/A	Normal	450	650	272	170	N/A	N/A	6.0	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 20 OF 23	
SHQ	HU	71	063	-	GARBAGE ROOM	SHQ	L1	120	GARBAGE ROOM	S/A	Normal	450	650	272	83	N/A	N/A	2.9	Indoor	9.0	9.0	N/A	SUS316L	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 20 OF 23	
SHQ	HU	71	091	-	MEETING ROOM	SHQ	L2	201	MEETING ROOM	S/A	Normal	450	650	272	248	N/A	N/A	8.8	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 18 OF 23	
SHQ	HU	71	092	-	MEETING ROOM	SHQ	L2	201	MEETING ROOM	S/A	Normal	450	650	272	248	N/A	N/A	8.8	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 18 OF 23	
SHQ	HU	71	093	-	MEETING ROOM	SHQ	L2	201	MEETING ROOM	S/A	Normal	450	650	272	248	N/A	N/A	8.8	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 18 OF 23	
SHQ	HU	71	094	-	MEETING ROOM	SHQ	L2	201	MEETING ROOM	S/A	Normal	450	650	272	249	N/A	N/A	8.8	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 18 OF 23	
SHQ	HU	71	095	-	MEETING ROOM	SHQ	L2	201	MEETING ROOM	S/A	Normal	450	650	272	249	N/A	N/A	8.8	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 18 OF 23	
SHQ	HU	71	099	-	TECHNICAL LIBRARY	SHQ	L2	220	TECHNICAL LIBRARY	S/A	Normal	450	650	272	233	N/A	N/A	8.2	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 18 OF 23	
SHQ	HU	71</																								




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Class	Class	System	Number	Code	Description	Platform	Deck	Room No.	Location		Service		Dimensions			Design conditions				Weight		Power	Material	Remarks	Ducting & Instr. Diagram (SHQ-HV-DS-303-0001)	Piping & Instr. Diagram / Overall Single line diagram (SHQ-HV-DP-301-0003)		
									Room Description	Service Type	Service Mode	Width or Dia. (mm)	Height (mm)	Length (mm)	Airflow (m³/h)	Capacity (kW)	Static Pressure (pa)	Air Vel. (m/s)	Install Location (Indoor/Outdoor)	Dry (kg)	Operate (kg)	(kW)	-					
					Room Unit (MS-35 TYPE)																							
SHQ	HU	71	095	-	MEETING ROOM	SHQ	L2	201	MEETING ROOM	S/A	Normal	450	650	272	249	N/A	N/A	8.8	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 18 OF 23			
SHQ	HU	71	099	-	TECHNICAL LIBRARY	SHQ	L2	220	TECHNICAL LIBRARY	S/A	Normal	450	650	272	233	N/A	N/A	8.2	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 18 OF 23			
SHQ	HU	71	100	-	TECHNICAL LIBRARY	SHQ	L2	220	TECHNICAL LIBRARY	S/A	Normal	450	650	272	233	N/A	N/A	8.2	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 18 OF 23			
SHQ	HU	71	101	-	TECHNICAL LIBRARY	SHQ	L2	220	TECHNICAL LIBRARY	S/A	Normal	450	650	272	233	N/A	N/A	8.2	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 18 OF 23			
SHQ	HU	71	102	-	TECHNICAL LIBRARY	SHQ	L2	220	TECHNICAL LIBRARY	S/A	Normal	450	650	272	233	N/A	N/A	8.2	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 18 OF 23			
SHQ	HU	71	103	-	MEETING ROOM	SHQ	L2	201	MEETING ROOM	S/A	Normal	450	650	272	249	N/A	N/A	8.8	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 18 OF 23			
SHQ	HU	71	117	-	TRANSIT ROOM	SHQ	L3	315	TRANSIT ROOM	S/A	Normal	450	650	272	258	N/A	N/A	9.1	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 17 OF 23			
SHQ	HU	71	118	-	TRANSIT ROOM	SHQ	L3	315	TRANSIT ROOM	S/A	Normal	450	650	272	259	N/A	N/A	9.2	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 17 OF 23			
SHQ	HU	71	119	-	TRANSIT ROOM	SHQ	L3	315	TRANSIT ROOM	S/A	Normal	450	650	272	259	N/A	N/A	9.2	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 17 OF 23			
SHQ	HU	71	120	-	TRANSIT ROOM	SHQ	L3	315	TRANSIT ROOM	S/A	Normal	450	650	272	258	N/A	N/A	9.1	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 17 OF 23			
SHQ	HU	71	121	-	TRANSIT ROOM	SHQ	L3	315	TRANSIT ROOM	S/A	Normal	450	650	272	259	N/A	N/A	9.2	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 17 OF 23			
SHQ	HU	71	122	-	TRANSIT ROOM	SHQ	L3	315	TRANSIT ROOM	S/A	Normal	450	650	272	259	N/A	N/A	9.2	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 17 OF 23			
SHQ	HU	71	123	-	TRANSIT ROOM	SHQ	L3	315	TRANSIT ROOM	S/A	Normal	450	650	272	259	N/A	N/A	9.2	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 17 OF 23			
SHQ	HU	71	124	-	TRANSIT ROOM	SHQ	L3	315	TRANSIT ROOM	S/A	Normal	450	650	272	259	N/A	N/A	9.2	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 17 OF 23			
SHQ	HU	71	128	-	TRANSIT ROOM	SHQ	L3	315	TRANSIT ROOM	S/A	Normal	450	650	272	259	N/A	N/A	9.2	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 17 OF 23			




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Class	Class	System	Number	Code	Description	Platform	Location			Service		Dimensions			Design conditions				Weight		Power	Material	Remarks	Ducting & Instr. Diagram (SHQ-HV-DS-303-0001)	Piping & Instr. Diagram / Overall Single line diagram (SHQ-HV-DP-301-0003)				
							Room No.	Room Description	Service Type	Service Mode	Width or Dia. (mm)	Height (mm)	Length (mm)	Airflow (m³/h)	Capacity (kW)	Static Pressure (pa)	Air Vel. (m/s)	Install Location (Indoor/Outdoor)	Dry (kg)	Operate (kg)	(kW)								
					Room Unit (MS-3S TYPE)																								
SHQ	HU	71	001	-	CARD ROOM	SHQ	L0	007	CARD ROOM	S/A	Normal	450	650	272	248	N/A	N/A	8.8	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 21 OF 23				
SHQ	HU	71	002	-	CARD ROOM	SHQ	L0	007	CARD ROOM	S/A	Normal	450	650	272	248	N/A	N/A	8.8	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 21 OF 23				
SHQ	HU	71	003	-	CARD ROOM	SHQ	L0	007	CARD ROOM	S/A	Normal	450	650	272	249	N/A	N/A	8.8	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 21 OF 23				
SHQ	HU	71	006	-	SMOKING ROOM	SHQ	L0	010	SMOKING ROOM	S/A	Normal	450	650	272	279	N/A	N/A	9.9	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 21 OF 23				
SHQ	HU	71	007	-	SMOKING ROOM	SHQ	L0	010	SMOKING ROOM	S/A	Normal	450	650	272	279	N/A	N/A	9.9	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 21 OF 23				
SHQ	HU	71	008	-	SMOKING ROOM	SHQ	L0	010	SMOKING ROOM	S/A	Normal	450	650	272	280	N/A	N/A	9.9	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 21 OF 23				
SHQ	HU	71	009	-	SMOKING ROOM	SHQ	L0	010	SMOKING ROOM	S/A	Normal	450	650	272	280	N/A	N/A	9.9	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 21 OF 23				
SHQ	HU	71	010	-	SMOKING ROOM	SHQ	L0	010	SMOKING ROOM	S/A	Normal	450	650	272	280	N/A	N/A	9.9	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 21 OF 23				
SHQ	HU	71	012	-	CHANGING ROOM	SHQ	L0	022	CHANGING ROOM	S/A	Normal	450	650	272	221	N/A	N/A	7.8	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 21 OF 23				
SHQ	HU	71	013	-	CHANGING ROOM	SHQ	L0	022	CHANGING ROOM	S/A	Normal	450	650	272	221	N/A	N/A	7.8	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 21 OF 23				
SHQ	HU	71	014	-	CHANGING ROOM	SHQ	L0	022	CHANGING ROOM	S/A	Normal	450	650	272	221	N/A	N/A	7.8	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 21 OF 23				
SHQ	HU	71	015	-	CHANGING ROOM	SHQ	L0	022	CHANGING ROOM	S/A	Normal	450	650	272	221	N/A	N/A	7.8	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 21 OF 23				
SHQ	HU	71	037	-	GYMNASIUM	SHQ	L0	019	GYMNASIUM	S/A	Emer'cy	450	650	272	213	N/A	N/A	7.5	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 22 OF 23				
SHQ	HU	71	038	-	GYMNASIUM	SHQ	L0	019	GYMNASIUM	S/A	Emer'cy	450	650	272	213	N/A	N/A	7.5	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 22 OF 23				
SHQ	HU	71	039	-	GYMNASIUM	SHQ	L0	019	GYMNASIUM	S/A	Emer'cy	450	650	272	213	N/A	N/A	7.5	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 22 OF 23				
SHQ	HU	71	040	-	GYMNASIUM	SHQ	L0	019	GYMNASIUM	S/A	Emer'cy	450	650	272	213	N/A	N/A	7.5	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 22 OF 23				
SHQ	HU	71	041	-	GYMNASIUM	SHQ	L0	019	GYMNASIUM	S/A	Emer'cy	450	650	272	213	N/A	N/A	7.5	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 22 OF 23				
SHQ	HU	71	042	-	GYMNASIUM	SHQ	L0	019	GYMNASIUM	S/A	Emer'cy	450	650	272	213	N/A	N/A	7.5	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 22 OF 23				
SHQ	HU	71	057	-	RECEPTION LOUNGE	SHQ	L1	116	RECEPTION LOUNGE	S/A	Normal	450	650	272	169	N/A	N/A	6.0	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 20 OF 23				
SHQ	HU	71	058	-	RECEPTION LOUNGE	SHQ	L1	116	RECEPTION LOUNGE	S/A	Normal	450	650	272	169	N/A	N/A	6.0	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 20 OF 23				
SHQ	HU	71	059	-	RECEPTION LOUNGE	SHQ	L1	116	RECEPTION LOUNGE	S/A	Normal	450	650	272	170	N/A	N/A	6.0	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 20 OF 23				
SHQ	HU	71	060	-	RECEPTION LOUNGE	SHQ	L1	116	RECEPTION LOUNGE	S/A	Normal	450	650	272	169	N/A	N/A	6.0	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 20 OF 23				
SHQ	HU	71	061	-	RECEPTION LOUNGE	SHQ	L1	116	RECEPTION LOUNGE	S/A	Normal	450	650	272	169	N/A	N/A	6.0	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 20 OF 23				
SHQ	HU	71	062	-	RECEPTION LOUNGE	SHQ	L1	116	RECEPTION LOUNGE	S/A	Normal	450	650	272	170	N/A	N/A	6.0	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 20 OF 23				
SHQ	HU	71	063	-	GARBAGE ROOM	SHQ	L1	120	GARBAGE ROOM	S/A	Normal	450	650	272	83	N/A	N/A	2.9	Indoor	9.0	9.0	N/A	SUS316L	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 20 OF 23				
SHQ	HU	71	091	-	MEETING ROOM	SHQ	L2	201	MEETING ROOM	S/A	Normal	450	650	272	248	N/A	N/A	8.8	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 18 OF 23				
SHQ	HU	71	092	-	MEETING ROOM	SHQ	L2	201	MEETING ROOM	S/A	Normal	450	650	272	248	N/A	N/A	8.8	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 18 OF 23				
SHQ	HU	71	093	-	MEETING ROOM	SHQ	L2	201	MEETING ROOM	S/A	Normal	450	650	272	248	N/A	N/A	8.8	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 18 OF 23				
SHQ	HU	71	094	-	MEETING ROOM	SHQ	L2	201	MEETING ROOM	S/A	Normal	450	650	272	249	N/A	N/A	8.8	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 18 OF 23				
SHQ	HU	71	095	-	MEETING ROOM	SHQ	L2	201	MEETING ROOM	S/A	Normal	450	650	272	249	N/A	N/A	8.8	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 18 OF 23				
SHQ																													




										SHWE - Detailed Engineering - Field Development Project HVAC Equipment List with Tags for Living Quarter																			
					N° SHQ-HV-EB-301-0001				Rev: 2		Status: AFC		Discipline: HVAC		Document type: LIS			Rev. Date: 17/01/2011											
Class	Class	System	Number	Code	Description	Platform	Deck	Room No.	Location		Service		Dimensions			Design conditions				Weight		Power	Material	Remarks	Ducting & Instr. Diagram (SHQ-HV-DS-303-0001)	Piping & Instr. Diagram / Overall Single line diagram (SHQ-HV-DP-301-0003)			
									Room Description	Service Type	Service Mode	Width or Dia. (mm)	Height (mm)	Length (mm)	Airflow (m³/h)	Capacity (kW)	Static Pressure (pa)	Air Vel. (m/s)	Install Location (Indoor/Outdoor)	Dry (kg)	Operate (kg)	(kW)	-						
					Room Unit (MS-35 TYPE)																								
SHQ	HU	71	095	-	MEETING ROOM	SHQ	L2	201	MEETING ROOM	S/A	Normal	450	650	272	249	N/A	N/A	8.8	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 18 OF 23				
SHQ	HU	71	099	-	TECHNICAL LIBRARY	SHQ	L2	220	TECHNICAL LIBRARY	S/A	Normal	450	650	272	233	N/A	N/A	8.2	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 18 OF 23				
SHQ	HU	71	100	-	TECHNICAL LIBRARY	SHQ	L2	220	TECHNICAL LIBRARY	S/A	Normal	450	650	272	233	N/A	N/A	8.2	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 18 OF 23				
SHQ	HU	71	101	-	TECHNICAL LIBRARY	SHQ	L2	220	TECHNICAL LIBRARY	S/A	Normal	450	650	272	233	N/A	N/A	8.2	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 18 OF 23				
SHQ	HU	71	102	-	TECHNICAL LIBRARY	SHQ	L2	220	TECHNICAL LIBRARY	S/A	Normal	450	650	272	233	N/A	N/A	8.2	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 18 OF 23				
SHQ	HU	71	103	-	MEETING ROOM	SHQ	L2	201	MEETING ROOM	S/A	Normal	450	650	272	249	N/A	N/A	8.8	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 18 OF 23				
SHQ	HU	71	117	-	TRANSIT ROOM	SHQ	L3	315	TRANSIT ROOM	S/A	Normal	450	650	272	258	N/A	N/A	9.1	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 17 OF 23				
SHQ	HU	71	118	-	TRANSIT ROOM	SHQ	L3	315	TRANSIT ROOM	S/A	Normal	450	650	272	259	N/A	N/A	9.2	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 17 OF 23				
SHQ	HU	71	119	-	TRANSIT ROOM	SHQ	L3	315	TRANSIT ROOM	S/A	Normal	450	650	272	259	N/A	N/A	9.2	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 17 OF 23				
SHQ	HU	71	120	-	TRANSIT ROOM	SHQ	L3	315	TRANSIT ROOM	S/A	Normal	450	650	272	258	N/A	N/A	9.1	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 17 OF 23				
SHQ	HU	71	121	-	TRANSIT ROOM	SHQ	L3	315	TRANSIT ROOM	S/A	Normal	450	650	272	259	N/A	N/A	9.2	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 17 OF 23				
SHQ	HU	71	122	-	TRANSIT ROOM	SHQ	L3	315	TRANSIT ROOM	S/A	Normal	450	650	272	259	N/A	N/A	9.2	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 17 OF 23				
SHQ	HU	71	123	-	TRANSIT ROOM	SHQ	L3	315	TRANSIT ROOM	S/A	Normal	450	650	272	259	N/A	N/A	9.2	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 17 OF 23				
SHQ	HU	71	124	-	TRANSIT ROOM	SHQ	L3	315	TRANSIT ROOM	S/A	Normal	450	650	272	259	N/A	N/A	9.2	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 17 OF 23				
SHQ	HU	71	128	-	TRANSIT ROOM	SHQ	L3	315	TRANSIT ROOM	S/A	Normal	450	650	272	259	N/A	N/A	9.2	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 12 OF 34	SHEET 17 OF 23				




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						N° SHQ-HV-EB-301-0001				Rev: 2		Status: AFC		Discipline:HVAC		Document type: LIS				Rev. Date: 17/01/2011													
Description						Platform		Deck		Room No.		Location		Service		Dimensions		Design conditions				Weight		Power		Material		Remarks		Ducting & Instr. Diagram (SHQ-HV-DS-303-0001)		Piping & Instr. Diagram / Overall Single line diagram (SHQ-HV-DP-301-0003)	
Room Unit (MLG - 55 S TYPE)																																	
SHQ	HU	71	201	-	FIREMEN'S EQ ROOM	SHQ	L0	001	FIREMEN'S EQ		R/A	Normal	300	400	308	196	N/A	N/A	2.7	Indoor	6.0	6.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 23 OF 34		SHEET 21 OF 23						
SHQ	HU	71	204	-	CARD ROOM	SHQ	L0	007	CARD ROOM		R/A	Normal	300	400	308	373	N/A	N/A	5.2	Indoor	6.0	6.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 23 OF 34		SHEET 21 OF 23						
SHQ	HU	71	210	-	SMOKING ROOM	SHQ	L0	010	SMOKING ROOM		M/E	Normal	300	400	308	466	N/A	N/A	6.4	Indoor	6.0	6.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 23 OF 34		SHEET 21 OF 23						
SHQ	HU	71	211	-	SMOKING ROOM	SHQ	L0	010	SMOKING ROOM		M/E	Normal	300	400	308	466	N/A	N/A	6.4	Indoor	6.0	6.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 23 OF 34		SHEET 21 OF 23						
SHQ	HU	71	212	-	SMOKING ROOM	SHQ	L0	010	SMOKING ROOM		M/E	Normal	300	400	308	466	N/A	N/A	6.4	Indoor	6.0	6.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 23 OF 34		SHEET 21 OF 23						
SHQ	HU	71	215	-	CORRIDOR	SHQ	L0	012	CORRIDOR		R/A	Normal	300	400	308	382	N/A	N/A	5.3	Indoor	6.0	6.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 23 OF 34		SHEET 21 OF 23						
SHQ	HU	71	219	-	CHANGING ROOM	SHQ	L0	022	CHANGING ROOM		M/E	Normal	300	400	308	442	N/A	N/A	6.1	Indoor	6.0	6.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 23 OF 34		SHEET 21 OF 23						
SHQ	HU	71	221	-	CHANGING ROOM	SHQ	L0	022	CHANGING ROOM		M/E	Normal	300	400	308	442	N/A	N/A	6.1	Indoor	6.0	6.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 23 OF 34		SHEET 21 OF 23						
SHQ	HU	71	223	-	CORRIDOR	SHQ	L0	014	CORRIDOR		R/A	Normal	300	400	308	221	N/A	N/A	3.1	Indoor	6.0	6.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 23 OF 34		SHEET 21 OF 23						
SHQ	HU	71	231	-	CAMP BOSS OFFICE	SHQ	L1	109	CAMP BOSS OFFICE		R/A	Normal	300	400	308	224	N/A	N/A	3.1	Indoor	6.0	6.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 23 OF 34		SHEET 20 OF 23						
SHQ	HU	71	233	-	RECEPTION LOUNGE	SHQ	L1	116	RECEPTION LOUNGE		R/A	Normal	300	400	308	339	N/A	N/A	4.7	Indoor	6.0	6.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 23 OF 34		SHEET 20 OF 23						
SHQ	HU	71	234	-	RECEPTION LOUNGE	SHQ	L1	116	RECEPTION LOUNGE		R/A	Normal	300	400	308	339	N/A	N/A	4.7	Indoor	6.0	6.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 23 OF 34		SHEET 20 OF 23						
SHQ	HU	71	246	-	CORRIDOR	SHQ	L1	114	CORRIDOR		R/A	Normal	300	400	308	376	N/A	N/A	5.2	Indoor	6.0	6.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 23 OF 34		SHEET 18 OF 23						
SHQ	HU	71	252	-	EMERGENCY COMMAND CENTRE	SHQ	L2	214	EMERGENCY COMMAND CENTRE		R/A	Emer'cy	300	400	308	291	N/A	N/A	4.0	Indoor	6.0	6.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 23 OF 34		SHEET 19 OF 23						
SHQ	HU	71	253	-	EMERGENCY COMMAND CENTRE	SHQ	L2	214	EMERGENCY COMMAND CENTRE		R/A	Emer'cy	300	400	308	290	N/A	N/A	4.0	Indoor	6.0	6.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 23 OF 34		SHEET 19 OF 23						
SHQ	HU	71	259	-	CORRIDOR	SHQ	L2	216	CORRIDOR		R/A	Normal	300	400	308	58	N/A	N/A	0.8	Indoor	6.0	6.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 23 OF 34		SHEET 18 OF 23						
SHQ	HU	71	261	-	CORRIDOR	SHQ	L2	218	CORRIDOR		R/A	Normal	300	400	308	180	N/A	N/A	2.5	Indoor	6.0	6.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 23 OF 34		SHEET 18 OF 23						
SHQ	HU	71	271	-	MEETING ROOM	SHQ	L2	201	MEETING ROOM		R/A	Normal	300	400	308	373	N/A	N/A	5.2	Indoor	6.0	6.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 23 OF 34		SHEET 18 OF 23						
SHQ	HU	71	272	-	MEETING ROOM	SHQ	L2	201	MEETING ROOM		R/A	Normal	300	400	308	372	N/A	N/A	5.2	Indoor	6.0	6.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 23 OF 34		SHEET 18 OF 23						
SHQ	HU	71	273	-	MEETING ROOM	SHQ	L2	201	MEETING ROOM		R/A	Normal	300	400	308	373	N/A	N/A	5.2	Indoor	6.0	6.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 23 OF 34		SHEET 18 OF 23						
SHQ	HU	71	274	-	MEETING ROOM	SHQ	L2	201	MEETING ROOM		R/A	Normal	300	400	308	372	N/A	N/A	5.2	Indoor	6.0	6.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 23 OF 34		SHEET 18 OF 23						
SHQ	HU	71	291	-	OIM ROOM	SHQ	L2	225	OIM ROOM		R/A	Normal	300	400	308	338	N/A	N/A	4.7	Indoor	6.0	6.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 23 OF 34		SHEET 18 OF 23						
SHQ	HU	71	293	-	OIM OFFICE	SHQ	L2	226	OIM OFFICE		R/A	Normal	300	400	308	440	N/A	N/A	6.1	Indoor	6.0	6.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 23 OF 34		SHEET 18 OF 23						
SHQ	HU	71	295	-	MAINTENANCE OFFICE	SHQ	L2	227	MAINTENANCE OFFICE		R/A	Normal	300	400	308	373	N/A	N/A	5.2	Indoor	6.0	6.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 23 OF 34		SHEET 18 OF 23						
SHQ	HU	71	297	-	PRODUCTION SUPERVISOR OFFICE	SHQ	L2	228	PRODUCTION SUP. OFFICE		R/A	Normal	300	400	308	372	N/A	N/A	5.1	Indoor	6.0	6.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 23 OF 34		SHEET 18 OF 23						
SHQ	HU	71	311	-	4-MAN(21)	SHQ	L3	301	4-MAN(21)		R/A	Normal	300	400	308	338	N/A	N/A	4.7	Indoor	6.0	6.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 23 OF 34		SHEET 16 OF 23						
SHQ	HU	71	329	-	BAGGAGE STORE	SHQ	L3	316	BAGGAGE STORE		R/A	Normal	300	400	308	413	N/A	N/A	5.7	Indoor	6.0	6.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 23 OF 34		SHEET 17 OF 23						
SHQ	HU	71	334	-	4-MAN(16)	SHQ	L3	320	4-MAN(16)		R/A	Normal	300	400	308	338	N/A	N/A	4.7	Indoor	6.0	6.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 23 OF 34		SHEET 16 OF 23						
SHQ	HU	71	335	-	4-MAN(17)	SHQ	L3	321	4-MAN(17)		R/A	Normal	300																				




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						N° SHQ-HV-EB-301-0001				Rev: 2		Status: AFC		Discipline:HVAC		Document type: LIS				Rev. Date: 17/01/2011											
Description						Location			Service		Dimensions			Design conditions				Weight		Power	Material	Remarks		Ducting & Instr. Diagram (SHQ-HV-DS-303-0001)		Piping & Instr. Diagram / Overall Single line diagram (SHQ-HV-DP-301-0003)					
						Platform	Deck	Room No.	Room Description	Service Type	Service Mode	Width or Dia. (mm)	Height (mm)	Length (mm)	Airflow (m³/h)	Capacity (kW)	Static Pressure (pa)	Air Vel. (m/s)	Install Location (Indoor/Outdoor)	Dry (kg)	Operate (kg)							(kW)	-		
Room Unit (MLG - 55 S TYPE)																															
SHQ	HU	71	373	-	4-MAN(40)	SHQ	L4	418	4-MAN(40)	R/A	Normal	300	400	308	338	N/A	N/A	4.7	Indoor	6.0	6.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 20 OF 34	SHEET 14 OF 23						
SHQ	HU	71	374	-	4-MAN(41)	SHQ	L4	419	4-MAN(41)	R/A	Normal	300	400	308	338	N/A	N/A	4.7	Indoor	6.0	6.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 23 OF 34	SHEET 14 OF 23						
SHQ	HU	71	375	-	4-MAN(42)	SHQ	L4	420	4-MAN(42)	R/A	Normal	300	400	308	338	N/A	N/A	4.7	Indoor	6.0	6.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 20 OF 34	SHEET 14 OF 23						
SHQ	HU	71	376	-	4-MAN(43)	SHQ	L4	422	4-MAN(43)	R/A	Normal	300	400	308	338	N/A	N/A	4.7	Indoor	6.0	6.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 23 OF 34	SHEET 15 OF 23						
SHQ	HU	71	377	-	4-MAN(44)	SHQ	L4	423	4-MAN(44)	R/A	Normal	300	400	308	338	N/A	N/A	4.7	Indoor	6.0	6.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 23 OF 34	SHEET 15 OF 23						
SHQ	HU	71	378	-	4-MAN(45)	SHQ	L4	424	4-MAN(45)	R/A	Normal	300	400	308	338	N/A	N/A	4.7	Indoor	6.0	6.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 23 OF 34	SHEET 15 OF 23						
SHQ	HU	71	379	-	4-MAN(46)	SHQ	L4	425	4-MAN(46)	R/A	Normal	300	400	308	338	N/A	N/A	4.7	Indoor	6.0	6.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 23 OF 34	SHEET 15 OF 23						
SHQ	HU	71	380	-	4-MAN(47)	SHQ	L4	426	4-MAN(47)	R/A	Normal	300	400	308	338	N/A	N/A	4.7	Indoor	6.0	6.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 23 OF 34	SHEET 15 OF 23						
SHQ	HU	71	381	-	4-MAN(30)	SHQ	L4	427	4-MAN(30)	R/A	Normal	300	400	308	338	N/A	N/A	4.7	Indoor	6.0	6.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 23 OF 34	SHEET 14 OF 23						
SHQ	HU	71	382	-	4-MAN(31)	SHQ	L4	428	4-MAN(31)	R/A	Normal	300	400	308	338	N/A	N/A	4.7	Indoor	6.0	6.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 23 OF 34	SHEET 14 OF 23						
SHQ	HU	71	383	-	4-MAN(32)	SHQ	L4	429	4-MAN(32)	R/A	Normal	300	400	308	338	N/A	N/A	4.7	Indoor	6.0	6.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 23 OF 34	SHEET 14 OF 23						
SHQ	HU	71	384	-	4-MAN(33)	SHQ	L4	430	4-MAN(33)	R/A	Normal	300	400	308	338	N/A	N/A	4.7	Indoor	6.0	6.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 23 OF 34	SHEET 14 OF 23						
SHQ	HU	71	385	-	4-MAN(34)	SHQ	L4	431	4-MAN(34)	R/A	Normal	300	400	308	338	N/A	N/A	4.7	Indoor	6.0	6.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 23 OF 34	SHEET 15 OF 23						
SHQ	HU	71	386	-	4-MAN(35)	SHQ	L4	432	4-MAN(35)	R/A	Normal	300	400	308	338	N/A	N/A	4.7	Indoor	6.0	6.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 23 OF 34	SHEET 15 OF 23						
SHQ	HU	71	387	-	4-MAN(36)	SHQ	L4	433	4-MAN(36)	R/A	Normal	300	400	308	338	N/A	N/A	4.7	Indoor	6.0	6.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 23 OF 34	SHEET 15 OF 23						
SHQ	HU	71	388	-	4-MAN(37)	SHQ	L4	434	4-MAN(37)	R/A	Normal	300	400	308	338	N/A	N/A	4.7	Indoor	6.0	6.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 23 OF 34	SHEET 15 OF 23						
SHQ	HU	71	389	-	4-MAN(38)	SHQ	L4	435	4-MAN(38)	R/A	Normal	300	400	308	338	N/A	N/A	4.7	Indoor	6.0	6.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 23 OF 34	SHEET 15 OF 23						
SHQ	HU	71	390	-	4-MAN(22)	SHQ	L4	438	4-MAN(22)	R/A	Normal	300	400	308	338	N/A	N/A	4.7	Indoor	6.0	6.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 20 OF 34	SHEET 14 OF 23						
SHQ	HU	71	391	-	4-MAN(23)	SHQ	L4	439	4-MAN(23)	R/A	Normal	300	400	308	338	N/A	N/A	4.7	Indoor	6.0	6.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 20 OF 34	SHEET 14 OF 23						
SHQ	HU	71	392	-	4-MAN(24)	SHQ	L4	440	4-MAN(24)	R/A	Normal	300	400	308	338	N/A	N/A	4.7	Indoor	6.0	6.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 23 OF 34	SHEET 14 OF 23						
SHQ	HU	71	393	-	4-MAN(25)	SHQ	L4	441	4-MAN(25)	R/A	Normal	300	400	308	338	N/A	N/A	4.7	Indoor	6.0	6.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 23 OF 34	SHEET 14 OF 23						
SHQ	HU	71	394	-	4-MAN(26)	SHQ	L4	443	4-MAN(26)	R/A	Normal	300	400	308	338	N/A	N/A	4.7	Indoor	6.0	6.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 23 OF 34	SHEET 14 OF 23						
SHQ	HU	71	395	-	4-MAN(27)	SHQ	L4	444	4-MAN(27)	R/A	Normal	300	400	308	338	N/A	N/A	4.7	Indoor	6.0	6.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 23 OF 34	SHEET 15 OF 23						
SHQ	HU	71	396	-	4-MAN(28)	SHQ	L4	445	4-MAN(28)	R/A	Normal	300	400	308	338	N/A	N/A	4.7	Indoor	6.0	6.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 23 OF 34	SHEET 15 OF 23						
SHQ	HU	71	397	-	4-MAN(29)	SHQ	L4	446	4-MAN(29)	R/A	Normal	300	400	308	338	N/A	N/A	4.7	Indoor	6.0	6.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 23 OF 34	SHEET 15 OF 23						
SHQ	HU	71	398	-	4-MAN(1)	SHQ	L4	447	4-MAN(1)	R/A	Normal	300	400	308	197	N/A	N/A	2.7	Indoor	6.0	6.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 23 OF 34	SHEET 15 OF 23						
SHQ	HU	71	451	-	GYMNASIUM	SHQ	L0	019	GYMNASIUM	R/A	Emer'cy	300	400	308	320	N/A	N/A	4.4	Indoor	6.0	6.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 23 OF 34	SHEET 22 OF 23						
SHQ	HU	71	453	-	GYMNASIUM	SHQ	L0	019	GYMNASIUM	R/A	Emer'cy	300	400	308	319	N/A	N/A	4.4	Indoor	6.0	6.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 23 OF 34	SHEET 22 OF 23						
SHQ	HU	71	471	-	EMERGENCY	SHQ	L2	213	CENTRAL CONTROL ROOM	R/A	Emer'cy	300	400	308	390	N/A	N/A	5.4	Indoor	6.0	6.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 23 OF 34	SHEET 19 OF 23						
SHQ	HU	71	472	-	EMERGENCY	SHQ	L2	213	CENTRAL CONTROL ROOM	R/A	Emer'cy	300	400	308	390	N/A	N/A	5.4	Indoor	6.0	6.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 23 OF 34	SHEET 19 OF 23						
SHQ	HU	71	473	-	EMERGENCY	SHQ	L2	213	CENTRAL CONTROL ROOM	R/A	Emer'cy	300	400	308	390	N/A	N/A	5.4	Indoor	6.0	6.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 23 OF 3							




										SHWE - Detailed Engineering - Field Development Project HVAC Equipment List with Tags for Living Quarter																				
					N° SHQ-HV-EB-301-0001					Rev: 2		Status: AFC		Discipline: HVAC		Document type: LIS				Rev. Date: 17/01/2011										
							Location		Service		Dimensions			Design conditions				Weight		Power		Material	Remarks	Ducting & Instr. Diagram (SHQ-HV-DS-303-0001)	Piping & Instr. Diagram / Overall Single line diagram (SHQ-HV-DP-301-0003)					
Class	Class	System	Number	Code	Description	Platform	Deck	Room No.	Room Description	Service Type	Service Mode	Width or Dia. (mm)	Height (mm)	Length (mm)	Airflow (m³/h)	Capacity (kW)	Static Pressure (pa)	Air Vel. (m/s)	Install Location (Indoor/Outdoor)	Dry (kg)	Operate (kg)	(kW)				-				
					Room Unit (MLG - 55 S TYPE)																									
SHQ	HU	71	312	-	WAITING ROOM	SHQ	L3	307	WAITING ROOM	M/E	Normal	300	400	308	150	N/A	N/A	2.1	Indoor	6.0	6.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 20 OF 34	SHEET 17 OF 23					
SHQ	HU	71	313	-	CONSULTATION OFFICE	SHQ	L3	308	CONSULTATION OFFICE	M/E	Normal	300	400	308	186	N/A	N/A	2.6	Indoor	6.0	6.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 20 OF 34	SHEET 17 OF 23					
SHQ	HU	71	314	-	EXAM. ROOM	SHQ	L3	309	EXAM. ROOM	M/E	Normal	300	400	308	282	N/A	N/A	3.9	Indoor	6.0	6.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 20 OF 34	SHEET 17 OF 23					
SHQ	HU	71	315	-	EXAM. ROOM	SHQ	L3	309	EXAM. ROOM	M/E	Normal	300	400	308	282	N/A	N/A	3.9	Indoor	6.0	6.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 20 OF 34	SHEET 17 OF 23					
SHQ	HU	71	317	-	OBSERV. ROOM	SHQ	L3	310	OBSERV. ROOM	M/E	Normal	300	400	308	294	N/A	N/A	4.1	Indoor	6.0	6.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 20 OF 34	SHEET 17 OF 23					
SHQ	HU	71	318	-	OBSERV. ROOM	SHQ	L3	310	OBSERV. ROOM	M/E	Normal	300	400	308	294	N/A	N/A	4.1	Indoor	6.0	6.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 20 OF 34	SHEET 17 OF 23					
SHQ	HU	71	331	-	CORRIDOR	SHQ	L3	319	CORRIDOR	R/A	Normal	300	400	308	146	N/A	N/A	2.0	Indoor	6.0	6.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 20 OF 34	SHEET 16 OF 23					
SHQ	HU	71	332	-	CORRIDOR	SHQ	L3	319	CORRIDOR	R/A	Normal	300	400	308	146	N/A	N/A	2.0	Indoor	6.0	6.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 20 OF 34	SHEET 16 OF 23					
SHQ	HU	71	346	-	4-MAN(2)	SHQ	L3	334	4-MAN(2)	R/A	Normal	300	400	308	338	N/A	N/A	4.7	Indoor	6.0	6.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 20 OF 34	SHEET 16 OF 23					
SHQ	HU	71	347	-	4-MAN(3)	SHQ	L3	335	4-MAN(3)	R/A	Normal	300	400	308	338	N/A	N/A	4.7	Indoor	6.0	6.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 20 OF 34	SHEET 16 OF 23					
SHQ	HU	71	369	-	CORRIDOR	SHQ	L4	414	CORRIDOR	R/A	Normal	300	400	308	155	N/A	N/A	2.2	Indoor	6.0	6.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 20 OF 34	SHEET 15 OF 23					
SHQ	HU	71	370	-	CORRIDOR	SHQ	L4	414	CORRIDOR	R/A	Normal	300	400	308	156	N/A	N/A	2.2	Indoor	6.0	6.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 20 OF 34	SHEET 15 OF 23					
SHQ	HU	71	371	-	CORRIDOR	SHQ	L4	414	CORRIDOR	R/A	Normal	300	400	308	155	N/A	N/A	2.1	Indoor	6.0	6.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 20 OF 34	SHEET 15 OF 23					
SHQ	HU	71	399	-	4-MAN(2)	SHQ	L4	448	4-MAN(2)	R/A	Normal	300	400	308	240	N/A	N/A	3.3	Indoor	6.0	6.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 20 OF 34	SHEET 15 OF 23					
SHQ	HU	71	452	-	GYMNASIUM	SHQ	L0	019	GYMNASIUM	R/A	Emer'cy	300	400	308	320	N/A	N/A	4.4	Indoor	6.0	6.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 20 OF 34	SHEET 22 OF 23					
SHQ	HU	71	454	-	GYMNASIUM	SHQ	L0	019	GYMNASIUM	R/A	Emer'cy	300	400	308	319	N/A	N/A	4.4	Indoor	6.0	6.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 20 OF 34	SHEET 22 OF 23					
SHQ	HU	71	481	-	CORRIDOR	SHQ	L2	217	CORRIDOR	R/A	Normal	300	400	308	167	N/A	N/A	2.3	Indoor	6.0	6.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 20 OF 34	SHEET 18 OF 23					
SHQ	HU	71	483	-	CORRIDOR	SHQ	L4	413	CORRIDOR	R/A	Normal	300	400	308	193	N/A	N/A	2.7	Indoor	6.0	6.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 20 OF 34	SHEET 14 OF 23					
SHQ	HU	71	485	-	CORRIDOR	SHQ	L4	415	CORRIDOR	R/A	Normal	300	400	308	141	N/A	N/A	1.9	Indoor	6.0	6.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 20 OF 34	SHEET 15 OF 23					
SHQ	HU	71	806	-	CORRIDOR	SHQ	L4	436	CORRIDOR	N/E	Normal	300	300	95	154	N/A	N/A	2.1	Indoor	6.0	6.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 20 OF 34	SHEET 14 OF 23					
SHQ	HU	71	808	-	CORRIDOR	SHQ	L4	437	CORRIDOR	N/E	Normal	300	300	95	178	N/A	N/A	2.5	Indoor	6.0	6.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 20 OF 34	SHEET 15 OF 23					
SHQ	HU	71	810	-	CORRIDOR	SHQ	L3	330	CORRIDOR	N/E	Normal	300	300	95	119	N/A	N/A	1.6	Indoor	6.0	6.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 20 OF 34	SHEET 16 OF 23					




					<div><div>SHWE - Detailed Engineering - Field Development Project HVAC Equipment List with Tags for Living Quarter</div></div>																					
					N° SHQ-HV-EB-301-0001				Rev: 2		Status: AFC		Disciplin:HVAC		Document type: LIS				Rev. Date: 17/01/2011							
Class	Class	System	Number	Code	Description	Platform	Deck	Location		Service		Dimensions			Design conditions				Weight		Power		Material	Remarks	Ducting & Instr. Diagram (SHQ-HV-DS-303-0001)	Piping & Instr. Diagram / Overall Single line diagram (SHQ-HV-DP-301-0003)
								Room Description	Service Type	Service Mode	Width or Dia. (mm)	Height (mm)	Length (mm)	Airflow (m³/h)	Capacity (kW)	Static Pressure (pa)	Air Vel. (m/s)	Install Location (Indoor/Outdoor)	Dry (kg)	Operate (kg)	(kW)	-				
					Room Unit (MLG - 90 S TYPE)																					
SHQ	HU	71	239	-	DRY GOODS STORE	SHQ	L1	125	DRY GOODS STORE	R/A	Normal	600	400	358	497	N/A	N/A	6.9	Indoor	12	12	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 26 OF 34	SHEET 20 OF 23	
SHQ	HU	71	531	-	TELECOM EQUIPMENT ROOM	SHQ	L2	212	TELECOM EQUIPMENT ROOM	R/A	Emer'cy	600	400	358	621	N/A	N/A	3.5	Indoor	12	12	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 26 OF 34	SHEET 19 OF 23	
SHQ	HU	71	532	-	TELECOM EQUIPMENT ROOM	SHQ	L2	212	TELECOM EQUIPMENT ROOM	R/A	Emer'cy	600	400	358	621	N/A	N/A	3.5	Indoor	12	12	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 26 OF 34	SHEET 19 OF 23	
SHQ	HU	71	533	-	TELECOM EQUIPMENT ROOM	SHQ	L2	212	TELECOM EQUIPMENT ROOM	R/A	Emer'cy	600	400	358	621	N/A	N/A	3.5	Indoor	12	12	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 26 OF 34	SHEET 19 OF 23	
SHQ	HU	71	537	-	TELECOM EQUIPMENT ROOM	SHQ	L2	212	TELECOM EQUIPMENT ROOM	R/A	Emer'cy	600	400	358	622	N/A	N/A	3.5	Indoor	12	12	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 26 OF 34	SHEET 19 OF 23	
SHQ	HU	71	538	-	TELECOM EQUIPMENT ROOM	SHQ	L2	212	TELECOM EQUIPMENT ROOM	R/A	Emer'cy	600	400	358	622	N/A	N/A	3.5	Indoor	12	12	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 26 OF 34	SHEET 19 OF 23	
					Room Unit (MLG - 90 L TYPE)																					
SHQ	HU	71	254	-	RADIO ROOM	SHQ	L2	229	RADIO ROOM	R/A	Emer'cy	600	400	358	598	N/A	N/A	4.2	Indoor	12	12	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 25 OF 34	SHEET 19 OF 23	
SHQ	HU	71	255	-	RADIO ROOM	SHQ	L2	229	RADIO ROOM	R/A	Emer'cy	600	400	358	599	N/A	N/A	4.2	Indoor	12	12	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 25 OF 34	SHEET 19 OF 23	
SHQ	HU	71	320	-	MULTI PURPOSE ROOM	SHQ	L3	314	MULTI PUR. ROOM	R/A	Normal	600	400	358	466	N/A	N/A	3.2	Indoor	12	12	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 25 OF 34	SHEET 17 OF 23	
SHQ	HU	71	501	-	T.V ROOM(1)	SHQ	L0	017	T.V ROOM(1)	R/A	Emer'cy	600	400	358	479	N/A	N/A	3.3	Indoor	12	12	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 25 OF 34	SHEET 22 OF 23	
SHQ	HU	71	502	-	T.V ROOM(1)	SHQ	L0	017	T.V ROOM(1)	R/A	Emer'cy	600	400	358	479	N/A	N/A	3.3	Indoor	12	12	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 25 OF 34	SHEET 22 OF 23	
SHQ	HU	71	503	-	T.V ROOM(1)	SHQ	L0	017	T.V ROOM(1)	R/A	Emer'cy	600	400	358	480	N/A	N/A	3.3	Indoor	12	12	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 25 OF 34	SHEET 22 OF 23	
SHQ	HU	71	504	-	T.V ROOM(1)	SHQ	L0	017	T.V ROOM(1)	R/A	Emer'cy	600	400	358	480	N/A	N/A	3.3	Indoor	12	12	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 25 OF 34	SHEET 22 OF 23	
SHQ	HU	71	505	-	T.V ROOM(2)	SHQ	L0	018	T.V ROOM(2)	R/A	Emer'cy	600	400	358	479	N/A	N/A	3.3	Indoor	12	12	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 25 OF 34	SHEET 22 OF 23	
SHQ	HU	71	506	-	T.V ROOM(2)	SHQ	L0	018	T.V ROOM(2)	R/A	Emer'cy	600	400	358	479	N/A	N/A	3.3	Indoor	12	12	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 25 OF 34	SHEET 22 OF 23	
SHQ	HU	71	507	-	T.V ROOM(2)	SHQ	L0	018	T.V ROOM(2)	R/A	Emer'cy	600	400	358	480	N/A	N/A	3.3	Indoor	12	12	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 25 OF 34	SHEET 22 OF 23	
SHQ	HU	71	508	-	T.V ROOM(2)	SHQ	L0	018	T.V ROOM(2)	R/A	Emer'cy	600	400	358	480	N/A	N/A	3.3	Indoor	12	12	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 25 OF 34	SHEET 22 OF 23	
SHQ	HU	71	534	-	TELECOM EQUIPMENT ROOM	SHQ	L2	212	TELECOM EQUIPMENT ROOM	R/A	Emer'cy	600	400	358	621	N/A	N/A	3.5	Indoor	12	12	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 25 OF 34	SHEET 19 OF 23	
SHQ	HU	71	535	-	TELECOM EQUIPMENT ROOM	SHQ	L2	212	TELECOM EQUIPMENT ROOM	R/A	Emer'cy	600	400	358	621	N/A	N/A	3.5	Indoor	12	12	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 25 OF 34	SHEET 19 OF 23	
SHQ	HU	71	536	-	TELECOM EQUIPMENT ROOM	SHQ	L2	212	TELECOM EQUIPMENT ROOM	R/A	Emer'cy	600	400	358	622	N/A	N/A	3.5	Indoor	12	12	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 25 OF 34	SHEET 19 OF 23	
SHQ	HU	71	581	-	TRANSIT ROOM	SHQ	L3	315	TRANSIT ROOM	R/A	Normal	600	400	358	582	N/A	N/A	3.3	Indoor	12	12	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 25 OF 34	SHEET 17 OF 23	
SHQ	HU	71	582	-	TRANSIT ROOM	SHQ	L3	315	TRANSIT ROOM	R/A	Normal	600	400	358	582	N/A	N/A	3.3	Indoor	12	12	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 25 OF 34	SHEET 17 OF 23	
SHQ	HU	71	583	-	TRANSIT ROOM	SHQ	L3	315	TRANSIT ROOM	R/A	Normal	600	400	358	582	N/A	N/A	3.3	Indoor	12	12	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 25 OF 34	SHEET 17 OF 23	
SHQ	HU	71	584	-	TRANSIT ROOM	SHQ	L3	315	TRANSIT ROOM	R/A	Normal	600	400	358	583	N/A	N/A	3.3	Indoor	12	12	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 25 OF 34	SHEET 17 OF 23	




					 <div>SHWE - Detailed Engineering - Field Development Project HVAC Equipment List with Tags for Living Quarter</div>																								
					N° SHQ-HV-EB-301-0001				Rev: 2		Status: AFC	Discipline: HVAC		Document type: LIS				Rev. Date: 17/01/2011											
Class	Class	System	Number	Code	Description	Platform	Deck	Location		Service		Dimensions			Design conditions				Weight		Power	Material	Remarks	Ducting & Instr. Diagram (SHQ-HV-DS-303-0001)	Piping & Instr. Diagram / Overall Single line diagram (SHQ-HV-DP-301-0003)				
								Room Description	Service Type	Service Mode	Width or Dia. (mm)	Height (mm)	Length (mm)	Airflow (m³/h)	Capacity (kW)	Static Pressure (pa)	Air Vel. (m/s)	Install Location (Indoor/Outdoor)	Dry (kg)	Operate (kg)	(kW)	-							
					Room Unit (KU - 100 TYPE)																								
SHQ	HU	71	600	-	SHOWER	SHQ	L0	021	SHOWER	M/E	Normal	ø137	63	21	N/A	N/A	0.7	Indoor	0.2	0.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 30 OF 34	SHEET 21 OF 23					
SHQ	HU	71	601	-	SHOWER	SHQ	L0	021	SHOWER	M/E	Normal	ø137	63	21	N/A	N/A	0.7	Indoor	0.2	0.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 30 OF 34	SHEET 21 OF 23					
SHQ	HU	71	602	-	SHOWER	SHQ	L0	021	SHOWER	M/E	Normal	ø137	63	21	N/A	N/A	0.7	Indoor	0.2	0.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 30 OF 34	SHEET 21 OF 23					
SHQ	HU	71	603	-	SHOWER	SHQ	L0	021	SHOWER	M/E	Normal	ø137	63	21	N/A	N/A	0.7	Indoor	0.2	0.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 30 OF 34	SHEET 21 OF 23					
SHQ	HU	71	604	-	SHOWER	SHQ	L0	021	SHOWER	M/E	Normal	ø137	63	21	N/A	N/A	0.7	Indoor	0.2	0.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 30 OF 34	SHEET 21 OF 23					
SHQ	HU	71	605	-	SHOWER	SHQ	L0	021	SHOWER	M/E	Normal	ø137	63	21	N/A	N/A	0.7	Indoor	0.2	0.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 30 OF 34	SHEET 21 OF 23					
SHQ	HU	71	606	-	SHOWER	SHQ	L0	021	SHOWER	M/E	Normal	ø137	63	21	N/A	N/A	0.7	Indoor	0.2	0.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 30 OF 34	SHEET 21 OF 23					
SHQ	HU	71	607	-	SHOWER	SHQ	L0	021	SHOWER	M/E	Normal	ø137	63	22	N/A	N/A	0.7	Indoor	0.2	0.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 30 OF 34	SHEET 21 OF 23					
SHQ	HU	71	608	-	SHOWER	SHQ	L0	021	SHOWER	M/E	Normal	ø137	63	22	N/A	N/A	0.7	Indoor	0.2	0.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 30 OF 34	SHEET 21 OF 23					
SHQ	HU	71	609	-	SHOWER	SHQ	L0	021	SHOWER	M/E	Normal	ø137	63	22	N/A	N/A	0.7	Indoor	0.2	0.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 30 OF 34	SHEET 21 OF 23					
SHQ	HU	71	611	-	TOILET EXHAUST	SHQ	L1	108	CATERING CHANGING ROOM	M/E	Normal	ø137	63	88	N/A	N/A	3.1	Indoor	0.2	0.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 30 OF 34	SHEET 20 OF 23					
SHQ	HU	71	612	-	TOILET EXHAUST	SHQ	L1	108	CATERING CHANGING ROOM	M/E	Normal	ø137	63	89	N/A	N/A	3.1	Indoor	0.2	0.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 30 OF 34	SHEET 20 OF 23					
SHQ	HU	71	613	-	TOILET	SHQ	L0	020	TOILET	M/E	Normal	ø137	63	27	N/A	N/A	1.0	Indoor	0.2	0.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 30 OF 34	SHEET 21 OF 23					
SHQ	HU	71	614	-	TOILET	SHQ	L0	020	TOILET	M/E	Normal	ø137	63	28	N/A	N/A	1.0	Indoor	0.2	0.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 30 OF 34	SHEET 21 OF 23					
SHQ	HU	71	615	-	FEMALE TOILET	SHQ	L1	102	FEMALE TOILET	M/E	Normal	ø137	63	27	N/A	N/A	1	Indoor	0.2	0.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 30 OF 34	SHEET 20 OF 23					
SHQ	HU	71	616	-	FEMALE TOILET	SHQ	L1	102	FEMALE TOILET	M/E	Normal	ø137	63	27	N/A	N/A	1	Indoor	0.2	0.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 30 OF 34	SHEET 20 OF 23					
SHQ	HU	71	617	-	MALE TOILET	SHQ	L1	107	MALE TOILET	M/E	Normal	ø137	63	46	N/A	N/A	1.6	Indoor	0.2	0.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 30 OF 34	SHEET 20 OF 23					
SHQ	HU	71	618	-	MALE TOILET	SHQ	L1	107	MALE TOILET	M/E	Normal	ø137	63	46	N/A	N/A	1.6	Indoor	0.2	0.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 30 OF 34	SHEET 20 OF 23					
SHQ	HU	71	621	-	FEMALE TOILET	SHQ	L2	210	FEMALE TOILET	M/E	Normal	ø137	63	26	N/A	N/A	0.9	Indoor	0.2	0.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 30 OF 34	SHEET 18 OF 23					
SHQ	HU	71	622	-	FEMALE TOILET	SHQ	L2	210	FEMALE TOILET	M/E	Normal	ø137	63	26	N/A	N/A	0.9	Indoor	0.2	0.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 30 OF 34	SHEET 18 OF 23					
SHQ	HU	71	623	-	MALE TOILET	SHQ	L2	207	MALE TOILET	M/E	Normal	ø137	63	32	N/A	N/A	1.1	Indoor	0.2	0.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 30 OF 34	SHEET 18 OF 23					
SHQ	HU	71	624	-	MALE TOILET	SHQ	L2	207	MALE TOILET	M/E	Normal	ø137	63	33	N/A	N/A	1.2	Indoor	0.2	0.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 30 OF 34	SHEET 18 OF 23					
SHQ	HU	71	625	-	TOILET EXHAUST	SHQ	L2	225	OIM ROOM	M/E	Normal	ø137	63	34	N/A	N/A	1.2	Indoor	0.2	0.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 30 OF 34	SHEET 18 OF 23					
SHQ	HU	71	626	-	TOILET EXHAUST	SHQ	L3	301	4-MAN(21)	M/E	Normal	ø137	63	35	N/A	N/A	1.2	Indoor	0.2	0.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 30 OF 34	SHEET 16 OF 23					
SHQ	HU	71	627	-	TOILET EXHAUST	SHQ	L3	320	4-MAN(16)	M/E	Normal	ø137	63	35	N/A	N/A	1.2	Indoor	0.2	0.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 30 OF 34	SHEET 16 OF 23					
SHQ	HU	71	628	-	TOILET EXHAUST	SHQ	L3	321	4-MAN(17)	M/E	Normal	ø137	63	35	N/A	N/A	1.2	Indoor	0.2	0.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 30 OF 34	SHEET 16 OF 23					
SHQ	HU	71	629	-	TOILET EXHAUST	SHQ	L3	322	4-MAN(18)	M/E	Normal	ø137	63	35	N/A	N/A	1.2	Indoor	0.2	0.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 30 OF 34	SHEET 16 OF 23					
SHQ	HU	71	630	-	TOILET EXHAUST	SHQ	L3	323	4-MAN(19)	M/E	Normal	ø137	63	35	N/A	N/A	1.2	Indoor	0.2	0.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 30 OF 34	SHEET 16 OF 23					
SHQ	HU	71	631	-	TOILET EXHAUST	SHQ	L3	324	4-MAN(20)	M/E	Normal	ø137	63	35	N/A	N/A	1.2	Indoor	0.2	0.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 30 OF 34	SHEET 16 OF 23					
SHQ	HU	71	632	-	TOILET EXHAUST	SHQ	L3	325	4-MAN(11)	M/E	Normal	ø137	63	35	N/A	N/A	1.2	Indoor	0.2	0.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 30 OF 34	SHEET 16 OF 23					
SHQ	HU	71	633	-	TOILET EXHAUST	SHQ	L3	326	4-MAN(12)	M/E	Normal	ø137	63	35	N/A	N/A	1.2	Indoor	0.2	0.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 30 OF 34	SHEET 16 OF 23					
SHQ	HU	71	634	-	TOILET EXHAUST	SHQ	L3	327	4-MAN(13)	M/E	Normal	ø137	63	35	N/A	N/A	1.2	Indoor	0.2	0.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 30 OF 34	SHEET 16 OF 23					
SHQ	HU	71	635	-	TOILET EXHAUST	SHQ	L3	328	4-MAN(14)	M/E	Normal	ø137	63	35	N/A	N/A	1.2	Indoor	0.2	0.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 30 OF 34	SHEET 16 OF 23					
SHQ	HU	71	636	-	TOILET EXHAUST	SHQ	L3	329	4-MAN(15)																				




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						N° SHQ-HV-EB-301-0001				Rev: 2		Status: AFC		Discipline: HVAC		Document type: LIS				Rev. Date: 17/01/2011									
Class	Class	System	Number	Code	Description	Platform	Deck	Room No.	Room Description	Service Type	Service Mode	Dimensions			Design conditions				Weight		Power		Material	Remarks	Ducting & Instr. Diagram (SHQ-HV-DS-303-0001)	Piping & Instr. Diagram / Overall Single line diagram (SHQ-HV-DP-301-0003)			
												Width or Dia. (mm)	Height (mm)	Length (mm)	Airflow (m³/h)	Capacity (kW)	Static Pressure (pa)	Air Vel. (m/s)	Install Location (Indoor/Outdoor)	Dry (kg)	Operate (kg)	(kW)					-		
Room Unit (KU - 100 TYPE)																													
SHQ	HU	71	657	-	TOILET EXHAUST	SHQ	L4	423	4-MAN(44)	M/E	Normal	ø137	63	35	N/A	N/A	1.2	Indoor	0.2	0.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 30 OF 34	SHEET 15 OF 23					
SHQ	HU	71	658	-	TOILET EXHAUST	SHQ	L4	424	4-MAN(45)	M/E	Normal	ø137	63	35	N/A	N/A	1.2	Indoor	0.2	0.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 30 OF 34	SHEET 15 OF 23					
SHQ	HU	71	659	-	TOILET EXHAUST	SHQ	L4	425	4-MAN(46)	M/E	Normal	ø137	63	35	N/A	N/A	1.2	Indoor	0.2	0.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 30 OF 34	SHEET 15 OF 23					
SHQ	HU	71	660	-	TOILET EXHAUST	SHQ	L4	426	4-MAN(47)	M/E	Normal	ø137	63	35	N/A	N/A	1.2	Indoor	0.2	0.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 30 OF 34	SHEET 15 OF 23					
SHQ	HU	71	661	-	TOILET EXHAUST	SHQ	L4	431	4-MAN(34)	M/E	Normal	ø137	63	35	N/A	N/A	1.2	Indoor	0.2	0.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 30 OF 34	SHEET 15 OF 23					
SHQ	HU	71	662	-	TOILET EXHAUST	SHQ	L4	432	4-MAN(35)	M/E	Normal	ø137	63	35	N/A	N/A	1.2	Indoor	0.2	0.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 30 OF 34	SHEET 15 OF 23					
SHQ	HU	71	663	-	TOILET EXHAUST	SHQ	L4	433	4-MAN(36)	M/E	Normal	ø137	63	35	N/A	N/A	1.2	Indoor	0.2	0.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 30 OF 34	SHEET 15 OF 23					
SHQ	HU	71	664	-	TOILET EXHAUST	SHQ	L4	434	4-MAN(37)	M/E	Normal	ø137	63	35	N/A	N/A	1.2	Indoor	0.2	0.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 30 OF 34	SHEET 15 OF 23					
SHQ	HU	71	665	-	TOILET EXHAUST	SHQ	L4	435	4-MAN(38)	M/E	Normal	ø137	63	35	N/A	N/A	1.2	Indoor	0.2	0.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 30 OF 34	SHEET 15 OF 23					
SHQ	HU	71	666	-	TOILET EXHAUST	SHQ	L4	444	4-MAN(27)	M/E	Normal	ø137	63	35	N/A	N/A	1.2	Indoor	0.2	0.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 30 OF 34	SHEET 15 OF 23					
SHQ	HU	71	667	-	TOILET EXHAUST	SHQ	L4	445	4-MAN(28)	M/E	Normal	ø137	63	35	N/A	N/A	1.2	Indoor	0.2	0.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 30 OF 34	SHEET 15 OF 23					
SHQ	HU	71	668	-	TOILET EXHAUST	SHQ	L4	446	4-MAN(29)	M/E	Normal	ø137	63	35	N/A	N/A	1.2	Indoor	0.2	0.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 30 OF 34	SHEET 15 OF 23					
SHQ	HU	71	669	-	TOILET EXHAUST	SHQ	L4	447	4-MAN(1)	M/E	Normal	ø137	63	35	N/A	N/A	1.2	Indoor	0.2	0.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 30 OF 34	SHEET 15 OF 23					
SHQ	HU	71	670	-	TOILET EXHAUST	SHQ	L4	448	4-MAN(2)	M/E	Normal	ø137	63	35	N/A	N/A	1.2	Indoor	0.2	0.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 30 OF 34	SHEET 15 OF 23					
SHQ	HU	71	671	-	TOILET EXHAUST	SHQ	L4	401	4-MAN(48)	M/E	Normal	ø137	63	35	N/A	N/A	1.2	Indoor	0.2	0.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 30 OF 34	SHEET 14 OF 23					
SHQ	HU	71	672	-	TOILET EXHAUST	SHQ	L4	417	4-MAN(39)	M/E	Normal	ø137	63	35	N/A	N/A	1.2	Indoor	0.2	0.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 30 OF 34	SHEET 14 OF 23					
SHQ	HU	71	673	-	TOILET EXHAUST	SHQ	L4	418	4-MAN(40)	M/E	Normal	ø137	63	35	N/A	N/A	1.2	Indoor	0.2	0.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 30 OF 34	SHEET 14 OF 23					
SHQ	HU	71	674	-	TOILET EXHAUST	SHQ	L4	419	4-MAN(41)	M/E	Normal	ø137	63	35	N/A	N/A	1.2	Indoor	0.2	0.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 30 OF 34	SHEET 14 OF 23					
SHQ	HU	71	675	-	TOILET EXHAUST	SHQ	L4	420	4-MAN(42)	M/E	Normal	ø137	63	35	N/A	N/A	1.2	Indoor	0.2	0.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 30 OF 34	SHEET 14 OF 23					
SHQ	HU	71	676	-	TOILET EXHAUST	SHQ	L4	427	4-MAN(30)	M/E	Normal	ø137	63	35	N/A	N/A	1.2	Indoor	0.2	0.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 30 OF 34	SHEET 14 OF 23					
SHQ	HU	71	677	-	TOILET EXHAUST	SHQ	L4	428	4-MAN(31)	M/E	Normal	ø137	63	35	N/A	N/A	1.2	Indoor	0.2	0.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 30 OF 34	SHEET 14 OF 23					
SHQ	HU	71	678	-	TOILET EXHAUST	SHQ	L4	429	4-MAN(32)	M/E	Normal	ø137	63	35	N/A	N/A	1.2	Indoor	0.2	0.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 30 OF 34	SHEET 14 OF 23					
SHQ	HU	71	679	-	TOILET EXHAUST	SHQ	L4	430	4-MAN(33)	M/E	Normal	ø137	63	35	N/A	N/A	1.2	Indoor	0.2	0.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 30 OF 34	SHEET 14 OF 23					
SHQ	HU	71	680	-	TOILET EXHAUST	SHQ	L4	438	4-MAN(22)	M/E	Normal	ø137	63	35	N/A	N/A	1.2	Indoor	0.2	0.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 30 OF 34	SHEET 14 OF 23					
SHQ	HU	71	681	-	TOILET EXHAUST	SHQ	L4	439	4-MAN(23)	M/E	Normal	ø137	63	35	N/A	N/A	1.2	Indoor	0.2	0.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 30 OF 34	SHEET 14 OF 23					
SHQ	HU	71	682	-	TOILET EXHAUST	SHQ	L4	440	4-MAN(24)	M/E	Normal	ø137	63	35	N/A	N/A	1.2	Indoor	0.2	0.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 30 OF 34	SHEET 14 OF 23					
SHQ	HU	71	683	-	TOILET EXHAUST	SHQ	L4	441	4-MAN(25)	M/E	Normal	ø137	63	35	N/A	N/A	1.2	Indoor	0.2	0.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 30 OF 34	SHEET 14 OF 23					
SHQ	HU	71	684	-	TOILET EXHAUST	SHQ	L4	443	4-MAN(26)	M/E	Normal	ø137	63	35	N/A	N/A	1.2	Indoor	0.2	0.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 30 OF 34	SHEET 14 OF 23					
SHQ	HU	71	685	-	LINEN STORE	SHQ	L4	442	LINEN STORE	R/A	Normal	ø137	63	43	N/A	N/A	1.5	Indoor	0.2	0.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 30 OF 34	SHEET 14 OF 23					
SHQ	HU	71	686	-	STORE	SHQ	L3	313	STORE	R/A	Normal	ø137	63	71	N/A	N/A	2.5	Indoor	0.2	0.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 30 OF 34	SHEET 16 OF 23					
SHQ	HU	71	687	-	TOILET&BATH ROOM	SHQ	L3	312	TOILET&BATH ROOM	M/E	Normal	ø137	63	41	N/A	N/A	1.5	Indoor	0.2	0.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 30 OF 34	SHEET 17 OF 23					
SHQ	HU	71	688	-	TOILET&SHOWER	SHQ	L0	023	TOILET&SHOWER	M/E	Normal	ø137	63	35	N/A	N/A	1.3	Indoor	0.2	0.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 30 OF 34	SHEET 21 OF 23					
SHQ	HU	71	689	-	TOILET&SHOWER	SHQ	L0	023	TOILET&SHOWER	M/E	Normal	ø137	63	35	N/A	N/A	1.3	Indoor	0.2	0.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 30 OF 34	SHEET 21 OF 23					
SHQ	HU	71	690	-	TOILET&SHOWER	SHQ	L0	023	TOILET&SHOWER	M/E	Normal	ø137	63	36	N/A	N/A	1.3	Indoor	0.2	0.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 30 OF 34	SHEET 21 OF 23					
SHQ	HU	71	691	-	TOILET&SHOWER	SHQ	L0	023	TOILET&SHOWER	M/E	Normal	ø137	63	36	N/A	N/A	1.3	Indoor	0.2	0.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 30 OF 34	SHEET 21 OF 23					
SHQ	HU	71	804	-	AIR LOCK	SHQ	L5	508	AIR LOCK	S/A	Emergency	ø137	63	38	N/A	N/A	0.3	Indoor	0.2	0.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 30 OF 34	SHEET 13 OF 23					
SHQ	HU	71	805	-	AIR LOCK	SHQ	L4	412	AIR LOCK	N/E	Normal	ø137	63	51	N/A	N/A	1.8												




																						SHWE - Detailed Engineering - Field Development Project HVAC Equipment List with Tags for Living Quarter													
					N° SHQ-HV-EB-301-0001					Rev: 2		Status: AFC		Discipline: HVAC		Document type: LIS			Rev. Date: 17/01/2011																
Class	Class	System	Number	Code	Description	Platform	Deck	Room No.	Location	Service		Dimensions		Design conditions				Weight		Power	Material	Remarks	Ducting & Instr. Diagram (SHQ-HV-DS-303-0001)	Piping & Instr. Diagram / Overall Single line diagram (SHQ-HV-DP-301-0003)											
									Room Description	Service Type	Service Mode	Width or Dia. (mm)	Height (mm)	Length (mm)	Airflow (m³/h)	Capacity (kW)	Static Pressure (pa)	Air Vel. (m/s)	Install Location (Indoor/Outdoor)	Dry (kg)	Operate (kg)				(kW)	-									
Room Unit (KU - 160 TYPE)																																			
SHQ	HU	71	701	-	STORE & JANITOR	SHQ	L0	002	STORE & JANITOR	R/A	Normal	ø212	100	132	N/A	N/A	1.8	Indoor	0.5	0.5	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 32 OF 34	SHEET 21 OF 23											
SHQ	HU	71	702	-	LINEN STORE	SHQ	L0	016	LINEN STORE	R/A	Normal	ø212	100	109	N/A	N/A	1.5	Indoor	0.5	0.5	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 32 OF 34	SHEET 21 OF 23											
SHQ	HU	71	711	-	STORE & JANITOR	SHQ	L1	101	STORE & JANITOR	R/A	Normal	ø212	100	117	N/A	N/A	1.6	Indoor	0.5	0.5	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 32 OF 34	SHEET 20 OF 23											
SHQ	HU	71	721	-	STORE & JANITOR	SHQ	L2	202	STORE & JANITOR	R/A	Normal	ø212	100	150	N/A	N/A	2.1	Indoor	0.5	0.5	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 32 OF 34	SHEET 18 OF 23											
SHQ	HU	71	722	-	STORE	SHQ	L2	221	STORE	R/A	Normal	ø212	100	96	N/A	N/A	3.4	Indoor	0.5	0.5	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 32 OF 34	SHEET 18 OF 23											
SHQ	HU	71	731	-	STORE & JANITOR	SHQ	L3	302	STORE & JANITOR	R/A	Normal	ø212	100	120	N/A	N/A	1.7	Indoor	0.5	0.5	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 32 OF 34	SHEET 16 OF 23											
SHQ	HU	71	732	-	MEDICAL STORE	SHQ	L3	311	MEDICAL STORE	R/A	Normal	ø212	100	121	N/A	N/A	1.7	Indoor	0.5	0.5	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 32 OF 34	SHEET 17 OF 23											
SHQ	HU	71	741	-	STORE & JANITOR	SHQ	L4	402	STORE & JANITOR	R/A	Normal	ø212	100	174	N/A	N/A	2.4	Indoor	0.5	0.5	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 32 OF 34	SHEET 14 OF 23											
SHQ	HU	71	742	-	LINEN STORE	SHQ	L4	421	LINEN STORE	R/A	Normal	ø212	100	147	N/A	N/A	2.0	Indoor	0.5	0.5	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 32 OF 34	SHEET 14 OF 23											




					 <div>SHWE - Detailed Engineering - Field Development Project HVAC Equipment List with Tags for Living Quarter</div>																					
					N° SHQ-HV-EB-301-0001				Rev: 2		Status: AFC		Discipline: HVAC		Document type: LIS				Rev. Date: 17/01/2011							
Class	Class	System	Number	Code	Description	Platform	Deck	Room No.	Room Description	Service		Dimensions			Design conditions				Weight		Power		Material	Remarks	Ducting & Instr. Diagram (SHQ-HV-DS-303-0001)	Piping & Instr. Diagram / Overall Single line diagram (SHQ-HV-DP-301-0003)
										Service Type	Service Mode	Width or Dia. (mm)	Height (mm)	Length (mm)	Airflow (m³/h)	Capacity (kW)	Static Pressure (pa)	Air Vel. (m/s)	Install Location (Indoor/Outdoor)	Dry (kg)	Operate (kg)	(kW)				
GRILLE / DIFFUSER																										
SHQ	HU	71	202	-	E&I TELECOM SHAFT	SHQ	L0	003	E&I TELECOM SHAFT	R/A	Normal	200	200	95	213	N/A	N/A	1.5	Indoor	6.0	6.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 33 OF 34	SHEET 21 OF 23	
SHQ	HU	71	242	-	E&I TELECOM SHAFT	SHQ	L1	103	E&I TELECOM SHAFT	S/A	Normal	200	200	95	196	N/A	N/A	2.7	Indoor	6.0	6.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 33 OF 34	SHEET 20 OF 23	
SHQ	HU	71	300	-	E&I TELECOM SHAFT	SHQ	L2	203	E&I TELECOM SHAFT	S/A	Normal	200	200	95	220	N/A	N/A	3.1	Indoor	6.0	6.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 33 OF 34	SHEET 18 OF 23	
SHQ	HU	71	356	-	E&I TELECOM SHAFT	SHQ	L3	303	E&I TELECOM SHAFT	R/A	Normal	300	200	95	267	N/A	N/A	3.7	Indoor	7.0	7.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 33 OF 34	SHEET 16 OF 23	
SHQ	HU	71	401	-	E&I TELECOM SHAFT	SHQ	L4	403	E&I TELECOM SHAFT	R/A	Normal	300	200	95	354	N/A	N/A	4.9	Indoor	7.0	7.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 33 OF 34	SHEET 14 OF 23	
SHQ	HU	71	519	-	STAIR	SHQ	L0	004	STAIR	S/A	Emergency	400	600	95	1607	N/A	N/A	1.9	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 33 OF 34	SHEET 22 OF 23	
SHQ	HU	71	548	-	LAUNDRY	SHQ	L0	015	LAUNDRY	E/A	Normal	500	500	95	1807	N/A	N/A	3.3	Indoor	18	18	N/A	SUS316L	SHQ-ME-DD-H01-0005, SHEET 34 OF 34	SHEET 21 OF 23	
SHQ	HU	71	549	-	LAUNDRY	SHQ	L0	015	LAUNDRY	E/A	Normal	500	500	95	1807	N/A	N/A	3.3	Indoor	18	18	N/A	SUS316L	SHQ-ME-DD-H01-0005, SHEET 34 OF 34	SHEET 21 OF 23	
SHQ	HU	71	550	-	LAUNDRY	SHQ	L0	015	LAUNDRY	E/A	Normal	500	500	95	1806	N/A	N/A	3.3	Indoor	18	18	N/A	SUS316L	SHQ-ME-DD-H01-0005, SHEET 34 OF 34	SHEET 21 OF 23	
SHQ	HU	71	800	-	GOODS LIFT	SHQ	L5	502	GOODS LIFT	N/E	Normal	300	300	95	580	N/A	N/A	1.8	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 33 OF 34	SHEET 12 OF 23	
SHQ	HU	71	801	-	FIREMEN'S CHANGE RM.	SHQ	L5	505	FIREMEN'S CHANGE RM.	N/E	Normal	300	300	95	269	N/A	N/A	2.1	Indoor	9.0	9.0	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 33 OF 34	SHEET 12 OF 23	
SHQ	HU	71	802	-	STAIR	SHQ	L5	501	STAIR	R/A	Emergency	300	500	95	1607	N/A	N/A	3.0	Indoor	13	13	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 33 OF 34	SHEET 13 OF 23	
SHQ	HU	71	803	-	STAIR	SHQ	L5	501	STAIR	S/A	Emergency	500	600	95	3220	N/A	N/A	3.7	Indoor	18	18	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 33 OF 34	SHEET 13 OF 23	
SHQ	HU	71	816	-	GARBAGE ROOM	SHQ	L1	120	GARBAGE ROOM	N/E	Normal	300	300	95	83	N/A	N/A	0.6	Indoor	12	12	N/A	SUS316L	SHQ-ME-DD-H01-0005, SHEET 34 OF 34	SHEET 20 OF 23	
SHQ	HU	71	817	-	DINING ROOM	SHQ	L1	117	DINING ROOM	S/A	Normal	800	800	95	5031	N/A	N/A	2.5	Indoor	35	35	N/A	SUS316L	SHQ-ME-DD-H01-0005, SHEET 34 OF 34	SHEET 20 OF 23	
SHQ	HU	71	818	-	DINING ROOM	SHQ	L1	117	DINING ROOM	S/A	Normal	800	800	95	5031	N/A	N/A	2.5	Indoor	35	35	N/A	SUS316L	SHQ-ME-DD-H01-0005, SHEET 34 OF 34	SHEET 20 OF 23	
SHQ	HU	71	819	-	DISH WASH	SHQ	L1	119	DISH WASH	S/A	Normal	800	800	95	5031	N/A	N/A	2.5	Indoor	35	35	N/A	SUS316L	SHQ-ME-DD-H01-0005, SHEET 34 OF 34	SHEET 20 OF 23	
SHQ	HU	71	820	-	DISH WASH	SHQ	L1	119	DISH WASH	S/A	Normal	800	800	95	5031	N/A	N/A	2.5	Indoor	35	35	N/A	SUS316L	SHQ-ME-DD-H01-0005, SHEET 34 OF 34	SHEET 20 OF 23	
SHQ	HU	71	823	-	HVAC PLANT ROOM	SHQ	L5	507	HVAC PLANT	N/E	Emergency	900	900	95	6312	N/A	N/A	2.2	Indoor	32	32	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 33 OF 34	SHEET 13 OF 23	
SHQ	HU	71	824	-	HVAC PLANT ROOM	SHQ	L5	507	HVAC PLANT	S/A	Emergency	500	500	95	2104	N/A	N/A	2.2	Indoor	15	15	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 33 OF 34	SHEET 13 OF 23	
SHQ	HU	71	825	-	HVAC PLANT ROOM	SHQ	L5	507	HVAC PLANT	S/A	Emergency	500	500	95	2104	N/A	N/A	2.2	Indoor	15	15	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 33 OF 34	SHEET 13 OF 23	
SHQ	HU	71	826	-	HVAC PLANT ROOM	SHQ	L5	507	HVAC PLANT	S/A	Emergency	500	500	95	2104	N/A	N/A	2.2	Indoor	15	15	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 33 OF 34	SHEET 13 OF 23	



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					N° SHQ-HV-EB-301-0001				Rev: 2		Status: AFC		Discipline: HVAC		Document type: LIS		Rev. Date: 17/01/2011									
Class	Class	System	Number	Code	Description	Platform	Deck	Room No.	Location		Service		Dimensions			Design conditions				Weight		Power	Material	Remarks	Ducting & Instr. Diagram (SHQ-HV-DS-303-0001)	Piping & Instr. Diagram / Overall Single line diagram (SHQ-HV-DP-301-0003)
									Room Description	Service Type	Service Mode	Width or Dia. (mm)	Height (mm)	Length (mm)	Airflow (m³/h)	Capacity (kW)	Static Pressure (pa)	Air Vel. (m/s)	Install Location (Indoor/Outdoor)	Dry (kg)	Operate (kg)	(kW)	-			
					ROOM UNIT(DLQ-AG TYPE)																					
SHQ	HU	71	021	-	T.V ROOM(1)	SHQ	L0	017	T.V ROOM(1)	S/A	Emergency	450	650	272	239	N/A	N/A	8.5	Indoor	10.2	10.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 37 OF 38	SHEET 22 OF 23	
SHQ	HU	71	022	-	T.V ROOM(1)	SHQ	L0	017	T.V ROOM(1)	S/A	Emergency	450	650	272	239	N/A	N/A	8.5	Indoor	10.2	10.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 37 OF 38	SHEET 22 OF 23	
SHQ	HU	71	023	-	T.V ROOM(1)	SHQ	L0	017	T.V ROOM(1)	S/A	Emergency	450	650	272	240	N/A	N/A	8.5	Indoor	10.2	10.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 37 OF 38	SHEET 22 OF 23	
SHQ	HU	71	024	-	T.V ROOM(1)	SHQ	L0	017	T.V ROOM(1)	S/A	Emergency	450	650	272	240	N/A	N/A	8.5	Indoor	10.2	10.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 37 OF 38	SHEET 22 OF 23	
SHQ	HU	71	025	-	T.V ROOM(1)	SHQ	L0	017	T.V ROOM(1)	S/A	Emergency	450	650	272	240	N/A	N/A	8.5	Indoor	10.2	10.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 37 OF 38	SHEET 22 OF 23	
SHQ	HU	71	026	-	T.V ROOM(1)	SHQ	L0	017	T.V ROOM(1)	S/A	Emergency	450	650	272	240	N/A	N/A	8.5	Indoor	10.2	10.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 37 OF 38	SHEET 22 OF 23	
SHQ	HU	71	027	-	T.V ROOM(1)	SHQ	L0	017	T.V ROOM(1)	S/A	Emergency	450	650	272	240	N/A	N/A	8.5	Indoor	10.2	10.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 37 OF 38	SHEET 22 OF 23	
SHQ	HU	71	028	-	T.V ROOM(1)	SHQ	L0	017	T.V ROOM(1)	S/A	Emergency	450	650	272	240	N/A	N/A	8.5	Indoor	10.2	10.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 37 OF 38	SHEET 22 OF 23	
SHQ	HU	71	029	-	T.V ROOM(2)	SHQ	L0	018	T.V ROOM(2)	S/A	Emergency	450	650	272	239	N/A	N/A	8.5	Indoor	10.2	10.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 37 OF 38	SHEET 22 OF 23	
SHQ	HU	71	030	-	T.V ROOM(2)	SHQ	L0	018	T.V ROOM(2)	S/A	Emergency	450	650	272	239	N/A	N/A	8.5	Indoor	10.2	10.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 37 OF 38	SHEET 22 OF 23	
SHQ	HU	71	031	-	T.V ROOM(2)	SHQ	L0	018	T.V ROOM(2)	S/A	Emergency	450	650	272	240	N/A	N/A	8.5	Indoor	10.2	10.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 37 OF 38	SHEET 22 OF 23	
SHQ	HU	71	032	-	T.V ROOM(2)	SHQ	L0	018	T.V ROOM(2)	S/A	Emergency	450	650	272	240	N/A	N/A	8.5	Indoor	10.2	10.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 37 OF 38	SHEET 22 OF 23	
SHQ	HU	71	033	-	T.V ROOM(2)	SHQ	L0	018	T.V ROOM(2)	S/A	Emergency	450	650	272	240	N/A	N/A	8.5	Indoor	10.2	10.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 37 OF 38	SHEET 22 OF 23	
SHQ	HU	71	034	-	T.V ROOM(2)	SHQ	L0	018	T.V ROOM(2)	S/A	Emergency	450	650	272	240	N/A	N/A	8.5	Indoor	10.2	10.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 37 OF 38	SHEET 22 OF 23	
SHQ	HU	71	035	-	T.V ROOM(2)	SHQ	L0	018	T.V ROOM(2)	S/A	Emergency	450	650	272	240	N/A	N/A	8.5	Indoor	10.2	10.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 37 OF 38	SHEET 22 OF 23	
SHQ	HU	71	036	-	T.V ROOM(2)	SHQ	L0	018	T.V ROOM(2)	S/A	Emergency	450	650	272	240	N/A	N/A	8.5	Indoor	10.2	10.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 37 OF 38	SHEET 22 OF 23	
SHQ	HU	71	071	-	CENTRAL CONTROL ROOM	SHQ	L2	213	CENTRAL CONTROL ROOM	S/A	Emergency	450	650	272	260	N/A	N/A	9.2	Indoor	10.2	10.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 37 OF 38	SHEET 19 OF 23	
SHQ	HU	71	072	-	CENTRAL CONTROL ROOM	SHQ	L2	213	CENTRAL CONTROL ROOM	S/A	Emergency	450	650	272	260	N/A	N/A	9.2	Indoor	10.2	10.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 37 OF 38	SHEET 19 OF 23	
SHQ	HU	71	073	-	CENTRAL CONTROL ROOM	SHQ	L2	213	CENTRAL CONTROL ROOM	S/A	Emergency	450	650	272	260	N/A	N/A	9.2	Indoor	10.2	10.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 37 OF 38	SHEET 19 OF 23	
SHQ	HU	71	074	-	CENTRAL CONTROL ROOM	SHQ	L2	213	CENTRAL CONTROL ROOM	S/A	Emergency	450	650	272	260	N/A	N/A	9.2	Indoor	10.2	10.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 37 OF 38	SHEET 19 OF 23	
SHQ	HU	71	075	-	CENTRAL CONTROL ROOM	SHQ	L2	213	CENTRAL CONTROL ROOM	S/A	Emergency	450	650	272	260	N/A	N/A	9.2	Indoor	10.2	10.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 37 OF 38	SHEET 19 OF 23	
SHQ	HU	71	076	-	CENTRAL CONTROL ROOM	SHQ	L2	213	CENTRAL CONTROL ROOM	S/A	Emergency	450	650	272	260	N/A	N/A	9.2	Indoor	10.2	10.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 37 OF 38	SHEET 19 OF 23	
SHQ	HU	71	080	-	RADIO ROOM	SHQ	L2	229	RADIO ROOM	S/A	Emergency	610	610	377	399	N/A	N/A	5.5	Indoor	10.2	10.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 37 OF 38	SHEET 19 OF 23	
SHQ	HU	71	081	-	RADIO ROOM	SHQ	L2	229	RADIO ROOM	S/A	Emergency	610	610	377	399	N/A	N/A	5.5	Indoor	10.2	10.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 37 OF 38	SHEET 19 OF 23	
SHQ	HU	71	082	-	RADIO ROOM	SHQ	L2	229	RADIO ROOM	S/A	Emergency	610	610	377	399	N/A	N/A	5.5	Indoor	10.2	10.2	N/A	ALUMINUM	SHQ-ME-DD-H01-0005, SHEET 37 OF 38	SHEET 19 OF 23	
SHQ	HU	71	561	-	DINING ROOM	SHQ	L1	117	DINING ROOM	S/A	Normal	610	610	377	503	N/A	N/A	3.6	Indoor	10.2	10.2	N/A	SUS316L	SHQ-ME-DD-H01-0005, SHEET 38 OF 38	SHEET 20 OF 23	
SHQ	HU	71	562	-	DINING ROOM	SHQ	L1	117	DINING ROOM	S/A	Normal	610	610	377	503	N/A	N/A	3.6	Indoor	10.2	10.2	N/A	SUS316L	SHQ-ME-DD-H01-0005, SHEET 38 OF 38	SHEET 20 OF 23	
SHQ	HU	71	563	-	DINING ROOM	SHQ	L1	117	DINING ROOM	S/A	Normal	610	610	377	503	N/A	N/A	3.6	Indoor	10.2	10.2	N/A	SUS316L	SHQ-ME-DD-H01-0005, SHEET 38 OF 38	SHEET 20 OF 23	
SHQ	HU	71	564	-	DINING ROOM	SHQ	L1	117	DINING ROOM	S/A	Normal	610	610	377	503	N/A	N/A	3.6	Indoor	10.2	10.2	N/A	SUS316L	SHQ-ME-DD-H01-0005, SHEET 38 OF 38	SHEET 20 OF 23	
SHQ	HU	71	565	-	DINING ROOM	SHQ	L1	117	DINING ROOM	S/A	Normal	610	610	377	504	N/A	N/A	3.6	Indoor	10.2	10.2	N/A	SUS316L	SHQ-ME-DD-H01-0005, SHEET 38 OF 38	SHEET 20 OF 23	
SHQ	HU	71	566	-	DINING ROOM	SHQ	L1	117	DINING ROOM	S/A	Normal	610	610	377	503	N/A	N/A	3.6	Indoor	10.2	10.2	N/A	SUS316L	SHQ-ME-DD-H01-0005, SHEET 38 OF 38	SHEET 20 OF 23	
SHQ	HU	71	567	-	DINING ROOM	SHQ	L1	117	DINING ROOM	S/A	Normal	610	610	377	503	N/A	N/A	3.6	Indoor	10.2	10.2	N/A	SUS316L	SHQ-ME-DD-H01-0005, SHEET 38 OF 38	SHEET 20 OF 23	
SHQ	HU	71	568	-	DINING ROOM	SHQ	L1	117	DINING ROOM	S/A	Normal	610	610	377	503	N/A	N/A	3.6	Indoor	10.2	10.2	N/A	SUS316L	SHQ-ME-DD-H01-0005, SHEET 38 OF 38	SHEET 20 OF 23	
SHQ	HU	71	569	-	DINING ROOM	SHQ	L1	117	DINING ROOM	S/A	Normal	610	610	377	503	N/A	N/A	3.6	Indoor	10.2	10.2	N/A	SUS316L	SHQ-ME-DD-H01-0005, SHEET 38 OF 38	SHEET 20 OF 23	
SHQ	HU	71	570	-	DINING ROOM	SHQ	L1	117	DINING ROOM	S/A	Normal	610	610	377	503	N/A	N/A	3.6	Indoor	10.2	10.2	N/A	SUS316L	SHQ-ME-DD-H01-0005, SHEET 38 OF 38	SHEET 20 OF 23	
SHQ	HU	71	571	-	DINING ROOM	SHQ	L1	117	DINING ROOM	S/A	Normal	610	610	377	503	N/A	N/A	3.6	Indoor	10.2	10.2	N/A	SUS316L	SHQ-ME-DD-H01-0005, SHEET 38 OF 38	SHEET 20 OF 23	
SHQ	HU	71	572	-	DINING ROOM	SHQ	L1	117	DINING ROOM	S/A	Normal	610	610	377	503	N/A	N/A	3.6	Indoor	10.2	10.2	N/A	SUS316L	SHQ-ME-DD-H01-0005, SHEET 38 OF 38	SHEET 20 OF 23	
SHQ	HU	71	573	-	DINING ROOM	SHQ	L1	117	DINING ROOM	S/A	Normal	610	610	377	504	N/A	N/A	3.6	Indoor	10.2	10.2	N/A	SUS316L	SHQ-ME-DD-H01-0005, SHEET 3		



										SHWE - Detailed Engineering - Field Development Project HVAC Equipment List with Tags for Living Quarter																			
					N° SHQ-HV-EB-301-0001					Rev: 2		Status: AFC		Discipline: HVAC		Document type: LIS		Rev. Date: 17/01/2011											
Class	Class	System	Number	Code	Description	Platform	Deck	Location		Service		Dimensions			Design conditions				Weight		Power	Material	Remarks	Ducting & Instr. Diagram (SHQ-HV-DS-303-0001)	Piping & Instr. Diagram / Overall Single line diagram (SHQ-HV-DP-301-0003)				
								Room No.	Room Description	Service Type	Service Mode	Width or Dia. (mm)	Height (mm)	Length (mm)	Airflow (m³/h)	Capacity (kW)	Static Pressure (pa)	Air Vel. (m/s)	Install Location (Indoor/Outdoor)	Dry (kg)	Operate (kg)	(kW)				-			
Sound Attenuator																													
SHP	HSA	71	502	-	LABORATORY EXHAUST AIR	SHP	L2	N/A	ON ROOF	M/E	Normal	500	400	1100	3948	N/A	N/A	5.5	Outdoor	141	141	N/A	SUS316L	SHP-ME-DD-H01-0007, Sheet 2 of 2	SHEET 8 OF 14				
SHP	HSA	71	503	-	ELECTRICAL TECHNICAL ROOM(RAISED FLOOR) SUPPLY AIR	SHP	L1	N/A	ETR	S/A	Normal	1200	400	1100	14773	N/A	N/A	8.5	Indoor	192	192	N/A	SUS316L	SHP-ME-DD-H01-0007, Sheet 2 of 2	SHEET 10 OF 14				
SHP	HSA	71	504	-	BATTERY ROOM EXHAUST AIR	SHP	L1	N/A	ON ROOF	M/E	Normal	400	400	1100	3168	N/A	N/A	5.5	Outdoor	113	113	N/A	SUS316L	SHP-ME-DD-H01-0007, Sheet 2 of 2	SHEET 11 OF 14				
SHP	HSA	71	505	-	WORKSHOP EXHAUST AIR	SHP	L0	N/A	ON ROOF	M/E	Normal	400	400	1100	3539	N/A	N/A	6.1	Outdoor	113	113	N/A	SUS316L	SHP-ME-DD-H01-0007, Sheet 2 of 2	SHEET 12 OF 14				
SHP	HSA	71	506	-	WELDING W/S & STORAGE AREA SUPPLY AIR	SHP	UPPER	N/A	ON ROOF	S/A	Normal	300	500	1100	4070	N/A	N/A	7.5	Indoor	100	100	N/A	SUS316L	SHP-ME-DD-H01-0007, Sheet 2 of 2	SHEET 14 OF 14				
SHP	HSA	71	507	-	WELDING W/S & STORAGE AREA SUPPLY AIR	SHP	UPPER	N/A	WELDING WORKSHOP	S/A	Normal	300	500	1100	4070	N/A	N/A	7.5	Indoor	100	100	N/A	SUS316L	SHP-ME-DD-H01-0007, Sheet 2 of 2	SHEET 14 OF 14				



 					SHWE - Detailed Engineering - Field Development Project HVAC Equipment List with Tags for Living Quarter																					
					N° SHQ-HV-EB-301-0001				Rev: 2		Status: AFC		Discipline: HVAC		Document type: LIS		Rev. Date: 18/04/2011									
Class	Class	System	Number	Code	Description	Platform	Deck	Location		Service		Dimensions			Design conditions				Weight		Power	Material	Remarks	Ducting & Instr. Diagram (SHQ-HV-DS-303-0001)	Piping & Instr. Diagram / Overall Single line diagram (SHQ-HV-DP-301-0003)	
								Room No.	Room Description	Service Type	Service Mode	Width or Dia. (mm)	Height (mm)	Length (mm)	Airflow (m³/h)	Capacity (kW)	Static Pressure (pa)	Air Vel. (m/s)	Install Location (Indoor/Outdoor)	Dry (kg)	Operate (kg)	(kW)				-
					Sound Attenuator																					
SHQ	HSA	71	001	-	T.V ROOM(2)	SHQ	L0	018	T.V ROOM(2)	R/A	Emer'cy	300	300	1100	1916	N/A	N/A	5.9	Indoor	87	87	N/A	SUS316L	SHQ-ME-DD-H01-0007, SHEET 2 OF 6	SHEET 22 OF 23	
SHQ	HSA	71	002	-	T.V ROOM(2)	SHQ	L0	018	T.V ROOM(2)	R/A	Emer'cy	300	300	1100	1920	N/A	N/A	5.9	Indoor	87	87	N/A	SUS316L	SHQ-ME-DD-H01-0007, SHEET 2 OF 6	SHEET 22 OF 23	
SHQ	HSA	71	003	-	SMOKING ROOM	SHQ	L0	010	SMOKING ROOM	M/E	Normal	400	300	1100	2282	N/A	N/A	5.3	Indoor	101	101	N/A	SUS316L	SHQ-ME-DD-H01-0007, SHEET 2 OF 6	SHEET 21 OF 23	
SHQ	HSA	71	004	-	LAUNDRY	SHQ	L0	015	LAUNDRY	M/E	Normal	500	600	1350	5420	N/A	N/A	5	Outdoor	165	165	N/A	SUS316L	N/A	SHEET 21 OF 23	
SHQ	HSA	71	005	-	T.V ROOM(1)	SHQ	L0	017	T.V ROOM(1)	S/A	Emer'cy	ø158.7		1020	478	N/A	N/A	6.6	Indoor	8	8	N/A	GAL'V	SHQ-ME-DD-H01-0007, SHEET 5 OF 6	SHEET 22 OF 23	
SHQ	HSA	71	006	-	T.V ROOM(1)	SHQ	L0	017	T.V ROOM(1)	S/A	Emer'cy	ø158.7		1020	478	N/A	N/A	6.6	Indoor	8	8	N/A	GAL'V	SHQ-ME-DD-H01-0007, SHEET 5 OF 6	SHEET 22 OF 23	
SHQ	HSA	71	007	-	T.V ROOM(1)	SHQ	L0	017	T.V ROOM(1)	S/A	Emer'cy	ø158.7		1020	478	N/A	N/A	6.6	Indoor	8	8	N/A	GAL'V	SHQ-ME-DD-H01-0007, SHEET 5 OF 6	SHEET 22 OF 23	
SHQ	HSA	71	008	-	T.V ROOM(1)	SHQ	L0	017	T.V ROOM(1)	S/A	Emer'cy	ø158.7		1020	240	N/A	N/A	8.5	Indoor	8	8	N/A	GAL'V	SHQ-ME-DD-H01-0007, SHEET 5 OF 6	SHEET 22 OF 23	
SHQ	HSA	71	009	-	T.V ROOM(1)	SHQ	L0	017	T.V ROOM(1)	S/A	Emer'cy	ø158.7		1020	240	N/A	N/A	8.5	Indoor	8	8	N/A	GAL'V	SHQ-ME-DD-H01-0007, SHEET 5 OF 6	SHEET 22 OF 23	
SHQ	HSA	71	010	-	T.V ROOM(2)	SHQ	L0	018	T.V ROOM(2)	S/A	Emer'cy	ø158.7		1020	240	N/A	N/A	8.5	Indoor	8	8	N/A	GAL'V	SHQ-ME-DD-H01-0007, SHEET 5 OF 6	SHEET 22 OF 23	
SHQ	HSA	71	011	-	T.V ROOM(2)	SHQ	L0	018	T.V ROOM(2)	S/A	Emer'cy	ø158.7		1020	240	N/A	N/A	8.5	Indoor	8	8	N/A	GAL'V	SHQ-ME-DD-H01-0007, SHEET 5 OF 6	SHEET 22 OF 23	
SHQ	HSA	71	012	-	T.V ROOM(2)	SHQ	L0	018	T.V ROOM(2)	S/A	Emer'cy	ø158.7		1020	240	N/A	N/A	8.5	Indoor	8	8	N/A	GAL'V	SHQ-ME-DD-H01-0007, SHEET 5 OF 6	SHEET 22 OF 23	
SHQ	HSA	71	013	-	T.V ROOM(2)	SHQ	L0	018	T.V ROOM(2)	S/A	Emer'cy	ø158.7		1020	240	N/A	N/A	8.5	Indoor	8	8	N/A	GAL'V	SHQ-ME-DD-H01-0007, SHEET 5 OF 6	SHEET 22 OF 23	
SHQ	HSA	71	014	-	T.V ROOM(2)	SHQ	L0	018	T.V ROOM(2)	S/A	Emer'cy	ø158.7		1020	240	N/A	N/A	8.5	Indoor	8	8	N/A	GAL'V	SHQ-ME-DD-H01-0007, SHEET 5 OF 6	SHEET 22 OF 23	
SHQ	HSA	71	015	-	T.V ROOM(2)	SHQ	L0	018	T.V ROOM(2)	S/A	Emer'cy	ø158.7		1020	240	N/A	N/A	8.5	Indoor	8	8	N/A	GAL'V	SHQ-ME-DD-H01-0007, SHEET 5 OF 6	SHEET 22 OF 23	
SHQ	HSA	71	016	-	T.V ROOM(2)	SHQ	L0	018	T.V ROOM(2)	S/A	Emer'cy	ø158.7		1020	240	N/A	N/A	8.5	Indoor	8	8	N/A	GAL'V	SHQ-ME-DD-H01-0007, SHEET 5 OF 6	SHEET 22 OF 23	
SHQ	HSA	71	017	-	T.V ROOM(2)	SHQ	L0	018	T.V ROOM(2)	S/A	Emer'cy	ø158.7		1020	240	N/A	N/A	8.5	Indoor	8	8	N/A	GAL'V	SHQ-ME-DD-H01-0007, SHEET 5 OF 6	SHEET 22 OF 23	
SHQ	HSA	71	018	-	DINING ROOM	SHQ	L1	117	DINING ROOM	S/A	Normal	800	500	1100	10062	N/A	N/A	7.0	Indoor	184	184	N/A	SUS316L	SHQ-ME-DD-H01-0007, SHEET 3 OF 6	SHEET 20 OF 23	
SHQ	HSA	71	019	-	GALLEY/DISH WASH	SHQ	L1	118	GALLEY / DISH WASH	M/E	Normal	1200	700	1350	14600	N/A	N/A	4.8	Outdoor	300	300	N/A	SUS316L	N/A	SHEET 20 OF 23	
SHQ	HSA	71	020	-	DINING ROOM	SHQ	L1	117	DINING ROOM	S/A	Normal	ø158.7		520	504	N/A	N/A	3.6	Indoor	4	4	N/A	GAL'V	SHQ-ME-DD-H01-0007, SHEET 5 OF 6	SHEET 20 OF 23	
SHQ	HSA	71	021	-	DINING ROOM	SHQ	L1	117	DINING ROOM	S/A	Normal	ø158.7		520	504	N/A	N/A	3.6	Indoor	4	4	N/A	GAL'V	SHQ-ME-DD-H01-0007, SHEET 5 OF 6	SHEET 20 OF 23	
SHQ	HSA	71	022	-	DINING ROOM	SHQ	L1	117	DINING ROOM	S/A	Normal	ø158.7		520	504	N/A	N/A	3.6	Indoor	4	4	N/A	GAL'V	SHQ-ME-DD-H01-0007, SHEET 5 OF 6	SHEET 20 OF 23	
SHQ	HSA	71	023	-	DINING ROOM	SHQ	L1	117	DINING ROOM	S/A	Normal	ø158.7		520	504	N/A	N/A	3.6	Indoor	4	4	N/A	GAL'V	SHQ-ME-DD-H01-0007, SHEET 5 OF 6	SHEET 20 OF 23	
SHQ	HSA	71	024	-	DINING ROOM	SHQ	L1	117	DINING ROOM	S/A	Normal	ø158.7		520	504	N/A	N/A	3.6	Indoor	4	4	N/A	GAL'V	SHQ-ME-DD-H01-0007, SHEET 5 OF 6	SHEET 20 OF 23	
SHQ	HSA	71	025	-	DINING ROOM	SHQ	L1	117	DINING ROOM	S/A	Normal	ø158.7		520	504	N/A	N/A	3.6	Indoor	4	4	N/A	GAL'V	SHQ-ME-DD-H01-0007, SHEET 5 OF 6	SHEET 20 OF 23	
SHQ	HSA	71	026	-	DINING ROOM	SHQ	L1	117	DINING ROOM	S/A	Normal	ø158.7		520	504	N/A	N/A	3.6	Indoor	4	4	N/A	GAL'V	SHQ-ME-DD-H01-0007, SHEET 5 OF 6	SHEET 20 OF 23	
SHQ	HSA	71	027	-	DINING ROOM	SHQ	L1	117	DINING ROOM	S/A	Normal	ø158.7		520	504	N/A	N/A	3.6	Indoor	4	4	N/A	GAL'V	SHQ-ME-DD-H01-0007, SHEET 5 OF 6	SHEET 20 OF 23	
SHQ	HSA	71	028	-	DINING ROOM	SHQ	L1	117	DINING ROOM	S/A	Normal	ø158.7		520	504	N/A	N/A	3.6	Indoor	4	4	N/A	GAL'V	SHQ-ME-DD-H01-0007, SHEET 5 OF 6	SHEET 20 OF 23	
SHQ	HSA	71	029	-	DINING ROOM	SHQ	L1	117	DINING ROOM	S/A	Normal	ø158.7		520	504	N/A	N/A	3.6	Indoor	4	4	N/A	GAL'V	SHQ-ME-DD-H01-0007, SHEET 5 OF 6	SHEET 20 OF 23	
SHQ	HSA	71	030	-	DINING ROOM	SHQ	L1	117	DINING ROOM	S/A	Normal	ø158.7		520	504	N/A	N/A	3.6	Indoor	4	4	N/A	GAL'V	SHQ-ME-DD-H01-0007, SHEET 5 OF 6	SHEET 20 OF 23	
SHQ	HSA	71	031	-	DINING ROOM	SHQ	L1	117	DINING ROOM	S/A	Normal	ø158.7		520	504	N/A	N/A	3.6	Indoor	4	4	N/A	GAL'V	SHQ-ME-DD-H01-0007, SHEET 5 OF 6	SHEET 20 OF 23	
SHQ	HSA	71	032	-	DINING ROOM	SHQ	L1	117	DINING ROOM	S/A	Normal	ø158.7		520	504	N/A	N/A	3.6	Indoor	4	4	N/A	GAL'V	SHQ-ME-DD-H01-0007, SHEET 5 OF 6	SHEET 20 OF 23	
SHQ	HSA	71	033	-	DINING ROOM	SHQ	L1	117	DINING ROOM	S/A	Normal	ø158.7		520	504	N/A	N/A	3.6	Indoor	4	4	N/A	GAL'V	SHQ		




												SHWE - Detailed Engineering - Field Development Project HVAC Equipment List with Tags for Living Quarter																	
						N° SHQ-HV-EB-301-0001				Rev: 2		Status: AFC		Discipline: HVAC		Document type: LIS				Rev. Date: 18/04/2011									
Class	Class	System	Number	Code	Description	Platform	Deck	Room No.	Room Description	Service Type	Service Mode	Width or Dia. (mm)	Height (mm)	Length (mm)	Airflow (m³/h)	Capacity (kW)	Static Pressure (pa)	Air Vel. (m/s)	Install Location (Indoor/Outdoor)	Dry (kg)	Operate (kg)	Power (kW)	Material	Remarks	Ducting & Instr. Diagram (SHQ-HV-DS-303-0001)	Piping & Instr. Diagram / Overall Single line diagram (SHQ-HV-DP-301-0003)			
					Sound Attenuator																								
SHQ	HSA	71	055	-	4-MAN(34)	SHQ	L4	414	CORRIDOR	R/A	Normal	400	300	1100	2521	N/A	N/A	5.8	Indoor	89	89	N/A	SUS316L	SHQ-ME-DD-H01-0007, SHEET 3 OF 6	SHEET 14 OF 23				
SHQ	HSA	71	056	-	4-MAN(26)	SHQ	L4	443	4-MAN(26)	R/A	Normal	300	300	800	1945	N/A	N/A	6.0	Indoor	51	51	N/A	SUS316L	SHQ-ME-DD-H01-0007, SHEET 3 OF 6	SHEET 14 OF 23				
SHQ	HSA	71	057	-	HVAC PLANT ROOM	SHQ	L5	507	HVAC PLANT ROOM	R/A	Normal	1500	800	1100	36796	N/A	N/A	7.1	Indoor	275	275	N/A	SUS316L	SHQ-ME-DD-H01-0007, SHEET 3 OF 6	SHEET 12 OF 23				




										SHWE - Detailed Engineering - Field Development Project																											
										HVAC Equipment List for Onshore																											
Location	Class	System	Number	Code	Description	Building	Platform	QTY	Location			Material			Service TYPE	Dimensions				OPENING SIZE				Design Conditions				Weight			Power (V/PH/Hz)	Hazadous Area Classification	Ducting & Instr. Diagram (OGT-HV-DP-302-0005)	Piping & Instr. Diagram / Overall Single line diagram	REFERENCE SPEC.	Instrument Layout Drawing (OGT-EL-DD-H02-0006)	Remarks
									Room Description	Indoor(I) / Outdoor(O)	Casing	Shaft	Blade	Width Or Dia. (mm)		Height (mm)	Length (mm)	Opening (mm)	Duct (mm)	Neck Size (mm)	Width (mm)	Height (mm)	Applicable Length (mm)	Airflow (m³/h)	Capacity(kW)		Static Pressure (pa)	Air Vel. (m/s)	Dry (kg)	Operating (kg)							
																									Cooling	Heating											
					Rooftop Unit																																
OGT	HA	71	101	A	RTU for Technical Building	Technical Building	OGT	1	Technical	O	AISI 316L	S/A	2660	2700	9700	-	-	-	-	-	-	-	-	33220	215.1	N/A	1750	15	9074	9374	400V/3Ph/50Hz	Zone 2, group IIB, T3 For the instrument : Zone 1,	Sheet 04 of 28	OGT-HV-DP-H02-0001	-	-	-
OGT	HA	71	101	B	RTU for Technical Building	Technical Building	OGT	1	Technical	O	AISI 316L	S/A	2660	2700	9700	-	-	-	-	-	-	-	-	33220	215.1	N/A	1750	15	9074	9374	400V/3Ph/50Hz	Zone 2, group IIB, T3 For the instrument : Zone 1,	Sheet 04 of 28	OGT-HV-DP-H02-0001	-	-	-
OGT	HA	71	102	A	RTU for Laboratory Building	Laboratory Building	OGT	1	Laboratory	O	AISI 316L	S/A	3360	2280	5095	-	-	-	-	-	-	-	-	2780	70.6	N/A	1450	15	4207	4257	400V/3Ph/50Hz	Zone 2, group IIB, T3 For the instrument : Zone 1,	Sheet 04 of 28	OGT-HV-DP-H02-0001	-	-	-
OGT	HA	71	102	B	RTU for Laboratory Building	Laboratory Building	OGT	1	Laboratory	O	AISI 316L	S/A	3360	2280	5095	-	-	-	-	-	-	-	-	2780	70.6	N/A	1450	15	4207	4257	400V/3Ph/50Hz	Zone 2, group IIB, T3 For the instrument : Zone 1,	Sheet 04 of 28	OGT-HV-DP-H02-0001	-	-	-
OGT	HA	71	301	A	RTU for Mess. Recreation Accommodation Building	Mess. Recreation Accommodation Building	OGT	1	Mess & Accomodation	O	AISI 316L	S/A	2660	2500	8600	-	-	-	-	-	-	-	-	11325	174.5	29	1900	15	6323	6470	400V/3Ph/50Hz	N/A	Sheet 09 of 28	OGT-HV-DP-H02-0001	-	-	-
OGT	HA	71	301	B	RTU for Mess. Recreation Accommodation Building	Mess. Recreation Accommodation Building	OGT	1	Mess & Accomodation	O	AISI 316L	S/A	2660	2500	8600	-	-	-	-	-	-	-	-	11325	174.5	29	1900	15	6323	6470	400V/3Ph/50Hz	N/A	Sheet 09 of 28	OGT-HV-DP-H02-0001	-	-	-
OGT	HA	71	301	C	RTU for Mess. Recreation Accommodation Building	Mess. Recreation Accommodation Building	OGT	1	Mess & Accomodation	O	AISI 316L	S/A	2660	2500	8600	-	-	-	-	-	-	-	-	11325	174.5	29	1900	15	6323	6470	400V/3Ph/50Hz	N/A	Sheet 09 of 28	OGT-HV-DP-H02-0001	-	-	-
OGT	HA	71	501	A	RTU for Office Building	Office Building	OGT	1	Office	O	AISI 316L	S/A	2300	2330	8045	-	-	-	-	-	-	-	-	7590	72.6	12.5	1600	15	5576	5636	400V/3Ph/50Hz	N/A	Sheet 13 of 28	OGT-HV-DP-H02-0001	-	-	-
OGT	HA	71	501	B	RTU for Office Building	Office Building	OGT	1	Office	O	AISI 316L	S/A	2300	2330	8045	-	-	-	-	-	-	-	-	7590	72.6	12.5	1600	15	5576	5636	400V/3Ph/50Hz	N/A	Sheet 13 of 28	OGT-HV-DP-H02-0001	-	-	-
OGT	HA	71	601	A	RTU for Warehouse & Workshop for OGT	Warehouse & Workshop	OGT	1	Warehouse & Workshop	O	AISI 316L	S/A	1350	1810	5800	-	-	-	-	-	-	-	-	2480	28	5.5	1700	15	2791	2831	400V/3Ph/50Hz	N/A	Sheet 17 of 28	OGT-HV-DP-H02-0001	-	-	-
OGT	HA	71	601	B	RTU for Warehouse & Workshop for OGT	Warehouse & Workshop	OGT	1	Warehouse & Workshop	O	AISI 316L	S/A	1350	1810	5800	-	-	-	-	-	-	-	-	2480	28	5.5	1700	15	2791	2831	400V/3Ph/50Hz	N/A	Sheet 17 of 28	OGT-HV-DP-H02-0001	-	-	-
OGT	HA	71	701	A	RTU for General Warehouse & Office Building for OGT	General Warehouse & Office Building	OGT	1	General Warehouse & Office	O	AISI 316L	S/A	2660	2500	9500	-	-	-	-	-	-	-	-	24000	148	21	2100	15	7594	7694	400V/3Ph/50Hz	N/A	Sheet 20 of 28	OGT-HV-DP-H02-0001	-	-	-
OGT	HA	71	701	B	RTU for General Warehouse & Office Building for OGT	General Warehouse & Office Building	OGT	1	General Warehouse & Office	O	AISI 316L	S/A	2660	2500	9500	-	-	-	-	-	-	-	-	24000	148	21	2100	15	7594	7694	400V/3Ph/50Hz	N/A	Sheet 20 of 28	OGT-HV-DP-H02-0001	-	-	-
					Sub Total			13																													




				SHWE - Detailed Engineering - Field Development Project																															
				HVAC Equipment List for Onshore																															
Location	Class	System	Number	Code	Description	Building	Platform	QTY	Location		Material			Service TYPE	Dimensions					OPENING SIZE			Design Conditions				Weight		Power (V/PH/HZ)	Hazardous Area Classification	Ducting & Instr. Diagram (OGT-HV-DP-302-0005)	Piping & Instr. Diagram / Overall Single line diagram	REFERENCE SPEC.	Instrument Layout Drawing (OGT-EL-DD-H02-0006)	Remarks
									Room Description	Indoor(I) / Outdoor(O)	Casing	Shaft	Blade		Width Or Dia. (mm)	Height (mm)	Length (mm)	Opening (mm)	Duct (mm)	Neck Size (mm)	Width (mm)	Height (mm)	Applcable Length (mm)	Airflow (m³/h)	Capacity(kW)		Static Pressure (pa)	Air Vel. (m/s)							
Cooling				Heating																															
				Split type A/C unit																															
OGT	HA	71	201	A	SAC for Security Building for OGT	Security Building	OGT	1	Security	I	Manufacturers Standard	S/A	1050	238	290	-	-	-	-	-	-	1044	7.1	8.2	Manufacturers Standard	Manufacturers Standard	12	17	230/1/50	N/A	Sheet 7 of 28	OGT-HV-DP-H02-0001	-	-	FTXS71FVMA
OGT	HC	71	201	A	SAC for Security Building for OGT	Security Building	OGT	1	Security	O	Manufacturers Standard	-	900	320	770	-	-	-	-	-	-	3426	7.1	8.2	Manufacturers Standard	Manufacturers Standard	71	78	230/1/50	N/A	Sheet 7 of 28	OGT-HV-DP-H02-0001	-	-	RXS71FVMA
OGT	HA	71	201	B	SAC for Security Building for OGT	Security Building	OGT	1	Security	I	Manufacturers Standard	-	1050	238	290	-	-	-	-	-	-	1044	7.1	8.2	Manufacturers Standard	Manufacturers Standard	12	17	230/1/50	N/A	Sheet 7 of 28	OGT-HV-DP-H02-0001	-	-	FTXS71FVMA
OGT	HC	71	201	B	SAC for Security Building for OGT	Security Building	OGT	1	Security	O	Manufacturers Standard	-	900	320	770	-	-	-	-	-	-	3426	7.1	8.2	Manufacturers Standard	Manufacturers Standard	71	78	230/1/50	N/A	Sheet 7 of 28	OGT-HV-DP-H02-0001	-	-	RXS71FVMA
OGT	HA	71	702	A	SAC for General Warehouse & Office Building for OGT	General Warehouse & Office	OGT	1	Store Office	I	Manufacturers Standard	S/A	575	286	575	-	-	-	-	-	-	720	4.7	5.5	Manufacturers Standard	Manufacturers Standard	-	17.5	230/1/50	N/A	Sheet 22 of 28	OGT-HV-DP-H02-0001	-	-	FFQ50BV1B
OGT	HC	71	702	A	SAC for General Warehouse & Office Building for OGT	General Warehouse & Office	OGT	1	Store Office	O	Manufacturers Standard	-	825	300	735	-	-	-	-	-	-	2934	4.7	5.5	Manufacturers Standard	Manufacturers Standard	-	48	230/1/50	N/A	Sheet 22 of 28	OGT-HV-DP-H02-0001	-	-	RXS50BVMA
OGT	HA	71	702	B	SAC for General Warehouse & Office Building for OGT	General Warehouse & Office	OGT	1	Store Office	I	Manufacturers Standard	S/A	575	286	575	-	-	-	-	-	-	882	4.7	5.5	Manufacturers Standard	Manufacturers Standard	-	17.5	230/1/50	N/A	Sheet 22 of 28	OGT-HV-DP-H02-0001	-	-	FFQ50BV1B
OGT	HC	71	702	B	SAC for General Warehouse & Office Building for OGT	General Warehouse & Office	OGT	1	Store Office	O	Manufacturers Standard	-	825	300	735	-	-	-	-	-	-	2934	4.7	5.5	Manufacturers Standard	Manufacturers Standard	-	48	230/1/50	N/A	Sheet 22 of 28	OGT-HV-DP-H02-0001	-	-	RXS50BVMA
OGT	HA	71	801	A	SAC for Chemical Warehouse for OGT	Chemical Warehouse	OGT	1	Electrical room	I	Manufacturers Standard	S/A	1050	238	290	-	-	-	-	-	-	972	5	5.8	Manufacturers Standard	Manufacturers Standard	12	17	230/1/50	N/A	Sheet 26 of 28	OGT-HV-DP-H02-0001	-	-	FTXS50FVMA
OGT	HC	71	801	A	SAC for Chemical Warehouse for OGT	Chemical Warehouse	OGT	1	Electrical room	O	Manufacturers Standard	-	825	300	735	-	-	-	-	-	-	3052.8	5	5.8	Manufacturers Standard	Manufacturers Standard	48	53	230/1/50	N/A	Sheet 26 of 28	OGT-HV-DP-H02-0001	-	-	RXS50FVMA
OGT	HA	71	801	B	SAC for Chemical Warehouse for OGT	Chemical Warehouse	OGT	1	Electrical room	I	Manufacturers Standard	S/A	1050	238	290	-	-	-	-	-	-	972	5	5.8	Manufacturers Standard	Manufacturers Standard	12	17	230/1/50	N/A	Sheet 26 of 28	OGT-HV-DP-H02-0001	-	-	FTXS50FVMA
OGT	HC	71	801	B	SAC for Chemical Warehouse for OGT	Chemical Warehouse	OGT	1	Electrical room	O	Manufacturers Standard	-	825	300	735	-	-	-	-	-	-	3052.8	5	5.8	Manufacturers Standard	Manufacturers Standard	48	53	230/1/50	N/A	Sheet 26 of 28	OGT-HV-DP-H02-0001	-	-	RXS50FVMA
SBU	HA	71	201	A	SAC for Office Building for Jetty Supply Base	Office Building	SBU	1	Hall	I	Manufacturers Standard	-	246	840	840	-	-	-	-	-	-	900	4.5	5	Manufacturers Standard	Manufacturers Standard	-	19.5	230/1/50	N/A	Sheet 27 of 28	OGT-HV-DP-H02-0001	-	-	FXFQ40PVE
SBU	HA	71	201	B	SAC for Office Building for Jetty Supply Base	Office Building	SBU	1	Hall	I	Manufacturers Standard	S/A	246	840	840	-	-	-	-	-	-	900	4.5	5	Manufacturers Standard	Manufacturers Standard	-	19.5	230/1/50	N/A	Sheet 27 of 28	OGT-HV-DP-H02-0001	-	-	FXFQ40PVE
SBU	HA	71	202	A	SAC for Office Building for Jetty Supply Base	Office Building	SBU	1	Security Room	I	Manufacturers Standard	S/A	246	840	840	-	-	-	-	-	-	900	4.5	5	Manufacturers Standard	Manufacturers Standard	-	19.5	230/1/50	N/A	Sheet 27 of 28	OGT-HV-DP-H02-0001	-	-	FXFQ40PVE
SBU	HA	71	202	B	SAC for Office Building for Jetty Supply Base	Office Building	SBU	1	Security Room	I	Manufacturers Standard	S/A	246	840	840	-	-	-	-	-	-	900	4.5	5	Manufacturers Standard	Manufacturers Standard	-	19.5	230/1/50	N/A	Sheet 27 of 28	OGT-HV-DP-H02-0001	-	-	FXFQ40PVE
SBU	HA	71	203	B	SAC for Office Building for Jetty Supply Base	Office Building	SBU	1	Communication Room	I	Manufacturers Standard	S/A	246	840	840	-	-	-	-	-	-	900	4.5	5	Manufacturers Standard	Manufacturers Standard	-	19.5	230/1/50	N/A	Sheet 27 of 28	OGT-HV-DP-H02-0001	-	-	FXFQ40PVE
SBU	HA	71	203	A	SAC for Office Building for Jetty Supply Base	Office Building	SBU	1	Communication Room	I	Manufacturers Standard	S/A	246	840	840	-	-	-	-	-	-	900	4.5	5	Manufacturers Standard	Manufacturers Standard	-	19.5	230/1/50	N/A	Sheet 27 of 28	OGT-HV-DP-H02-0001	-	-	FXFQ40PVE
SBU	HA	71	204	A	SAC for Office Building for Jetty Supply Base	Office Building	SBU	1	Multi-purpose Room	I	Manufacturers Standard	S/A	246	840	840	-	-	-	-	-	-	900	4.5	5	Manufacturers Standard	Manufacturers Standard	-	19.5	230/1/50	N/A	Sheet 27 of 28	OGT-HV-DP-H02-0001	-	-	FXFQ40PVE
SBU	HA	71	204	B	SAC for Office Building for Jetty Supply Base	Office Building	SBU	1	Multi-purpose Room	I	Manufacturers Standard	S/A	246	840	840	-	-	-	-	-	-	900	4.5	5	Manufacturers Standard	Manufacturers Standard	-	19.5	230/1/50	N/A	Sheet 27 of 28	OGT-HV-DP-H02-0001	-	-	FXFQ40PVE
SBU	HA	71	205	A	SAC for Office Building for Jetty Supply Base	Office Building	SBU	1	Office	I	Manufacturers Standard	S/A	246	840	840	-	-	-	-	-	-	900	4.5	5	Manufacturers Standard	Manufacturers Standard	-	19.5	230/1/50	N/A	Sheet 27 of 28	OGT-HV-DP-H02-0001	-	-	FXFQ40PVE
SBU	HA	71	205	B	SAC for Office Building for Jetty Supply Base	Office Building	SBU	1	Office	I	Manufacturers Standard	S/A	246	840	840	-	-	-	-	-	-	900	4.5	5	Manufacturers Standard	Manufacturers Standard	-	19.5	230/1/50	N/A	Sheet 27 of 28	OGT-HV-DP-H02-0001	-	-	FXFQ40PVE
SBU	HA	71	206	A	SAC for Office Building for Jetty Supply Base	Office Building	SBU	1	Mess Room & Pantry	I	Manufacturers Standard	S/A	246	840	840	-	-	-	-	-	-	900	4.5	5	Manufacturers Standard	Manufacturers Standard	-	19.5	230/1/50	N/A	Sheet 27 of 28	OGT-HV-DP-H02-0001	-	-	FXFQ40PVE
SBU	HA	71	206	B	SAC for Office Building for Jetty Supply Base	Office Building	SBU	1	Mess Room & Pantry	I	Manufacturers Standard	S/A	246	840	840	-	-	-	-	-	-	900	4.5	5	Manufacturers Standard	Manufacturers Standard	-	19.5	230/1/50	N/A	Sheet 27 of 28	OGT-HV-DP-H02-0001	-	-	FXFQ40PVE
SBU	HA	71	207	A	SAC for Office Building for Jetty Supply Base	Office Building	SBU	1	Toilet & Shower	I	Manufacturers Standard	S/A	246	840	840	-	-	-	-	-	-	960	5.6	6.3	Manufacturers Standard	Manufacturers Standard	-	19.5	230/1/50	N/A	Sheet 27 of 28	OGT-HV-DP-H02-0001	-	-	FXFQ50PVE
SBU	HA	71	207	B	SAC for Office Building for Jetty Supply Base	Office Building	SBU	1	Toilet & Shower	I	Manufacturers Standard	S/A	246	840	840	-	-	-	-	-	-	960	5.6	6.3	Manufacturers Standard	Manufacturers Standard	-	19.5	230/1/50	N/A	Sheet 27 of 28	OGT-HV-DP-H02-0001	-	-	FXFQ50PVE
SBU	HC	71	201	A	SAC for Office Building for Jetty Supply Base	Office Building	SBU	1	Yard	O	Manufacturers Standard	-	930	1680	765	-	-	-	-	-	-	11100	28	31.5	Manufacturers Standard	Manufacturers Standard	-	284	400/3/50	N/A	Sheet 27 of 28	OGT-HV-DP-H02-0001	-	-	RQYQ10PY1
SBU	HC	71	201	B	SAC for Office Building for Jetty Supply Base	Office Building	SBU	1	Yard	O	Manufacturers Standard	-	930	1680	765	-	-	-	-	-	-	11100	28	31.5	Manufacturers Standard	Manufacturers Standard	-	284	400/3/50	N/A	Sheet 27 of 28	OGT-HV-DP-H02-0001	-	-	RQYQ10PY1
						Sub Total		28																											
						FRESH AIR KIT for Office Building for Jetty Supply Base	Office Building	SBU	14																										



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Location	Class	System	Number Code	Description	Building	Platform	QTY	Location		Material			Service TYPE	Dimensions				OPENING SIZE			Design Conditions				Weight		Power (V/PH/HZ)	Hazadous Area Classification	Ducting & Instr. Diagram (OGT-HV-DP-302-0005)	Piping & Instr. Diagram / Overall Single line diagram	REFERENCE SPEC.	Instrument Layout Drawing (OGT-EL-DD-H02-0006)	Remarks																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
								Room Description	Indoor(I) / Outdoor(O)	Casing	Shaft	Blade		Width Or Dia. (mm)	Height (mm)	Length (mm)	Opening (mm)	Duct (mm)	Neck Size (mm)	Width (mm)	Height (mm)	Applcabl e Length (mm)	Airflow (m³/h)	Capacity(kW)		Static Pressure (pa)								Air Vel. (m/s)	Dry (kg)	Operating (kg)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
Coiling				Heating																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										




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Location	Class	System	Number	Code	Description	Building	Platform	QTY		Room Description	Indoor(f) / Outdoor(O)	Casing	Shaft	Blade	Service TYPE	Width Or Dia. (mm)	Height (mm)	Length (mm)	Opening (mm)	Duct (mm)	Neck Size (mm)	Width (mm)	Height (mm)	Applicabl e Length (mm)	Airflow (m³/h)	Capacity(kW)		Static Pressure (pa)	Air Vel. (m/s)	Dry (kg)	Operating (kg)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
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					HVAC Equipment List for Onshore																																		
Location	Class	System	Number	Code	Description	Building	Platform	QTY	Location		Material			Service TYPE	Dimensions					OPENING SIZE			Design Conditions				Weight		Power (V/PH/HZ)	Hazardous Area Classification	Ducting & Instr. Diagram (OGT-HV-DP-302-0005)	Piping & Instr. Diagram / Overall Single line diagram	REFERENCE SPEC.	Instrument Layout Drawing (OGT-EL-DD-H02-0006)	Remarks				
																							Capacity(kW)		Static Pressure (pa)	Air Vel. (m/s)	Dry (kg)	Operating (kg)											
																							Cooling	Heating															
																																				Fans (Wall Fan)			
OGT	HK	71	201	A	Exhaust Fan for Toilet Area	Security Building	OGT	1	Toilet Area	-	Galvanised steel			E/A	530	530	148	-	-	-	-	-	-	90	N/A	100	-	6.4	-	230/1/50		Sheet 07 of 28	-	-	-	-			
OGT	HK	71	201	B	Exhaust Fan for Toilet Area	Security Building	OGT	1	Toilet Area	-	Galvanised steel			E/A	530	530	148	-	-	-	-	-	-	90	N/A	100	-	6.4	-	230/1/50		Sheet 07 of 28	-	-	-	-			
SBU	HK	71	201	A	Exhaust Fan for Mess Room & Fans	Office Building for Jetty Supply BASE	SBU	1	Mess Room & Fans	-	Galvanised steel			E/A	530	530	148	-	-	-	-	-	-	50	N/A	100	-	6.4	-	230/1/50		Sheet 07 of 28	-	-	-	-			
SBU	HK	71	201	B	Exhaust Fan for Mess Room & Fans	Office Building for Jetty Supply BASE	SBU	1	Mess Room & Fans	-	Galvanised steel			E/A	530	530	148	-	-	-	-	-	-	50	N/A	100	-	6.4	-	230/1/50		Sheet 07 of 28	-	-	-	-			
SBU	HK	71	202	A	Exhaust Fan for Toilet & Shower	Office Building for OGT Supply BASE	SBU	1	Toilet & Shower	-	Galvanised steel			E/A	530	530	148	-	-	-	-	-	-	130	N/A	100	-	6.4	-	230/1/50		Sheet 27 of 28	-	-	-	-			
SBU	HK	71	202	B	Exhaust Fan for Toilet & Shower	Office Building for OGT Supply BASE	SBU	1	Toilet & Shower	-	Galvanised steel			E/A	530	530	148	-	-	-	-	-	-	130	N/A	100	-	6.4	-	230/1/50		Sheet 27 of 28	-	-	-	-			
						Sub Total			6																														



										SHWE - Detailed Engineering - Field Development Project																													
										HVAC Equipment List for Onshore																													
Location	Class	System	Number	Code	Description	Building	Platform	QTY	Location		Material			Service TYPE	Dimensions						OPENING SIZE			Design Conditions				Weight			Power (V/PH/HZ)	Hazardous Area Classification	Ducting & Instr. Diagram (OGT-HV-DP-302-0005)	Piping & Instr. Diagram / Overall Single line diagram	REFERENCE SPEC.	Instrument Layout Drawing (OGT-EL-DD-H02-0006)	Remarks		
									Room Description	Indoor(I) / Outdoor(O)	Casing	Shaft	Blade		Width Or Dia. (mm)	Height (mm)	Length (mm)	Opening (mm)	Duct (mm)	Neck Size (mm)	Width (mm)	Height (mm)	Applicable Length (mm)	Airflow (m³/h)	Capacity(KW)		Static Pressure		Air Vel. (m/s)	Dry (kg)								Operating (kg)	
																									Cooling	Heating	Clean	Dirty											
					Filter Coalescer																																		
OGT	HB	71	101	A	Filter Coalescer/Weather Louver for Technical Building Control & Office	Technical Building & Laboratory Building	OGT	1	Control & Office Zone Area	-	SUS316L	F/A	650	1100	430	-	-	-	-	-	-	-	-	-	-	4,640	N/A	195	395	2.54	215	-	N/A	-	Sheet 04 of 28	-	-	-	-
OGT	HB	71	101	B	Filter Coalescer/Weather Louver for Technical Building Control & Office	Technical Building & Laboratory Building	OGT	1	Control & Office Zone Area	-	SUS316L	F/A	650	1100	430	-	-	-	-	-	-	-	-	-	-	4,640	N/A	195	395	2.54	215	-	N/A	-	Sheet 04 of 28	-	-	-	-
OGT	HB	71	102	A	Filter Coalescer/Weather Louver for Technical Building Control & Office	Technical Building & Laboratory Building	OGT	1	Laboratory Area	-	SUS316L	F/A	550	750	430	-	-	-	-	-	-	-	-	-	2,780	N/A	187	387	2.62	15	-	N/A	-	Sheet 04 of 28	-	-	-	-	
OGT	HB	71	102	B	Filter Coalescer/Weather Louver for Technical Building Control & Office	Technical Building & Laboratory Building	OGT	1	Laboratory Area	-	SUS316L	F/A	550	750	430	-	-	-	-	-	-	-	-	-	2,780	N/A	187	387	2.62	153	-	N/A	-	Sheet 04 of 28	-	-	-	-	
OGT	HB	71	301	A	Filter Coalescer/Weather Louver for Mess Recreation/Accommodation Building	Mess Recreation/ Accomodation Building	OGT	1	Mess. /Accomodation Building Area	-	SUS316L	F/A	750	1200	430	-	-	-	-	-	-	-	-	-	6,050	N/A	193	393	2.53	248	-	N/A	-	Sheet 09 of 28	-	-	-	-	
OGT	HB	71	301	B	Filter Coalescer/Weather Louver for Mess Recreation/Accommodation Building	Mess Recreation/ Accomodation Building	OGT	1	Mess. /Accomodation Building Area	-	SUS316L	F/A	750	1200	430	-	-	-	-	-	-	-	-	-	6,050	N/A	193	393	2.53	248	-	N/A	-	Sheet 09 of 28	-	-	-	-	
OGT	HB	71	301	C	Filter Coalescer/Weather Louver for Mess Recreation/Accommodation Building	Mess Recreation/ Accomodation Building	OGT	1	Mess. /Accomodation Building Area	-	SUS316L	F/A	750	1200	430	-	-	-	-	-	-	-	-	-	6,050	N/A	193	393	2.53	248	-	N/A	-	Sheet 09 of 28	-	-	-	-	
OGT	HB	71	501	A	Filter Coalescer/Weather Louver for Office Building	Office Building	OGT	1	Office Building Area	-	SUS316L	F/A	550	600	430	-	-	-	-	-	-	-	-	-	2,120	N/A	184	384	2.61	133	-	N/A	-	Sheet 13 of 28	-	-	-	-	
OGT	HB	71	501	B	Filter Coalescer/Weather Louver for Office Building	Office Building	OGT	1	Office Building Area	-	SUS316L	F/A	550	600	430	-	-	-	-	-	-	-	-	-	2,120	N/A	184	384	2.61	133	-	N/A	-	Sheet 13 of 28	-	-	-	-	
OGT	HB	71	601	A	Filter Coalescer/Weather Louver for Warehouse Workshop	Warehouse Workshop	OGT	1	Warehouse Workshop Area	-	SUS316L	F/A	350	500	430	-	-	-	-	-	-	-	-	-	900	N/A	158	358	2.47	101	-	N/A	-	Sheet 17 of 28	-	-	-	-	
OGT	HB	71	601	B	Filter Coalescer/Weather Louver for Warehouse Workshop	Warehouse Workshop	OGT	1	Warehouse Workshop Area	-	SUS316L	F/A	350	500	430	-	-	-	-	-	-	-	-	-	900	N/A	158	358	2.47	101	-	N/A	-	Sheet 17 of 28	-	-	-	-	
OGT	HB	71	701	A	Filter Coalescer/Weather Louver for General Warehouse & Office	General Warehouse & Office	OGT	1	General Warehouse & Office Area	-	SUS316L	F/A	550	700	430	-	-	-	-	-	-	-	-	-	2,660	N/A	201	401	2.72	147	-	N/A	-	Sheet 20 of 28	-	-	-	-	
OGT	HB	71	701	B	Filter Coalescer/Weather Louver for General Warehouse & Office	General Warehouse & Office	OGT	1	General Warehouse & Office Area	-	SUS316L	F/A	550	700	430	-	-	-	-	-	-	-	-	-	2,660	N/A	201	401	2.72	147	-	N/A	-	Sheet 20 of 28	-	-	-	-	
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Location	Class	System	Number	Code	Description	Building	Platform	QTY	Location		Material			Service TYPE	Dimensions					OPENING SIZE			Design Conditions				Weight		Power (V/PH/HZ)	Hazardous Area Classification	Ducting & Instr. Diagram (OGT-HV-DP-302-0005)	Piping & Instr. Diagram / Overall Single line diagram	REFERENCE SPEC.	Instrument Layout Drawing (OGT-EL-DD-H02-0006)	Remarks																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
									Room Description	Indoor(I) / Outdoor(O)	Casing	Shaft	Blade		Width Or Dia. (mm)	Height (mm)	Length (mm)	Opening (mm)	Duct (mm)	Neck Size (mm)	Width (mm)	Height (mm)	Applicable Length (mm)	Airflow (m³/h)	Capacity(kW)		Static Pressure (pa)	Air Vel. (m/s)								Dry (kg)	Operating (kg)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									




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					Location				Material			Service TYPE	Dimensions					OPENING SIZE				Design Conditions				Weight		Power (V/PH/HZ)	Hazardous Area Classification	Ducting & Instr. Diagram (OGT-HV-DP-302-0005)	Piping & Instr. Diagram / Overall Single line diagram	REFERENCE SPEC.	Instrument Layout Drawing (OGT-EL-DD-H02-0006)	Remarks			
Location	Class	System	Number	Code	Description	Building	Platform	QTY	Room Description	Indoor(I) / Outdoor(O)	Casing	Shaft	Blade		Width Or Dia. (mm)	Height (mm)	Length (mm)	Opening (mm)	Duct (mm)	Neck Size (mm)	Width (mm)	Height (mm)	Applcabl e Length (mm)	Airflow (m³/h)	Capacity(kW)	Static Pressure (pa)	Air Vel. (m/s)	Dry (kg)	Operating (kg)								
OGT	HN	71	370		SUPPLY AIR	MESS. ACCOMODATION	OGT	1	-	I	GALV METAL SHEET			S/A	300	150	200	-	-	-	-	-	-	-	420	N/A	-	2.6	16	-	N/A	-	SHEET 10 OF 28	-	-	-	-
OGT	HN	71	371		SUPPLY AIR	MESS. ACCOMODATION	OGT	1	-	I	GALV METAL SHEET			S/A	250	150	200	-	-	-	-	-	-	-	400	N/A	-	3.0	15	-	N/A	-	SHEET 10 OF 28	-	-	-	-
OGT	HN	71	372		RETURN AIR	MESS. ACCOMODATION	OGT	1	-	I	GALV METAL SHEET			R/A	250	150	200	-	-	-	-	-	-	-	280	N/A	-	2.1	15	-	N/A	-	SHEET 10 OF 28	-	-	-	-
OGT	HN	71	373		TOILET EXHAUST AIR	MESS. ACCOMODATION	OGT	1	TOILET	I	GALV METAL SHEET			E/A	150	150	200	-	-	-	-	-	-	-	90	N/A	-	1.1	13	-	N/A	-	SHEET 10 OF 28	-	-	-	-
OGT	HN	71	374		TOILET EXHAUST AIR	MESS. ACCOMODATION	OGT	1	TOILET	I	GALV METAL SHEET			E/A	150	150	200	-	-	-	-	-	-	-	90	N/A	-	1.1	13	-	N/A	-	SHEET 10 OF 28	-	-	-	-
OGT	HN	71	375		RETURN AIR	MESS. ACCOMODATION	OGT	1	-	I	GALV METAL SHEET			R/A	250	150	200	-	-	-	-	-	-	-	290	N/A	-	2.1	15	-	N/A	-	SHEET 10 OF 28	-	-	-	-
OGT	HN	71	376		SUPPLY AIR	MESS. ACCOMODATION	OGT	1	-	I	GALV METAL SHEET			S/A	250	150	200	-	-	-	-	-	-	-	410	N/A	-	3.0	15	-	N/A	-	SHEET 10 OF 28	-	-	-	-
OGT	HN	71	377		SUPPLY AIR	MESS. ACCOMODATION	OGT	1	-	I	GALV METAL SHEET			S/A	350	150	200	-	-	-	-	-	-	-	500	N/A	-	2.6	16	-	N/A	-	SHEET 10 OF 28	-	-	-	-
OGT	HN	71	378		RETURN AIR	MESS. ACCOMODATION	OGT	1	-	I	GALV METAL SHEET			R/A	300	150	200	-	-	-	-	-	-	-	380	N/A	-	2.3	16	-	N/A	-	SHEET 10 OF 28	-	-	-	-
OGT	HN	71	379		TOILET EXHAUST AIR	MESS. ACCOMODATION	OGT	1	TOILET	I	GALV METAL SHEET			E/A	150	150	200	-	-	-	-	-	-	-	90	N/A	-	1.1	13	-	N/A	-	SHEET 10 OF 28	-	-	-	-
OGT	HN	71	380		TOILET EXHAUST AIR	MESS. ACCOMODATION	OGT	1	TOILET	I	GALV METAL SHEET			E/A	150	150	200	-	-	-	-	-	-	-	90	N/A	-	1.1	13	-	N/A	-	SHEET 10 OF 28	-	-	-	-
OGT	HN	71	381		RETURN AIR	MESS. ACCOMODATION	OGT	1	-	I	GALV METAL SHEET			R/A	300	150	200	-	-	-	-	-	-	-	380	N/A	-	2.3	16	-	N/A	-	SHEET 10 OF 28	-	-	-	-
OGT	HN	71	382		SUPPLY AIR	MESS. ACCOMODATION	OGT	1	-	I	GALV METAL SHEET			S/A	350	150	200	-	-	-	-	-	-	-	500	N/A	-	2.6	16	-	N/A	-	SHEET 10 OF 28	-	-	-	-
OGT	HN	71	383		SUPPLY AIR	MESS. ACCOMODATION	OGT	1	-	I	GALV METAL SHEET			S/A	350	150	200	-	-	-	-	-	-	-	500	N/A	-	2.6	16	-	N/A	-	SHEET 10 OF 28	-	-	-	-
OGT	HN	71	384		RETURN AIR	MESS. ACCOMODATION	OGT	1	-	I	GALV METAL SHEET			R/A	300	150	200	-	-	-	-	-	-	-	380	N/A	-	2.3	16	-	N/A	-	SHEET 10 OF 28	-	-	-	-
OGT	HN	71	385		TOILET EXHAUST AIR	MESS. ACCOMODATION	OGT	1	TOILET	I	GALV METAL SHEET			E/A	150	150	200	-	-	-	-	-	-	-	90	N/A	-	1.1	13	-	N/A	-	SHEET 10 OF 28	-	-	-	-
OGT	HN	71	386		TOILET EXHAUST AIR	MESS. ACCOMODATION	OGT	1	TOILET	I	GALV METAL SHEET			E/A	150	150	200	-	-	-	-	-	-	-	90	N/A	-	1.1	13	-	N/A	-	SHEET 10 OF 28	-	-	-	-
OGT	HN	71	387		RETURN AIR	MESS. ACCOMODATION	OGT	1	-	I	GALV METAL SHEET			R/A	300	150	200	-	-	-	-	-	-	-	380	N/A	-	2.3	16	-	N/A	-	SHEET 10 OF 28	-	-	-	-
OGT	HN	71	388		SUPPLY AIR	MESS. ACCOMODATION	OGT	1	-	I	GALV METAL SHEET			S/A	350	150	200	-	-	-	-	-	-	-	500	N/A	-	2.6	16	-	N/A	-	SHEET 10 OF 28	-	-	-	-
OGT	HN	71	389		RETURN AIR	MESS. ACCOMODATION	OGT	1	CORRIDOR-1 (LEFT)	I	GALV METAL SHEET			R/A	250	150	200	-	-	-	-	-	-	-	320	N/A	-	2.4	15	-	N/A	-	SHEET 10 OF 28	-	-	-	-
OGT	HN	71	390		SUPPLY AIR	MESS. ACCOMODATION	OGT	1	CORRIDOR-1 (LEFT)	I	GALV METAL SHEET			S/A	250	150	200	-	-	-	-	-	-	-	320	N/A	-	2.4	15	-	N/A	-	SHEET 10 OF 28	-	-	-	-
OGT	HN	71	391		SUPPLY AIR	MESS. ACCOMODATION	OGT	1	-	I	GALV METAL SHEET			S/A	350	150	200	-	-	-	-	-	-	-	500	N/A	-	2.6	16	-	N/A	-	SHEET 10 OF 28	-	-	-	-
OGT	HN	71	392		RETURN AIR	MESS. ACCOMODATION	OGT	1	-	I	GALV METAL SHEET			R/A	300	150	200	-	-	-	-	-	-	-	380	N/A	-	2.3	16	-	N/A	-	SHEET 10 OF 28	-	-	-	-
OGT	HN	71	393		TOILET EXHAUST AIR	MESS. ACCOMODATION	OGT	1	TOILET	I	GALV METAL SHEET			E/A	150	150	200	-	-	-	-	-	-	-	90	N/A	-	1.1	13	-	N/A	-	SHEET 10 OF 28	-	-	-	-
OGT	HN	71	394		TOILET EXHAUST AIR	MESS. ACCOMODATION	OGT	1	TOILET	I	GALV METAL SHEET			E/A	150	150	200	-	-	-	-	-	-	-	90	N/A	-	1.1	13	-	N/A	-	SHEET 10 OF 28	-	-	-	-
OGT	HN	71	395		RETURN AIR	MESS. ACCOMODATION	OGT	1	-	I	GALV METAL SHEET			R/A	300	150	200	-	-	-	-	-	-	-	380	N/A	-	2.3	16	-	N/A	-	SHEET 10 OF 28	-	-	-	-
OGT	HN	71	396		SUPPLY AIR	MESS. ACCOMODATION	OGT	1	-	I	GALV METAL SHEET			S/A	350	150	200	-	-	-	-	-	-	-	500	N/A	-	2.6	16	-	N/A	-	SHEET 10 OF 28	-	-	-	-
OGT	HN	71	397		SUPPLY AIR	MESS. ACCOMODATION	OGT	1	-	I	GALV METAL SHEET			S/A	350	150	200	-	-	-	-	-	-	-	500	N/A	-	2.6	16	-	N/A	-	SHEET 10 OF 28	-	-	-	-
OGT	HN	71	398		TOILET EXHAUST AIR	MESS. ACCOMODATION	OGT	1	TOILET	I	GALV METAL SHEET			E/A	150	150	200	-	-	-	-	-	-	-	90	N/A	-	1.1	13	-	N/A	-	SHEET 10 OF 28	-	-	-	-
OGT	HN	71	399		RETURN AIR	MESS. ACCOMODATION	OGT	1	-	I	GALV METAL SHEET			R/A	300	150	200	-	-	-	-	-	-	-	380	N/A	-	2.3	16	-	N/A	-	SHEET 10 OF 28	-	-	-	-
OGT	HN	71	401		TOILET EXHAUST AIR	MESS. ACCOMODATION	OGT	1	TOILET	I	GALV METAL SHEET			E/A	150	150	200	-	-	-	-	-	-	-	90	N/A	-	1.1	13	-	N/A	-	SHEET 10 OF 28	-	-	-	-
OGT	HN	71	402		RETURN AIR	MESS. ACCOMODATION	OGT	1	-	I	GALV METAL SHEET			R/A	300	150	200	-	-	-	-	-	-	-	370	N/A	-	2.3	16	-	N/A	-	SHEET 10 OF 28	-	-	-	-
OGT	HN	71	403		SUPPLY AIR	MESS. ACCOMODATION	OGT	1	-	I	GALV METAL SHEET			S/A	350	150	200	-	-	-	-	-	-	-	510	N/A	-	2.7	16	-	N/A	-	SHEET 10 OF 28	-	-	-	-
OGT	HN	71	404		RETURN AIR	MESS. ACCOMODATION	OGT	1	CORRIDOR-1 (RIGHT)	I	GALV METAL SHEET			R/A	250	150	200	-	-	-	-	-	-	-	170	N/A	-	1.3	15	-	N/A	-	SHEET 10 OF 28	-	-	-	-
OGT	HN	71	405</																																		



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Location	Class	System	Number	Code	Description	Building	Platform	QTY	Room Description	Indoor(I) / Outdoor(O)	Casing	Shaft	Blade	Service TYPE	Width Or Dia. (mm)	Height (mm)	Length (mm)	Opening (mm)	Duct (mm)	Neck Size (mm)	Width (mm)	Height (mm)	Applcabl e Length (mm)	Airflow (m³/h)	Capacity(kW)	Static Pressure (pa)	Air Vel. (m/s)	Dry (kg)	Operating (kg)	Power (V/PH/HZ)	Hazadous Area Classification	Ducting & Instr. Diagram (OGT-HV-DP-302-0005)	Piping & Instr. Diagram / Overall Single line diagram	REFERENCE SPEC.	Instrument Layout Drawing (OGT-EL-DD-H02-0006)	Remarks		
OGT	HN	71	503		SUPPLY AIR	OFFICE	OGT	1	ELECTICAL RM.	I	GALV METAL SHEET			S/A	400	200	200	-	-	-	-	-	-	860	N/A	-	3.0	20	-	N/A	-	SHEET 14 OF 28	-	-	-	WITH COUNTER FLAGE		
OGT	HN	71	504		RETURN AIR	OFFICE	OGT	1	OFFICE-5	I	GALV METAL SHEET			R/A	300	200	200	-	-	-	-	-	-	320	N/A	-	1.5	17	-	N/A	-	SHEET 14 OF 28	-	-	-	-		
OGT	HN	71	505		RETURN AIR	OFFICE	OGT	1	OFFICE-6	I	GALV METAL SHEET			R/A	300	200	200	-	-	-	-	-	-	410	N/A	-	1.9	17	-	N/A	-	SHEET 14 OF 28	-	-	-	-		
OGT	HN	71	506		SUPPLY AIR	OFFICE	OGT	1	OFFICE-6	I	GALV METAL SHEET			S/A	300	200	200	-	-	-	-	-	-	440	N/A	-	2.0	17	-	N/A	-	SHEET 14 OF 28	-	-	-	-		
OGT	HN	71	507		RETURN AIR	OFFICE	OGT	1	OFFICE-7	I	GALV METAL SHEET			R/A	300	200	200	-	-	-	-	-	-	400	N/A	-	1.9	17	-	N/A	-	SHEET 14 OF 28	-	-	-	-		
OGT	HN	71	508		SUPPLY AIR	OFFICE	OGT	1	OFFICE-7	I	GALV METAL SHEET			S/A	300	200	200	-	-	-	-	-	-	450	N/A	-	2.1	17	-	N/A	-	SHEET 14 OF 28	-	-	-	-		
OGT	HN	71	509		SUPPLY AIR	OFFICE	OGT	1	OFFICE-5	I	GALV METAL SHEET			S/A	300	200	200	-	-	-	-	-	-	350	N/A	-	1.6	17	-	N/A	-	SHEET 14 OF 28	-	-	-	-		
OGT	HN	71	510		SUPPLY AIR	OFFICE	OGT	1	CORRIDOR	I	GALV METAL SHEET			S/A	500	300	200	-	-	-	-	-	-	2,160	N/A	-	4.0	26	-	N/A	-	SHEET 14 OF 28	-	-	-	WITH COUNTER FLAGE		
OGT	HN	71	511		SUPPLY AIR	OFFICE	OGT	1	CORRIDOR	I	GALV METAL SHEET			S/A	300	200	200	-	-	-	-	-	-	530	N/A	-	2.5	17	-	N/A	-	SHEET 14 OF 28	-	-	-	-		
OGT	HN	71	512		SUPPLY AIR	OFFICE	OGT	1	CORRIDOR	I	GALV METAL SHEET			S/A	300	200	200	-	-	-	-	-	-	420	N/A	-	1.9	17	-	N/A	-	SHEET 14 OF 28	-	-	-	-		
OGT	HN	71	513		SUPPLY AIR	OFFICE	OGT	1	CORRIDOR	I	GALV METAL SHEET			S/A	700	350	200	-	-	-	-	-	-	5,430	N/A	-	6.2	33	-	N/A	-	SHEET 14 OF 28	-	-	-	WITH COUNTER FLAGE		
OGT	HN	71	514		SUPPLY AIR	OFFICE	OGT	1	CORRIDOR	I	GALV METAL SHEET			S/A	300	200	200	-	-	-	-	-	-	420	N/A	-	1.9	17	-	N/A	-	SHEET 14 OF 28	-	-	-	-		
OGT	HN	71	515		SUPPLY AIR	OFFICE	OGT	1	CORRIDOR	I	GALV METAL SHEET			S/A	350	200	200	-	-	-	-	-	-	670	N/A	-	2.7	18	-	N/A	-	SHEET 14 OF 28	-	-	-	-		
OGT	HN	71	516		SUPPLY AIR	OFFICE	OGT	1	CORRIDOR	I	GALV METAL SHEET			S/A	300	200	200	-	-	-	-	-	-	215	N/A	-	1.0	17	-	N/A	-	SHEET 14 OF 28	-	-	-	-		
OGT	HN	71	517		RETURN AIR	OFFICE	OGT	1	OFFICE-1	I	GALV METAL SHEET			R/A	300	200	200	-	-	-	-	-	-	480	N/A	-	2.2	17	-	N/A	-	SHEET 14 OF 28	-	-	-	-		
OGT	HN	71	518		RETURN AIR	OFFICE	OGT	1	OFFICE-2	I	GALV METAL SHEET			R/A	300	200	200	-	-	-	-	-	-	390	N/A	-	1.8	17	-	N/A	-	SHEET 14 OF 28	-	-	-	-		
OGT	HN	71	519		RETURN AIR	OFFICE	OGT	1	OFFICE-3	I	GALV METAL SHEET			R/A	300	200	200	-	-	-	-	-	-	390	N/A	-	1.8	17	-	N/A	-	SHEET 14 OF 28	-	-	-	-		
OGT	HN	71	520		RETURN AIR	OFFICE	OGT	1	OFFICE-4	I	GALV METAL SHEET			R/A	350	200	200	-	-	-	-	-	-	610	N/A	-	2.4	18	-	N/A	-	SHEET 14 OF 28	-	-	-	-		
OGT	HN	71	521		RETURN AIR	OFFICE	OGT	1	OFFICE-8	I	GALV METAL SHEET			R/A	300	200	200	-	-	-	-	-	-	320	N/A	-	1.5	17	-	N/A	-	SHEET 15 OF 28	-	-	-	-		
OGT	HN	71	522		SUPPLY AIR	OFFICE	OGT	1	OFFICE-8	I	GALV METAL SHEET			S/A	300	200	200	-	-	-	-	-	-	360	N/A	-	1.7	17	-	N/A	-	SHEET 15 OF 28	-	-	-	-		
OGT	HN	71	523		SUPPLY AIR	OFFICE	OGT	1	MEETING RM.	I	GALV METAL SHEET			S/A	400	200	200	-	-	-	-	-	-	920	N/A	-	3.2	20	-	N/A	-	SHEET 15 OF 28	-	-	-	WITH COUNTER FLAGE		
OGT	HN	71	524		RETURN AIR	OFFICE	OGT	1	METTING RM.	I	GALV METAL SHEET			R/A	300	300	200	-	-	-	-	-	-	860	N/A	-	2.7	20	-	N/A	-	SHEET 15 OF 28	-	-	-	-		
OGT	HN	71	525		RETURN AIR	OFFICE	OGT	1	FILLING RM.	I	GALV METAL SHEET			R/A	200	200	200	-	-	-	-	-	-	110	N/A	-	0.8	15	-	N/A	-	SHEET 15 OF 28	-	-	-	-		
OGT	HN	71	526		SUPPLY AIR	OFFICE	OGT	1	FILLING RM.	I	GALV METAL SHEET			S/A	200	200	200	-	-	-	-	-	-	150	N/A	-	1.0	15	-	N/A	-	SHEET 15 OF 28	-	-	-	-		
OGT	HN	71	527		TOILET EXHAUST AIR	OFFICE	OGT	1	TOILET(M)	I	GALV METAL SHEET			E/A	200	200	200	-	-	-	-	-	-	380	N/A	-	2.6	15	-	N/A	-	SHEET 15 OF 28	-	-	-	-		
OGT	HN	71	528		SUPPLY AIR	OFFICE	OGT	1	CORRIDOR	I	GALV METAL SHEET			S/A	200	200	200	-	-	-	-	-	-	230	N/A	-	1.6	15	-	N/A	-	SHEET 15 OF 28	-	-	-	-		
OGT	HN	71	529		SUPPLY AIR	OFFICE	OGT	1	TOILET(M)	I	GALV METAL SHEET			S/A	200	200	200	-	-	-	-	-	-	190	N/A	-	1.3	15	-	N/A	-	SHEET 15 OF 28	-	-	-	-		
OGT	HN	71	530		SUPPLY AIR	OFFICE	OGT	1	CORRIDOR	I	GALV METAL SHEET			S/A	300	200	200	-	-	-	-	-	-	470	N/A	-	2.2	17	-	N/A	-	SHEET 15 OF 28	-	-	-	-		
OGT	HN	71	531		RETURN AIR	OFFICE	OGT	1	SECRETARY	I	GALV METAL SHEET			R/A	300	200	200	-	-	-	-	-	-	440	N/A	-	2.0	17	-	N/A	-	SHEET 15 OF 28	-	-	-	-		
OGT	HN	71	532		SUPPLY AIR	OFFICE	OGT	1	CORRIDOR	I	GALV METAL SHEET			S/A	300	200	200	-	-	-	-	-	-	420	N/A	-	1.9	17	-	N/A	-	SHEET 15 OF 28	-	-	-	-		
OGT	HN	71	533		SUPPLY AIR	OFFICE	OGT	1	CORRIDOR	I	GALV METAL SHEET			S/A	400	300	200	-	-	-	-	-	-	850	N/A													

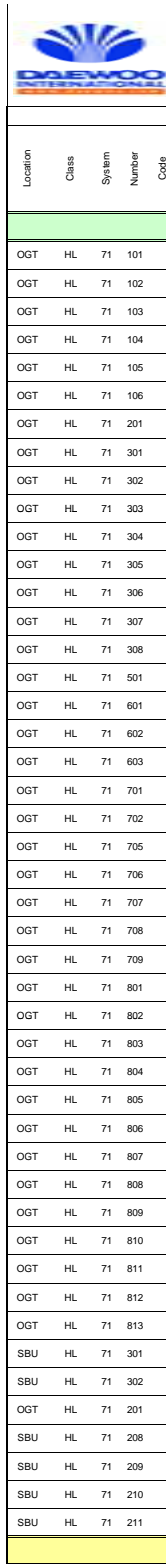
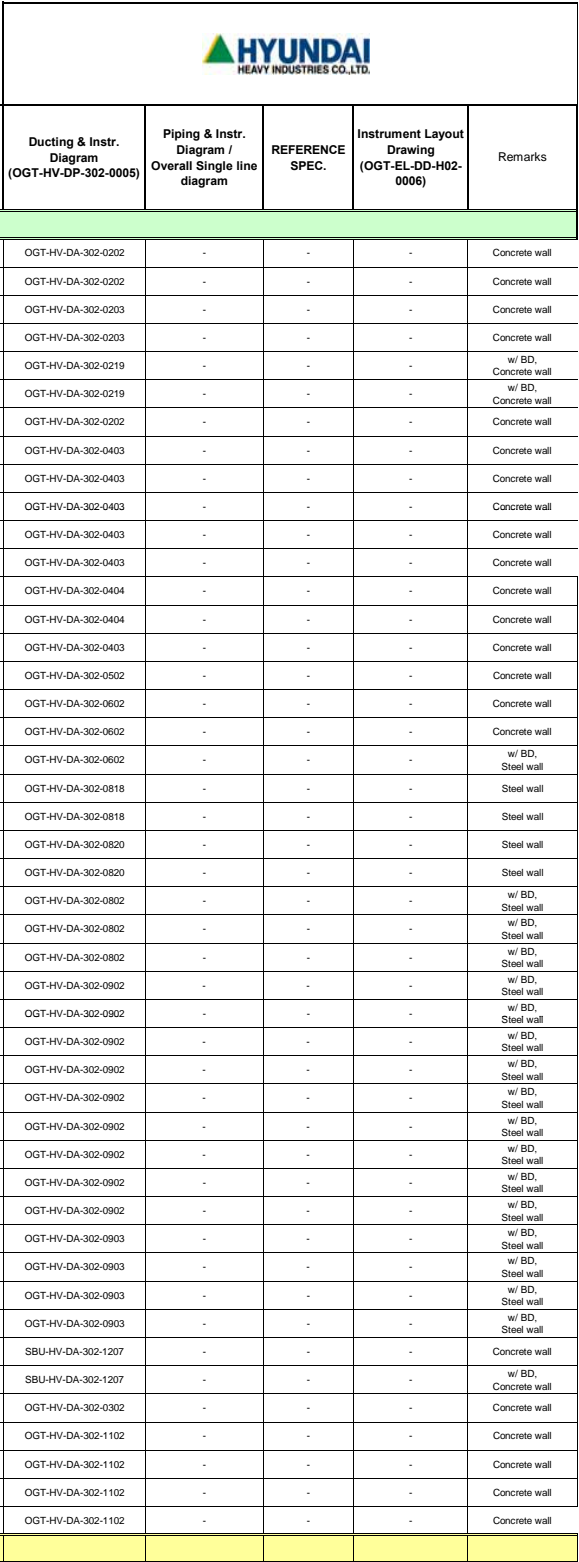
				SHWE - Detailed Engineering - Field Development Project																																	
				HVAC Equipment List for Onshore																																	
Location	Class	System	Number	Code	Description	Building	Platform	QTY	Location		Material			Service TYPE	Dimensions						OPENING SIZE			Design Conditions				Weight		Power (V/PH/HZ)	Hazardous Area Classification	Ducting & Instr. Diagram (OGT-HV-DP-302-0005)	Piping & Instr. Diagram / Overall Single line diagram	REFERENCE SPEC.	Instrument Layout Drawing (OGT-EL-DD-H02-0006)	Remarks	
									Room Description	Indoor(I) / Outdoor(O)	Casing	Shaft	Blade		Width Or Dia. (mm)	Height (mm)	Length (mm)	Opening (mm)	Duct (mm)	Neck Size (mm)	Width (mm)	Height (mm)	Applcabl e Length (mm)	Airflow (m³/h)	Capacity(kW)		Static Pressure (pa)	Air Vel. (m/s)	Dry (kg)								Operating (kg)
OGT	HN	71	712		RETURN AIR	G/W & OFFICE	OGT	1		MEETING RM.	I	GAL'V METAL SHEET	R/A	300	250	200	-	-	-	-	-	-	825	N/A	-	3.1	19	-	N/A	-		SHEET 21 OF 28	-	-	-	-	-
OGT	HN	71	713		SUPPLY AIR	G/W & OFFICE	OGT	1		PANTRY	I	GAL'V METAL SHEET	S/A	200	150	200	-	-	-	-	-	-	40	N/A	-	0.4	14	-	N/A	-		SHEET 22 OF 28	-	-	-	-	-
OGT	HN	71	714		SUPPLY AIR	G/W & OFFICE	OGT	1		TOILET(W)	I	GAL'V METAL SHEET	S/A	200	150	200	-	-	-	-	-	-	130	N/A	-	1.2	14	-	N/A	-		SHEET 22 OF 28	-	-	-	-	-
OGT	HN	71	715		PANTRY EXHAUST AIR	G/W & OFFICE	OGT	1		PANTRY	I	GAL'V METAL SHEET	E/A	200	150	200	-	-	-	-	-	-	40	N/A	-	0.4	14	-	N/A	-		SHEET 22 OF 28	-	-	-	-	-
OGT	HN	71	716		JANITORY EXHAUST AIR	G/W & OFFICE	OGT	1		JANITORY	I	GAL'V METAL SHEET	E/A	200	150	200	-	-	-	-	-	-	70	N/A	-	0.6	14	-	N/A	-		SHEET 22 OF 28	-	-	-	-	-
OGT	HN	71	717		TOILET EXHAUST AIR	G/W & OFFICE	OGT	1		TOILET(W)	I	GAL'V METAL SHEET	E/A	200	150	200	-	-	-	-	-	-	130	N/A	-	1.2	14	-	N/A	-		SHEET 22 OF 28	-	-	-	-	-
OGT	HN	71	718		SUPPLY AIR	G/W & OFFICE	OGT	1		TOILET(M)	I	GAL'V METAL SHEET	S/A	200	150	200	-	-	-	-	-	-	200	N/A	-	1.9	14	-	N/A	-		SHEET 22 OF 28	-	-	-	-	-
OGT	HN	71	719		SUPPLY AIR	G/W & OFFICE	OGT	1		JANITORY	I	GAL'V METAL SHEET	S/A	200	150	200	-	-	-	-	-	-	30	N/A	-	0.3	14	-	N/A	-		SHEET 22 OF 28	-	-	-	-	-
OGT	HN	71	720		SUPPLY AIR	G/W & OFFICE	OGT	1		MEETING RM.	I	GAL'V METAL SHEET	S/A	300	250	200	-	-	-	-	-	-	1,160	N/A	-	4.3	19	-	N/A	-		SHEET 22 OF 28	-	-	-	-	-
OGT	HN	71	721		TOILET EXHAUST AIR	G/W & OFFICE	OGT	1		TOILET(M)	I	GAL'V METAL SHEET	E/A	200	150	200	-	-	-	-	-	-	190	N/A	-	1.8	14	-	N/A	-		SHEET 22 OF 28	-	-	-	-	-
OGT	HN	71	722		SUPPLY AIR	G/W & OFFICE	OGT	1		HALL	I	GAL'V METAL SHEET	S/A	400	250	200	-	-	-	-	-	-	1,160	N/A	-	4.6	22	-	N/A	-		SHEET 22 OF 28	-	-	-	-	WITH COUNTER FLAGE
OGT	HN	71	723		EXHAUST FAN (OGT-HK-71701A) EXHAUST AIR	G/W & OFFICE	OGT	1		-	I	GAL'V METAL SHEET	E/A	200	200	200	-	-	-	-	-	-	320	N/A	-	2.2	15	-	N/A	-		SHEET 22 OF 28	-	-	-	-	-
OGT	HN	71	724		SUPPLY AIR	G/W & OFFICE	OGT	1		HALL	I	GAL'V METAL SHEET	S/A	200	150	200	-	-	-	-	-	-	260	N/A	-	1.4	14	-	N/A	-		SHEET 22 OF 28	-	-	-	-	-
OGT	HN	71	725		EXHAUST FAN (OGT-HK-71701B) EXHAUST AIR	G/W & OFFICE	OGT	1		-	I	GAL'V METAL SHEET	E/A	200	200	200	-	-	-	-	-	-	320	N/A	-	2.2	15	-	N/A	-		SHEET 22 OF 28	-	-	-	-	-
OGT	HN	71	726		FRESH AIR	G/W & OFFICE	OGT	1		WAREHOUSE	I	SUS 316L	F/A	1930	1180	200	-	-	-	-	-	-	12,000	N/A	-	1.5	141	-	N/A	-		SHEET 22 OF 28	-	-	-	-	STEEL WALL (C.F. SLEEVE)
OGT	HN	71	727		FRESH AIR	G/W & OFFICE	OGT	1		WAREHOUSE	I	SUS 316L	F/A	1930	1180	200	-	-	-	-	-	-	12,000	N/A	-	1.5	141	-	N/A	-		SHEET 22 OF 28	-	-	-	-	STEEL WALL (C.F. SLEEVE)
OGT	HN	71	728		FRESH AIR	G/W & OFFICE	OGT	1		WAREHOUSE	I	SUS 316L	F/A	1930	1180	200	-	-	-	-	-	-	12,000	N/A	-	1.5	141	-	N/A	-		SHEET 22 OF 28	-	-	-	-	STEEL WALL (C.F. SLEEVE)
OGT	HN	71	729		SUPPLY AIR	G/W & OFFICE	OGT	1		TEMP. CONTROL STORAGE-2	I	GAL'V METAL SHEET	S/A	500	350	200	-	-	-	-	-	-	3,650	N/A	-	5.8	28	-	N/A	-		SHEET 23 OF 28	-	-	-	-	WITH COUNTER FLAGE
OGT	HN	71	730		RETURN AIR	G/W & OFFICE	OGT	1		TEMP. CONTROL STORAGE-2	I	GAL'V METAL SHEET	R/A	500	350	200	-	-	-	-	-	-	3,470	N/A	-	5.5	28	-	N/A	-		SHEET 23 OF 28	-	-	-	-	WITH COUNTER FLAGE
OGT	HN	71	731		RETURN AIR	G/W & OFFICE	OGT	1		TEMP. CONTROL STORAGE-2	I	GAL'V METAL SHEET	R/A	500	350	200	-	-	-	-	-	-	3,470	N/A	-	5.5	28	-	N/A	-		SHEET 23 OF 28	-	-	-	-	WITH COUNTER FLAGE
OGT	HN	71	732		RETURN AIR	G/W & OFFICE	OGT	1		MEETING & TRAINING RM.	I	GAL'V METAL SHEET	R/A	350	250	200	-	-	-	-	-	-	1,380	N/A	-	4.4	20	-	N/A	-		SHEET 23 OF 28	-	-	-	-	-
OGT	HN	71	733		SUPPLY AIR	G/W & OFFICE	OGT	1		MEETING & TRAINING RM.	I	GAL'V METAL SHEET	S/A	300	300	200	-	-	-	-	-	-	1,470	N/A	-	4.5	20	-	N/A	-		SHEET 23 OF 28	-	-	-	-	-
OGT	HN	71	734		SUPPLY AIR	G/W & OFFICE	OGT	1		TEMP. CONTROL STORAGE-2	I	GAL'V METAL SHEET	S/A	500	350	200	-	-	-	-	-	-	3,650	N/A	-	5.8	28	-	N/A	-		SHEET 23 OF 28	-	-	-	-	WITH COUNTER FLAGE
OGT	HN	71	735		RETURN AIR	G/W & OFFICE	OGT	1		TEMP. CONTROL STORAGE-2	I	GAL'V METAL SHEET	R/A	650	400	200	-	-	-	-	-	-	5,480	N/A	-	5.9	34	-	N/A	-		SHEET 23 OF 28	-	-	-	-	WITH COUNTER FLAGE
OGT	HN	71	736		SUPPLY AIR	G/W & OFFICE	OGT	1		TEMP. CONTROL STORAGE-2	I	GAL'V METAL SHEET	S/A	750	400	200	-	-	-	-	-	-	6,470	N/A	-	6.0	37	-	N/A	-		SHEET 23 OF 28	-	-	-	-	WITH COUNTER FLAGE
OGT	HN	71	737		RETURN AIR	G/W & OFFICE	OGT	1		BASE MANAGER RM.	I	GAL'V METAL SHEET	R/A	250	200	200	-	-	-	-	-	-	480	N/A	-	1.4	16	-	N/A	-		SHEET 23 OF 28	-	-	-	-	-
OGT	HN	71	738		RETURN AIR	G/W & OFFICE	OGT	1		LOGISTIC SUPERVISOR RM.	I	GAL'V METAL SHEET	R/A	250	200	200	-	-	-	-	-	-	440	N/A	-	2.4	16	-	N/A	-		SHEET 23 OF 28	-	-	-	-	-
OGT	HN	71	739		SUPPLY AIR	G/W & OFFICE	OGT	1		BASE MANAGER RM.	I	GAL'V METAL SHEET	S/A	250	200	200	-	-	-	-	-	-	520	N/A	-	2.9	16	-	N/A	-		SHEET 23 OF 28	-	-	-	-	-
OGT	HN	71	740		SUPPLY AIR	G/W & OFFICE	OGT	1		LOGISTIC SUPERVISOR RM.	I	GAL'V METAL SHEET	S/A	250	200	200	-	-	-	-	-	-	480	N/A	-	1.4	16	-	N/A	-</							




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Location	Class	System	Number	Code	Description	Building	Platform	Q'TY	Location		Material			Service TYPE	Dimensions						OPENING SIZE			Design Conditions				Weight		Power (V/PH/HZ)	Hazardous Area Classification	Ducting & Instr. Diagram (OGT-HV-DP-302-0005)	Piping & Instr. Diagram / Overall Single line diagram	REFERENCE SPEC.	Instrument Layout Drawing (OGT-EL-OD-H02-0006)	Remarks	
									Room Description	Indor(f) / Outdoor(O)	Casing	Shaft	Blade		Width Or Dia. (mm)	Height (mm)	Length (mm)	Opening (mm)	Duct (mm)	Neck Size (mm)	Width (mm)	Height (mm)	Applicable Length (mm)	Airflow (m³/h)	Capacity(kW)		Static Pressure (pa)	Air Vel. (m/s)	Dry (kg)								Operating (kg)
																									Cooling	Heating											
SBU	HN	71	303	EXHAUST AIR		G/H - JETTY S/B	SBU	1	ELECTRICAL RM.	I		SUS 316L	E/A	400	200	200	-	-	-	-	-	-	2,100		N/A	-	7.3	20	-	N/A	-	SHEET 28 OF 28	-	-	-	WITH COUNTER FLAGE	
						Sub Total		330																													




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HVAC Equipment List for Onshore																																									
Location	Class	System	Number	Code	Description	Building	Platform	Q'TY	Location			Material			Service TYPE	Dimensions					OPENING SIZE			Design Conditions				Weight		Power (V/PH/HZ)	Hazardous Area Classification	Ducting & Instr. Diagram (OGT-HV-DP-302-0005)	Piping & Instr. Diagram / Overall Single line diagram	REFERENCE SPEC.	Instrument Layout Drawing (OGT-EL-DD-H02-0006)	Remarks					
									Room Description	Indoor(I) / Outdoor(O)	Casing	Shaft	Blade	Width Or Dia. (mm)		Height (mm)	Length (mm)	Opening (mm)	Duct (mm)	Neck Size (mm)	Width (mm)	Height (mm)	Applicable Length (mm)	Airflow (m³/h)	Capacity(kW)		Static Pressure (pa)	Air Vel. (m/s)	Dry (kg)								Operating (kg)				
																									Cooling	Heating															
PRESSURE RELIEF DAMPER																																									
OGT	HR	71	101		AIR LOCK-1 PRESSURE RELIEF	T/B & LABORATORY	OGT	1	AIR LOCK-1	I	SUS316L	E/A		200	200	200	-	-	-	-	-	-	210	N/A	-	1.5	12	-	N/A	-	SHEET 06 OF 28	-	-	-	-						
OGT	HR	71	106		AIR LOCK-3 PRESURE RELIEF DUCT	T/B & LABORATORY	OGT	1	AIR LOCK-3	I	SUS316L	E/A		300	250	200	-	-	-	-	-	-	430	N/A	-	1.6	14	-	N/A	-	SHEET 05 OF 28	-	-	-	-						
Sub Total								2																																	




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Location	Class	System	Number	Code	Description	Building	Platform	QTY	Location		Material			Service TYPE	Dimensions					OPENING SIZE			Design Conditions				Weight		Power (V/PH/HZ)	Hazardous Area Classification	Ducting & Instr. Diagram (OGT-HV-DP-302-0005)	Piping & Instr. Diagram / Overall Single line diagram	REFERENCE SPEC.	Instrument Layout Drawing (OGT-EL-DD-H02-0006)	Remarks	
									Room Description	Indoor(I) / Outdoor(O)	Casing	Shaft	Blade		Width Or Dia. (mm)	Height (mm)	Length (mm)	Opening (mm)	Duct (mm)	Neck Size (mm)	Width (mm)	Height (mm)	Applicable Length (mm)	Capacity(kW)		Static Pressure (pa)	Air Vel. (m/s)	Dry (kg)								Operating (kg)
				Cooling					Heating																											
					NON RETURN DAMPER																															
OGT	HR	71	102		LAB. EXH. FAN(OGT-HK-71101) DISCHARGE	T/B & LABORATORY	OGT	1		LABORATORY	I	SUS 316L	E/A	400	300	200	-	-	-	-	-	-	1790	N/A	-	4.7	17	-	N/A	-	SHEET 06 OF 28	-	-	-	WITH COUNTER FLAGE	
OGT	HR	71	103		LAB. EXH. FAN(OGT-HK-71101) DISCHARGE	T/B & LABORATORY	OGT	1		LABORATORY	I	SUS 316L	E/A	400	350	200	-	-	-	-	-	-	1790	N/A	-	4.7	18	-	N/A	-	SHEET 06 OF 28	-	-	-	WITH COUNTER FLAGE	
OGT	HR	71	104		TOILET EXH. FAN(OGT-HK-71103) DISCHARGE	T/B & LABORATORY	OGT	1		OFFICE-3	I	GALV METAL SHEET	E/A	200	250	200	-	-	-	-	-	-	520	N/A	-	2.9	12	-	N/A	-	SHEET 06 OF 28	-	-	-	-	
OGT	HR	71	105		TOILET EXH. FAN(OGT-HK-71103) DISCHARGE	T/B & LABORATORY	OGT	1		OFFICE-3	I	GALV METAL SHEET	E/A	250	200	200	-	-	-	-	-	-	520	N/A	-	2.9	12	-	N/A	-	SHEET 06 OF 28	-	-	-	-	
OGT	HR	71	107		BATTERY ROOM EXH. FAN(OGT-HK-71102) DISCHARGE	T/B & LABORATORY	OGT	1		BATTERY RM.	I	SUS 316L	E/A	400	300	200	-	-	-	-	-	-	2170	N/A	-	5	17	-	N/A	-	SHEET 05 OF 28	-	-	-	WITH COUNTER FLAGE	
OGT	HR	71	108		BATTERY ROOM EXH. FAN(OGT-HK-71102) DISCHARGE	T/B & LABORATORY	OGT	1		BATTERY RM.	I	SUS 316L	E/A	400	300	200	-	-	-	-	-	-	2170	N/A	-	5	17	-	N/A	-	SHEET 05 OF 28	-	-	-	WITH COUNTER FLAGE	
OGT	HR	71	109		LABORATORY Exhaust Air	T/B & LABORATORY	OGT	1		LABORATORY	I	SUS 316L	E/A	400	150	200	-	-	-	-	-	-	930	N/A	-	4.3	12	-	N/A	-	SHEET 06 OF 28	-	-	-	WITH COUNTER FLAGE	
OGT	HR	71	110		LABORATORY Exhaust Air	T/B & LABORATORY	OGT	1		LABORATORY	I	SUS 316L	E/A	250	200	200	-	-	-	-	-	-	990	N/A	-	5.5	12	-	N/A	-	SHEET 06 OF 28	-	-	-	-	
OGT	HR	71	301		KITCHEN HOOD MAKE UP FAN(OGT-HK-71306) DISCHARGE	MESS RESCREATION & ACCOMMODATION	OGT	1		DINNING	I	SUS 316L	S/A	800	550	200	-	-	-	-	-	-	10830	N/A	-	6.8	28	-	N/A	-	SHEET 11 OF 28	-	-	-	WITH COUNTER FLAGE	
OGT	HR	71	302		KITCHEN HOOD MAKE UP FAN(OGT-HK-71306) DISCHARGE	MESS RESCREATION & ACCOMMODATION	OGT	1		DINNING	I	SUS 316L	S/A	950	500	200	-	-	-	-	-	-	10830	N/A	-	6.8	30	-	N/A	-	SHEET 11 OF 28	-	-	-	WITH COUNTER FLAGE	
OGT	HR	71	303		KITCHEN HOOD EXH. FAN(OGT-HK-71307) DISCHARGE	MESS RESCREATION & ACCOMMODATION	OGT	1		DINNING	I	SUS 316L	E/A	700	550	200	-	-	-	-	-	-	10830	N/A	-	7.2	27	-	N/A	-	SHEET 11 OF 28	-	-	-	WITH COUNTER FLAGE	
OGT	HR	71	304		KITCHEN HOOD EXH. FAN(OGT-HK-71307) DISCHARGE	MESS RESCREATION & ACCOMMODATION	OGT	1		DINNING	I	SUS 316L	E/A	700	600	200	-	-	-	-	-	-	10830	N/A	-	7.2	28	-	N/A	-	SHEET 11 OF 28	-	-	-	WITH COUNTER FLAGE	
OGT	HR	71	305		KITCHEN & DINNING EXH. FAN(OGT-HK-71305) DISCHARGE	MESS RESCREATION & ACCOMMODATION	OGT	1		KITCHEN	I	SUS 316L OR GALV SHEET METAL	E/A	650	400	200	-	-	-	-	-	-	5890	N/A	-	6.3	23	-	N/A	-	SHEET 11 OF 28	-	-	-	WITH COUNTER FLAGE	
OGT	HR	71	306		KITCHEN & DINNING EXH. FAN(OGT-HK-71305) DISCHARGE	MESS RESCREATION & ACCOMMODATION	OGT	1		KITCHEN	I	SUS 316L OR GALV SHEET METAL	E/A	750	350	200	-	-	-	-	-	-	5890	N/A	-	6.3	24	-	N/A	-	SHEET 11 OF 28	-	-	-	WITH COUNTER FLAGE	
OGT	HR	71	307		TOILET EXH. FAN(OGT-HK-71303) DISCHARGE	MESS RESCREATION & ACCOMMODATION	OGT	1		STORAGE-2	I	GALV METAL SHEET	E/A	300	250	200	-	-	-	-	-	-	820	N/A	-	3.0	14	-	N/A	-	SHEET 11 OF 28	-	-	-	-	
OGT	HR	71	308		TOILET EXH. FAN(OGT-HK-71303) DISCHARGE	MESS RESCREATION & ACCOMMODATION	OGT	1		STORAGE-2	I	GALV METAL SHEET	E/A	300	250	200	-	-	-	-	-	-	820	N/A	-	3.0	14	-	N/A	-	SHEET 11 OF 28	-	-	-	-	
OGT	HR	71	309		LAUNDRY EXH. FAN(OGT-HK-71308) DISCHARGE	MESS RESCREATION & ACCOMMODATION	OGT	1		CORRIDOR-2	I	SUS316L	E/A	350	200	200	-	-	-	-	-	-	930	N/A	-	3.7	14	-	N/A	-	SHEET 11 OF 28	-	-	-	-	
OGT	HR	71	310		LAUNDRY EXH. FAN(OGT-HK-71308) DISCHARGE	MESS RESCREATION & ACCOMMODATION	OGT	1		CORRIDOR-2	I	SUS316L	E/A	350	200	200	-	-	-	-	-	-	930	N/A	-	3.7	14	-	N/A	-	SHEET 11 OF 28	-	-	-	-	
OGT	HR	71	311		CLINIC & STORAGE-1 EXH. FAN(OGT-HK-71304) DISCHARGE	MESS RESCREATION & ACCOMMODATION	OGT	1		GYMNASIUM	I	GALV METAL SHEET	E/A	200	200	200	-	-	-	-	-	-	460	N/A	-	3.2	12	-	N/A	-	SHEET 11 OF 28	-	-	-	-	
OGT	HR	71	312		CLINIC & STORAGE-1 EXH. FAN(OGT-HK-71304) DISCHARGE	MESS RESCREATION & ACCOMMODATION	OGT	1		GYMNASIUM	I	GALV METAL SHEET	E/A	200	200	200	-	-	-	-	-	-	460	N/A	-	3.2	12	-	N/A	-	SHEET 11 OF 28	-	-	-	-	
OGT	HR	71	313		PRIVATE TOILET EXHAUST FAN(OGT-HK-71301) DISCHARGE	MESS RESCREATION & ACCOMMODATION	OGT	1		DOUBLE ROOM	I	GALV METAL SHEET	E/A	350	200	200	-	-	-	-	-	-	1080	N/A	-	4	14	-	N/A	-	SHEET 10 OF 28	-	-	-	-	
OGT	HR	71	314		PRIVATE TOILET EXHAUST FAN(OGT-HK-71301) DISCHARGE	MESS RESCREATION & ACCOMMODATION	OGT	1		DOUBLE ROOM	I	GALV METAL SHEET	E/A	300	250	200	-	-	-	-	-	-	1080	N/A	-	4	14	-	N/A	-	SHEET 10 OF 28	-	-	-	-	
OGT	HR	71	315		PRIVATE TOILET EXHAUST FAN(OGT-HK-71302) DISCHARGE	MESS RESCREATION & ACCOMMODATION	OGT	1		DOUBLE ROOM	I	GALV METAL SHEET	E/A	350	200	200	-	-	-	-	-	-	1080	N/A	-	4	14	-	N/A	-	SHEET 10 OF 28	-	-	-	-	
OGT	HR	71	316		PRIVATE TOILET EXHAUST FAN(OGT-HK-71302) DISCHARGE	MESS RESCREATION & ACCOMMODATION	OGT	1		DOUBLE ROOM	I	GALV METAL SHEET	E/A	300	250	200	-	-	-	-	-	-	1080	N/A	-	4	14	-	N/A	-	SHEET 10 OF 28	-	-	-	-	
OGT	HR	71	501		TOILET EXH. FAN(OGT-HK-71501) DISCHARGE	OFFICE BUILDING	OGT	1		TOILET	I	GALV METAL SHEET	E/A	300	300	200	-	-	-	-	-	-	1060	N/A	-	3.3	15	-	N/A	-	SHEET 15 OF 28	-	-	-	-	
OGT	HR	71	502		TOILET EXH. FAN(OGT-HK-71501) DISCHARGE	OFFICE BUILDING	OGT	1		TOILET	I	GALV METAL SHEET	E/A	300	300	200	-	-	-	-	-	-	1060	N/A	-	3.3	15	-	N/A	-	SHEET 15 OF 28	-	-	-	-	
OGT	HR	71	601		TOILET & SHOWER ROOM EXH. FAN(OGT-HK-71601) DISCHARGE	WAREHOUSE & WORKSHOP	OGT	1		TOILET & SHOWER ROOM	I	SUS 316L OR GALV SHEET METAL	E/A	250	200	200	-	-	-	-	-	-	280	N/A	-	1.6	12	-	N/A	-	SHEET 18 OF 28	-	-	-	-	
OGT	HR	71	602		TOILET & SHOWER ROOM EXH. FAN(OGT-HK-71601) DISCHARGE	WAREHOUSE & WORKSHOP	OGT	1		TOILET & SHOWER ROOM	I	SUS 316L OR GALV SHEET METAL	E/A	250	200	200	-	-	-	-	-	-	280	N/A	-	1.6	12	-	N/A	-	SHEET 18 OF 28	-	-	-	-	
OGT	HR	71	603		ELEC. & INST. WORKSHOP EXH. FAN(OGT-HK-71603) DISCHARGE	WAREHOUSE & WORKSHOP	OGT	1		SPARE PARTS STORE	I	GALV SHEET METAL	E/A	300	150	200	-	-	-	-	-	-	430	N/A	-	2.4	12	-	N/A	-	SHEET 18 OF 28	-	-	-	-	
OGT	HR	71	604		ELEC. & INST. WORKSHOP EXH. FAN(OGT-HK-71603) DISCHARGE	WAREHOUSE & WORKSHOP	OGT	1		SPARE PARTS STORE	I	GALV SHEET METAL	E/A	250	200	200	-	-	-	-	-	-	430	N/A	-	2.4	12	-	N/A	-	SHEET 18 OF 28	-	-	-	-	
OGT	HR	71	701		PANTRY & JANITOR EXH. FAN(OGT-HK-71702) DISCHARGE	GENERAL WAREHOUSE & OFFICE	OGT	1		OFFICE	I	GALV SHEET METAL	E/A	200	200	200	-	-	-	-	-	-	110	N/A	-	0.8	12	-	N/A	-	SHEET 21 OF 28	-	-	-	-	
OGT	HR	71	702		PANTRY & JANITOR EXH. FAN(OGT-HK-71702) DISCHARGE	GENERAL WAREHOUSE & OFFICE	OGT	1		OFFICE	I	GALV SHEET METAL	E/A	200	200	200	-	-	-	-	-	-	110	N/A	-	0.8	12	-	N/A	-	SHEET 21 OF 28	-	-	-	-	
OGT	HR	71	703		TOILET EXH. FAN(OGT-HK-71702) DISCHARGE	GENERAL WAREHOUSE & OFFICE	OGT	1		HALL	I	GALV SHEET METAL	E/A	200	200	200	-	-	-	-	-	-	320	N/A	-	2.2	12	-	N/A	-	SHEET 22 OF 28	-	-	-	-	
OGT	HR	71	704		TOILET EXH. FAN(OGT-HK-71702) DISCHARGE	GENERAL WAREHOUSE & OFFICE	OGT	1		HALL	I	GALV SHEET METAL	E/A	200	200	200	-	-	-	-	-	-	320	N/A	-	2.2	12	-	N/A	-	SHEET 22 OF 28	-	-	-	-	
OGT	HR	71	705		TOILET EXH. FAN(OGT-HK-71703) DISCHARGE	GENERAL WAREHOUSE & OFFICE	OGT	1		HALL	I	GALV SHEET METAL	E/A	200	200	200	-	-	-	-	-	-	340	N/A	-	2.4	12	-	N/A	-	SHEET 24 OF 28	-	-	-	-	
OGT	HR																																			




				SHWE - Detailed Engineering - Field Development Project																																	
				HVAC Equipment List for Onshore																																	
					Location				Material			Dimensions							OPENING SIZE				Design Conditions				Weight		Power (V/PH/HZ)	Hazardous Area Classification	Ducting & Instr. Diagram (OGT-HV-DP-302-0005)	Piping & Instr. Diagram / Overall Single line diagram	REFERENCE SPEC.	Instrument Layout Drawing (OGT-EL-DD-H02-0006)	Remarks		
Location	Class	System	Number	Code	Description	Building	Platform	QTY	Room Description	Indoor(I) / Outdoor(O)	Casing	Shaft	Blade	Service TYPE	Width Or Dia. (mm)	Height (mm)	Length (mm)	Opening (mm)	Duct (mm)	Neck Size (mm)	Width (mm)	Height (mm)	Applicable Length (mm)	Airflow (m³/h)	Capacity(kW)	Static Pressure (pa)	Air Vel. (m/s)	Dry (kg)								Operating (kg)	
					SOUND ATTENUATOR																																
OGT	HS	71	101		ROOFTOP UNIT(OGT-HA-71101A,B) Supply Air	T/B & LABORATORY	OGT	1	T/B & LABORATORY	O	SUS316L			S/A	1200	800	2000	-	-	-	-	-	-	33,220	N/A	-	14.4	-	-	-	-	SHEET 04 OF 28	Refer To. OGT-HV-EL-302-0201	-	-	Rect. + Baffle	
OGT	HS	71	102		ROOFTOP UNIT(OGT-HA-71101A,B) Return Air	T/B & LABORATORY	OGT	1	T/B & LABORATORY	O	SUS316L			R/A	1200	700	2000	-	-	-	-	-	-	28,580	N/A	-	14.2	-	-	-	-	SHEET 04 OF 28	Refer To. OGT-HV-EL-302-0201	-	-	Rect. + Baffle	
OGT	HS	71	104		Electrical Technical	T/B & LABORATORY	OGT	1	Electical Technical	I				GALV.	R/A	700	400	1100	-	-	-	-	-	-	6,735	N/A	-	6.7	-	-	-	-	SHEET 04 OF 28	Refer To. OGT-HV-EL-302-0201	-	-	Rectangular
OGT	HS	71	105		Electrical Technical	T/B & LABORATORY	OGT	1	Electical Technical	I				GALV.	R/A	700	400	1100	-	-	-	-	-	-	6,735	N/A	-	6.7	-	-	-	-	SHEET 04 OF 28	Refer To. OGT-HV-EL-302-0201	-	-	Rectangular
OGT	HS	71	106		Electrical Technical	T/B & LABORATORY	OGT	1	Electical Technical	I				GALV.	S/A	700	400	1100	-	-	-	-	-	-	6,900	N/A	-	6.8	-	-	-	-	SHEET 04 OF 28	Refer To. OGT-HV-EL-302-0201	-	-	Rectangular
OGT	HS	71	107		Electrical Technical	T/B & LABORATORY	OGT	1	Electical Technical	I				GALV.	E/A	700	400	1100	-	-	-	-	-	-	6,900	N/A	-	6.8	-	-	-	-	SHEET 04 OF 28	Refer To. OGT-HV-EL-302-0201	-	-	Rectangular
OGT	HS	71	108		Battery	T/B & LABORATORY	OGT	1	Battery	I				SUS316L	R/A	400	300	1000	-	-	-	-	-	-	1,150	N/A	-	2.7	-	-	-	-	SHEET 04 OF 28	Refer To. OGT-HV-EL-302-0201	-	-	Rect. + Elbow
OGT	HS	71	109		Central Control	T/B & LABORATORY	OGT	1	Central Control	I				GALV.	S/A	500	300	1100	-	-	-	-	-	-	2,780	N/A	-	5.1	-	-	-	-	SHEET 04 OF 28	Refer To. OGT-HV-EL-302-0201	-	-	Rectangular
OGT	HS	71	110		Central Control	T/B & LABORATORY	OGT	1	Central Control	I				GALV.	S/A	500	300	965	-	-	-	-	-	-	2,860	N/A	-	5.3	-	-	-	-	SHEET 04 OF 28	Refer To. OGT-HV-EL-302-0201	-	-	Rect. + Elbow
OGT	HS	71	111		Instrument Equipment	T/B & LABORATORY	OGT	1	Instrument Equipment	I				GALV.	S/A	550	300	1800	-	-	-	-	-	-	6,140	N/A	-	10.3	-	-	-	-	SHEET 04 OF 28	Refer To. OGT-HV-EL-302-0201	-	-	Rect. + T branch
OGT	HS	71	112		Instrument Equipment	T/B & LABORATORY	OGT	1	Instrument Equipment	I				GALV.	R/A	600	400	820	-	-	-	-	-	-	2,986	N/A	-	3.5	-	-	-	-	SHEET 04 OF 28	Refer To. OGT-HV-EL-302-0201	-	-	Rectangular
OGT	HS	71	113		Instrument Equipment	T/B & LABORATORY	OGT	1	Instrument Equipment	I				GALV.	R/A	650	400	1150	-	-	-	-	-	-	2,986	N/A	-	4.1	-	-	-	-	SHEET 04 OF 28	Refer To. OGT-HV-EL-302-0201	-	-	Rectangular
OGT	HS	71	114		Office-3	T/B & LABORATORY	OGT	1	Office-3	I				GALV.	E/A	200	250	1100	-	-	-	-	-	-	520	N/A	-	2.9	-	-	-	-	SHEET 04 OF 28	Refer To. OGT-HV-EL-302-0201	-	-	Rectangular
OGT	HS	71	103		ROOFTOP UNIT(OGT-HA-71102A,B) Supply Air	T/B & LABORATORY	OGT	1	T/B & LABORATORY	O				SUS316L	S/A	400	400	1500	-	-	-	-	-	-	2,780	N/A	-	4.8	-	-	-	-	SHEET 04 OF 28	Refer To. OGT-HV-EL-302-0201	-	-	Rectangular
OGT	HS	71	115		Laboratory	T/B & LABORATORY	OGT	1	Laboratory	I				SUS316L	E/A	400	350	2501.5	-	-	-	-	-	-	2,490	N/A	-	4.9	-	-	-	-	SHEET 04 OF 28	Refer To. OGT-HV-EL-302-0201	-	-	Rectangular
OGT	HS	71	116		He & N2	T/B & LABORATORY	OGT	1	He & N2	I				GALV.	E/A	200	200	600	-	-	-	-	-	-	500	N/A	-	3.5	-	-	-	-	SHEET 04 OF 28	Refer To. OGT-HV-EL-302-0201	-	-	Rectangular
OGT	HS	71	301		ROOFTOP UNIT(OGT-HA-71301A,B,C) Supply Air	MESS. ACCOMODATION	OGT	1	MESS. ACCOMODATION	O				SUS316L	S/A	1300	600	2000	-	-	-	-	-	-	22,650	N/A	-	11.7	-	-	-	-	SHEET 09 OF 28	Refer To. OGT-HV-EL-302-0401	-	-	Rect. + Baffle
OGT	HS	71	302		ROOFTOP UNIT(OGT-HA-71301A,B,C) Return Air	MESS. ACCOMODATION	OGT	1	MESS. ACCOMODATION	O				SUS316L	R/A	850	500	2000	-	-	-	-	-	-	10,540	N/A	-	7.8	-	-	-	-	SHEET 09 OF 28	Refer To. OGT-HV-EL-302-0401	-	-	Rect. + Baffle
OGT	HS	71	303		Hall	MESS. ACCOMODATION	OGT	1	Hall	I				GALV.	S/A	1000	600	1100	-	-	-	-	-	-	16,760	N/A	-	8.6	-	-	-	-	SHEET 09 OF 28	Refer To. OGT-HV-EL-302-0401	-	-	Rect. + Baffle
OGT	HS	71	304		Gymnasium	MESS. ACCOMODATION	OGT	1	Gymnasium	I				GALV.	E/A	200	200	1100	-	-	-	-	-	-	490	N/A	-	3.4	-	-	-	-	SHEET 09 OF 28	Refer To. OGT-HV-EL-302-0401	-	-	Rectangular
OGT	HS	71	305		Kitchen	MESS. ACCOMODATION	OGT	1	Kitchen	I				SUS316L	E/A	650	400	2255	-	-	-	-	-	-	5,890	N/A	-	6.3	-	-	-	-	SHEET 09 OF 28	Refer To. OGT-HV-EL-302-0401	-	-	Rectangular
OGT	HS	71	306		Kitchen	MESS. ACCOMODATION	OGT	1	Kitchen	I				SUS316L	S/A	800	550	2000	-	-	-	-	-	-	10,830	N/A	-	9.1	-	-	-	-	SHEET 09 OF 28	Refer To. OGT-HV-EL-302-0401	-	-	Rectangular
OGT	HS	71	307 A		Dining	MESS. ACCOMODATION	OGT	1	Dining	I				SUS316L	E/A	700	600	1800	-	-	-	-	-	-	10,830	N/A	-	12.5	-	-	-	-	SHEET 09 OF 28	Refer To. OGT-HV-EL-302-0401	-	-	Baffle
OGT	HS	71	307 B		Dining	MESS. ACCOMODATION	OGT	1	Dining	I				SUS316L	E/A	700	600	1800	-	-	-	-	-	-	10,830	N/A	-	12.5	-	-	-	-	SHEET 09 OF 28	Refer To. OGT-HV-EL-302-0401	-	-	Baffle (Spare)
OGT	HS	71	308		02D Double	MESS. ACCOMODATION	OGT	1	02D Double	I				GALV.	E/A	300	250	1225	-	-	-	-	-	-	1,080	N/A	-	4.0	-	-	-	-	SHEET 09 OF 28	Refer To. OGT-HV-EL-302-0401	-	-	Rect. + Elbow
OGT	HS	71	309		10D Double	MESS. ACCOMODATION	OGT	1	10D Double	I				GALV.	E/A	300	250	1225	-	-	-	-	-	-	1,080	N/A	-	4.0	-	-	-	-	SHEET 09 OF 28	Refer To. OGT-HV-EL-302-0401	-	-	Rect. + Elbow
OGT	HS	71	501		ROOFTOP UNIT(OGT-HA-71501A,B) Supply Air	OFFICE	OGT	1	OFFICE	O				SUS316L	S/A	800	400	2000	-	-	-	-	-	-	7,590	N/A	-	7.5	-	-	-	-	SHEET 13 OF 28	Refer To. OGT-HV-EL-302-0501	-	-	Rect. + Baffle
OGT	HS	71	502		ROOFTOP UNIT(OGT-HA-71501A,B) Return Air	OFFICE	OGT	1	OFFICE	O				SUS316L	R/A	700	400	2000	-	-	-	-	-	-	5,470	N/A	-	6.3	-	-	-	-	SHEET 13 OF 28	Refer To. OGT-HV-EL-302-0501	-	-	Rect. + Baffle
OGT	HS	71	503		Corridor	OFFICE	OGT	1	Corridor	I				Indoor	S/A	500	300	1100	-	-	-	-	-	-	2,160	N/A	-	4.0	-	-	-	-	SHEET 13 OF 28	Refer To. OGT-HV-EL-302-0501	-	-	Rectangular
OGT	HS	71	504		Office-3	OFFICE	OGT	1	Office-3	I				GALV.	S/A	300	200	700	-	-	-	-	-	-	420	N/A	-	1.9	-	-	-	-	SHEET 13 OF 28	Refer To. OGT-HV-EL-302-0501	-	-	Rectangular
OGT	HS	71	505		Office-6	OFFICE	OGT	1	Office-6	I				GALV.	S/A	300	200	700	-	-	-	-	-	-	440	N/A	-	2.0	-	-	-	-	SHEET 13 OF 28	Refer To. OGT-HV-EL-302-0501	-	-	Rectangular
OGT	HS	71	506		Toilet (M)	OFFICE	OGT	1	Toilet (M)	I				GALV.	E/A	300	300	1100	-	-	-	-	-	-	1,060	N/A	-	3.3	-	-	-	-	SHEET 13 OF 28	Refer To. OGT-HV-EL-302-0501	-	-	Rect. + Elbow
OGT	HS	71	601		ROOFTOP UNIT(OGT-HA-71601A,B) Supply Air																																




				SHWE - Detailed Engineering - Field Development Project																																
				HVAC Equipment List for Onshore																																
Location	Class	System	Number	Code	Description	Building	Platform	QTY	Location		Material			Service TYPE	Dimensions				OPENING SIZE				Design Conditions		Weight		Power (V/PH/HZ)	Hazardous Area Classification	Ducting & Instr. Diagram (OGT-HV-DP-302-0005)	Piping & Instr. Diagram / Overall Single line diagram	REFERENCE SPEC.	Instrument Layout Drawing (OGT-EL-DD-H02-0006)	Remarks			
									Room Description	Indoor(I) / Outdoor(O)	Casing	Shaft	Blade		Width Or Dia. (mm)	Height (mm)	Length (mm)	Opening (mm)	Duct (mm)	Neck Size (mm)	Width (mm)	Height (mm)	Applicable Length (mm)	Airflow (m³/h)	Capacity(kW)	Static Pressure (pa)								Air Vel. (m/s)	Dry (kg)	Operating (kg)
				LOUVER																																
OGT	HL	71	101		Weather Louver w/insect screen	T/B, Laboratory	OGT	1		T/B, Laboratory	-	SUS316L	E.A	850	550	100	-	-	-	-	-	-	-	2490	N/A	-	-	19	-	N/A	-	OGT-HV-DA-302-0202	-	-	-	Concrete wall
OGT	HL	71	102		Weather Louver w/insect screen	T/B, Laboratory	OGT	1		T/B, Laboratory	-	SUS316L	E.A	350	300	100	-	-	-	-	-	-	-	520	N/A	-	-	8	-	N/A	-	OGT-HV-DA-302-0202	-	-	-	Concrete wall
OGT	HL	71	103		Weather Louver w/insect screen	T/B, Laboratory	OGT	1		T/B, Laboratory	-	SUS316L	E.A	700	600	100	-	-	-	-	-	-	-	2170	N/A	-	-	17	-	N/A	-	OGT-HV-DA-302-0203	-	-	-	Concrete wall
OGT	HL	71	104		Weather Louver w/insect screen	T/B, Laboratory	OGT	1		T/B, Laboratory	-	SUS316L	E.A	300	250	100	-	-	-	-	-	-	-	430	N/A	-	-	7	-	N/A	-	OGT-HV-DA-302-0203	-	-	-	Concrete wall
OGT	HL	71	105		Weather Louver w/mosquito screen	T/B, Laboratory	OGT	1		T/B, Laboratory	-	SUS316L	S.A	200	200	200	-	-	-	-	-	-	-	250	N/A	-	-	10	-	N/A	-	OGT-HV-DA-302-0219	-	-	-	w/ BD, Concrete wall
OGT	HL	71	106		Weather Louver w/mosquito screen	T/B, Laboratory	OGT	1		T/B, Laboratory	-	SUS316L	S.A	200	200	200	-	-	-	-	-	-	-	250	N/A	-	-	10	-	N/A	-	OGT-HV-DA-302-0219	-	-	-	w/ BD, Concrete wall
OGT	HL	71	201		Weather Louver w/insect screen	T/B, Laboratory	OGT	1		T/B, Laboratory	-	SUS316L	E.A	200	200	100	-	-	-	-	-	-	-	210	N/A	-	-	6	-	N/A	-	OGT-HV-DA-302-0202	-	-	-	Concrete wall
OGT	HL	71	301		Weather Louver w/insect screen	Mess. Accomodation	OGT	1		Mess. Accomodation	-	SUS316L	E.A	300	300	100	-	-	-	-	-	-	-	460	N/A	-	-	8	-	N/A	-	OGT-HV-DA-302-0403	-	-	-	Concrete wall
OGT	HL	71	302		Weather Louver w/insect screen	Mess. Accomodation	OGT	1		Mess. Accomodation	-	SUS316L	E.A	600	250	100	-	-	-	-	-	-	-	820	N/A	-	-	11	-	N/A	-	OGT-HV-DA-302-0403	-	-	-	Concrete wall
OGT	HL	71	303		Weather Louver w/insect screen	Mess. Accomodation	OGT	1		Mess. Accomodation	-	SUS316L	E.A	1200	900	100	-	-	-	-	-	-	-	5890	N/A	-	-	32	-	N/A	-	OGT-HV-DA-302-0403	-	-	-	Concrete wall
OGT	HL	71	304		Weather Louver w/insect screen	Mess. Accomodation	OGT	1		Mess. Accomodation	-	SUS316L	E.A	2000	1000	100	-	-	-	-	-	-	-	10830	N/A	-	-	49	-	N/A	-	OGT-HV-DA-302-0403	-	-	-	Concrete wall
OGT	HL	71	305		Weather Louver w/insect screen	Mess. Accomodation	OGT	1		Mess. Accomodation	-	SUS316L	S.A	2100	500	200	-	-	-	-	-	-	-	10830	N/A	-	-	76	-	N/A	-	OGT-HV-DA-302-0403	-	-	-	Concrete wall
OGT	HL	71	306		Weather Louver w/insect screen	Mess. Accomodation	OGT	1		Mess. Accomodation	-	SUS316L	E.A	700	300	100	-	-	-	-	-	-	-	1080	N/A	-	-	12	-	N/A	-	OGT-HV-DA-302-0404	-	-	-	Concrete wall
OGT	HL	71	307		Weather Louver w/insect screen	Mess. Accomodation	OGT	1		Mess. Accomodation	-	SUS316L	E.A	700	300	100	-	-	-	-	-	-	-	1080	N/A	-	-	12	-	N/A	-	OGT-HV-DA-302-0404	-	-	-	Concrete wall
OGT	HL	71	308		Weather Louver w/insect screen	Mess. Accomodation	OGT	1		Mess. Accomodation	-	SUS316L	E.A	450	400	100	-	-	-	-	-	-	-	930	N/A	-	-	11	-	N/A	-	OGT-HV-DA-302-0403	-	-	-	Concrete wall
OGT	HL	71	501		Weather Louver w/insect screen	Office	OGT	1		Office	-	SUS316L	E.A	700	300	100	-	-	-	-	-	-	-	1060	N/A	-	-	12	-	N/A	-	OGT-HV-DA-302-0502	-	-	-	Concrete wall
OGT	HL	71	601		Weather Louver w/insect screen	Warehouse&Workshop	OGT	1		Warehouse&Workshop	-	SUS316L	E.A	200	250	100	-	-	-	-	-	-	-	280	N/A	-	-	6	-	N/A	-	OGT-HV-DA-302-0602	-	-	-	Concrete wall
OGT	HL	71	602		Weather Louver w/insect screen	Warehouse&Workshop	OGT	1		Warehouse&Workshop	-	SUS316L	E.A	300	300	100	-	-	-	-	-	-	-	430	N/A	-	-	8	-	N/A	-	OGT-HV-DA-302-0602	-	-	-	Concrete wall
OGT	HL	71	603		Weather Louver w/mosquito screen	Warehouse&Workshop	OGT	1		Warehouse&Workshop	-	SUS316L	S.A	900	600	200	-	-	-	-	-	-	-	3400	N/A	-	-	68	-	N/A	-	OGT-HV-DA-302-0602	-	-	-	w/ BD, Steel wall
OGT	HL	71	701		Weather Louver w/insect screen	G/W&Office	OGT	1		G/W&Office	-	SUS316L	E.A	300	200	100	-	-	-	-	-	-	-	320	N/A	-	-	9	-	N/A	-	OGT-HV-DA-302-0818	-	-	-	Steel wall
OGT	HL	71	702		Weather Louver w/insect screen	G/W&Office	OGT	1		G/W&Office	-	SUS316L	E.A	200	200	100	-	-	-	-	-	-	-	110	N/A	-	-	8	-	N/A	-	OGT-HV-DA-302-0818	-	-	-	Steel wall
OGT	HL	71	705		Weather Louver w/insect screen	G/W&Office	OGT	1		G/W&Office	-	SUS316L	E.A	250	250	100	-	-	-	-	-	-	-	340	N/A	-	-	10	-	N/A	-	OGT-HV-DA-302-0820	-	-	-	Steel wall
OGT	HL	71	706		Weather Louver w/insect screen	G/W&Office	OGT	1		G/W&Office	-	SUS316L	E.A	200	150	100	-	-	-	-	-	-	-	130	N/A	-	-	7	-	N/A	-	OGT-HV-DA-302-0820	-	-	-	Steel wall
OGT	HL	71	707		Weather Louver w/mosquito screen	G/W&Office	OGT	1		G/W&Office	-	SUS316L	S.A	1930	1180	200	-	-	-	-	-	-	-	12000	N/A	-	-	159	-	N/A	-	OGT-HV-DA-302-0802	-	-	-	w/ BD, Steel wall
OGT	HL	71	708		Weather Louver w/mosquito screen	G/W&Office	OGT	1		G/W&Office	-	SUS316L	S.A	1930	1180	200	-	-	-	-	-	-	-	12000	N/A	-	-	159	-	N/A	-	OGT-HV-DA-302-0802	-	-	-	w/ BD, Steel wall
OGT	HL	71	709		Weather Louver w/mosquito screen	G/W&Office	OGT	1		G/W&Office	-	SUS316L	S.A	1930	1180	200	-	-	-	-	-	-	-	12000	N/A	-	-	159	-	N/A	-	OGT-HV-DA-302-0802	-	-	-	w/ BD, Steel wall
OGT	HL	71	801		Weather Louver w/mosquito screen	Chemical Warehouse	OGT	1		Chemical Warehouse	-	SUS316L	S.A	1600	600	200	-	-	-	-	-	-	-	4050	N/A	-	-	96	-	N/A	-	OGT-HV-DA-302-0902	-	-	-	w/ BD, Steel wall
OGT	HL	71	802		Weather Louver w/mosquito screen	Chemical Warehouse	OGT	1		Chemical Warehouse	-	SUS316L	S.A	1600	600	200	-	-	-	-	-	-	-	4050	N/A	-	-	96	-	N/A	-	OGT-HV-DA-302-0902	-	-	-	w/ BD, Steel wall
OGT	HL	71	803		Weather Louver w/mosquito screen	Chemical Warehouse	OGT	1		Chemical Warehouse	-	SUS316L	S.A	500	1100	200	-	-	-	-	-	-	-	2305	N/A	-	-	71	-	N/A	-	OGT-HV-DA-302-0902	-	-	-	w/ BD, Steel wall
OGT	HL	71	804		Weather Louver w/mosquito screen	Chemical Warehouse	OGT	1		Chemical Warehouse	-	SUS316L	S.A	500	1100	200	-	-	-	-	-	-	-	2305	N/A	-	-	71	-	N/A	-	OGT-HV-DA-302-0902	-	-	-	w/ BD, Steel wall
OGT	HL	71	805		Weather Louver w/mosquito screen	Chemical Warehouse	OGT	1		Chemical Warehouse	-	SUS316L	S.A	1800	600	200	-	-	-	-	-	-	-	4610	N/A	-	-	107	-	N/A	-	OGT-HV-DA-302-0902	-	-	-	w/ BD, Steel wall
OGT	HL	71	806		Weather Louver w/mosquito screen	Chemical Warehouse	OGT	1		Chemical Warehouse	-	SUS316L	S.A	1100	600	200	-	-	-	-	-	-	-	8650	N/A	-	-	78	-	N/A	-	OGT-HV-DA-302-0902	-	-	-	w/ BD, Steel wall
OGT	HL	71	807		Weather Louver w/mosquito screen	Chemical Warehouse	OGT	1		Chemical Warehouse	-	SUS316L	S.A	1100	600	200	-	-	-	-	-	-	-	8650	N/A	-	-	78	-	N/A	-	OGT-HV-DA-302-0902	-	-	-	w/ BD, Steel wall
OGT	HL	71	808		Weather Louver w/mosquito screen	Chemical Warehouse	OGT	1		Chemical Warehouse	-	SUS316L	S.A	1100	600	200	-	-	-	-	-	-	-	8650	N/A	-	-	78	-	N/A	-	OGT-HV-DA-302-0902	-	-	-	w/ BD, Steel wall
OGT	HL	71	809		Weather Louver w/mosquito screen	Chemical Warehouse	OGT	1		Chemical Warehouse	-	SUS316L	S.A	1100	600																					




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HVAC Equipment List for Onshore																																																					
Location	Class	System	Number	Code	Description	Building	Platform	Q'TY	Location		Material			Service TYPE	Dimensions						OPENING SIZE				Design Conditions				Weight		Power (V/PH/HZ)	Hazardous Area Classification	Ducting & Instr. Diagram (OGT-HV-DP-302-0005)	Piping & Instr. Diagram / Overall Single line diagram	REFERENCE SPEC.	Instrument Layout Drawing (OGT-EL-OD-H02-0006)	Remarks																
									Room Description	Indor(f) / Outdoor(O)	Casing	Shaft	Blade		Width Or Dia. (mm)	Height (mm)	Length (mm)	Opening (mm)	Duct (mm)	Neck Size (mm)	Width (mm)	Height (mm)	Applcabl e Length (mm)	Airflow (m³/h)	Capacity(kW)		Static Pressure (pa)	Air Vel. (m/s)	Dry (kg)	Operating (kg)																							
																									Cooling	Heating																											
					Hood with mosquito screen																																																
SBU	HL	71	201		Weather Louver w/mosquito screen, Air Filter	Office - Jetty S/B	SBU	1	Office - Jetty S/B	-	SUS316L			S.A	ø260	-	-	ø250	ø150	-	-	-	-	150	N/A	-	-	10	-	N/A	-	SBU-HV-DA-302-1102	Concrete wall	-	-	Concrete wall																	
SBU	HL	71	202		Weather Louver w/mosquito screen, Air Filter	Office - Jetty S/B	SBU	1	Office - Jetty S/B	-	SUS316L			S.A	ø260	-	-	ø250	ø150	-	-	-	-	110	N/A	-	-	10	-	N/A	-	SBU-HV-DA-302-1102	Concrete wall	-	-	Concrete wall																	
SBU	HL	71	203		Weather Louver w/mosquito screen, Air Filter	Office - Jetty S/B	SBU	1	Office - Jetty S/B	-	SUS316L			S.A	ø260	-	-	ø250	ø150	-	-	-	-	30	N/A	-	-	10	-	N/A	-	SBU-HV-DA-302-1102	Concrete wall	-	-	Concrete wall																	
SBU	HL	71	204		Weather Louver w/mosquito screen, Air Filter	Office - Jetty S/B	SBU	1	Office - Jetty S/B	-	SUS316L			S.A	ø260	-	-	ø250	ø150	-	-	-	-	60	N/A	-	-	10	-	N/A	-	SBU-HV-DA-302-1102	Concrete wall	-	-	Concrete wall																	
SBU	HL	71	205		Weather Louver w/mosquito screen, Air Filter	Office - Jetty S/B	SBU	1	Office - Jetty S/B	-	SUS316L			S.A	ø260	-	-	ø250	ø150	-	-	-	-	60	N/A	-	-	10	-	N/A	-	SBU-HV-DA-302-1102	Concrete wall	-	-	Concrete wall																	
SBU	HL	71	206		Weather Louver w/mosquito screen, Air Filter	Office - Jetty S/B	SBU	1	Office - Jetty S/B	-	SUS316L			S.A	ø260	-	-	ø250	ø150	-	-	-	-	80	N/A	-	-	10	-	N/A	-	SBU-HV-DA-302-1102	Concrete wall	-	-	Concrete wall																	
SBU	HL	71	207		Weather Louver w/mosquito screen, Air Filter	Office - Jetty S/B	SBU	1	Office - Jetty S/B	-	SUS316L			S.A	ø260	-	-	ø250	ø150	-	-	-	-	160	N/A	-	-	10	-	N/A	-	SBU-HV-DA-302-1102	Concrete wall	-	-	Concrete wall																	
					Sub Total			7																																													




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Location					Description					Building		Platform	QTY	Location		Material			Service TYPE	Dimensions					OPENING SIZE			Design Conditions				Weight		Power (V/PH/HZ)	Hazardous Area Classification	Ducting & Instr. Diagram (OGT-HV-DP-302-0005)	Piping & Instr. Diagram / Overall Single line diagram	REFERENCE SPEC.	Instrument Layout Drawing (OGT-EL-DD-H02-0006)	Remarks
Class	System	Number	Code		Room Description	Indoor(I) / Outdoor(O)	Casing	Shaft	Blade	Width Or Dia. (mm)	Height (mm)	Length (mm)	Opening (mm)	Duct (mm)	Neck Size (mm)	Width (mm)	Height (mm)	Applicable Length (mm)		Airflow (m³/h)	Capacity(kW)		Static Pressure (pa)	Air Vel. (m/s)	Dry (kg)	Operating (kg)														
TECHNICAL & LABORATORY					INDUCTION DIFFUSER / REGISTER																																			
OGT	SD01	71	101		Diffuser	S.D-01	TECHNICAL & LABORATORY		OGT	1	Laboratory	-	Stainless Steel 316L	S.A	600	600	-	-	-	300	-	-	-	468	N/A	8	0.5	10	-	N/A	Hazardous	-	-	Manned area	-	-				
OGT	SD01	71	102		Diffuser	S.D-01			OGT	1		-		S.A	600	600	-	-	-	300	-	-	-	468	N/A	8	0.5	10	-	N/A										
OGT	SD01	71	103		Diffuser	S.D-01			OGT	1		-		S.A	600	600	-	-	-	300	-	-	-	468	N/A	8	0.5	10	-	N/A										
OGT	SD01	71	104		Diffuser	S.D-01			OGT	1		-		S.A	600	600	-	-	-	300	-	-	-	468	N/A	8	0.5	10	-	N/A										
OGT	ED01	71	101		Diffuser	E.D-01			OGT	1		-		E.A	600	600	-	-	-	300	-	-	-	465	N/A	8	0.5	10	-	N/A										
OGT	ED01	71	102		Diffuser	E.D-01			OGT	1		-		E.A	600	600	-	-	-	300	-	-	-	465	N/A	8	0.5	10	-	N/A										
OGT	SD02	71	101		Diffuser	S.D-02	TECHNICAL & LABORATORY		OGT	1	Air Lock-1	-	Aluminium with coating	S.A	300	300	-	-	-	150	-	-	-	210	N/A	50	3	4	-	N/A	Non-Hazardous	-	-	Unmanned area	-	-				
OGT	SD03	71	101		Diffuser	S.D-03	TECHNICAL & LABORATORY		OGT	1	Office-1	-	Aluminium with coating	S.A	300	300	-	-	-	200	-	-	-	325	N/A	30	2	4	-	N/A	Non-Hazardous	-	-	Manned area	-	-				
OGT	SD03	71	102		Diffuser	S.D-03			OGT	1		-		S.A	300	300	-	-	-	200	-	-	-	325	N/A	30	2	4	-	N/A										
OGT	RD01	71	101		Diffuser	R.D-01			OGT	1		-		R.A	300	300	-	-	-	200	-	-	-	300	N/A	30	2	4	-	N/A										
OGT	RD01	71	102		Diffuser	R.D-01			OGT	1		-		R.A	300	300	-	-	-	200	-	-	-	300	N/A	30	2	4	-	N/A										
OGT	SD04	71	101		Diffuser	S.D-04	TECHNICAL & LABORATORY		OGT	1	Pantry	-	Aluminium with coating	S.A	300	300	-	-	-	100	-	-	-	70	N/A	18	1	4	-	N/A	Non-Hazardous	-	-	Unmanned area	-	-				
OGT	ED02	71	101		Diffuser	E.D-02	OGT	1	-	E.A		300		300	-	-	-	100	-	-	-	50	N/A	8	0.5	4	-	N/A												
OGT	SD05	71	101		Diffuser	S.D-05	TECHNICAL & LABORATORY		OGT	1	Office-3	-	Aluminium with coating	S.A	300	300	-	-	-	200	-	-	-	288	N/A	30	2	4	-	N/A	Non-Hazardous	-	-	Manned area	-	-				
OGT	SD05	71	102		Diffuser	S.D-05			OGT	1		-		S.A	300	300	-	-	-	200	-	-	-	298	N/A	30	2	4	-	N/A										
OGT	SD05	71	103		Diffuser	S.D-05			OGT	1		-		S.A	300	300	-	-	-	200	-	-	-	298	N/A	30	2	4	-	N/A										
OGT	SD05	71	104		Diffuser	S.D-05			OGT	1		-		S.A	300	300	-	-	-	200	-	-	-	298	N/A	30	2	4	-	N/A										
OGT	RD02	71	101		Diffuser	R.D-02			OGT	1		-		R.A	300	300	-	-	-	200	-	-	-	285	N/A	30	2	4	-	N/A										
OGT	RD02	71	102		Diffuser	R.D-02			OGT	1		-		R.A	300	300	-	-	-	200	-	-	-	285	N/A	30	2	4	-	N/A										
OGT	RD02	71	103		Diffuser	R.D-02			OGT	1		-		R.A	300	300	-	-	-	200	-	-	-	285	N/A	30	2	4	-	N/A										
OGT	RD02	71	104		Diffuser	R.D-02			OGT	1		-		R.A	300	300	-	-	-	200	-	-	-	265	N/A	30	2	4	-	N/A										
OGT	SD06	71	101		Diffuser	S.D-06	TECHNICAL & LABORATORY		OGT	1	Meeting & ERC Room	-	Aluminium with coating	S.A	300	300	-	-	-	200	-	-	-	350	N/A	50	3	4	-	N/A	Non-Hazardous	-	-	Manned area	-	-				
OGT	SD06	71	102		Diffuser	S.D-06			OGT	1		-		S.A	300	300	-	-	-	200	-	-	-	350	N/A	50	3	4	-	N/A										
OGT	RD03	71	101		Diffuser	R.D-03			OGT	1		-		R.A	300	300	-	-	-	200	-	-	-	330	N/A	50	3	4	-	N/A										
OGT	RD03	71	102		Diffuser	R.D-03			OGT	1		-		R.A	300	300	-	-	-	200	-	-	-	330	N/A	50	3	4	-	N/A										
OGT	SD07	71	101		Diffuser	S.D-07	TECHNICAL & LABORATORY		OGT	1	Coridor	-	Aluminium with coating	S.A	300	300	-	-	-	150	-	-	-	160	N/A	20	1	4	-	N/A	Non-Hazardous	-	-	Unmanned area	-	-				
OGT	SD07	71	102		Diffuser	S.D-07	OGT	1	-	S.A		300		300	-	-	-	150	-	-	-	160	N/A	20	1	4	-	N/A												
OGT	SD08	71	101		Diffuser	S.D-08	TECHNICAL & LABORATORY		OGT	1	Toilet(M)	-	Aluminium with coating	S.A	300	300	-	-	-	125	-	-	-	105	N/A	20	1	4	-	N/A	Non-Hazardous	-	-	Unmanned area	-	-				
OGT	SD08	71	102		Diffuser	S.D-08			OGT	1		-		S.A	300	300	-	-	-	125	-	-	-	105	N/A	20	1	4	-	N/A										
OGT	ED03	71	101		Diffuser	E.D-03			OGT	1		-		E.A	300	300	-	-	-	150	-	-	-	135	N/A	20	1	4	-	N/A										
OGT	ED03	71	102		Diffuser	E.D-03			OGT	1		-		E.A	300	300	-	-	-	150	-	-	-	135	N/A	20	1	4	-	N/A										
OGT	SD09	71	101		Diffuser	S.D-09	TECHNICAL & LABORATORY		OGT	1	Toilet(W)	-	Aluminium with coating	S.A	300	300	-	-	-	150	-	-	-	170	N/A	30	2	4	-	N/A	Non-Hazardous	-	-	Unmanned area	-	-				
OGT	ED04	71	101		Diffuser	E.D-04	OGT	1	-	E.A		300		300	-	-	-	150	-	-	-	150	N/A	20	1	4	-	N/A												
OGT	SD10	71	101		Diffuser	S.D-10	TECHNICAL & LABORATORY		OGT	1	Office-2	-	Aluminium with coating	S.A	300	300	-	-	-	200	-	-	-	275	N/A	20	1	4	-	N/A	Non-Hazardous	-	-	Manned area	-	-				
OGT	SD10	71	102		Diffuser	S.D-10			OGT	1		-		S.A	300	300	-	-	-	200	-	-	-	275	N/A	20	1	4	-	N/A										
OGT	RD04	71	101		Diffuser	R.D-04			OGT	1		-		R.A	300	300	-	-	-	200	-	-	-	250	N/A	20	1	4	-	N/A										
OGT	RD04	71	102		Diffuser	R.D-04			OGT	1		-		R.A	300	300	-	-	-	200	-	-	-	250	N/A	20	1	4	-	N/A										
OGT	SD11	71	101		Diffuser	S.D-11	TECHNICAL & LABORATORY		OGT	1	Central Control Room	-	Aluminium with coating	S.A	600	600	-	-	-	350	-	-	-	715	N/A	20	1	10	-	N/A	Non-Hazardous	-	-	Manned area	-	-				
OGT	SD11	71	102		Diffuser	S.D-11			OGT	1		-		S.A	600	600	-	-	-	350	-	-	-	715	N/A	20	1	10	-	N/A										
OGT	SD11	71	103		Diffuser	S.D-11			OGT	1		-		S.A	600	600	-	-	-	350	-	-	-	715	N/A	20	1	10	-	N/A										
OGT	SD11	71	104		Diffuser	S.D-11			OGT	1		-		S.A	600	600	-	-	-	350	-	-	-	715	N/A	20	1	10	-	N/A										
OGT	RD05	71	101		Diffuser	R.D-05			OGT	1		-		R.A	600	600	-	-	-	350	-	-	-	695	N/A	20	1	10	-	N/A										
OGT	RD05	71	102		Diffuser	R.D-05			OGT	1		-		R.A	600	600	-	-	-	350	-	-	-	695	N/A	20	1	10	-	N/A										
OGT	RD05	71	103		Diffuser	R.D-05			OGT	1		-		R.A	600	600	-	-	-	350	-	-	-	695	N/A	20	1	10	-	N/A										
OGT	SR05	71	104		Diffuser	R.D-05			OGT	1		-		R.A	600	600	-	-	-	350	-	-	-	695	N/A	20	1	10	-	N/A										
OGT	SD13	71	101		Diffuser	S.D-13	TECHNICAL & LABORATORY		OGT	1	Janitor	-	Aluminium with coating	S.A	300	300	-	-	-	100	-	-	-	50	N/A	10	1	4	-	N/A	Non-Hazardous	-	-	Unmanned area	-	-				
OGT	ED05	71	101		Diffuser	E.D-05	OGT	1	-	E.A		300		300	-	-	-	100	-	-	-	50	N/A	10	1	4	-	N/A												
OGT	SD14	71	101		Diffuser	S.D-14	TECHNICAL & LABORATORY		OGT	1	Air Lock-2	-	Aluminium with coating	S.A	300	300	-	-	-	150	-	-	-	130	N/A	20	1	4	-	N/A	Non-Hazardous	-	-	Unmanned area	-	-				
OGT	SD121	71	101		Diffuser	S.D-121	TECHNICAL & LABORATORY		OGT	1	IER	-	Aluminium with coating	S.A	600	600	-	-	-	350	-	-	-	768	N/A	20	1	10	-	N/A	Non-Hazardous	-	-	Manned area	-	-				
OGT	SD121	71	102		Diffuser	S.D-121			OGT	1		-		S.A	600	600	-	-	-	350	-	-	-	768	N/A	20	1	10	-	N/A										
OGT	SD121	71	103		Diffuser	S.D-121			OGT	1		-		S.A	600	600	-	-	-	350	-	-	-	768	N/A	20	1	10	-	N/A										
OGT	SD121	71	104		Diffuser	S.D-121			OGT	1		-		S.A	600	600	-	-	-	350	-	-	-	768	N/A	20	1	10	-	N/A										
OGT	SD121	71	105		Diffuser	S.D-121			OGT	1		-		S.A	600	600	-	-	-	350	-	-	-	768	N/A	20	1	10	-	N/A										
OGT	SD121	71	106		Diffuser	S.D-121			OGT	1		-		S.A	600	600	-	-	-	350	-	-	-	768	N/A	20	1	10	-	N/A										
OGT	SD121	71	107		Diffuser	S.D-121			OGT	1		-		S.A	600	600	-	-	-	350	-	-	-	768	N/A	20	1	10	-	N/A										
OGT	SD121	71	108		Diffuser	S.D-121			OGT	1		-		S.A	600	600	-	-	-	350	-	-	-	768																




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HVAC Equipment List for Onshore																																					
Location	Class	System	Number	Code	Description	Building	Platform	QTY	Location		Material			Service TYPE	Dimensions					OPENING SIZE			Design Conditions				Weight		Power (V/PH/HZ)	Hazadous Area Classification	Ducting & Instr. Diagram (OGT-HV-DP-302-0005)	Piping & Instr. Diagram / Overall Single line diagram	REFERENCE SPEC.	Instrument Layout Drawing (OGT-EL-DD-H02-0006)	Remarks		
									Room Description	Indoor(I) / Outdoor(O)	Casing	Shaft	Blade		Width Or Dia. (mm)	Height (mm)	Length (mm)	Opening (mm)	Duct (mm)	Neck Size (mm)	Width (mm)	Height (mm)	Applcable Length (mm)	Airflow (m³/h)	Capacity(kW)		Static Pressure (pa)	Air Vel. (m/s)								Dry (kg)	Operating (kg)
																									Cooling	Heating											
OGT	SD08	71	301		Diffuser	S.D-08		1	Resting Room	-	Aluminium with coating	S.A	300	300	-	-	-	150	-	-	-	150	N/A	20	1	4	-	N/A	Non-Hazardous	-	-	Unmanned area	-	-			
OGT	ED07	71	301		Diffuser	R.D-07		1		-		R.A	300	300	-	-	-	150	-	-	-	110	N/A	15	1	4	-	N/A									
OGT	SD09	71	301		Diffuser	S.D-09		1	Gymnasium	-	Aluminium with coating	S.A	300	300	-	-	-	200	-	-	-	330	N/A	40	2	4	-	N/A	Non-Hazardous	-	-	Manned area	-	-			
OGT	SD09	71	302		Diffuser	S.D-09		1		-		S.A	300	300	-	-	-	200	-	-	-	330	N/A	40	2	4	-	N/A									
OGT	RD08	71	301		Diffuser	R.D-08		1		-		R.A	300	300	-	-	-	200	-	-	-	295	N/A	30	2	4	-	N/A									
OGT	RD08	71	302		Diffuser	R.D-08		1		-		R.A	300	300	-	-	-	200	-	-	-	295	N/A	30	2	4	-	N/A									
OGT	SD10	71	301		Diffuser	S.D-10		1	Storage	-	Aluminium with coating	S.A	300	300	-	-	-	150	-	-	-	180	N/A	30	2	4	-	N/A	Non-Hazardous	-	-	Unmanned area	-	-			
OGT	ED06	71	302		Diffuser	E.D-06		1		-		E.A	300	300	-	-	-	125	-	-	-	130	N/A	30	2	4	-	N/A									
OGT	SD11	71	301		Diffuser	S.D-11		1	Laundry	-	Stainless steel 316L	S.A	300	300	-	-	-	200	-	-	-	327	N/A	40	2	4	-	N/A	Non-Hazardous	-	-	Manned area	-	-			
OGT	SD11	71	302		Diffuser	S.D-11		1		-		S.A	300	300	-	-	-	200	-	-	-	327	N/A	40	2	4	-	N/A									
OGT	SD11	71	303		Diffuser	S.D-11		1		-		S.A	300	300	-	-	-	200	-	-	-	327	N/A	40	2	4	-	N/A									
OGT	ED07	71	301		Diffuser	E.D-07		1		-		E.A	300	300	-	-	-	200	-	-	-	310	N/A	40	2	4	-	N/A									
OGT	ED07	71	302		Diffuser	E.D-07		1		-		E.A	300	300	-	-	-	200	-	-	-	310	N/A	40	2	4	-	N/A									
OGT	ED07	71	303		Diffuser	E.D-07		1		-		E.A	300	300	-	-	-	200	-	-	-	310	N/A	40	2	4	-	N/A									
OGT	SD12	71	301		Diffuser	S.D-12		1	Dining Room	-	Aluminium with coating	S.A	600	600	-	-	-	200	-	-	-	295	N/A	30	2	10	-	N/A	Non-Hazardous	-	-	Manned area	-	-			
OGT	SD12	71	302		Diffuser	S.D-12		1		-		S.A	600	600	-	-	-	200	-	-	-	295	N/A	30	2	10	-	N/A									
OGT	SD12	71	303		Diffuser	S.D-12		1		-		S.A	600	600	-	-	-	200	-	-	-	295	N/A	30	2	10	-	N/A									
OGT	SD12	71	304		Diffuser	S.D-12		1		-		S.A	600	600	-	-	-	200	-	-	-	295	N/A	30	2	10	-	N/A									
OGT	SD12	71	305		Diffuser	S.D-12		1		-		S.A	600	600	-	-	-	200	-	-	-	295	N/A	30	2	10	-	N/A									
OGT	SD12	71	306		Diffuser	S.D-12		1		-		S.A	600	600	-	-	-	200	-	-	-	295	N/A	30	2	10	-	N/A									
OGT	SD12	71	307		Diffuser	S.D-12		1		-		S.A	600	600	-	-	-	200	-	-	-	295	N/A	30	2	10	-	N/A									
OGT	SD12	71	308		Diffuser	S.D-12		1		-		S.A	600	600	-	-	-	200	-	-	-	295	N/A	30	2	10	-	N/A									
OGT	SD12	71	309		Diffuser	S.D-12		1		-		S.A	600	600	-	-	-	200	-	-	-	295	N/A	30	2	10	-	N/A									
OGT	SD12	71	310		Diffuser	S.D-12		1		-		S.A	600	600	-	-	-	200	-	-	-	295	N/A	30	2	10	-	N/A									
OGT	SD12	71	311		Diffuser	S.D-12		1		-		S.A	600	600	-	-	-	200	-	-	-	295	N/A	30	2	10	-	N/A									
OGT	SD12	71	312		Diffuser	S.D-12		1		-		S.A	600	600	-	-	-	200	-	-	-	295	N/A	30	2	10	-	N/A									
OGT	ED08	71	301		Diffuser	E.D-08		1		-		E.A	600	600	-	-	-	250	-	-	-	503	N/A	35	2	10	-	N/A									
OGT	ED08	71	302		Diffuser	E.D-08		1		-		E.A	600	600	-	-	-	250	-	-	-	503	N/A	35	2	10	-	N/A									
OGT	ED08	71	303		Diffuser	E.D-08		1		-		E.A	600	600	-	-	-	250	-	-	-	503	N/A	35	2	10	-	N/A									
OGT	SD13	71	301		Diffuser	S.D-13		1	Kitchen	-	Stainless steel 316L	S.A	600	600	-	-	-	250	-	-	-	470	N/A	30	2	10	-	N/A	Non-Hazardous	-	-	Manned area	-	-			
OGT	SD13	71	302		Diffuser	S.D-13		1		-		S.A	600	600	-	-	-	250	-	-	-	470	N/A	30	2	10	-	N/A									
OGT	SD13	71	303		Diffuser	S.D-13		1		-		S.A	600	600	-	-	-	250	-	-	-	470	N/A	30	2	10	-	N/A									
OGT	SD13	71	304		Diffuser	S.D-13		1		-		S.A	600	600	-	-	-	250	-	-	-	470	N/A	30	2	10	-	N/A									
OGT	SD13	71	305		Diffuser	S.D-13		1		-		S.A	600	600	-	-	-	250	-	-	-	470	N/A	30	2	10	-	N/A									
OGT	TR01	71	306		Register	T.R-01		1		-		T.A	600	600	-	-	-	-	-	-	-	2030	N/A	10	1	10	-	N/A									
OGT	TR01	71	307		Register	T.R-01		1		-		T.A	600	600	-	-	-	-	-	-	-	2030	N/A	10	1	10	-	N/A									
OGT	ED09	71	301		Diffuser	E.D-09		1		-		E.A	600	600	-	-	-	350	-	-	-	876	N/A	30	2	10	-	N/A									
OGT	ED09	71	302		Diffuser	E.D-09		1		-		E.A	600	600	-	-	-	350	-	-	-	876	N/A	30	2	10	-	N/A									
OGT	ED09	71	303		Diffuser	E.D-09		1		-		E.A	600	600	-	-	-	350	-	-	-	876	N/A	30	2	10	-	N/A									
OGT	ED09	71	304		Diffuser	E.D-09		1		-		E.A	600	600	-	-	-	350	-	-	-	876	N/A	30	2	10	-	N/A									
OGT	ED09	71	305		Diffuser	E.D-09		1		-		E.A	600	600	-	-	-	350	-	-	-	876	N/A	30	2	10	-	N/A									
OGT	SD14	71	301		Diffuser	S.D-14		1	Corridor-2	-	Aluminium with coating	S.A	300	300	-	-	-	150	-	-	-	160	N/A	20	1	4	-	N/A	Non-Hazardous	-	-	Unmanned area	-	-			
OGT	SD14	71	302		Diffuser	S.D-14		1		-		S.A	300	300	-	-	-	150	-	-	-</																

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Location	Class	System	Number	Code	Description	Building	Platform	QTY	Location	Indoor(I) / Outdoor(O)	Material			Service TYPE	Dimensions					OPENING SIZE			Design Conditions				Weight		Power (V/PH/HZ)	Hazardous Area Classification	Ducting & Instr. Diagram (OGT-HV-DP-302-0005)	Piping & Instr. Diagram / Overall Single line diagram	REFERENCE SPEC.	Instrument Layout Drawing (OGT-EL-DD-H02-0006)	Remarks
											Casing	Shaft	Blade		Width Or Dia. (mm)	Height (mm)	Length (mm)	Opening (mm)	Duct (mm)	Neck Size (mm)	Width (mm)	Height (mm)	Applicable Length (mm)	Airflow (m³/h)	Capacity(kW)		Static Pressure (pa)	Air Vel. (m/s)							
OGT	SD21	71	301		Diffuser	S.D-21	MESS RECREATION, ACCOMMODATION	OGT	1	02D Double Room (Toilet)	-	Aluminium with coating	S.A	600	600	-	-	-	300	-	-	-	500	N/A	10	1	10	-	N/A	Non-Hazardous	-	-	Manned area	-	-
OGT	RD11	71	301		Diffuser	R.D-11		OGT	1		-		R.A	600	600	-	-	-	250	-	-	-	380	N/A	20	1	10	-	N/A						
OGT	ED13	71	301		Diffuser	E.D-13		OGT	1		-		E.A	200	200	-	-	-	100	-	-	-	90	N/A	25	1	4	-	N/A						
OGT	SD22	71	301		Diffuser	S.D-22	MESS RECREATION, ACCOMMODATION	OGT	1	03D Double Room (Toilet)	-	Aluminium with coating	S.A	600	600	-	-	-	300	-	-	-	500	N/A	10	1	10	-	N/A	Non-Hazardous	-	-	Manned area	-	-
OGT	RD13	71	301		Diffuser	R.D-13		OGT	1		-		R.A	600	600	-	-	-	250	-	-	-	380	N/A	20	1	10	-	N/A						
OGT	ED15	71	301		Diffuser	E.D15		OGT	1		-		E.A	200	200	-	-	-	100	-	-	-	90	N/A	25	1	4	-	N/A						
OGT	SD23	71	301		Diffuser	S.D-23	MESS RECREATION, ACCOMMODATION	OGT	1	04D Double Room (Toilet)	-	Aluminium with coating	S.A	600	600	-	-	-	300	-	-	-	500	N/A	10	1	10	-	N/A	Non-Hazardous	-	-	Manned area	-	-
OGT	RD14	71	301		Diffuser	R.D-14		OGT	1		-		R.A	600	600	-	-	-	250	-	-	-	380	N/A	20	1	10	-	N/A						
OGT	ED16	71	301		Diffuser	E.D-16		OGT	1		-		E.A	200	200	-	-	-	100	-	-	-	90	N/A	25	1	4	-	N/A						
OGT	SD24	71	301		Diffuser	S.D-24	MESS RECREATION, ACCOMMODATION	OGT	1	5D Double Room (Toilet)	-	Aluminium with coating	S.A	600	600	-	-	-	300	-	-	-	500	N/A	10	1	10	-	N/A	Non-Hazardous	-	-	Manned area	-	-
OGT	RD15	71	301		Diffuser	R.D-15		OGT	1		-		R.A	600	600	-	-	-	250	-	-	-	380	N/A	20	1	10	-	N/A						
OGT	ED17	71	301		Diffuser	E.D-17		OGT	1		-		E.A	200	200	-	-	-	100	-	-	-	90	N/A	25	1	4	-	N/A						
OGT	SD25	71	301		Diffuser	S.D-25	MESS RECREATION, ACCOMMODATION	OGT	1	6D Double Room (Toilet)	-	Aluminium with coating	S.A	600	600	-	-	-	300	-	-	-	500	N/A	10	1	10	-	N/A	Non-Hazardous	-	-	Manned area	-	-
OGT	RD16	71	301		Diffuser	R.D-16		OGT	1		-		R.A	600	600	-	-	-	250	-	-	-	380	N/A	20	1	10	-	N/A						
OGT	ED18	71	301		Diffuser	E.D-18		OGT	1		-		E.A	200	200	-	-	-	100	-	-	-	90	N/A	25	1	4	-	N/A						
OGT	SD26	71	301		Diffuser	S.D-26	MESS RECREATION, ACCOMMODATION	OGT	1	7D Double Room (Toilet)	-	Aluminium with coating	S.A	600	600	-	-	-	300	-	-	-	500	N/A	10	1	10	-	N/A	Non-Hazardous	-	-	Manned area	-	-
OGT	RD17	71	301		Diffuser	R.D-17		OGT	1		-		R.A	600	600	-	-	-	250	-	-	-	380	N/A	20	1	10	-	N/A						
OGT	ED19	71	301		Diffuser	E.D-19		OGT	1		-		E.A	200	200	-	-	-	100	-	-	-	90	N/A	25	1	4	-	N/A						
OGT	SD27	71	301		Diffuser	S.D-27	MESS RECREATION, ACCOMMODATION	OGT	1	8D Double Room (Toilet)	-	Aluminium with coating	S.A	600	600	-	-	-	300	-	-	-	500	N/A	10	1	10	-	N/A	Non-Hazardous	-	-	Manned area	-	-
OGT	RD18	71	301		Diffuser	R.D-18		OGT	1		-		R.A	600	600	-	-	-	250	-	-	-	380	N/A	20	1	10	-	N/A						
OGT	ED20	71	301		Diffuser	E.D-20		OGT	1		-		E.A	200	200	-	-	-	100	-	-	-	90	N/A	25	1	4	-	N/A						
OGT	SD28	71	301		Diffuser	S.D-28	MESS RECREATION, ACCOMMODATION	OGT	1	9D Double Room (Toilet)	-	Aluminium with coating	S.A	600	600	-	-	-	250	-	-	-	450	N/A	10	1	10	-	N/A	Non-Hazardous	-	-	Manned area	-	-
OGT	RD19	71	301		Diffuser	R.D-19		OGT	1		-		R.A	300	300	-	-	-	200	-	-	-	310	N/A	20	1	4	-	N/A						
OGT	ED21	71	301		Diffuser	E.D-21		OGT	1		-		E.A	200	200	-	-	-	100	-	-	-	90	N/A	25	1	4	-	N/A						
OGT	SD29	71	301		Diffuser	S.D-29	MESS RECREATION, ACCOMMODATION	OGT	1	10D Double Room (Toilet)	-	Aluminium with coating	S.A	600	600	-	-	-	250	-	-	-	410	N/A	10	1	10	-	N/A	Non-Hazardous	-	-	Manned area	-	-
OGT	RD20	71	301		Diffuser	R.D-20		OGT	1		-		R.A	300	300	-	-	-	200	-	-	-	290	N/A	20	1	4	-	N/A						
OGT	ED22	71	301		Diffuser	E.D-22		OGT	1		-		E.A	200	200	-	-	-	100	-	-	-	90	N/A	25	1	4	-	N/A						
OGT	SD30	71	301		Diffuser	S.D-30	MESS RECREATION, ACCOMMODATION	OGT	1	11D Double Room (Toilet)	-	Aluminium with coating	S.A	600	600	-	-	-	250	-	-	-	420	N/A	10	1	10	-	N/A	Non-Hazardous	-	-	Manned area	-	-
OGT	RD21	71	301		Diffuser	R.D-21		OGT	1		-		R.A	300	300	-	-	-	200	-	-	-	300	N/A	20	1	4	-	N/A						
OGT	ED23	71	301		Diffuser	E.D-23		OGT	1		-		E.A	200	200	-	-	-	100	-	-	-	90	N/A	25	1	4	-	N/A						
OGT	SD31	71	301		Diffuser	S.D-31	MESS RECREATION, ACCOMMODATION	OGT	1	12D Double Room (Toilet)	-	Aluminium with coating	S.A	600	600	-	-	-	250	-	-	-	410	N/A	10	1	10	-	N/A	Non-Hazardous	-	-	Manned area	-	-
OGT	RD22	71	301		Diffuser	R.D-22		OGT	1		-		R.A	300	300	-	-	-	200	-	-	-	290	N/A	20	1	4	-	N/A						
OGT	ED24	71	301		Diffuser	E.D-24		OGT	1		-		E.A	200	200	-	-	-	100	-	-	-	90	N/A	25	1	4	-	N/A						
OGT	SD32	71	301		Diffuser	S.D-32	MESS RECREATION, ACCOMMODATION	OGT	1	13D Double Room (Toilet)	-	Aluminium with coating	S.A	600	600	-	-	-	250	-	-	-	420	N/A	10	1	10	-	N/A	Non-Hazardous	-	-	Manned area	-	-
OGT	RD23	71	301		Diffuser	R.D-23		OGT	1		-		R.A	300	300	-	-	-	200	-	-	-	300	N/A	20	1	4	-	N/A						
OGT	ED25	71	301		Diffuser	E.D-25		OGT	1		-		E.A	200	200	-	-	-	100	-	-	-	90	N/A	25	1	4	-	N/A						
OGT	SD33	71	301		Diffuser	S.D-33	MESS RECREATION, ACCOMMODATION	OGT	1	14D Double Room (Toilet)	-	Aluminium with coating	S.A	600	600	-	-	-	250	-	-	-	410	N/A	10	1	10	-	N/A	Non-Hazardous	-	-	Manned area	-	-
OGT	RD24	71	301		Diffuser	R.D-24		OGT	1		-		R.A	300	300	-	-	-	200	-	-	-	290	N/A	20	1	4	-	N/A						
OGT	ED26	71	301		Diffuser	E.D-26		OGT	1		-		E.A	200	200	-	-	-	100	-	-	-	90	N/A	25	1	4	-	N/A						
OGT	SD34	71	301		Diffuser	S.D-34	MESS RECREATION, ACCOMMODATION	OGT	1	15D Double Room (Toilet)	-	Aluminium with coating	S.A	600	600	-	-	-	250	-	-	-	420	N/A	10	1	10	-	N/A	Non-Hazardous	-	-	Manned area	-	-
OGT	RD25	71	301		Diffuser	R.D-25		OGT	1		-		R.A	300	300	-	-	-	200	-	-	-	300	N/A	20	1	4	-	N/A						
OGT	ED27	71	301		Diffuser	E.D-27		OGT	1		-		E.A	200	200	-	-	-	100	-	-	-	90	N/A	25	1	4	-	N/A						
OGT	SD35	71	301		Diffuser	S.D-35	MESS RECREATION, ACCOMMODATION	OGT	1	01S Single Room (Toilet)	-	Aluminium with coating	S.A	300	300	-	-	-	200	-	-	-	320	N/A	20	1	4	-	N/A	Non-Hazardous	-	-	Manned area	-	-
OGT	RD26	71	301		Diffuser	R.D-26		OGT	1		-		R.A	300	300	-	-	-	200	-	-	-	200	N/A	15	1	4	-	N/A						
OGT	ED28	71	301		Diffuser	E.D-28		OGT	1		-		E.A	200	200	-	-	-	100	-	-	-	90	N/A	25	1	4	-	N/A						
OGT	SD36	71	301		Diffuser	S.D-36	MESS RECREATION, ACCOMMODATION	OGT	1	02S Single Room (Toilet)	-	Aluminium with coating	S.A	300	300	-	-	-	200	-	-	-	330	N/A	20	1	4	-	N/A	Non-Hazardous	-	-	Manned area	-	-
OGT	RD27	71	301		Diffuser	R.D-27		OGT	1		-		R.A	300	300	-	-	-	200	-	-	-	210	N/A	15	1	4	-	N/A						
OGT	ED29	71	301		Diffuser	E.D-29		OGT	1		-		E.A	200	200	-	-	-	100	-	-	-	90	N/A	25	1	4	-	N/A						
OGT	SD37	71	301		Diffuser	S.D-37	MESS RECREATION, ACCOMMODATION	OGT	1	03S Single Room (Toilet)	-	Aluminium with coating	S.A	300	300	-	-	-	200	-	-	-	320	N/A	20	1	4	-	N/A	Non-Hazardous	-	-	Manned area	-	-
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Appendix T: Material safety data sheet of R-134A



NATIONAL REFRIGERANTS, INC.

R-134a

Safety Data Sheet

R-134a

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: R-134a
OTHER NAME: 1,1,1,2-Tetrafluoroethane
USE: Refrigerant Gas
DISTRIBUTOR: National Refrigerants, Inc.
661 Kenyon Avenue
Bridgeton, New Jersey 08302

FOR MORE INFORMATION CALL:
(Monday-Friday, 8:00am-5:00pm)
1-800-262-0012

IN CASE OF EMERGENCY CALL:
CHEMTREC: 1-800-424-9300

2. HAZARDS IDENTIFICATION

CLASSIFICATION: Gases under pressure, Liquefied Gas
SIGNAL WORD: WARNING
HAZARD STATEMENT: Contains gas under pressure, may explode if heated
SYMBOL: Gas Cylinder
PRECAUTIONARY STATEMENT: STORAGE: Protect from sunlight, store in a well ventilated place



EMERGENCY OVERVIEW: Colorless, volatile liquid with ethereal and faint sweetish odor. Non-flammable material. Overexposure may cause dizziness and loss of concentration. At higher levels, CNS depression and cardiac arrhythmia may result from exposure. Vapors displace air and can cause asphyxiation in confined spaces. At higher temperatures, (>250°C), decomposition products may include Hydrofluoric Acid (HF) and carbonyl halides.

POTENTIAL HEALTH HAZARDS

SKIN: Irritation would result from a defatting action on tissue. Liquid contact could cause frostbite.

EYES: Liquid contact can cause severe irritation and frostbite. Mist may irritate.

INHALATION: R-134a is low in acute toxicity in animals. When oxygen levels in air are reduced to 12-14% by displacement, symptoms of asphyxiation, loss of coordination, increased pulse rate and deeper respiration will occur. At high levels, cardiac arrhythmia may occur.

INGESTION: Ingestion is unlikely because of the low boiling point of the material. Should it occur, discomfort in the gastrointestinal tract from rapid evaporation of the material and consequent evolution of gas would result. Some effects of inhalation and skin exposure would be expected.

DELAYED EFFECTS: None Known

Ingredients found on one of the OSHA designated carcinogen lists are listed below.

**INGREDIENT NAME**

No ingredients listed in this section

NTP STATUS**IARC STATUS****OSHA LIST****3. COMPOSITION / INFORMATION ON INGREDIENTS****INGREDIENT NAME**

1,1,1,2-Tetrafluoroethane

CAS NUMBER

811-97-2

WEIGHT %

100

COMMON NAME AND SYNONYMS

R-134a; HFC134a

There are no impurities or stabilizers that contribute to the classification of the material identified in Section 2

4. FIRST AID MEASURES

SKIN: Promptly flush skin with water until all chemical is removed. If there is evidence of frostbite, bathe (do not rub) with lukewarm (not hot) water. If water is not available, cover with a clean, soft cloth or similar covering. Get medical attention if symptoms persist.

EYES: Immediately flush eyes with large amounts of water for at least 15 minutes (in case of frostbite, water should be lukewarm, not hot) lifting eyelids occasionally to facilitate irrigation. Get medical attention if symptoms persist.

INHALATION: Immediately move to fresh air. If breathing has stopped, give artificial respiration. Use oxygen as required, provided a qualified operator is available. Get medical attention immediately. **DO NOT** give epinephrine (adrenaline).

INGESTION: Ingestion is unlikely because of the physical properties and is not expected to be hazardous. **DO NOT** induce vomiting unless instructed to do so by a physician.

ADVICE TO PHYSICIAN: Because of the possible disturbances of cardiac rhythm, catecholamine drugs, such as epinephrine, should be used with special caution and only in situations of emergency life support. Treatment of overexposure should be directed at the control of symptoms and the clinical conditions.

5. FIRE FIGHTING MEASURES**FLAMMABLE PROPERTIES****FLASH POINT:**

Gas, not applicable per DOT regulations

FLASH POINT METHOD:

Not applicable

AUTOIGNITION TEMPERATURE:

>750°C

UPPER FLAME LIMIT (volume % in air):

None*

LOWER FLAME LIMIT (volume % in air):

None*

*Based on ASHRAE Standard 34 with match ignition

FLAME PROPAGATION RATE (solids):

Not applicable

OSHA FLAMMABILITY CLASS:

Not applicable

EXTINGUISHING MEDIA:

Use any standard agent – choose the one most appropriate for type of surrounding fire (material itself is not flammable)



UNUSUAL FIRE AND EXPLOSION HAZARDS:

R-134a is not flammable at ambient temperatures and atmospheric pressure. However, this material will become combustible when mixed with air under pressure and exposed to strong ignition sources.

Contact with certain reactive metals may result in formation of explosive or exothermic reactions under specific conditions (e.g. very high temperatures and/or appropriate pressures).

SPECIAL FIRE FIGHTING PRECAUTIONS/INSTRUCTIONS:

Firefighters should wear self-contained, NIOSH-approved breathing apparatus for protection against possible toxic decomposition products. Proper eye and skin protection should be provided. Use water spray to keep fire-exposed containers cool.

6. ACCIDENTAL RELEASE MEASURES

IN CASE OF SPILL OR OTHER RELEASE: (Always wear recommended personal protective equipment.)

Evacuate unprotected personnel. Product dissipates upon release. Protected personnel should remove ignition sources and shut off leak, if without risk, and provide ventilation. Unprotected personnel should not return to the affected area until air has been tested and determined safe, including low-lying areas.

Spills and releases may have to be reported to Federal and/or local authorities. See Section 15 regarding reporting requirements.

7. HANDLING AND STORAGE

NORMAL HANDLING:

(Always wear recommended personal protective equipment.)

Avoid breathing vapors and liquid contact with eyes, skin or clothing. Do not puncture or drop cylinders, expose them to open flame or excessive heat. Use authorized cylinders only. Follow standard safety precautions for handling and use of compressed gas cylinders.

R-134a should not be mixed with air above atmospheric pressure for leak testing or any other purpose.

STORAGE RECOMMENDATIONS:

Store in a cool, well-ventilated area of low fire risk and out of direct sunlight. Protect cylinder and its fittings from physical damage. Storage in subsurface locations should be avoided. Close valve tightly after use and when empty.

INCOMPATIBILITIES:

Freshly abraded aluminum surfaces at specific temperatures and pressures may cause a strong exothermic reaction.

Chemically reactive metals: potassium, calcium, powdered aluminum, magnesium, and zinc.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

ENGINEERING CONTROLS:

Provide local ventilation at filling zones and areas where leakage is probable. Mechanical (general) ventilation may be adequate for other operating and storage areas.

**PERSONAL PROTECTIVE EQUIPMENT****SKIN PROTECTION:**

Skin contact with refrigerant may cause frostbite. General work clothing and gloves (leather) should provide adequate protection. If prolonged contact with liquid or gas is anticipated, insulated gloves constructed of PVA, neoprene or butyl rubber should be used. Any contaminated clothing should be promptly removed and washed before reuse.

EYE PROTECTION:

For normal conditions, wear safety glasses. Where there is reasonable probability of liquid contact, wear chemical safety goggles.

RESPIRATORY PROTECTION:

None generally required for adequately ventilated work situations. For accidental release or non-ventilated situations, or release into confined space, where the concentration may be above the PEL of 1,000 ppm, use a self-contained, NIOSH approved breathing apparatus or supplied air respirator. For escape: use the former or a NIOSH approved gas mask with organic vapor canister.

ADDITIONAL RECOMMENDATIONS:

Where contact with liquid is likely, such as in a spill or leak, impervious boots and clothing should be worn. High dose-level warning signs are recommended for areas of principle exposure. Provide eyewash stations and quick-drench shower facilities at convenient locations. For tank cleaning operations, see OSHA regulations, 29 CFR 1910.132 and 29 CFR 1910.133.

EXPOSURE GUIDELINES**INGREDIENT NAME**

1,1,1,2-Tetrafluoroethane

ACGIH TLV

None

OSHA PEL

None

OTHER LIMIT

*1000 ppm TWA (8hr)

* = Workplace Environmental Exposure Level (AIHA)

OTHER EXPOSURE LIMITS FOR POTENTIAL DECOMPOSITION PRODUCTS:

Hydrogen Fluoride: ACGIH TLV: 2 ppm ceiling, 0.5 ppm TLV-TWA

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE:	Clear, colorless liquid and vapor
PHYSICAL STATE:	Gas at ambient temperatures
MOLECULAR WEIGHT:	102
CHEMICAL FORMULA:	F ₃ CCH ₂ F
ODOR:	Faint ethereal odor
SPECIFIC GRAVITY (water = 1.0):	<1.22
SOLUBILITY IN WATER (weight %):	0.15 wt%
pH:	Neutral
BOILING POINT:	-26.2°C (-15.1°F)
FREEZING POINT:	-92.5°C (-141.9°F)
VAPOR PRESSURE:	85.8 psia @ 70°F 213.4 psia @ 130°F
VAPOR DENSITY (air = 1.0):	3.5
EVAPORATION RATE:	>1 COMPARED TO: CCl ₄ = 1
% VOLATILES:	100



ODOR THRESHHOLD:	Not established
FLAMMABILITY:	Not applicable
LEL/UEL:	None/None
RELATIVE DENSITY:	1.21g/cm ³ at 25°C
PARTITION COEFF (n-octanol/water)	Log Pow: 1.06
AUTO IGNITION TEMP:	>750°C
DECOMPOSITION TEMPERATURE:	>250°C
VISCOSITY:	Not applicable
FLASH POINT:	Not applicable

(Flash point method and additional flammability data are found in Section 5.)

10. STABILITY AND REACTIVITY

NORMALLY STABLE: (CONDITIONS TO AVOID):

The product is stable.

Do not mix with oxygen or air above atmospheric pressure. Any source of high temperatures, such as lighted cigarettes, flames, hot spots or welding may yield toxic and/or corrosive decomposition products.

INCOMPATIBILITIES:

(Under specific conditions: e.g. very high temperatures and/or appropriate pressures) – Freshly abraded aluminum surfaces (may cause strong exothermic reaction). Chemically reactive metals: potassium, calcium, powdered aluminum, magnesium, and zinc.

HAZARDOUS DECOMPOSITION PRODUCTS:

Halogens, halogen acids and possibly carbonyl halides.

HAZARDOUS POLYMERIZATION:

Will not occur.

11. TOXICOLOGICAL INFORMATION

IMMEDIATE (ACUTE) EFFECTS:

LC₅₀ :Inhalation 4 hr. (rat) - > 500,000 ppm / Cardiac Sensitization threshold (dog) 80,000 ppm. NOEL – 50,000 ppm

DELAYED (SUBCHRONIC AND CHRONIC) EFFECTS:

Not mutagenic in four tests

Teratogenic NOEL (rat and rabbit) – 40,000 ppm

Subchronic inhalation (rat) NOEL – 50,000 ppm

Chronic NOEL – 10,000 ppm

REPEATED DOSE TOXICITY:

Lifetime inhalation exposure of male rats was associated with a small increase in salivary gland fibrosarcomas.

FURTHER INFORMATION:

Acute effects of rapid evaporation of the liquid may cause frostbite. Vapors are heavier than air and can displace oxygen causing difficulty breathing or suffocation. May cause cardiac arrhythmia.

OTHER DATA:

Metabolism <0.5% as CO₂ in tests at 50,000 ppm, late developing benign tumors were found.



12. ECOLOGICAL INFORMATION

Degradability (BOD): R-134a is a gas at room temperature; therefore, it is unlikely to remain in water.**Octanol Water Partition Coefficient:** See Section 9

13. DISPOSAL CONSIDERATIONS

RCRA**Is the unused product a RCRA hazardous waste if discarded?**

Not a hazardous waste

If yes, the RCRA ID number is:

Not applicable

OTHER DISPOSAL CONSIDERATIONS:

Disposal must comply with federal, state, and local disposal or discharge laws. R-134a is subject to U.S. Environmental Protection Agency Clean Air Act Regulations Section 608 in 40 CFR Part 82 regarding refrigerant recycling.

The information offered here is for the product as shipped. Use and/or alterations to the product such as mixing with other materials may significantly change the characteristics of the material and alter the RCRA classification and the proper disposal method.

14. TRANSPORT INFORMATION

US DOT ID NUMBER: UN3159**US DOT PROPER SHIPPING NAME:** 1,1,1,2-Tetrafluoroethane or Refrigerant Gas R 134a**US DOT HAZARD CLASS:** 2.2**US DOT PACKING GROUP:** Not applicable

For additional information on shipping regulations affecting this material, contact the information number found in Section 1.

15. REGULATORY INFORMATION

TOXIC SUBSTANCES CONTROL ACT (TSCA)**TSCA INVENTORY STATUS:** Listed on the TSCA inventory**OTHER TSCA ISSUES:** Subject to Section 12(b) export notification. May contain 0-10 ppm Ethane, 2-chloro-1,1,1-trifluoro, CAS# 75-88-7**SARA TITLE III / CERCLA**

“Reportable Quantities” (RQs) and/or “Threshold Planning Quantities” (TPQs) exist for the following ingredients.

INGREDIENT NAME**SARA / CERCLA RQ (lb.)****SARA EHS TPQ (lb.)**

No ingredients listed in this section

Spills or releases resulting in the loss of any ingredient at or above its RQ requires immediate notification to the National Response Center [(800) 424-8802] and to your Local Emergency Planning Committee.

SECTION 311 HAZARD CLASS:IMMEDIATE
PRESSURE**SARA 313 TOXIC CHEMICALS:**

The following ingredients are SARA 313 “Toxic Chemicals”. CAS numbers and weight percents are found in Section 2.

INGREDIENT NAME**COMMENT**

No ingredients listed in this section



STATE RIGHT-TO-KNOW

In addition to the ingredients found in Section 2, the following are listed for state right-to-know purposes.

INGREDIENT NAME

WEIGHT %

COMMENT

No ingredients listed in this section

ADDITIONAL REGULATORY INFORMATION:

R-134a is subject to U.S. Environmental Protection Agency Clean Air Act Regulations at 40 CFR Part 82.

WARNING: DO NOT vent to the atmosphere. To comply with provisions of the U.S. Clean Air Act, any residual must be recovered. **Contains 1,1,1,2-Tetrafluoroethane (HFC-134a)**, a greenhouse gas which may contribute to global warming.

WHMIS CLASSIFICATION (CANADA):

This product has been evaluated in accordance with the hazard criteria of the CPR and the SDS contains all the information required by the CPR.

FOREIGN INVENTORY STATUS:

Canada – Listed on DSL
EU - EINECS # 223770

16. OTHER INFORMATION

CURRENT ISSUE DATE: January 04, 2021

PREVIOUS ISSUE DATE: April, 2018

OTHER INFORMATION: HMIS Classification: Health – 1, Flammability – 1, Reactivity – 0
NFPA Classification: Health – 2, Flammability – 1, Reactivity – 0
ANSI/ASHRAE 34 Safety Group – A1
UL Classified

Regulatory Standards:

1. OSHA regulations for compressed gases: 29 CFR 1910.101
2. DOT classification per 49 CFR 172.101

Toxicity information per PAFT Testing

DISCLAIMER:

National Refrigerants, Inc. believes that the information and recommendations contained herein (including data and statements are accurate as of the date hereof. NO WARRANTY OF FITNESS FOR ANY PARTICULAR PURPOSE, WARRANTY OF MERCHANTABILITY, OR ANY OTHER WARRANTY, EXPRESSED OR IMPLIED, IS MADE CONCERNING THE INFORMATION PROVIDED HEREIN. The information provided herein relates only to the specific product designated and may not be valid where such product is used in combination with any other methods of use of the product and of the information referred to herein are beyond the control of National Refrigerants. National Refrigerants expressly disclaims any and all liability as to any results obtained or arising from any use of the product or reliance on such information.



NATIONAL REFRIGERANTS, INC.

R-407C

Safety Data Sheet

R-407C

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: R-407C
OTHER NAME: Difluoromethane, Pentafluoroethane, 1,1,1,2-Tetrafluoroethane
USE: Refrigerant Gas
DISTRIBUTOR: National Refrigerants, Inc.
661 Kenyon Avenue
Bridgeton, New Jersey 08302

FOR MORE INFORMATION CALL:
(Monday-Friday, 8:00am-5:00pm)
1-800-262-0012

IN CASE OF EMERGENCY CALL:
CHEMTREC: 1-800-424-9300

2. HAZARDS IDENTIFICATION

CLASSIFICATION: Gases under pressure, Liquefied Gas
SIGNAL WORD: WARNING
HAZARD STATEMENT: Contains gas under pressure, may explode if heated
SYMBOL: Gas Cylinder
PRECAUTIONARY STATEMENT: STORAGE: Protect from sunlight, store in a well ventilated place



EMERGENCY OVERVIEW: Colorless, volatile liquid with ethereal and faint sweetish odor. Non-flammable material. Overexposure may cause dizziness and loss of concentration. At higher levels, CNS depression and cardiac arrhythmia may result from exposure. Vapors displace air and can cause asphyxiation in confined spaces. At higher temperatures, (>250°C), decomposition products may include Hydrofluoric Acid (HF) and carbonyl halides.

POTENTIAL HEALTH HAZARDS

SKIN: Irritation would result from a defatting action on tissue. Liquid contact could cause frostbite.

EYES: Liquid contact can cause severe irritation and frostbite. Mist may irritate.

INHALATION: R-407C is low in acute toxicity in animals. When oxygen levels in air are reduced to 12-14% by displacement, symptoms of asphyxiation, loss of coordination, increased pulse rate and deeper respiration will occur. At high levels, cardiac arrhythmia may occur.

INGESTION: Ingestion is unlikely because of the low boiling point of the material. Should it occur, discomfort in the gastrointestinal tract from rapid evaporation of the material and consequent evolution of gas would result. Some effects of inhalation and skin exposure would be expected.

DELAYED EFFECTS: None known.



3. COMPOSITION / INFORMATION ON INGREDIENTS

<u>INGREDIENT NAME</u>	<u>CAS NUMBER</u>	<u>WEIGHT %</u>
Difluoromethane (HFC-32)	75-10-5	23
Pentafluoroethane (HFC-125)	354-33-6	25
1,1,1,2-Tetrafluoroethane (HFC-134a)	811-97-2	52

COMMON NAME and SYNONYMS

R-407C

There are no impurities or stabilizers that contribute to the classification of the material identified in Section 2

4. FIRST AID MEASURES

SKIN: Promptly flush skin with water until all chemical is removed. If there is evidence of frostbite, bathe (do not rub) with lukewarm (not hot) water. If water is not available, cover with a clean, soft cloth or similar covering. Get medical attention if symptoms persist.

EYES: Immediately flush eyes with large amounts of water for at least 15 minutes (in case of frostbite water should be lukewarm, not hot) lifting eyelids occasionally to facilitate irrigation. Get medical attention if symptoms persist.

INHALATION: Immediately remove to fresh air. If breathing has stopped, give artificial respiration. Use oxygen as required, provided a qualified operator is available. Get medical attention. Do not give epinephrine (adrenaline).

INGESTION: Ingestion is unlikely because of the physical properties and is not expected to be hazardous. Do not induce vomiting unless instructed to do so by a physician.

ADVICE TO PHYSICIAN: Because of the possible disturbances of cardiac rhythm, catecholamine drugs, such as epinephrine, should be used with special caution and only in situations of emergency life support. Treatment of overexposure should be directed at the control of symptoms and the clinical conditions.

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES

FLASH POINT:	Gas, not applicable per DOT regulations
FLASH POINT METHOD:	Not applicable
AUTOIGNITION TEMPERATURE:	Unknown for mixture
UPPER FLAME LIMIT (volume % in air):	None*
LOWER FLAME LIMIT (volume % in air):	None*
	*Based on ASHRAE Standard 34 with match ignition
FLAME PROPAGATION RATE (solids):	Not applicable
OSHA FLAMMABILITY CLASS:	Not applicable

EXTINGUISHING MEDIA:

Use any standard agent – choose the one most appropriate for type of surrounding fire (material itself is not flammable)



UNUSUAL FIRE AND EXPLOSION HAZARDS:

R-407C is not flammable at ambient temperatures and atmospheric pressure. However, this material will become combustible when mixed with air under pressure and exposed to strong ignition sources.

Contact with certain reactive metals may result in formation of explosive or exothermic reactions under specific conditions (e.g. very high temperatures and/or appropriate pressures).

SPECIAL FIRE FIGHTING PRECAUTIONS/INSTRUCTIONS:

Firefighters should wear self-contained, NIOSH-approved breathing apparatus for protection against possible toxic decomposition products. Proper eye and skin protection should be provided. Use water spray to keep fire-exposed containers cool.

6. ACCIDENTAL RELEASE MEASURES

IN CASE OF SPILL OR OTHER RELEASE:

(Always wear recommended personal protective equipment.)

Evacuate unprotected personnel. Product dissipates upon release. Protected personnel should remove ignition sources and shut off leak, if without risk, and provide ventilation. Unprotected personnel should not return to the affected area until air has been tested and determined safe, including low-lying areas.

Spills and releases may have to be reported to Federal and/or local authorities. See Section 15 regarding reporting requirements.

7. HANDLING AND STORAGE

NORMAL HANDLING:

(Always wear recommended personal protective equipment.)

Avoid breathing vapors and liquid contact with eyes, skin or clothing. Do not puncture or drop cylinders, expose them to open flame or excessive heat. Use authorized cylinders only. Follow standard safety precautions for handling and use of compressed gas cylinders.

R-407C should not be mixed with air above atmospheric pressure for leak testing or any other purpose.

STORAGE RECOMMENDATIONS:

Store in a cool, well-ventilated area of low fire risk and out of direct sunlight. Protect cylinder and its fittings from physical damage. Storage in subsurface locations should be avoided. Close valve tightly after use and when empty.

INCOMPATIBILITIES:

Freshly abraded aluminum surfaces at specific temperatures and pressures may cause a strong exothermic reaction. Chemically reactive metals: potassium, calcium, powdered aluminum, magnesium, and zinc.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

ENGINEERING CONTROLS:

Provide local ventilation at filling zones and areas where leakage is probable. Mechanical (general) ventilation may be adequate for other operating and storage areas.

PERSONAL PROTECTIVE EQUIPMENT

**SKIN PROTECTION:**

Skin contact with refrigerant may cause frostbite. General work clothing and gloves (leather) should provide adequate protection. If prolonged contact with the liquid or gas is anticipated, insulated gloves constructed of PVA, neoprene or butyl rubber should be used. Any contaminated clothing should be promptly removed and washed before reuse.

EYE PROTECTION:

For normal conditions, wear safety glasses. Where there is reasonable probability of liquid contact, wear chemical safety goggles.

RESPIRATORY PROTECTION:

None generally required for adequately ventilated work situations. For accidental release or non-ventilated situations, or release into confined space, where the concentration may be above the PEL of 1,000 ppm, use a self-contained, NIOSH-approved breathing apparatus or supplied air respirator. For escape: use the former or a NIOSH-approved gas mask with organic vapor canister.

ADDITIONAL RECOMMENDATIONS:

Where contact with liquid is likely, such as in a spill or leak, impervious boots and clothing should be worn. High dose-level warning signs are recommended for areas of principle exposure. Provide eyewash stations and quick-drench shower facilities at convenient locations. For tank cleaning operations, see OSHA regulations, 29 CFR 1910.132 and 29 CFR 1910.133.

EXPOSURE GUIDELINES

<u>INGREDIENT NAME</u>	<u>ACGIH TLV</u>	<u>OSHA PEL</u>	<u>OTHER LIMIT</u>
Difluoromethane	None	None	*1000 ppm TWA (8hr)
Pentafluoroethane	None	None	*1000 ppm TWA (8hr)
1,1,1,2-Tetrafluoroethane	None	None	*1000 ppm TWA (8hr)

* = Workplace Environmental Exposure Level (AIHA)

OTHER EXPOSURE LIMITS FOR POTENTIAL DECOMPOSITION PRODUCTS:

Hydrogen Fluoride: ACGIH TLV: 2 ppm ceiling, 0.5 TLV-TWA

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE:	Clear, colorless liquid and vapor
PHYSICAL STATE:	Gas at ambient temperatures
MOLECULAR WEIGHT:	86.2
CHEMICAL FORMULA:	CH ₂ F ₂ , CF ₃ CHF ₂ , CH ₂ FCF ₃
ODOR:	Faint ethereal odor
SPECIFIC GRAVITY (water = 1.0):	1.16 @ 21.1°C (70°F)
SOLUBILITY IN WATER (weight %):	Unknown
pH:	Neutral
BOILING POINT:	-43°C (-45.4°F)
FREEZING POINT:	Not determined
VAPOR PRESSURE:	156.2 psia @ 70°F 356.7 psia @ 130°F
VAPOR DENSITY (air = 1.0):	3.0
EVAPORATION RATE:	>1 COMPARED TO: CC1 ₄ = 1
% VOLATILES:	100
ODOR THRESHHOLD:	Not established



FLAMMABILITY:	Not applicable
LEL/UEL:	None/None
RELATIVE DENSITY:	1.16 g/cm ³ at 21.1 C
PARTITION COEFF (n-octanol/water)	Not applicable
AUTO IGNITION TEMP:	Not Determined
DECOMPOSITION TEMPERATURE:	>250°C
VISCOSITY:	Not applicable
FLASH POINT:	Not applicable
(Flash point method and additional flammability data are found in Section 5.)	

10. STABILITY AND REACTIVITY

NORMALLY STABLE? (CONDITIONS TO AVOID):

The product is stable.

Do not mix with oxygen or air above atmospheric pressure. Any source of high temperature, such as lighted cigarettes, flames, hot spots or welding may yield toxic and/or corrosive decomposition products.

INCOMPATIBILITIES:

(Under specific conditions: e.g. very high temperatures and/or appropriate pressures) – Freshly abraded aluminum surfaces (may cause strong exothermic reaction). Chemically active metals: potassium, calcium, powdered aluminum, magnesium and zinc.

HAZARDOUS DECOMPOSITION PRODUCTS:

Halogens, halogen acids and possibly carbonyl halides.

HAZARDOUS POLYMERIZATION:

Will not occur.

11. TOXICOLOGICAL INFORMATION

IMMEDIATE (ACUTE) EFFECTS:

HFC-32:	LC ₅₀ : Inhalation 4 hr. (rat) - 520,000 ppm / Cardiac Sensitization threshold (dog) 350,000 ppm
HFC-125:	LC ₅₀ : Inhalation 4 hr. (rat) - > 800,000 ppm / Cardiac Sensitization threshold (dog) 75,000 ppm
HFC-134a:	LC ₅₀ : Inhalation 4 hr. (rat) - > 500,000 ppm / Cardiac Sensitization threshold (dog) > 80,000 ppm

DELAYED (SUBCHRONIC AND CHRONIC) EFFECTS:

HFC-32:	Teratogenic NOEL (rat and rabbit) – 50,000 ppm Subchronic inhalation (rat) NOEL – 50,000 ppm
HFC-125:	Teratogenic NOEL (rat and rabbit) – 50,000 ppm Subchronic inhalation (rat) NOEL - ≥ 50,000 ppm Chronic NOEL – 10,000 ppm
HFC-134a:	Teratogenic NOEL (rat and rabbit) – 40,000 ppm Subchronic inhalation (rat) NOEL – 50,000 ppm Chronic NOEL – 10,000 ppm

REPEATED DOSE TOXICITY:

Lifetime inhalation exposure of male rats was associated with a small increase in salivary gland fibrosarcomas.



OTHER DATA:

HFC-32, HFC-125, HFC-134a: Not active in four genetic studies

FURTHER INFORMATION:

Acute effects of rapid evaporation of the liquid may cause frostbite. Vapors are heavier than air and can displace oxygen causing difficulty breathing or suffocation. May cause cardiac arrhythmia.

POTENTIAL HEALTH HAZARDS

SKIN: Irritation would result from a defatting action on tissue. Liquid contact could cause frostbite.

EYES: Liquid contact can cause severe irritation and frostbite. Mist may irritate.

INHALATION: R-407C is low in acute toxicity in animals. When oxygen levels in air are reduced to 12-14% by displacement, symptoms of asphyxiation, loss of coordination, increased pulse rate and deeper respiration will occur. At high levels, cardiac arrhythmia may occur.

INGESTION: Ingestion is unlikely because of the low boiling point of the material. Should it occur, discomfort in the gastrointestinal tract from rapid evaporation of the material and consequent evolution of gas would result. Some effects of inhalation and skin exposure would be expected.

DELAYED EFFECTS: None known.

Ingredients found on one of the OSHA designated carcinogen lists are listed below.

INGREDIENT NAME

NTP STATUS

IARC STATUS

OSHA LIST

No ingredients listed in this section

12. ECOLOGICAL INFORMATION

Degradability (BOD):

R-407C is a gas at room temperature; therefore, it is unlikely to remain in water.

Octanol Water Partition Coefficient: Unknown for mixture

13. DISPOSAL CONSIDERATIONS

RCRA

Is the unused product a RCRA hazardous waste if discarded?

Not a hazardous waste.

If yes, the RCRA ID number is:

Not applicable.

OTHER DISPOSAL CONSIDERATIONS:

Disposal must comply with federal, state, and local disposal or discharge laws. R-407C is subject to U.S. Environmental Protection Agency Clean Air Act Regulations Section 608 in 40 CFR Part 82 regarding refrigerant recycling.

The information offered here is for the product as shipped. Use and/or alterations to the product such as mixing with other materials may significantly change the characteristics of the material and alter the RCRA classification and the proper disposal method.



14. TRANSPORT INFORMATION

US DOT ID NUMBER: UN3340
US DOT PROPER SHIPPING NAME: Refrigerant gas R 407C
US DOT HAZARD CLASS: 2.2
US DOT PACKING GROUP: Not applicable

For additional information on shipping regulations affecting this material, contact the information number found in Section 1.

15. REGULATORY INFORMATION

TOXIC SUBSTANCES CONTROL ACT (TSCA)

TSCA INVENTORY STATUS: Components listed on the TSCA inventory
OTHER TSCA ISSUES: Subject to Section 12(b) export notification. May contain 0-10 ppm Ethane, 2-chloro-1,1,1-trifluoro, CAS# 75-88-7

SARA TITLE III / CERCLA

“Reportable Quantities” (RQs) and/or “Threshold Planning Quantities” (TPQs) exist for the following ingredients.

INGREDIENT NAME**SARA / CERCLA RQ (lb.)****SARA EHS TPQ (lb.)**

No ingredients listed in this section

Spills or releases resulting in the loss of any ingredient at or above its RQ requires immediate notification to the National Response Center [(800) 424-8802] and to your Local Emergency Planning Committee.

SECTION 311 HAZARD CLASS: IMMEDIATE PRESSURE

SARA 313 TOXIC CHEMICALS:

The following ingredients are SARA 313 “Toxic Chemicals”. CAS numbers and weight percents are found in Section 2.

INGREDIENT NAME**COMMENT**

No ingredients listed in this section

STATE RIGHT-TO-KNOW

In addition to the ingredients found in Section 2, the following are listed for state right-to-know purposes.

INGREDIENT NAME**WEIGHT %****COMMENT**

No ingredients listed in this section

ADDITIONAL REGULATORY INFORMATION:

R-407C is subject to U.S. Environmental Protection Agency Clean Air Act Regulations at 40 CFR Part 82.

WARNING: Do not vent to the atmosphere. To comply with provisions of the U.S. Clean Air Act, any residual must be recovered. **Contains Pentafluoroethane (HFC-125), Difluoromethane (HFC-32), and Tetrafluoroethane (HFC-134a)**, greenhouse gases which may contribute to global warming.

WHMIS CLASSIFICATION (CANADA):

This product has been evaluated in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.



FOREIGN INVENTORY STATUS:

EU – EINECS # 2065578 – HFC-125

2008394 – HFC-32

223770 – HFC-134a

16. OTHER INFORMATION

CURRENT ISSUE DATE: January 4, 2021

PREVIOUS ISSUE DATE: April, 2018

OTHER INFORMATION: HMIS Classification: Health – 1, Flammability – 1, Reactivity – 0
NFPA Classification: Health – 2, Flammability – 1, Reactivity – 0
ANSI / ASHRAE 34 Safety Group – A1

Regulatory Standards:

1. OSHA regulations for compressed gases: 29 CFR 1910.101
2. DOT classification per 49 CFR 172.101
3. Toxicity information per PAFT Testing

DISCLAIMER:

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Appendix U: Chemical List and Usage

LOW STOCK CHEMICALS						
Update on (dd/mm/yyyy)		1/17/2025				
DESCRIPTION	PRODUCT CODE	Available Volume (L)	Current daily Consumption (L/D)	Day Stock Remaining	Run out on	Open order (Total volume)
MONO ETHYLENE GLYCOL	MEG PFR143	47,352	265	179	7/14/2025	
DEFOAMER	DFW8345	4,260	15.4	277	10/20/2025	5,824
ANTI OXIDANT	BPB55608	2,820	8.0	353	1/4/2026	800
CORROSION INHIBITOR	SUBSEA133	29,927	45.0	665	11/13/2026	10,000
HYPOCHLORITE	PFR797	4,703	7.0	672	11/19/2026	800
BIOCIDE B	XC80102 (GLUT)	6,262	8.1	769	2/25/2027	
ANTI SCALANT BGRD-801	801/PC-191T	6,057	2.4	2,503	11/24/2031	0
CORROSION INHIBITOR MEG	CGW24566	683	0.1	6,830	9/30/2043	
DIESEL BIOCID	XC82205	93	0.0	9,300	7/5/2050	

ODT Daily Chemical Consumption List for Sewage, Diesel Tanks & RO units

Month: January 24 Unit: Liters

Date	Daily Usage Monitoring				Diesel Tank				Chemical/Inoculating Qty & Production Dept Stock				Remarks
	Seepage Unit	July	RO Unit	Anti-Scalant	Anti-Disinfect	Biocide	Treated	Raw	NaOCl	Anti-Scalant	Anti-Disinfect	Biocide	
1	110.0												
2	100.0												
3	100.0	1.1			0.0								
4	100.0												
5	100.0												
6	100.0												
7	100.0												
8	100.0												
9	100.0												
10	100.0												
11	100.0												
12	100.0												
13	100.0												
14	100.0												
15	100.0					0.0	2.0						
16	100.0												
17	100.0												
18	100.0												
19	100.0	1.0		0.0									
20	100.0												
21	100.0												
22	100.0												
23	100.0												
24	100.0												
25	100.0												
26	100.0												
27	100.0												
28	100.0												
29	100.0												Withstand 200 L from 2024
30	100.0												
31	100.0					0.0							
32	100.0												
SubTotal:	600.0	0.0	0.1	0.0	0.0	0.0	2.0						
Total Usage:	600.0	0.0	0.0	0.0	0.0	0.0	2.0						

Month: April 24 Unit: Liters

Date	Daily Usage Monitoring				Diesel Tank				Chemical/Inoculating Qty & Production Dept Stock				Remarks
	Seepage Unit	July	RO Unit	Anti-Scalant	Anti-Disinfect	Biocide	Treated	Raw	NaOCl	Anti-Scalant	Anti-Disinfect	Biocide	
1	0.0								30.0	100.0			
2	0.0								30.0	100.0			
3	0.0								30.0	100.0			30 L to Chlorination Chamber
4	0.0								30.0	100.0			
5	0.0								30.0	100.0			
6	100.0								30.0	100.0			
7	100.0								30.0	100.0			
8	100.0								30.0	100.0			
9	100.0								30.0	100.0			
10	100.0								30.0	100.0			
11	100.0								30.0	100.0			
12	100.0								30.0	100.0			Withstand 1 share of NaOCl
13	100.0								30.0	100.0			
14	100.0								30.0	100.0			
15	100.0					0.0	0.0		30.0	100.0			Withstand 1 share Biocide
16	100.0								30.0	100.0			
17	100.0	1.0							30.0	100.0			
18	100.0								30.0	100.0			
19	100.0								30.0	100.0			
20	100.0								30.0	100.0			
21	100.0								30.0	100.0			
22	100.0								30.0	100.0			
23	100.0								30.0	100.0			
24	100.0					0.0			30.0	100.0			
25	100.0								30.0	100.0			
26	100.0								30.0	100.0			Withstand 1 share of NaOCl
27	100.0								30.0	100.0			
28	100.0								30.0	100.0			
29	100.0								30.0	100.0			
30	100.0								30.0	100.0			
31	100.0								30.0	100.0			
SubTotal:	300.0	0.0	0.0	0.0	0.0	0.0	0.0						
Total Usage:	300.0	0.0	0.0	0.0	0.0	0.0	0.0						







Month: July 24 Unit: Liters









Date	Daily Usage Monitoring				Diesel Tank				Chemical/Inoculating Qty & Production Dept Stock				Remarks
	Seepage Unit	July	RO Unit	Anti-Scalant	Anti-Disinfect	Biocide	Treated	Raw	NaOCl	Anti-Scalant	Anti-Disinfect	Biocide	
1	110.0				0.0	1.7			350.0	100.0	100.0	100.0	
2	110.0								350.0	100.0	100.0	100.0	
3	110.0								350.0	100.0	100.0	100.0	
4	110.0								350.0	100.0	100.0	100.0	
5	110.0	2.0							350.0	100.0	100.0	100.0	
6	110.0								350.0	100.0	100.0	100.0	
7	110.0								350.0	100.0	100.0	100.0	
8	110.0								350.0	100.0	100.0	100.0	
9	110.0								350.0	100.0	100.0	100.0	
10	110.0								350.0	100.0	100.0	100.0	
11	110.0								350.0	100.0	100.0	100.0	
12	110.0								350.0	100.0	100.0	100.0	
13	110.0								350.0	100.0	100.0	100.0	
14	110.0								350.0	100.0	100.0	100.0	
15	110.0								350.0	100.0	100.0	100.0	
16	110.0								350.0	100.0	100.0	100.0	
17	110.0								350.0	100.0	100.0	100.0	Withstand 1 share (200 L) of NaOCl
18	110.0								350.0	100.0	100.0	100.0	
19	110.0								350.0	100.0	100.0	100.0	
20	110.0								350.0	100.0	100.0	100.0	
21	110.0								350.0	100.0	100.0	100.0	
22	110.0								350.0	100.0	100.0	100.0	
23	110.0								350.0	100.0	100.0	100.0	
24	110.0								350.0	100.0	100.0	100.0	
25	110.0								350.0	100.0	100.0	100.0	
26	110.0								350.0	100.0	100.0	100.0	
27	110.0								350.0	100.0	100.0	100.0	
28	110.0								350.0	100.0	100.0	100.0	
29	110.0								350.0	100.0	100.0	100.0	
30	110.0								350.0	100.0	100.0	100.0	Withstand 1 share (200 L) of NaOCl
31	110.0								350.0	100.0	100.0	100.0	
SubTotal:	3570.0	2.0	0.0	0.0	0.0	1.7	0.0	0.0					
Total Usage:	3570.0	2.0	0.0	0.0	0.0	1.7	0.0	0.0					






Month: October 24 Unit: Liters









Daily Usage Monitoring													Unit - Liters
Date	Seepage Unit	RO Unit				Diesel Tank		Chemical/Inoculating Qty & Production Dept Stock				Remarks	
		No/CL	Anti-Scalant	Anti-Disinfect	Biocide	NaOCl	Anti-Scalant	Anti-Disinfect	Biocide				
1	0.0							100.0	10.0	100.0	100.0		
2	0.0							100.0	10.0	100.0	100.0		
3	0.0							100.0	10.0	100.0	100.0		
4	0.0							100.0	10.0	100.0	100.0		
5	0.0							100.0	10.0	100.0	100.0		
6	0.0							100.0	7.0	100.0	100.0		
7	0.0							110.0	7.0	100.0	100.0		
8	0.0							100.0	7.0	100.0	100.0		
9	0.0							100.0	7.0	100.0	100.0		
10	0.0							100.0	7.0	100.0	100.0		
11	0.0	2.0						70.0	7.0	100.0	100.0		
12	0.0							100.0	7.0	100.0	100.0		
13	0.0							60.0	7.0	100.0	100.0		
14	0.0							100.0	7.0	100.0	100.0		
15	0.0							40.0	7.0	100.0	100.0		
16	0.0							20.0	7.0	100.0	100.0		
17	0.0							20.0	7.0	100.0	100.0		
18	0.0							20.0	7.0	100.0	100.0		
19	0.0							210.0	7.0	100.0	100.0		
20	0.0							100.0	7.0	100.0	100.0		
21	0.0							100.0	7.0	100.0	100.0		
22	0.0							100.0	7.0	100.0	100.0		
23	0.0							100.0	7.0	100.0	100.0		
24	10.0							120.0	7.0	100.0	100.0		
25	0.0							100.0	7.0	100.0	100.0		
26	0.0			0.0				100.0	7.0	100.0	100.0		
27	0.0							100.0	7.0	100.0	100.0		
28	0.0							100.0	7.0	100.0	100.0		
29	0.0							100.0	7.0	100.0	100.0		
30	0.0							100.0	7.0	100.0	100.0		
31	0.0							100.0	7.0	100.0	100.0		
Total/Trend	200.0	2.0	0.0	7.0	0.0	0.0	0.0	100.0	7.0	100.0	100.0		






OGT Chemical Inventory List with MSDS









Sr	Storage Area	Materials SAP Number	Name of Product	Solid, Liquid or Gas	Size of Container	Hazardous Substance -Name of Group -UN Class -Packing Group	MSDS in Hand	UN Number	QTY	UOM
1	WHSE-D	8000001768	PFR797 SODIUM HYPOCHLORITE	LIQUID	DRUM	Disinfectant, CLASS-8, PG-III	 8000001768-SODIUM HYPOCHLORITE.pdf	1791	3952	LT
2	WHSE-D	8000001698	BPB55608	LIQUID	DRUM	Oxygen Scavenger, CLASS-8, PG-III	 8000001698-ANTI-OXIDANT 208, BPB556	2693	12	DR
3	WHSE-D	8000000870	HYDREX 4507/9	LIQUID	DRUM	Conforms to BS EN 939: 2009 Hydrochloric Acid Use, CLASS-8	 8000000870 HYDREX 4507_9.pdf	3264	0	EA
4	WHSE-D	8000001733	Lanotec Citra-Force	LIQUID	PAIL	Lanotec Citra-Force, 750ml Spray, CLASS-3, PG-III	 20250122093211.pdf	2052	9	EA
5	WHSE-D	8000001554	DISTILLED WATER	LIQUID	PAIL	NON-HAZARDOUS SUBSTANCE	 8000001554 - DISTILLED WATER.pc	N/A	140	LT
6	WHSE-D	8000001391	ZOK 27	LIQUID	PAIL	Detergent Corrosion, CLASS-8	 8000001391_ZOK 27__12-JUN-2015.pdf	4524	20	LT

7	WHSE-D	8000001169	SODIUM HYPOCHLORITE	LIQUID	PAIL	HYPOCHLORITE SOLUTION,CLASS-8,PG-III	 8000001169-SODIUM HYPOCHLORITE.pdf	1791	48	EA
8	WHSE-D	8000001720	Roundup® Weed & Grass Killer Super Concentrate	LIQUID	PAIL	Roundup® Weed & Grass Killer Super Concentrate	 8000001720_12.15.2015ROUNDUP WEEE	N/A	14	EA
9	WHSE-D	8000001491	GLYPHOSATE ISOPROPYLAMMONIUM 41.0 %	LIQUID	BT	GLYPHOSATE ISOPROPYLAMMONIUM 41.0 %	 8000001491_GLYPHOSATE ISOPROPYLA	N/A	9	BT
10	WHSE-D	3500002749	ETHYLENE GLYCOL POLYESTER GRADE	LIQUID	PAIL	ETHYLENE GLYCOL POLYESTER GRADE	 3500002749-Glycol MSDS.pdf	N/A	3	EA
11	WHSE-D	3000010010	Chemguard 3% AFFF C-303	LIQUID	PAIL	proprietary mixture	 3000010010-FOAM 3%.pdf	N/A	14	EA
12	WHSE-D	3000010011	AFFF-AR 3% F-10	LIQUID	PAIL	Storage of Synthetic Fire Extinguishing Foam Concentrates	 3000010011 MOUSSOL AFFF-AR	N/A	9	EA
13	WHSE-D	3500002736	Organic Acid Inhibitor A272	LIQUID	PAIL	Used as a corrosion inhibitor in oilfield applications.,CLASS-3(601),PG-II	 3500002736-Organic Acid Inhibitor A272	1992	11	EA
14	WHSE-D	3500002765	Non-Emulsifying Agent W54	LIQUID	PAIL	Toxic: danger of very serious irreversible,CLASS-3,PG-II	 3500002765-NON EMULSIFYING ANGEI	1992	7	EA

15	WHSE-D	8000001762	ORSA HIW82254 HYDRATE INHIBITOR	LIQUID	IBC	Gas hydrate inhibitor CLASS-8	 8000001762_KINETIC HYDRATE INHIBITC	N/A	91164	LT
16	WHSE-D	8000000869	Hydrex 4501	LIQUID	PAIL	Reverse Osmosis Membrane Cleaner, CLASS-8,PG-II	 8000000869 VEOLIA - HYDREX 4501.pdf	3262	0	EA
17	WHSE-D	8000001764	SUBSEA133 CORROSION INHIBITOR	LIQUID	IBC	CORROSION INHIBITOR, CLASS-9,PG-III	 8000001764-CORROSION INHIBIT	3082	2100	LT
18	WHSE-D	8000000368	OCEAN HW 443R	LIQUID	DR + IBC	A hydraulic fluid used for production control in the Offshore, CLASS-8	 8000000368_HYDRAULIC OIL.pdf	N/A	100	DR
19	WHSE-D	8000001763	DFW8345 DEFOAMER	LIQUID	DRUM	DEFOAMER, CLASS-8	 8000001763_MEG DEFOAMER DFW834	N/A	2080	LT
20	WHSE-D	8000001780	RE33020RBW	LIQUID	DRUM	WATER CLARIFIER, CLASS-8,PG-III	 8000001780_WATER CLARIFIER.pdf	3264	8736	LT
21	WHSE-D	8000000867	ANSULITE 3% AFFF (AFC-5-A)	LIQUID	DRUM	Fire extinguishing agent, CLASS-8	 8000000867 CHEMGUARD - AFFF	N/A	17	DR
22	WHSE-D	8000001170	NALCO® 8338	LIQUID	DRUM	CLOSED SYSTEM CORROSION INHIBITOR, CLASS-8,PG-III	 8000001170 NALCO 8338.pdf	1760	2	DR

23	WHSE-D	3000001281	CHEMGUARD Ultraguard	LIQUID	DRUM	Fire extinguishing agent, CLASS-8	 3000001281 CHEMGUARD AFFF-	N/A	1	EA
24	WHSE-D	8000001767	XC80102	LIQUID	DRUM	BIOCIDE, CLASS-8,PG-III	 8000001767-BIOCID E, XC80102.pdf	3265	5200	LT
25	WHSE-D	8000001699	GUARDION 801	LIQUID	DRUM	Antiscalant, CLASS-8,PG-III	 8000001699 Anti-Scalant- GUAR	3265	29	DR
26	WHSE-D	3000002584	DRYOCEL 810/848/848HM	SOLID	BAG	ADSORBENT ANTI MOISTURE AGENT	 3000002584_CONS, DESICCANT.pdf	N/A	2090	KG
27	WHSE-D	3000005343	ABC Dry Chemical Powder	SOLID	BAG	Multi-purpose Dry Chemical (CH550, F15, F18), CLASS-8	 3000005343 SEAPLUS ABC DRY C	1044	12	KG
28	WHSE-D	3000002470	DRY TYPE FIRE EXTINGUISHER FOR EMTAL FIRES	SOLID	BAG	EUTECTIC MIXTURE OF CHLRIDES, CLASS-8	 3000002470- DRY POWDER Fire_Exting	N/A	5	KG
29	WHSE-D	3000002471	DRY TYPE FIRE EXTINGUISHER FOR EMTAL FIRES	SOLID	BAG	EUTECTIC MIXTURE OF CHLRIDES, CLASS-8	N/A	N/A	0	KG
30	WHSE-D	3000013901	601 Valve Cleaner	LIQUID	PAIL	Proprietary degreaser to remove and clean valve cavities	 3000013901-VALVE, CLEANER, EUROLUB	N/A	0	EA
31	WHSE-D	8000001137	Genetron® 407C	GAS	BOTTLE	Refrigerant,CLASS-2.2	 8000001137 HONEYWELL - GENE	3340	67	EA

32	WHSE-D	8000001138	Genetron® 404A (R-404A)	GAS	BOTTLE	REFRIGERANT,CLASS-2	 8000001138_REFRIGERANT R-404	3337	39	EA
33	WHSE-D	3500002780	REFRIGERANT R410A	GAS	BOTTLE	This substance is not classified as dangerous according to Directive 67/548A,CLASS-2	 3500002780-REFRIGERANT410A.pdf	3163	9	CAN
34	WHSE-D	3000000801	R134a	GAS	BOTTLE	REFRIGERANT GAS R-134A,CLASS-2.2	 3000000801_R134A.pdf	3159	130	CAN
35	WHSE-D	8000002318	HERESITE VR-514	LIQUID	PAIL	H225 HIGHLY FLAMMABLE LIQUID AND VAPOR, CLASS-3,PG-II	 8000002318_COOLER COATING, HERESITE	1263	0	KG
36	WHSE-D	8000002194	PLASMET ZF AEROSOL (ALL COLOURS)	LIQUID	BOTTLE	CLP FLAM AEROSOL, PRESS GAS EYE,CLASS-2.1	 8000002194-PAINT, SPRAY CAN (PLASMET)	1950	37	CAN
37	WHSE-D	8000002316	HERESITE VR-514T	LIQUID	BOTTLE	RED BROWN AIR DRY PHENOLIC COATING, CLASS-8	 8000002316-AIR DRY PHENOLIC, HERESITE	N/A	75	EA
38	WHSE-D	8000000551	ROHPER LSPR 6PK GLOSS SAFETY RED	LIQUID	BOTTLE	Causes eye irritation, CLASS-2.1	 8000000551 RUSTOLEUM - V2163	1950	1	EA
39	WHSE-D	8000000547	ROHPER LSPR 6PK GLOSS SAFETY RED	LIQUID	BOTTLE	Harmful if swallowed. Extremely flammable liquid and vapor,CLASS-2.1	 20250122093045.pdf	1950	2	EA

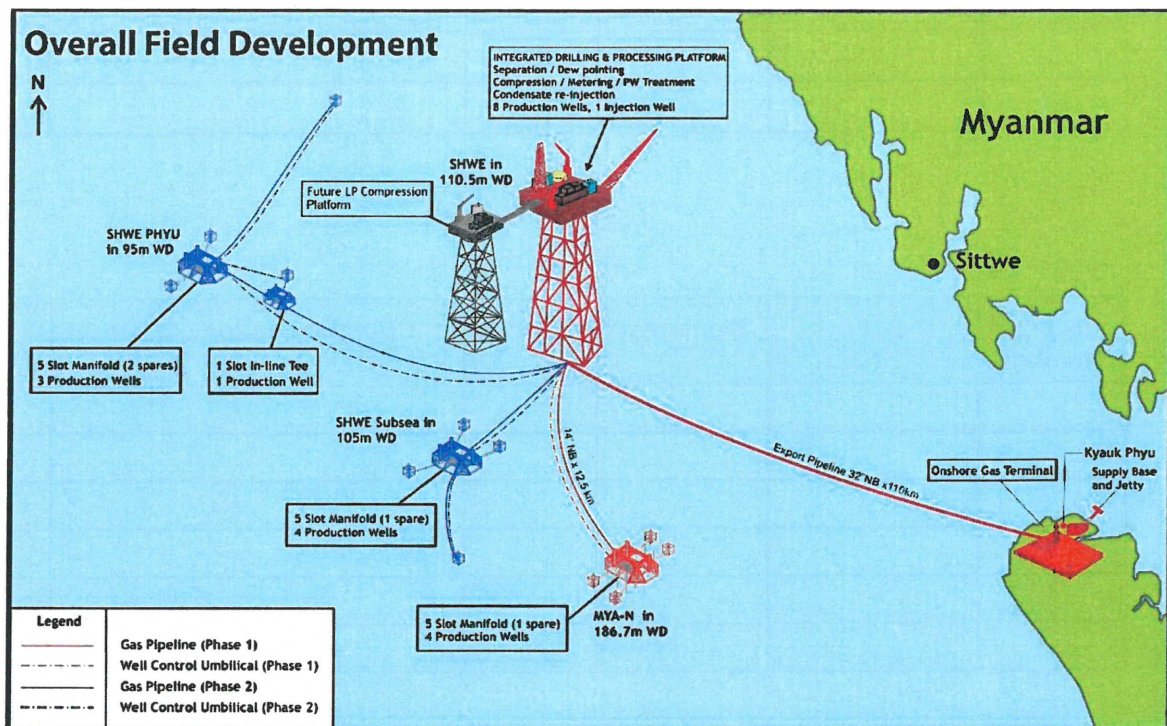
40	WHSE-D	8000001869	KROIL	LIQUID	BOTTLE	FLAMMABLE LIQUID,CLASS-3,PG-III	 8000001869_OIL, PENETRATING, KANC	1993	5	EA
41	WHSE-D	8000000553	PTOUCH +6X340GM GP GRAY PRIMER	LIQUID	BOTTLE	Harmful if swallowed. Extremely flammable liquid and vapor,CLASS-2.1	 20250122093006.pdf	1950	7	EA
42	WHSE-D	8000000186	388-8623 LEAK DETECTOR	LIQUID	BOTTLE	Non destructive leak detection, CLASS-2	 8000000186,DETECTOR, 400 ML, RS-388-	1950	19	EA
43	WHSE-D	8000000044	BATTERY TERMINAL, PROTECTOR	LIQUID	BOTTLE	Anti Corrosion Products, CLASS-2	 8000000044-05-May-2015_ CRC - TERMIN	1950	19	EA
44	WHSE-D	8000000255	TAP MAGIC PROTAP (AEROSOL)	LIQUID	BOTTLE	GHS04: PRESSURIZED GAS,CLASS-2.2	 8000000255,FLUID, AEROSOL, 12 OZ.pd	1950	11	EA
45	WHSE-D	8000000549	ROHPER LSPR 6PK GLOSS SAFETY, YELLOW	LIQUID	BOTTLE	Causes Serious Eye Irritation, CLASS-2.1	 8000000549,PAINT, AEROSOL CAN, 12 O	1950	2	EA
46	WHSE-D	3000010336	#1 Gray	SOLID	BOTTLE	May form combustible dust concentrations in air. Suspected of causing cancer, CLASS-8	 3000010336 MAGNAFLUX - GREY	N/A	1	EA
47	WHSE-D	8000001870	AEROKROIL	LIQUID	BOTTLE	CAUSE SKIN IRRITATION ,CLASS-2.1	 SAP#8000001870_A EROKROIL.pdf	1950	41	EA

Appendix V: Training and Development Manual

PROJECT / JOB TITLE: **SHWE PROJECT**

DOCUMENT TITLE: **Training and Development Manual**

DOCUMENT NUMBER: **YGG-OM-MP-03-04-0001**



		JL	MZW	OIM	OGTS	DYK
0	Issued for use	15-Jun-20	15-Jun-20	9.06.20	10.06.20	14-7-20
				MM	TD	
Revision Number	Description	Prepared	Checked		Approved	

Revision History

Revision Number	Date	Section(s)	Page(s)	Brief Description of Change	Author of Change
A	15-Apr-2020	All	All	Draft Issued for Comment	JL
0	15-Jun-2020	All	All	New Document for Implementation / Use	JL

Hold Record

Hold Number	Date	Section(s)	Page(s)	Brief Description of Hold	Cleared
1 & 2	July 2020	6.0	13 & 14	The Organisation charts shown are examples only. Personnel numbers, positions & nationalities change as the Nationalisation program progresses and the crews are adjusted as the project moves towards phase 3.	(Expected to be cleared at next revision)
3 & 4	July	6.0	15 & 16	At the time of document first issue, the "Understudy" positions shown with blue cell background are 'proposed' only and do not constitute formal promotions attracting any grade or salary adjustments. This may change when formally approved.	(Expected to be cleared at next revision)

RACI Chart

The following RACI chart, showing those **R**esponsible, **A**ccountable, to whom **C**ommunicated, and to whom **I**nformed” has been developed to ensure that all parties and groups are clear on their roles within this particular POSCO International Corporation (Myanmar E&P) O&M document.

The Responsible Person for a document will decide who is required to comment on a particular document and who simply requires to be informed.

No.	Role Description	Responsible	Accountable	Communicate for Comments	Informed (cc'd on final)	Comments
1	O&M Director				Yes	
2	O&M Manager	Yes	Yes		Yes	Overall responsibility
3	O&M Training Coordinator	Yes	Yes	Yes	Yes	Manage and deliver
4	Head of HSSE			Yes	Yes	
5	HR Manager			Yes	Yes	Advise on legality
6	OIM		Yes	Yes	Yes	Manage and deliver
7	OGT Superintendent		Yes	Yes	Yes	Manage and deliver
8	O&M Head of Operations			Yes	Yes	
9	O&M Head of Maintenance			Yes	Yes	

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1.0 PART 1

This document has been split into two parts. This, part 1, describes the roles and responsibilities, the training process and procedure; and covers identification of training needs, the various training methods and Budget considerations.

Part II of this document is introduced and commences from Section 11.0.

2.0 PURPOSE

2.1 Background

The UK Health and Safety at Work etc. Act (as an example) requires that employers ensure that their employees are provided with such information, instruction, training and supervision to ensure, so far as reasonably practicable, their health and safety at work. It also requires employees to cooperate with their employers to enable them to comply with their legal duties.

The Myanmar Occupational Safety and Health Law requires employers to provide adequate health and safety training at different points in their employment (e.g. at recruitment, on being given new or different responsibilities, or when new work equipment, technologies or systems of work are introduced). This training may be repeated periodically, where appropriate.

Other health, safety and fire regulations include a requirement for employees to receive appropriate training as required.

Every organisation needs employees who are trained and competent to a degree suitable for their activities, for their roles (including management roles) and for the decisions they take which affect the health and safety of others.

Many individual regulations include specific requirements for training for those potentially exposed to specific hazards or who are required to conduct specialist work.

Those who manage activities must be competent to assess the risks of those activities, and to take steps to eliminate or reduce the likelihood or severity of harm occurring.

Operation and Maintenance of the Shwe Gas Project entails high-priority occupations requiring long-term on-the-job training and/or basic trades with at least five years of work experience.

2.2 This Manual

This Training and Development Manual governs the methods used to ensure O&M employees possess the necessary education, training and skills to adequately perform their particular job function.

The Training and Development Manual establishes training requirements for O&M Staff employees, contractor personnel working on rotation and consultants, and the minimum requirements for outside parties involved in work at sites onshore and offshore.

This Manual includes timelines for basic orientation and induction training for new hires, construction of a training plan for each job title, and re-training requirements for existing personnel.

The Manual includes guidance on training effectiveness checks and includes relevant training matrices to establish the required training for each job position within the O&M Department.

3.0 SCOPE

This Training and Development Manual applies to all personnel in the Shwe Operations and Maintenance department.

It is important that the phrase 'training and development' is understood in its broadest terms and is generally accepted as covering:

- Formal training sessions (in-house or at specific training centres)
- Employee Coaching and Mentoring by Supervisors and Peers
- Participating in work groups, observing and questioning
- On-the-job training where specific elements of work are demonstrated
- Self-development and learning, where the best employees actively pursue knowledge, by themselves and seek verification through questioning and interaction with mentors and supervisors.

The scope of this manual includes;

- Identification of training needs (SGTNA)
- Selection of training method
- Mandatory training
- Compulsory training
- HSSEMS training
- Discipline training
- Development training
- Specialist training
- Ad-hoc training
- On the job training (OJT)
- Refresher training
- Self-development
- Training effectiveness checks
- PIC recommended training validity periods;

It does not cover the Competency Assurance Management System (CAMS) which is detailed in Company procedure YGG-OM-SD-03-04-0001 COMPETENCE ASSURANCE MANAGEMENT STANDARD.

It also does not cover the necessary in-house training for roles under the HSSEMS, such as Area Authority, Performing Authority etc. required in Company procedure YGG-OM-MP-03-07-0049, INTEGRATED SAFE SYSTEM OF WORK (ISSOW) PTW MANUAL.

4.0 DEFINITIONS AND COMMON ABBREVIATIONS

4.1 Definitions

Training: is any planned activity designed to impart knowledge or skills to another person, to help them reach a desired level of performance. Training activities can take different forms – for example through site instructions, online training, coaching and mentoring, briefings (including “tool box talks”), hands-on and formal classroom style.

Mandatory Training: is training that must be completed, as an absolute minimum, for an individual to be able to commence or continue work in any specific role. This is normally minimum required Safety training and includes TBOSIET / HUET / EBS for offshore assigned personnel.

Compulsory Training: While almost equivalent to ‘Mandatory Training’, within this document and training descriptions it shall be interpreted as meaning that training which is required to fulfill a certain job position; and which is required before an employee could be considered fully competent in that role. It is not required for all personnel in all job descriptions but is specific to certain roles. For example Lifeboat Coxswain training is ‘Compulsory’ for personnel assigned as Lifeboat Coxswains.

HSSEMS Training: is in-house introductory training on specific elements and procedures from within the established Health, Safety, Security and Environmental Management System. It provides the work force with minimum required information for compliance with a procedure or the system. This would include, but not be limited to; Waste Management, PPE, MOC system, PTW, Risk Assessment, Step-back 5x5, UCUA, Use of tools and equipment, Bolt/Flange tightening etc.

SGTNA: (Skills Gap and Training Needs Analysis) is an exercise in which the skills required to be competent in a job are compared with a persons’ currently held skills and thus gaps are identified allowing targeted instruction, training and development applications, to fill the gaps.

Competence: (as defined by the UK Health and Safety Executive) is the combination of training, skills, experience and knowledge that a person has, and their ability to apply these to perform a task safely or to manage the health and safety of an activity. Competence can be affected by factors such as stress, hurrying, attitude or mental and physical ability.

Discipline Training: is in-house or training provider instruction in subject matter specific to a discipline. (Coupling alignment is an example for Mechanical technicians, COMPEX is an example for Electrical and Instrument technicians, Process Safety is an example for Production Technicians.)

Development Training: is training required by a technician who is being considered for a promotion or who requires a specific training course to improve performance. (Examples include Leadership training and MEMIR or Responsible Electrical Person and the other designations identified within the Electrical Safety Procedures and Electrical Safety Rules.)

Specialist Training: is detailed training provided to certain disciplines which is required due to the complex nature of their work. (Examples could be Turbine and Gas compression training for Turbo Technicians or PLC training for Instrument technicians.)

Ad-Hoc Training: As the title suggests, is training in any subject when needed or ‘as necessary’ but this also refers to training that may have been unplanned but which can be given at sites by specialist vendor representatives or suitably knowledgeable contractors, when time permits.

OJT: (On the Job Training) refers to the ongoing process of learning by being mentored, instructed or guided by a more senior work colleague in tasks, methods and theory relating to regular work within the discipline or more in-depth subject matter to assist development and knowledge.

Refresher Training: is conducting subsequent training in the same subject, at predetermined intervals to maintain a level of knowledge and ability. It is also required in support of many courses with certification through examination. It should be noted that not all training requires refresher attendance, especially where the initial training is put to use immediately, practiced regularly and further developed by other methods.

Self-Development: is an extremely important method for knowledge building and improvement but relies on an employees' personal drive and determination to exceed and progress. Self-development is considered as Training, even though it is 'self-administered'. It requires study and questioning, often in an employees' own time.

Training effectiveness checks: The benefits of training must be tracked and effectiveness checks are essential to determine if there was added value and if the training actually accomplished what was required and also to determine if the training provider meet all expectations of Company and the attendees. Effectiveness checks can be conducted by the use of feed-back forms or new skills and knowledge examination.

PIC recommended validity period: Certain training requires regular reiteration and updating of skills, means and methods, especially where there may have been changes in the law, changes in the equipment or systems of work. Re-training may also be required where the skills imparted during the training are not used regularly and the trainee becomes less skilled knowledgeable over time. (An example of training requiring refresher is 'Lifeboat Coxswain' and an example not requiring refresher could be 'Coupling Alignment'. The difference is that acting as a lifeboat coxswain is not something that is done regularly at work and the practical skill level may decline where as a mechanical technician may be involved in pump coupling alignment every few months, throughout his career.) PIC will determine the training validity period based on Industry standard but also on perceived skills and knowledge retention.

Engineers Training: This is similar to Specialist Training but in this manual refers specifically to the office based support engineers in the Operations and Maintenance Departments. The training in this case may include seminar attendance, association membership etc. and will always involve 'Self-development' as introduced above.

Support Staff Training: Relating to O&M office support staff, this training will follow the terms already covered, as required to maintain or improve skills levels, ensuring that the required levels of support are self-sustaining and under continuous improvement throughout the Shwe project life-cycle. Much of this training may be controlled by the Human Resources department (HR).

Recognition of Prior Learning: (RPL). This description is given to situations where, due to many years of experience, possibly coupled with previous formal training or other 'learning', it can be assumed that senior personnel have the necessary knowledge, skills and competence, to conduct the work, contribute to the ISSOW process and mentor or assess developing personnel in the specific subject matter. RPL can be assigned by the OIM or OGTS, for site personnel, or for these positions by the O&M Manager, Head of Production and Operations or Head of Maintenance, based on personal observation of work practices or their other demonstrations of the necessary competence.

4.2 Common Abbreviations

AGT	Authorized Gas Tester
ATEX	Rating for equipment and protective systems intended for use in potentially explosive atmospheres (acronym derived from “Atmosphère Explosible” (French for explosive atmosphere)
BS	British Standard
CA-EBS	Compressed air emergency breathing System
CAMS	Competency Assurance Management Standard (system)
CAT	CAMS Assessor Training
CITB	Construction Industry Training Board
Company	POSCO INTERNATIONAL Corporation Myanmar E & P
COMPEX	Competency in Explosive atmospheres
Contractor	Provider of services or contracted works at Company controlled sites
CROER	Control Room Operator Emergency Response
CSER	Confined Space Entry and Rescue
EBS	Emergency Breathing System
F&A	Finance and Accounting (Department)
FOET	Further Offshore Emergency Training
HERTL	Helideck Emergency Response Team Leader
HERTM	Helideck Emergency Response Team Member
HLO	Helicopter Landing Officer
HOIT	Helideck Operations Initial Training
HOM	Head of Maintenance
HOO	Head of Operations
HPE	High Potential Employee
HQ	Head Quarters
HR	Human Resources (Department)
HSSE	Health, Safety, Security and Environment
HSSEMS	Health, Safety, Security and Environment Management System
HUET	Helicopter Underwater Escape Training
IATA	International Air Transport Association
IMDG	International Maritime Dangerous Goods
IOSH	Institution of Occupational Safety & Health
ISO	International Standards Organisation
ISSOW	Integrated Safe System of Work (PTW Procedure)

JD	Job Description outlining the requirements and roles for each position
LBC	Lifeboat Coxswain
MBO	Management by Objectives (Office National Staff Appraisal system)
MEMIR	Major Emergency Management Initial Response
MOC	Management of Change (procedure)
MOME	Management of Major Emergencies
NEBOSH IGC	NEBOSH International General Certificate
NFPA	National Fire Protection Association
OEM	Original Equipment Manufacturer
OERTM	Offshore Emergency Response Team Member
OERTL	Offshore Emergency Response Team Leader
OGT	Onshore Gas Terminal
OGTS	Onshore Gas Terminal Superintendent
OIM	Offshore Installation Manager
O&M	Operations and Maintenance
OMD	Operations Maintenance Department
OPITO	Offshore Petroleum Industry Training Organisation (Industry Standards)
OpEx	Operational Expenditure (OpEx)
PIC	POSCO INTERNATIONAL Corporation, Myanmar E & P (Company)
PIP	Personal Improvement Plan
PLC	Programmable Logic Controller
PPE	Personal Protective Equipment
PTW	Permit to Work
RA	Risk Assessment
R&L	Basic Rigging and Lifting
ROI	Return on Investment
RPO	Radiation Protection Officer
RPL	Recognition of Prior Learning
RSO	Registered Safety Officer
SAP	System Applications & Products (for resource planning)
SI	Scaffolding Inspection
SGTNA	Skills Gap and Training Needs Analysis
SHP	SHWE Offshore Production Platform
TA	Technical Authority

TBOSIET	Tropical Basic Offshore Survival Initial Emergency Training
Tripod Beta	Incident and Accident analysis methodology (developed by Shell)
WRH	Working and Rescue at height

5.0 REFERENCES

PIC HR Document 'Internal Regulations for National Employees'

YGG-SF-MS-01-01-0001 HSS&E MANAGEMENT SYSTEM

YGG-OM-SD-03-04-0001 COMPETENCE ASSURANCE MANAGEMENT STANDARD

YGG-OM-MP-03-07-0002 OPERATIONS WORK MANAGEMENT GUIDELINES

YGG-OM-MP-03-07-0049 INTEGRATED SAFE SYSTEM OF WORK (ISSOW) PTW MANUAL.

ISO 10015:2019: Quality management - Guidelines for competence management and people development.

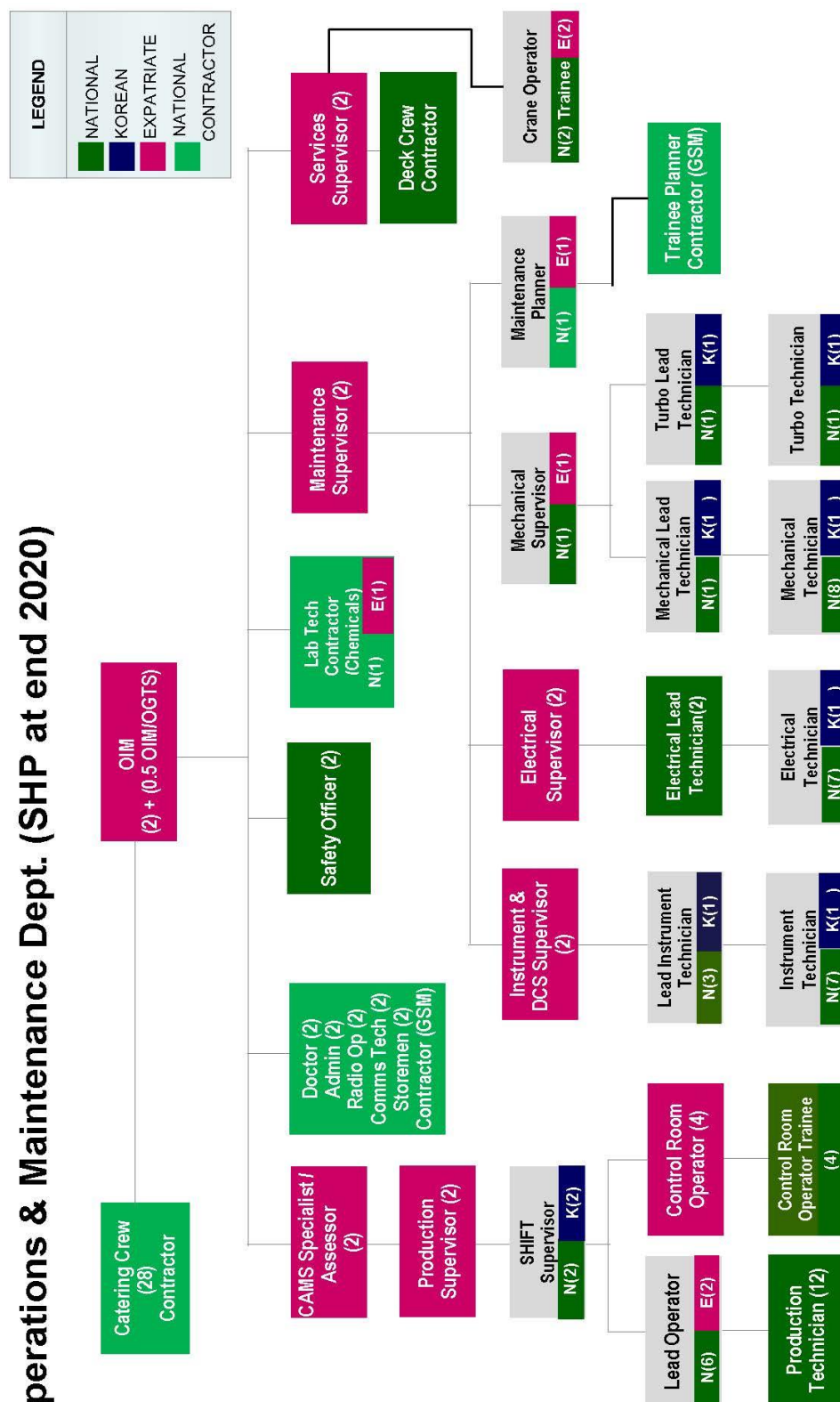
6.0 COMPETENCE TRAINING & AWARENESS MANAGEMENT

As required within Element 03-04, of the PIC HSS&E MANAGEMENT SYSTEM (Document number YGG-SF-MS-01-01-0001

Key positions within the O&M site operations teams are identified based on the manning studies conducted for each development phase and each position identified has an associated Job Description, outlining the requirements for that position and the roles and responsibilities assigned to it. This includes contractor sourced positions essential for the safe operation and maintenance of the facilities. These positions are depicted on the SHP and OGT site Organisation charts. Current (date of document issue) organisation charts are shown below for information, although the SHP technician grade numbers will be increasing as Shwe development moves toward Phase 3.

Organization

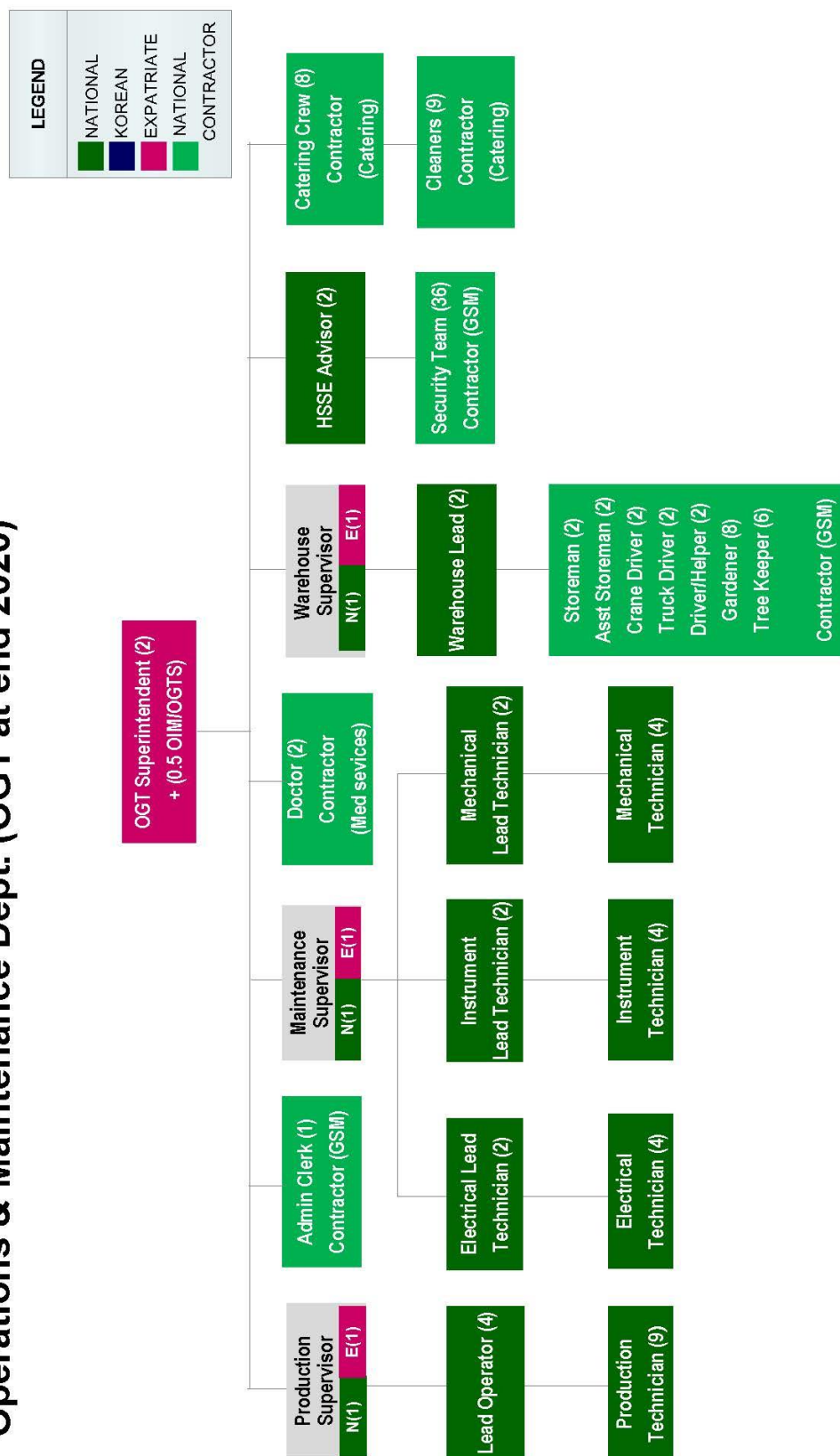
Operations & Maintenance Dept. (SHP at end 2020)



HOLD 1: The above nationality distribution is included to show the current intent at the time of document issue. It is not a formal organisation chart and personnel numbers, positions and nationalities are continually changing in accordance with the Nationalisation program and preparations for Shwe Phase 3.

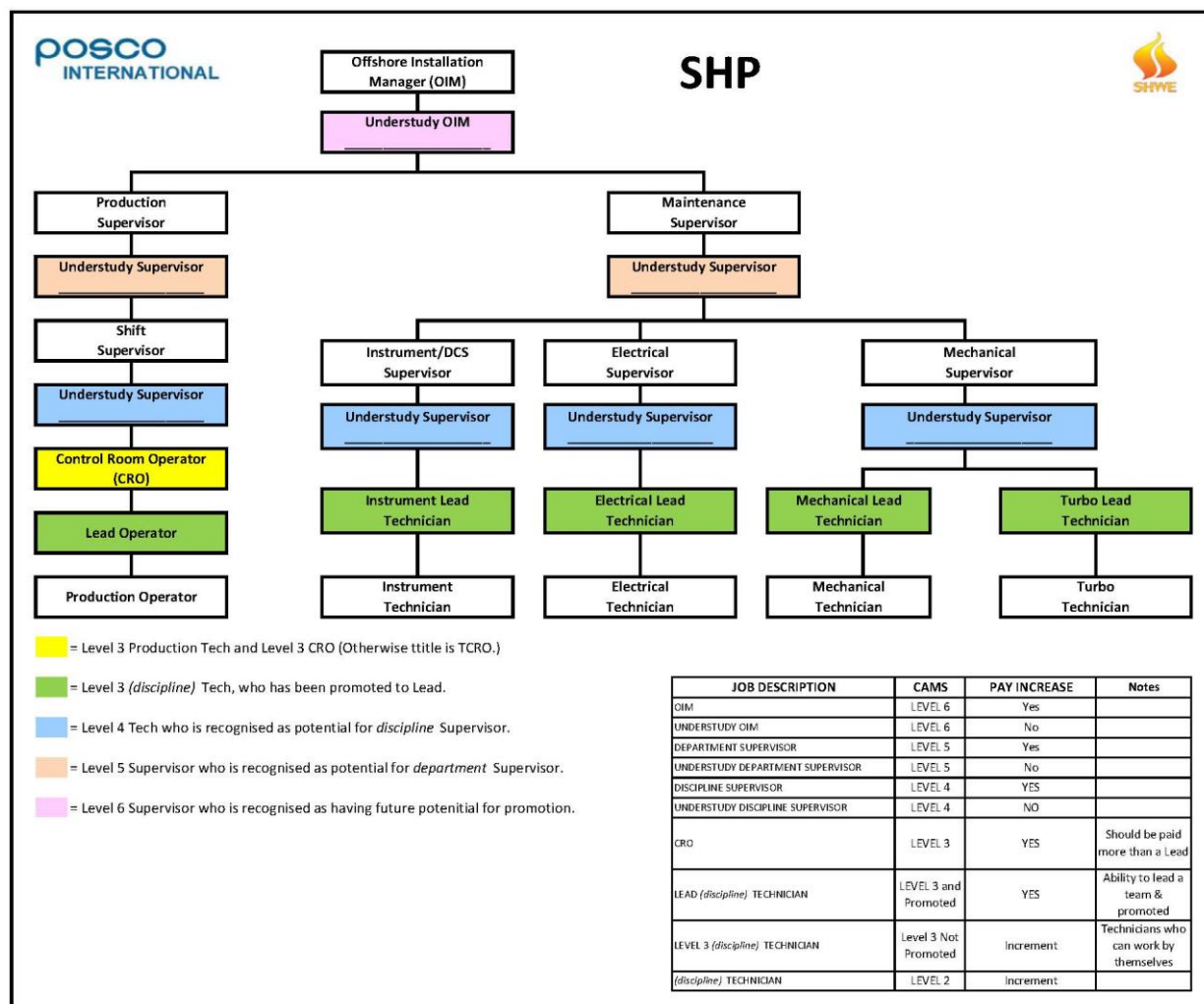
Organization

Operations & Maintenance Dept. (OGT at end 2020)

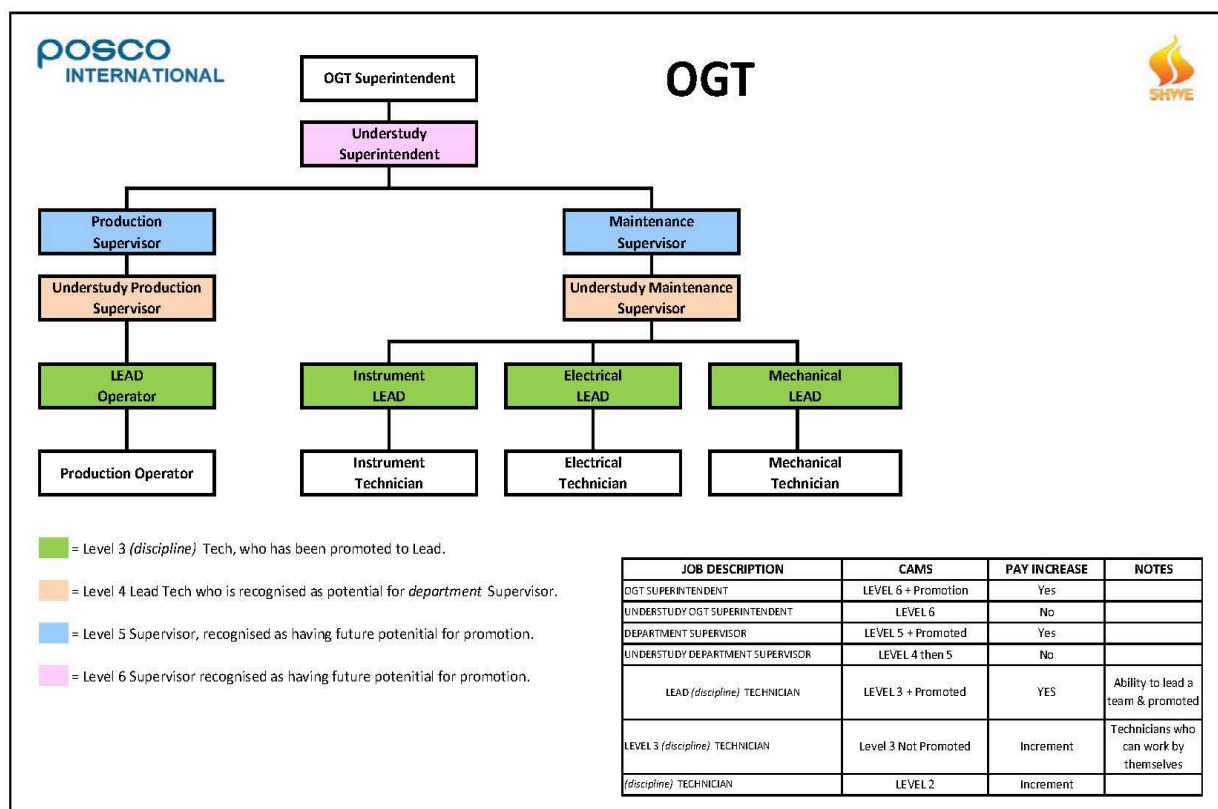


HOLD 2: The above nationality distribution is included to show the current intent at the time of document issue. It is not a formal organisation chart and personnel numbers, positions and nationalities are continually changing in accordance with the Nationalisation program and preparations for Shwe Phase 3.

The Competence Assurance Management Standard document, referred to in section 5, above, outlines the Competency level (1 through 6) required for each position and the charts below show the expected progression through the site O&M positions for SHP and OGT.



HOLD 3: At the time of document first issue, the “Understudy” positions shown with blue cell background are ‘proposed’ only and do not constitute formal promotions attracting any grade or salary adjustments. This may change if formally approved.



HOLD 4: At the time of document first issue, the “Understudy” positions shown with blue cell background are ‘proposed’ only and do not constitute formal promotions attracting any grade or salary adjustments. This may change if formally approved.

A Training Matrix (described later in this document) shows each employee and job title and the training required for each individual. The actual Compulsory training required for each employee within a group (i.e. for any specific Job Title) is also shown so that personnel are aware of what training is required as they advance through the job positions.

These elements tie together the identification of key positions along with required competencies, and the training and experience recommended.

7.0 ROLES AND RESPONSIBILITIES

7.1 O&M Director

Provides the necessary guidance and considered approvals for all proposed training, including budgetary approvals.

7.2 O & M Manager

Reviews and approves all training requests for site personnel.

7.3 Head of Operations

Reviews and approves all training requests for office based Operations engineers and support personnel. Works with Training Coordinator and relevant Administration Assistant(s) to ensure office based Operations Engineers receive the necessary technical and development training.

7.4 Head of Maintenance

Reviews and approves all training requests for office based Maintenance engineers and support personnel. Works with Training Coordinator and relevant Administration Assistant(s) to ensure office based Maintenance Engineers receive the necessary technical and development training.

7.5 Discipline Technical Authorities

Review specialist and discipline specific training requests and proposed course content for relevance and suitability. May recommend specialist or discipline specific training to head of department.

7.6 Training Coordinator

Raises and Coordinates all aspects of approved training requests. Prepares budget estimations and initiates, plans and expedites approved training through interdepartmental liaison with training participants, site management and the training centres. Prepares all Groupware and SAP applications, maintains the training matrix, distributes original and maintains copy certificates and completion records, for all O&M personnel. (This does not include personally, or otherwise, arranged individuals development training.)

7.7 Head of HSE

Works with the Training Coordinator to propose and facilitate HSSE specialist subject training for Office HSSE group and site Safety team members, as required.

7.8 OIM and/or OGT Superintendent

Works with Training Coordinator to ensure proposed training dates do not affect daily production and sales operations and that sufficient personnel remain on duty to cover all operational and emergency scenarios. Liaise with site senior supervisors when assessing individual site personnel training requests and promotes coaching, mentoring, OJT and self-development.

7.9 Site Discipline Supervisors

Organises best possible coaching and mentoring opportunities for all discipline subordinates. Closely monitors developmental progress and conducts an annual Training Needs Analysis to report to Training Coordinator and record on personnel annual appraisals as appropriate.

7.10 Site HSSE Representative (OGT HSSE Supervisor and SHP safety Officer)

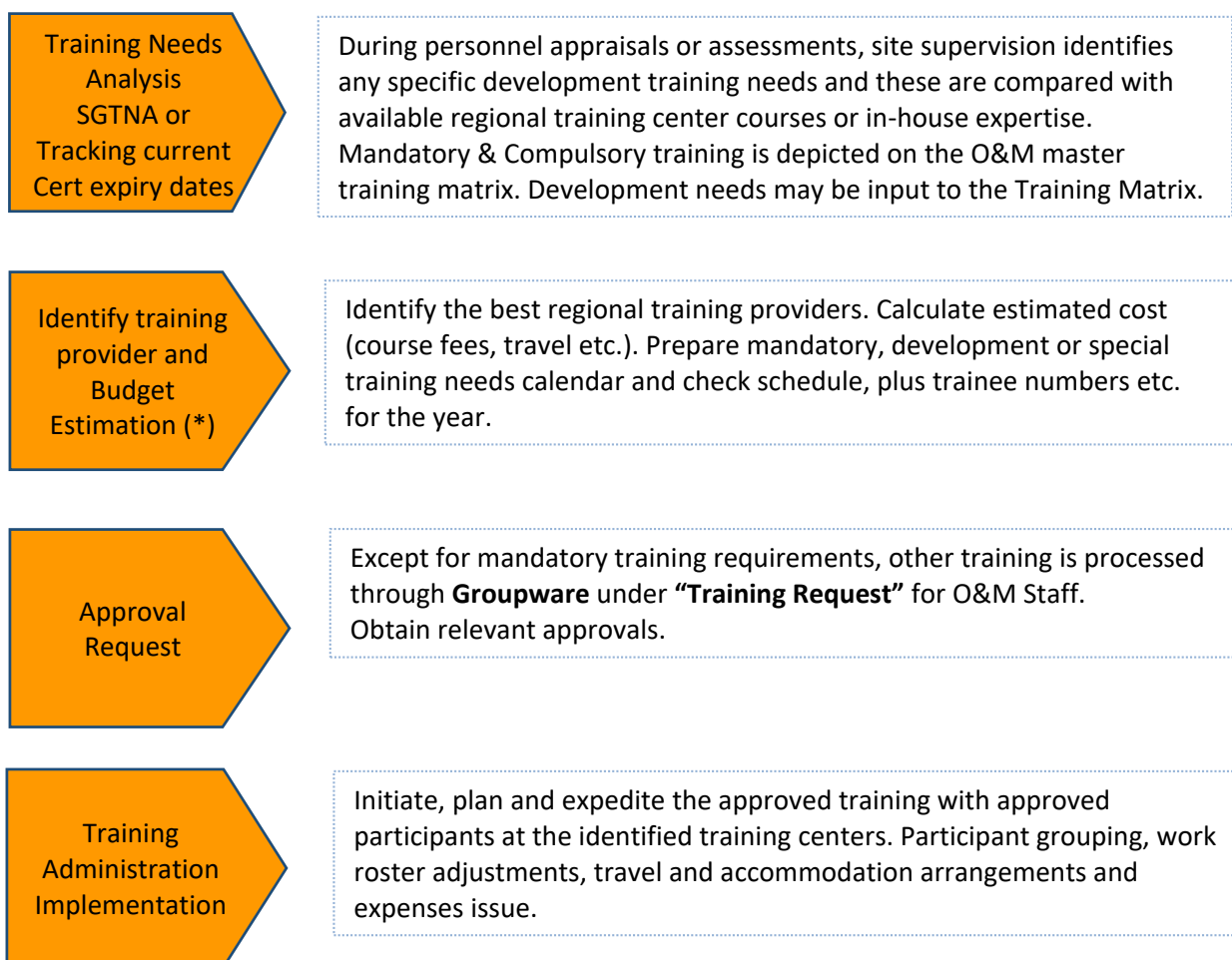
Promotes site ad-hoc training in all subjects that are safety or environmentally oriented and ensures that site personnel are familiar and comply, with all HSSEMS procedures and work-instructions.

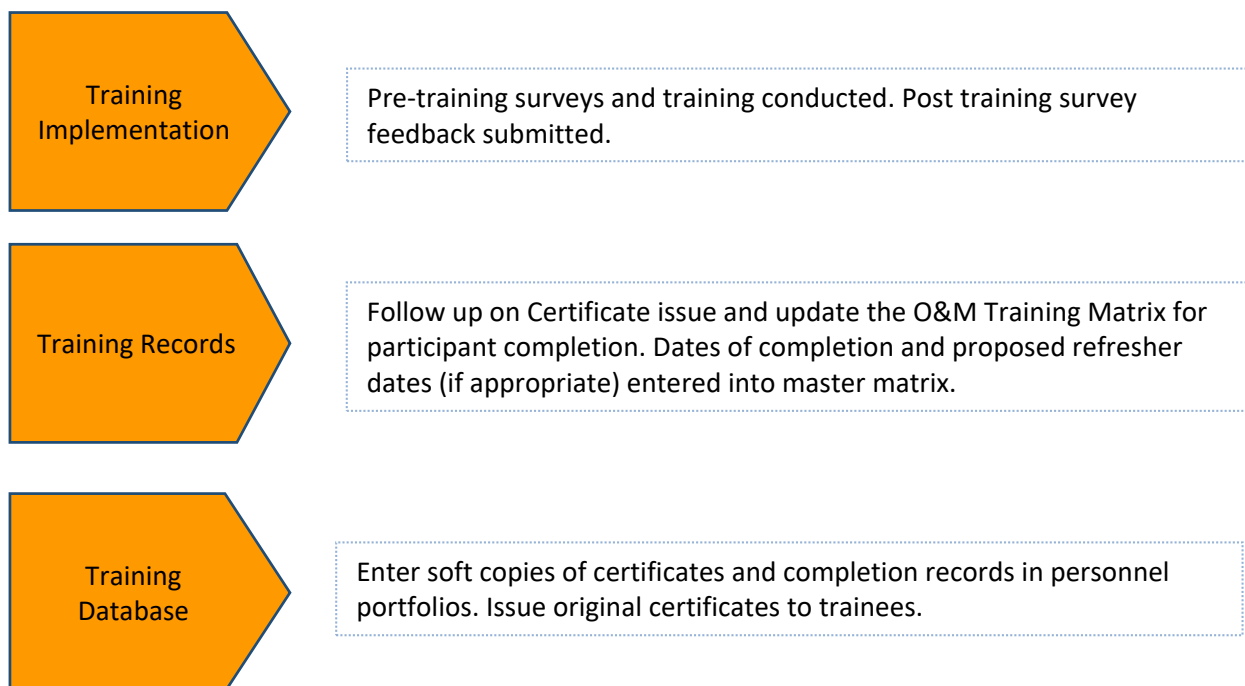
7.11 Contractor Operations Managers / Project Coordinators

Responsible for ensuring that all contract personnel (core-rotational and temporary workers) have received all Mandatory training and adequate instruction or specialist training, to conduct the contracted work-scopes.

8.0 THE TRAINING PROCESS

In its simplest form, the training process involves the following steps;





8.1 Groupware Training Administration

All training, except Mandatory training, is processed and recorded through Groupware and costs involved are recorded in SAP for budgetary tracking of all associated expenditures.

(All relevant completed forms, used by Yangon Office, can be found on Groupware for information.)

Expenses, allowances and Payments must all be applied for and approved, in accordance with PIC HR Department Internal Regulations for National Employees and for Korean and Consultant employees, in accordance with HQ or contractual requirements.

There are 6 phases in the administration process, conducted by our Training Coordinator;

1. Vendor (training provider) Registration in Groupware and SAP (Same form is used to update or change Vendor details)
2. Training Request (are completed for each individual course title and date range)
3. Business Trip Request (Same form is used to prepare the Business Trip Settlement)
4. Air Fare Payment request (If appropriate)
5. Trip Settlements for trainees (Payments of allowances etc.)
6. Payments for the Training providers services.

However, for any one training attendance the following processes are necessary.

No.	Description	Process Action	Remark
1	Training Request	<p>Formal Training Approval is requested and processed after verbal agreement among all relevant parties. Also involves coordination with external company (or) training provider and attendees – rosters / availability etc.</p> <p>Once complete approval is achieved, it is flexible for training date range changes from both company and training provider sides, depending on the situation, availability, etc.</p>	
2	Vendor Registration Creation / Details updates	<p>Before any training can be processed the training centre/provider must be in the PIC approved vendor list. Where necessary new vendor registration, or update of existing data, is required.</p> <p>F&A Dep't conducts the registration based on the Registration request form.</p>	
3	Scheduling	Normally conducted by the Training Coordinator, based on the Training Matrix requirements and agreed by site management and attendees, or office HODs. Attendees are grouped based on availability and also with consideration given to costs and benefits.	
4	Business Trip Request (Local Training Attendance)	Planned Training Allowances with estimated expenditures are processed via Business Trip Request(s) for the participants (Rotational National Staff Only)	Training Allowances for each training are processed two times: 1) At Request; and 2) At Settlement
5	Business Trip Settlement (Local Training Attendance)	Actual Training Allowances with entitled expenditures are processed via Business Trip Settlement(s) for the participants (Rotational National Staff Only)	
6	Business Trip Request (Oversea Training Attendance)	Planned Training Allowances with estimated expenditures (including Airfare) are processed via Business Trip Request(s) for the participants (Rotational National Staff Only)	
7	Business Trip Settlement (Oversea Training Attendance)	Actual Training Allowances with entitled expenditures (including Airfare) are processed via Business Trip Settlement(s) for the participants (Rotational National Staff Only)	
8	Airfare Payment (Local Training Attendance)	If training is arranged by Company, at site(s), Airfare payments or charter flight arrangements are processed by Training Coordinator for attendance at site or YGN Office training venue (Rotational National Staff Only)	

		For Non-YGN Residents' training attendance in YGN, is managed by the individual and costs are settled via Business Trip Settlement (Rotational National Staff Only)	
9	Airfare Payment (Oversea Training Attendance)	Airfare arrangements for Company arranged training overseas are processed by the Training Coordinator (Rotational National Staff Only)	
10	Training Service Completion Report	Once training is completed, it is processed with formal evidence/records for training provider payment for contracted call off training	
11	Training Payment (Non-Contractual)	Is processed by Training Coordinator for minor training fees to local training provider(s)	
12	Training Payment (Contractual) [Call Off]	Cost Controller (P&L Dept) processes training payment(s) to contracted local training provider(s)	
13	Oversea Training Payment [Service Order]	Cost Controller (P&L Dept) to process for training payment(s) to <u>overseas</u> training provider(s)	

8.2 Training administration in SAP

SAP entries for costs and budgeting records include the following elements.

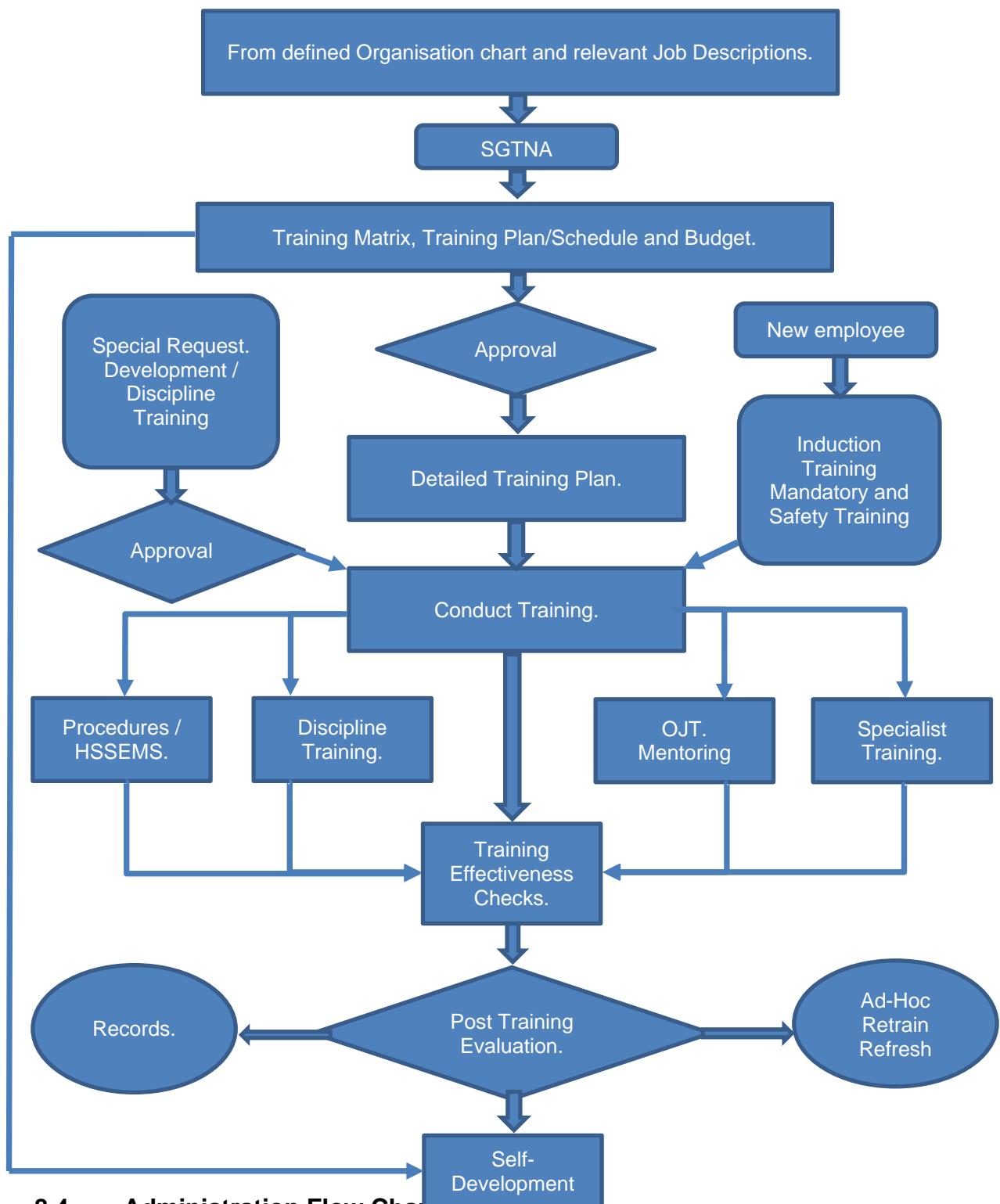
No.	Description	Process Action
1	Create Purchase Requisition	To generate approved PR so that Contract Team can issue relevant CO/SO/PO to training provider Account assignment shall be according to Section 10.0 Budget in this Procedure If required, all estimated items (e.g. Trainer's logistical expenses, Training Room rental cost, etc.) shall be entered in the PR
2	CO/SO/PO Issuance	Contract Engineer (P&L Dept) processes the proposed training requirement under the approval of Director (P&L Dept) Contract Engineer (P&L Dept) directly communicates to training provider for PIC's approved CO/SO/PO with relevant terms & conditions
3	Service Entry Sheet	When a certain training activity is completed, Training Coordinator prepares the SAP Service Entry sheet to notify service completion so that Cost Control (P&L Dept) can move forward with the payment process after also receiving the "Training Services Completion Report" from Training Coordinator (O&M) via groupware as in section 8.1 Table element 10.

8.3 Simplified Training Flow Chart

REVISION 0.

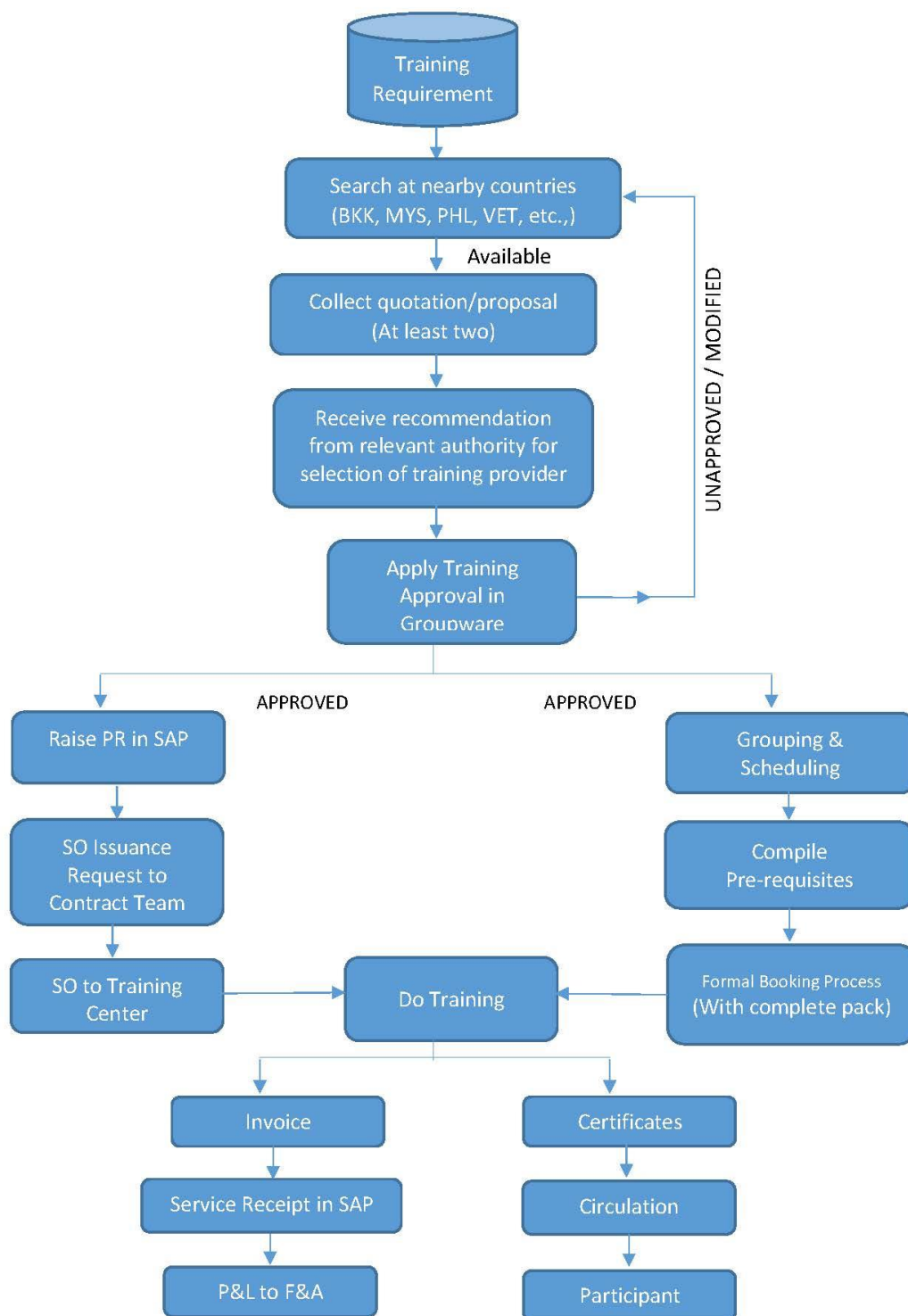
TRAINING FLOW-CHART.

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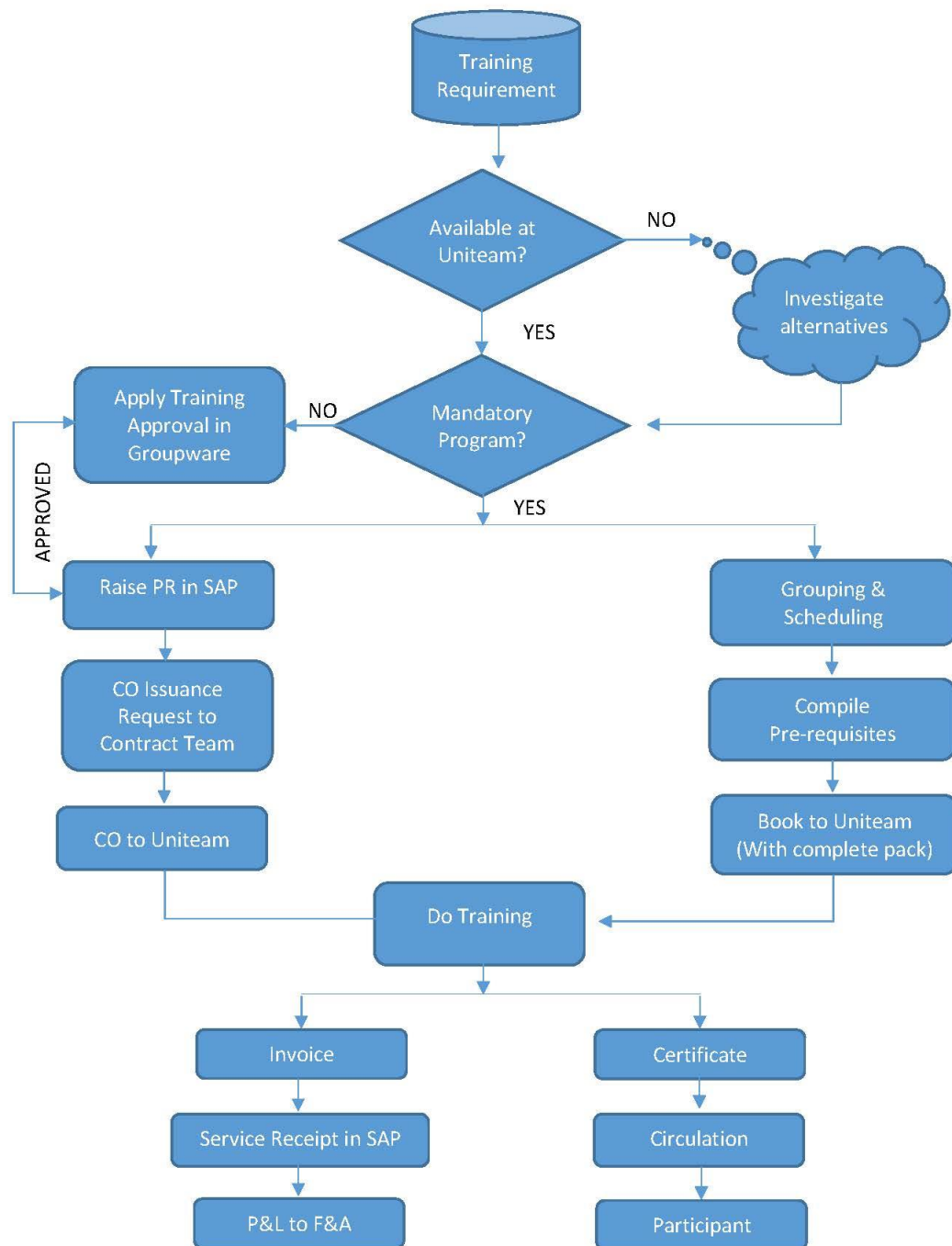
8.4 Administration Flow Chart (a)

Administration – (External)



8.5 Administration Flow Chart (b)

Administration – (Internal)



9.0 PROCEDURE

9.1 Staff Groups

9.1.1 Korean National PIC Staff

Korean Engineering Support staff and site technical staff will have the Mandatory training for travel offshore and current job position, refreshed before certification expiry. This mandatory training, such as TBOSIET, ERTM, ERTL etc. and discipline specific Compulsory training, is tracked and administered by the Training Coordinator. Other development training needs and arrangements are made through direct contact with Department Director and HQ.

All Korean national staff demonstrate self-development practices, to varying degrees and this is encouraged along with following changes and innovations within their discipline through reading of technical notes and journals, Industry Periodicals and by Association memberships where these are of benefit.

9.1.2 Office support staff:

At annual 'self-appraisal' time, when preparing the Management By Objectives (MBO) proposal for the coming year, office support staff have the opportunity to propose training that they themselves feel is necessary for their personal development or the changing work demands of their position. Additionally, HR department may, from time to time, recommend general training which should be attended by office based staff.

Also at the year-end self-appraisal review, the reporting manager/head of department may make recommendations for training requirements in the coming year within their comments relating to past performance and new expectations. Such recommendations will be discussed with the incumbent.

The HSSE department may also present introductory training relating to compliance with relevant sections of the HSSEMS or propose arrangements for Fire Warden or First Aid training refresher, etc.

If a need for special discipline training is identified by support staff, they should initially engage their line manager/head of department to discuss the need.

Where necessary Office Support staff will have the Mandatory training for travel offshore, refreshed before certification expiry. This mandatory training, such as TBOSIET, is tracked by the Training Coordinator.

9.1.3 Office based National Engineering staff:

In addition to the notes above for Office Support Staff, technical training needs will be identified by Head of Maintenance or Head of Operations (as appropriate) during SGTNA, normally conducted annually. This will be based on discipline and personal development needs and such training scheduled for achievement in the coming year, where possible.

Engineers are encouraged to practice self-development and follow changes and innovations within their discipline through reading of technical notes and journals, Industry Periodicals and by Association memberships where these are of benefit.

Engineering staff will have the Mandatory training for travel offshore, refreshed before certification expiry. This mandatory training, such as TBOSIET, is tracked by the Training Coordinator.

9.1.4 Office and Site based management:

Senior Office and Site based Consultants will have the Mandatory training for travel offshore and current job position, refreshed before certification expiry. This mandatory training, such as TBOSIET, ERTM, ERTL, etc. is tracked and administered by the Training Coordinator.

As the key elements in Consultants roles and responsibilities include mentoring, provision of guidance and transfer of experience and knowledge, recognition of prior learning, discipline training and experience is foremost and further discipline development in these roles is not considered imperative.

9.1.5 Site National Staff (All technical grades):

In addition to the notes above for Office Support Staff, (with the exception of the annual self-appraisal and MBO, which is currently for office personnel only) technical training needs will be identified by Heads of Department in consultation with the OIM and OGTS (as appropriate) during SGTNA or the annual appraisal system review process. This will be based on discipline and personal development needs and such training may be scheduled for achievement, by the Training Coordinator, in the coming year, where possible.

Site National staff will have the Mandatory training for travel offshore, refreshed before certification expiry. This mandatory training, such as TBOSIET, and specific training required within the job scopes, is tracked by the Training Coordinator.

Site technical personnel may make personal or group requests for discipline or specialist training but this will only be approved when sufficient details are provided and the training will result in discipline development which presents abilities in higher levels of equipment maintenance and potentially reduces the need for OEM or Vendor attendance.

Self-development is a prerequisite for site staff who wish to prepare themselves for advancement and promotion or other opportunities. All technical grades are encouraged to continuously demonstrate their commitment and dedication in this way.

9.1.6 Key Contractors

It should be noted that Contractors personnel (e.g. Catering, General Services Manpower, etc.) are trained in accordance with current contract requirements. The contracts all require personnel to be trained in accordance with their job descriptions and that the Contractor is responsible for such training. Only in exceptional cases, where the 'contract' did not define a specific training need, required by Company due to changes in operational practices etc., would O&M training coordinator be required to include such contract personnel within the relevant course being attended by O&M personnel.

9.2 Identification of training needs

As noted in 9.1 it is likely that most development training needs will be identified during annual appraisal reviews and SGTNA, where conducted, while all mandatory training needs will be identified for relevant job positions.

Not only should training needs be identified but also the expected outcomes. Training attendance is not, in itself, adequate. Training must be targeted to those who will benefit most and who will then be of benefit to the site or company organisation.

Training Pyramid;



The training pyramid shows a common representation of how training impact reduces from the trainees reaction to the Return on Investment, ROI, (actual benefit to company).

This might suggest that we need to train everyone to get some return on investment but actually Company must make attempts to change the pyramid shape into a rectangle where all five elements are the same size. (Or at least broaden the behaviour, results and ROI sections.)

By first setting some expectations on training outcomes and then conducting Training effectiveness checks (13.0) Company can attempt to measure training benefits which will help to identify the most appropriate and best training for our various disciplines and job titles.

The intent is to boost employee engagement in training and to ensure that new knowledge and skills are 'applied' consistently and regularly, subsequent to the training.

9.3 Selection of training method

Mandatory Safety Training which includes TBOSIET with CA-EBS, ERTM, ERTL, Coxswain, AGT, COMPEX, CROER, CSER etc. must be done at recognised and approved training centres and the syllabus is defined by OPITO or other standards bodies. Most of this training will be arranged in Yangon and involves class-room and practical sessions. Where certification issue depends on successful completion of examinations, such examinations will be administered at the training centre. Selection of these training methods is therefore predetermined and Company have no authority over the methods of training.

However, where it is more cost efficient to bring the trainer(s) to site, this will be investigated for courses that do not require specialist equipment or for which our own site equipment can be used. This is determined on a case by case basis.

The most appropriate training methods, considering course requirements, materials and equipment needs, attendees and costs, will be selected. Training may be internal (in the office or meeting room at site) or external (at an approved training centre or other external venue).

In addition to formal Training Providers / Centres, additional options include;

Best for manual task learning;

Hands-on training: This can be either on-the-job training (OJT), where employees are shown something visually before repeating it themselves in the work environment; or hands-on training during a workshop, where the same thing happens, but in a controlled environment, where no catastrophes are likely. These are both excellent tools for training employees in both the practical and theoretical aspects of their jobs and can be accomplished by experienced peers, Supervisors or Yangon based discipline Engineers.

Best for procedures familiarization;

Site or Office based presentation meetings: During these, employees will listen to a training guide while following a PowerPoint or other presentation. Depending on the workplace and subject matter, they may or may not take their own, or be provided with presentation notes. In all cases, these are quite theoretical, and generally, don't involve practical skills. Questioning and engagement with the presenter(s) will improve the learning outcomes.

Best for specific discipline knowledge updating;

Seminars / Conferences: During these, employees are taken away from their normal place of work for a day or more to learn new skills in a different environment. These can feature training in recent industry or discipline innovations or involve specific subject matter relevant to the attendees, their discipline subject matter or general development.

Best for introduction to theory and concepts;

Web learning: Employees can learn online by taking virtual courses, including following presentations, taking quizzes, and even doing coursework such as simple assignments. These are effective because they allow employees to access the knowledge at their own learning speed from any location with a web access.

Best for personal development in any subject;

Self-learning: Basically involves an individual 'reading vendor or Company documents, instructions, procedures and self-familiarizing through reviewing drawings etc. This will also involve questioning supervisors as required to ensure that the subject matter is being correctly understood. Probably the most difficult learning method as it requires personal discipline and sacrifice of personal time. With the wealth of information available through the internet and the improved connectivity at sites, there is easy access to information on a scale never before available. Additionally there are soft copy text books available for review on-screen, at sites.

9.4 Mandatory & Compulsory training

As generally covered in preceding sections mandatory training must be completed, as an absolute minimum, for an individual to be able to commence or continue work in any specific role. This is normally minimum required Safety training and includes TBOSIET / HUET / EBS.

Assignment to positions such as Authorised Gas Tester, Lifeboat Coxswain, Fire Team Member (or Leader), HLO, HOIT and etc. requires Compulsory training to enable individuals assigned to these roles to properly function correctly, ensuring that we have emergency response capabilities and personnel who are capable in these roles.

Mandatory and most Compulsory training will almost always be carried out in approved training centers.

A more complete listing of Mandatory and Compulsory Training and the job positions to which it applies, is covered in the Training Matrices of which examples are contained in the appendices.

The training matrix is intended to be available to all personnel (read-only) from within the O&M Training Matrices which will be stored and edited from within the 'Groupware' system. Groupware is a term used for collaborative software in which Groupware refers to programs that help people work together collectively while located remotely from each other. Programs that enable real time collaboration are called synchronous groupware. Groupware services include the sharing of calendars, collective writing, e-mail handling, shared database access, news feeds, access to approval systems, reports, Site Rosters and etc. and the training requirements and recording matrices are being added to this easily accessed system (circa 2020).

9.5 HSSEMS training

The Health, Safety, Security, Environmental Management System contains our key Safety Critical and other operational procedures which have been written to provide instructions or guidance relating to how the Operations and Maintenance Department function safely and in accordance with best industry practice, to achieve the required Company goals. An obvious example, familiar to all site personnel is the Integrated Safe System of work, Permit to Work Procedure. Other familiar procedures should include all Standard Operating Procedures. Less familiar but no less important procedures include topics from Waste Management to Emergency Response.

For non-technical elements of the HSSEMS, where training in these procedures is identified as necessary, for new employees or to refresh longer term employees memories, this will be conducted in house and generally lead by the Yangon HSSE department, on site.

Environmental awareness training, including the requirements of ISO 14001 relating to Compliance, Environmental Aspects and Impacts, the PIC Environmental Management Plan and employees roles and responsibilities relating to waste management and reduction etc. will generally be conducted as in-house training, at site and presented by the HSSE team.

For the technical elements of the HSSEMS, training will mostly involve 'Self-learning / development', OJT and presentations or familiarisation group discussions, led by site Supervisors or O&M engineers, as appropriate.

9.6 Discipline training

Discipline training refers to job specific training required by Production, Electrical, Instruments, Mechanical or Turbo Technicians, Lead Technicians or Discipline Supervisors and site support

personnel which may improve their technical abilities resulting in greater knowledge or better performance in their day to day work, operating and maintaining the Shwe facilities.

A more complete listing of Discipline Training and the job positions to which it applies, is covered in the Training Matrices of which examples are contained in the appendices. The full suite of Discipline training, where noted as compulsory, required for any given Job Description, must be completed, before employees can be considered for advancement / promotion etc.

9.7 Development training

Development training will normally be training in soft skills such as Communication, Competency Assessor, Team Building, Planning, Effective presentation, Effective delegation, coaching and mentoring, Supervisory skills, common Computer software use, Assertiveness, Problem solving, accident/incident investigation, technical writing and a host of similar topics.

This training would normally be provided to High Potential Employees (HPE) who were progressing towards promotion readiness.

These skills are not included in the Training Matrices due to their particular nature and as not all employees will move through the promotional chain, such training will be provided to HPE who are deemed to be most likely to benefit. It is not compulsory training for all.

However all personnel may make requests for development training, if they believe it will be of benefit to them personally and to the organisation. Requests may be made through line management for consideration and may also be recommended by line-management during annual appraisals and performance reports.

9.8 Specialist training

This is generally a reserved category for office based engineers. It is not included in the training matrices and would be considered for office based engineers progressing towards Head of Department status or where it was deemed important for the O&M department in general. Typical examples could be Aspen Hysys process modelling Software training, Reliability or Risk based Inspection techniques training or similar subject matter. It may be requested by an engineer or recommended through SGTNA at annual performance review time. It may also include subjects required for progress through the engineers discipline competency process leading to a Technical Authority position nationalisation, within an internal succession plan.

9.9 Ad-hoc training

Ad hoc training is, as the description suggests, impromptu training that may be available as an opportunity arises. It is generally unplanned and therefore may occur anywhere, for any employee(s) where time permits and the subject matter is relevant.

It may be arranged on site or in the office and the subject matter is appropriate at that time.

9.10 On the job training (OJT)

Probably the most valuable training while at work and is an important topic of human resource management. It helps develop the knowledge, skills and career path of the individual and contributes greatly to growth of the organisation. On the job training is a form of training provided

at the workplace. During the training, employees are familiarized with the working environment, gain hands-on experience using machinery, equipment, tools, materials, etc. Part of on-the-job training is to face the challenges that occur during the performance of the job. An experienced employee, supervisor or manager act in the role of the mentor who through written, or verbal instructions and demonstrations pass on their knowledge and company or work specific skills to the new or more junior employee. Executing the training at the job location, rather than the classroom, creates a stress-free environment for the employees. On-the-job training is the most popular method of training in most of the developed countries, such as the United Kingdom, USA, etc. Its effectiveness is based on the use of existing workplace tools, machines, documents and equipment, and the knowledge of specialists who are working in this field and have vast experience of the topic. On-the-job training is easy to arrange and manage and it simplifies the learning process. On-the-job training is best used for practical tasks. Upon satisfactory completion of OJT the employee may record the subject completed, along with personal notes to aid knowledge retention. OJT may also be recorded on an annual performance review/appraisal. Additionally the employee could request some form of written recognition that OJT was completed satisfactorily. This could simply take the form of an e-mail to the employee from the 'trainer' stating that a specific task was demonstrated and the employee attended.

9.11 Refresher training

Refresher Training or Retraining is attendance on a course or training program with the purpose of reacquainting personnel with previously provided skills or knowledge.

The Refresher training is based on the assumption that the skills and knowledge previously gained have not been frequently used and therefore the knowledge and skills have deteriorated. It may also be required due to previous subject matter becoming obsolete or outdated because of advancement in technology, changing equipment, policies or procedures and is also required due to the human tendency of forgetting things. Thus, refresher /retraining is conducted to keep employees knowledge and skills levels current and adequate for the task (s) concerned.

An example where this is necessary would be for a designated SHP Lifeboat coxswain. The lifeboat coxswain has an important emergency response role and needs to have a suitable level of competence in operating a lifeboat and controlling its passengers. However, as the coxswain almost never has a chance to practice the skills gained in earlier training, the subject matter needs to be refreshed.

9.12 Self-development

Self-development is taking steps to better yourself, such as by learning new skills or overcoming bad habits. Employees have a unique insight into the requirements of their own role — and when they direct their own development, with support from line supervisors and managers, those needs are more likely to be addressed.

Work-based learning, such as seeking out and undertaking special projects, shadowing colleagues and engaging with mentors and the acceptance of new duties, will help in an individual career path.

Self-directed learning, such as reading academic and industry texts, Company procedures, Vendors documentation including operation and maintenance texts etc.

formulating questions or points requiring clarification and then discussing these with an available mentor, is a route to personal development and improvement.

All employees at site, and in the office environment should allocate some time (possibly even personal time) to pursue this valuable means of improvement.

It also demonstrated dedication and the desire to progress through the work positions with a view to promotion and acceptance of greater responsibilities.

9.13 PIC recommended training validity periods

There is a huge misperception that individuals must have formal training and certification for every aspect of their work scope. While this has become true for safety critical training, complex job skills training and is now seen as necessary for environmental responsibility training, the whole issue is driven by perceptions of need, rather than demonstration of requirement. Training has become an industry and often for subjects that should be 'common sense' or learned through alternative means such as OJT. The practice of training centres applying their own training validity periods has become prolific and the same training certificate can be issued by different training centres with differing expiry dates.

OPITO or other formal Industry body, 'approved training' will always have the same validity period, regardless of which training centre was attended and therefore OPITO approved training is recommended, wherever possible. Likewise training to approved standards such as ISO, IOSH, NEBOSH, CITB, BS, NFPA etc. for Compulsory and discipline training where possible.

10.0 BUDGET

Budget Codes for training are allocated by the SAP team (GL codes) in consultation with contracts and finance, where necessary.

Separate codes are utilised for:

- All training related costs for overseas training, arranged by HR Dept (OpEx Staff Training)
- Training of other departmental staff as well as HQ Staff, incorporated into training courses arranged by O&M Department including BOSIET etc. (OpEx Staff Training)
- Training related costs for O&M Staff (**YGN Office**) including BOSIET and etc. (OpEx Technical Services Training)
- Training related costs for O&M Staff (**SHP/OGT**) including BOSIET and etc. (OpEx Site Training)
- Training costs for **MOGE** Staff including BOSIET and etc. who must be trained under MOGE instruction (OpEx Site Training)
- Training costs for **Contractor** Staff where the training is required by PIC but is not specifically required within a current contract (OpEx Site Training)
- Training related costs for **Consultants employed by Coens (example) (at SHP/OGT)** including BOSIET and etc. (OpEx-Site Personnel-Cost. Note Consultants are each allocated separate budget codes)

- Training related costs for **Consultants employed by COENS (example) (YGN Office)** including BOSIET and etc. (OpEx Site Personnel costs. Note Consultants are each allocated separate budget codes)

Additionally HQ, in Korea, maintains a budget for Korean National staff development training.

11.0 PART 2

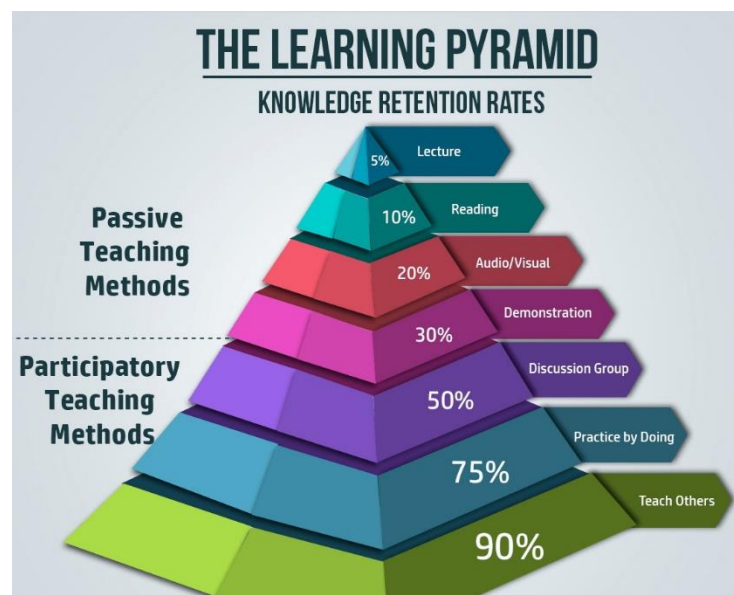
This second part introduces Training Effectiveness measurement, Personal Improvement Plans, Trainee responsibilities and provides guidance on the training effectiveness forms and contains the Appendices, in Section 17.

12.0 WHY IS TRAINING EFFECTIVENESS MEASUREMENT NECESSARY

All training needs to be put to use immediately after completion and then regularly thereafter in order to maintain the knowledge and skill and with further self-development, contributes to the individuals experience and competence progression. It is well documented that the benefits of training are short-lived unless applied and routinely practiced. Application of new skills and knowledge, obtained through formal training, is essential, if it is to remain beneficial.



The training pyramid shown below is a very common depiction of expected knowledge retention after the various types of training received. The pyramid shows how the best retention of knowledge (and skills) comes from participatory engagement (discussions and learning by doing) and not necessarily from attendance on training courses involving class room work only.



To make the passive training methods worthwhile it is therefore important to use new-found knowledge to the benefits of others and particularly the recently trained. For example, if new knowledge or skills are used to 'teach others', the recently trained employee will almost certainly retain more of his new found knowledge and skills. Utilising new knowledge and skills (practice

by doing) and even discussing the new knowledge with others or fellow training group members (discussion group) will also assist in retention.

As noted earlier in this document, it is therefore imperative that you put your newly acquired skills to use immediately and then continue to use these.

The pyramid above also demonstrates that practice-by-doing and subject discussion is probably more valuable than sitting in a class room. This is why OJT is so important.

Where training requires passing examinations it can generally be assumed that this training will require refreshing at some point and probably renewal of the certification through further or re-examination. Also where the content of a training subject changes over time, (due to new legislation, changes in industry practices or updating of procedures etc.), it will be necessary to undergo refresher training to update knowledge and skills in that specific subject.

Not all training, whether development, discipline or specialist, requires updating and training certificates that have an expiry date should never be considered to indicate that an individual has suddenly lost the skills from that date. It is not unreasonable for Company to assume the individual has greatly improved in knowledge and skill received through training, by application and constant learning.

PIC expects formal training to be refreshed at intervals common in the industry due to the impracticalities of continuous application of knowledge and skills during the period after initial training or the changes in rules, equipment or training content, likely to be encountered.

Examples include;

- TBOSIET / HUET & (FOET)
- COMPEX
- Lifeboat Coxswain
- Fire Team Leader and Fire Team Member (OERTL / OERTM)
- CSER
- Authorised Gas Tester
- IMDG & IATA Carriage of Dangerous goods

PIC does not perceive the need to refresh some training as the knowledge and skills obtained should be applied immediately after training, either in the employees' day to day work-scope or through exercises, drills and through accumulation of experience etc. except possibly where there are changes in the equipment / materials / methodologies being used, although such new equipment introductory training may be provided by a vendor representative on delivery of such equipment.

Examples include;

- MEMIR / MOME
- Permit to Work

- Rigging and Lifting (for non-specialists)
- Fork-lift Driver / Operator
- Crane Operator
- Truck Driver
- Genie / Man-lift
- CA-EBS
- CAMS Assessor Training
- CROER
- NEBOSH International General Certificate

Continuous updating of knowledge and skills will generally rely on self-development, experience and constant application.

13.0 TRAINING EFFECTIVENESS CHECKS

Effectiveness checks actually begin before the training takes place by a Pre-training assessment which can be more than just a skills gap analysis. It may also take the form of a written or practical assessment of the candidate current level of skills and knowledge. This can be objective, through observation or written test or subjective through a supervisors opinions of current candidate performance combined with the candidates' perception of his own knowledge.



The key questions are always;

“What is the training designed to accomplish?” and then;

“Did the training accomplish the expected goals?”

One model used to assess training effectiveness is the “Kirkpatrick Model”.

13.1 The Kirkpatrick Model

The most well-known and commonly used model for measuring the effectiveness of training programs was developed by Donald Kirkpatrick in the late 1950s. It has since been adapted and modified by a number of writers, however, the basic structure has stood the test of time.

The basic structure of Kirkpatrick's four-level model is shown here.

Kirkpatrick Model for Evaluating Effectiveness of Training Programs

• Level 4 - Results

What measurable organizational benefits resulted from the training in terms such as productivity and efficiency?

• Level 3 - Behavior

To what extent did participants change their behaviour, or improve their performance, back in the workplace as a result of the training?

• Level 2 - Learning

To what extent did participants improve knowledge and skills and change attitudes as a result of the training?

• Level 1 - Reaction

To what extent did the participants find the training useful, challenging, well-structured, organized, and so on?

An evaluation at each level answers whether a fundamental requirement of the training program was met. It's not that conducting an evaluation at one level is more important than another. All levels of evaluation are important. In fact, the Kirkpatrick model explains the usefulness of performing training evaluations at each level. Each level provides a diagnostic checkpoint for problems at the succeeding level. So, if participants did not learn (Level 2), participant reactions gathered at Level 1 (Reaction) will reveal the barriers to learning. Now moving up to the next level, if participants did not use the skills once back in the workplace (Level 3), perhaps they did not learn the required skills in the first place (Level 2). Finally, if there are no measureable benefits demonstrated, subsequent to the training (Level 4) then there is no valuable change in performance (Level 3).

The difficulty and cost of conducting an evaluation increases as you move up the levels. So, careful consideration needs to be given to what levels of evaluation will be conducted for which training programs. It is intended that Level 1 evaluations (Reaction) are required for all training, Level 2 evaluations (Learning) for "hard-skills" programs only, Level 3 evaluations (Behavior) for strategic, leadership and soft skills programs only and Level 4 evaluations (Results) for high

cost training programs. Above all else, before starting an evaluation, we must be crystal clear about the purpose of conducting such an evaluation.

13.2 Using the Kirkpatrick Model

How do you conduct a training evaluation? Here is a quick guide on some appropriate information sources for each level.

13.2.1.1 Level 1 (Reaction)

- completed participant feedback questionnaires
- informal comments from participants
- focus group sessions with participants

13.2.1.2 Level 2 (Learning)

- pre- and post-test scores
- on-the-job assessments pre- and post-training
- supervisor reports / annual appraisals

13.2.1.3 Level 3 (Behavior)

- completed self-assessment questionnaire
- on-the-job observation
- reports from peers and supervisors

13.2.1.4 Level 4 (Results)

- measurable changes in efficiency
- better teamwork / collaborative input
- higher levels of contribution in safety and work
- greater mentoring abilities
- developing leadership qualities

When considering what sources of data you will use for your evaluation, think about time involved in collecting the data. Balance this against the accuracy of the source and the accuracy you actually need. Will existing sources suffice or will you need to collect new information?

Supervisors and Managers must think broadly about where the evaluation results are sourced and how reliable it may be. Sources include:

- daily meeting input
- input to safety initiatives, meetings etc.
- personnel appraisals, increased productivity
- interviews with peers and supervisors
- checklists and tests

- direct observation
- questionnaires, self-rating and multi-rating
- Focus Group sessions

Once a training effectiveness has been evaluated, it should be distributed to people who need to read it. In deciding on the distribution list, refer to previously stated reasons for conducting the evaluation. And of course, if there were lessons learned from the evaluation on how to make the training more effective, then act on them!

13.3 Conducting Training effectiveness evaluations

Step 1 is pre-training and is to be used to assess, through a simple questionnaire, the candidates' current level of knowledge and his expectations regarding learning outcomes during the training, what he hopes to gain and how he can put that to use, subsequent to the training.

This should be used for all Compulsory training but is not necessary for "Mandatory" training.

Step 2 is subsequent to the training and is involves completion of the "Training effectiveness" questionnaire.

Step 3 is feedback from the relevant site supervisor relating to his/their perception of the training benefit.

See section 11, "Guidance on Forms".

Pre and Post training evaluation forms will be analysed by the Training Coordinator and Head of the relevant department (Safety, Operations or Maintenance) to establish trends which may dictate changes in the types of training provided, the syllabuses presented or the training providers.

14.0 GUIDANCE ON TRAINING EFFECTIVENESS FORMS

14.1 Pre-Training expectations evaluation question set.

Form 1.

This form contains an 8 question set to be completed by the trainee, before attendance on any course (as requested). It can be completed by hand or using the MS Excel native file form and should be returned to the Training Coordinator for analysis and records. The top of the form contains sections on the course name/title, planned attendance dates and venue, etc.

Training expectations survey questions

The following questions will be answered by all trainees before attending the training. Do not copy answers from another employee – this is a record of the individuals' perceptions.

There are no right or wrong answers.

Question #1. What do you personally expect to gain from attendance on this training?

A narrative answer is expected where the potential training candidate answers the question with his/her own ideas of what they want to gain.

Question #2. What training method expectations do you have for this training?

Here the candidate writes his/her ideas of how the training should be presented. Class room, presentations, movies, Practical sessions, simulations etc.

Question #3. List four key points that you are already familiar with, relating to the proposed training subject?

Expect a narrative answer with ideas from the candidate of their existing knowledge of the subject.

Question #4. What topics would you personally like to learn / become familiar with, during this training?

Expect a list of topics that the candidate believes should be covered.

Question #5. Which skills would you like to improve on, during this training?

As question 4 but more emphasis on the practical side of the training.

Question #6. What extra, do you think you will be able to accomplish after attending this training?

This is a space for recording how the training candidate thinks his/her performance will be improved.

Question #7. What level of expertise do you require in this subject, to do your job correctly and safely?

Just an open question to get the candidates ideas of his/her perception on what they think are the essentials in this subject.

Question #8. How confident are you that the training is going to be of value in your work responsibilities?

Open question hoping to solicit perceptions of training need. If a group of people do not believe the training is of value in their own work then the training needs should be questioned.

End Note.

Trainees should be encouraged to complete the form honestly. There are no correct or incorrect responses. A note exists on the form that individual responses are kept confidential and will only be used to improve training or improve PIC training needs selection etc. Nothing in the effectiveness evaluation system reflects on an employees' abilities nor will it be used in any personnel appraisal etc.

14.2 Training Effectiveness Evaluation Check Question set (Kirkpatrick Level 1)

Form 2.

This form contains a questionnaire comprising of 14 questions. It can be completed by hand or using the MS Excel native file form and should be returned to the Training Coordinator for

analysis and feedback to the training centre or the originator of the training request. The top of the form contains sections on the course name/title, dates and venue, etc.

Level 1 training effectiveness survey questions

The following questions will be answered by all trainees after all training attendance.

Question #1. In your opinion, were the training arrangements, pre-training information and joining instructions all satisfactory?

A narrative answer is expected for input to any necessary pre-training changes in arrangements or instructions.

Question #2. What did you personally expect to gain from attendance on this training?

A narrative answer is expected where the trainee must state his/her expectations. This is asked to determine if the trainees shared their expectations and were attending for the correct reasons.

Question #3. How well did the training content meet your expectations?

Expect a narrative answer. This needs to be asked to help identify whether the training content matched the participants' expectations. If you have a course where many respondents indicated that the training failed to meet their expectations, this could indicate a problem with the course content, venue, method, equipment, training materials or trainer.

Question #4. Was the size of your training group appropriate?

A 'yes' / 'no' answer is not acceptable and the form requires narrative explaining 'why'. This question helps illuminate whether the learners felt comfortable in their group(s). If the group size was too large, the participants may feel that their needs were not met. Responses can help to tailor future training sessions for optimal numbers of trainees per course / session.

Question #5. How would you rate the quality of the training?

A 1 to 5 option is given (1, 2, 3, 4, 5) with 1 = unacceptable and 5 = outstanding. This should provide an idea of how the trainees viewed the instruction, overall. If a course received many low ratings, you could reasonably assume that the course provider or the content didn't meet the needs of the learners.

Question #6. How would you rate the quality of the training centre, the equipment and facilities?

A 1 to 5 option is given (1, 2, 3, 4, 5) with 1 = unacceptable and 5 = outstanding. This should provide an idea of how the trainees viewed the quality of the training centre and equipment etc. A space for narrative examples is provided. This may allow Company to query the standard of the training centre and equipment available for the training.

Question #7 Was the mix of presentations and activities suitable?

Training courses may feature a mixture of instructor-led presentation sessions and activities where the trainees work individually or in groups on certain tasks. A presentation-heavy training course may leave attendees feeling as though they lacked time to put what they learned into practice or became bored or easily distracted.

This question is answered with a 1 to 5 multiple-choice option.

Question #8. How would you rate the quality of the instructor?

A 1 to 5 ranking system (1 = unacceptable; 5 = outstanding) would help you identify how the trainees felt about the course instructor. Many low ratings may indicate that the instructor wasn't well suited to delivering the course. Many high ratings would indicate that the learners felt comfortable with the quality of the instructor.

This question is additionally broken down as follows;

What was the instructors' level of content knowledge? (1 to 5)

How was the speed of delivery? (1 to 5)

How would you rate their organization and preparation? (1 to 5)

How was their enthusiasm? (1 to 5)

Was the Instructors' Language clear and concise? (1 to 5)

A space is available for handwritten or typed responses with the instruction: 'Please provide any additional feedback relating to the instructor.' This gives participants an opportunity to give praise or offer criticism in ways that multiple-choice responses cannot accommodate.

Question #9. Did you learn anything new?

Trainees answer this with a 'Yes' or 'No' option but then must follow up with an example if the answer is 'Yes'. If the answer is 'No' then the trainee is required to answer why he/she felt this was the case. This may give valuable data on the areas that the trainees felt of most value or where the course failed in the expected learning outcomes.

Question #10. Was the training relevant to your needs?

To dig down into the details, you need to understand whether the trainees felt the course was a valuable use of their time. This question could invite responses in a multiple-choice format, for example, 0 = irrelevant and 5 = highly relevant. This data gives you a clear idea of whether the participants found the course useful and helpful and covered the correct or expected content for their current job level.

Question #11. Will the course learning outcomes be suitable and easy for you to apply at work?

The results from a training effectiveness survey should be used in conjunction with other training evaluations. In later stages, we may need to assess whether learning took place and to what extent the training made its way into the workplace. This question helps understand how the trainees felt about the course. If later assessments found little evidence that participants were putting the training into practice at work, the answers from this question may offer clues as to why that was the case. Expect a narrative answer.

Question #12. Would you (course participant) recommend the training to colleagues?

A 'Yes' or 'No' response option is most suitable for this question. High numbers of participants indicating that they would not recommend a course is a sign that the training failed to live up to expectations or was poorly planned and implemented.

Question #13. Do you have any suggestions to improve this course?

This question is best asked as an open-ended handwritten response. This type of response takes longer to read and interpret but can highlight areas that other questions missed. For the participant's perspective, it's important that they feel able to express their opinions about a training course in an open and unconstrained manner.

Question #14. If there was an examination associated with this training, how difficult was it?

Response intended to check if training courses requiring examination before certificate issue are being targeted at the correct level of employee. If everyone thinks the examination was extremely difficult (and there are only a few passes) then maybe this training needs to be directed to a different staff group or level?

End Note.

Trainees may feel awkward about signing a training effectiveness evaluation but they should add their name and job-position, as appropriate. A note exists on the form that individual responses are kept confidential and will only be used to improve training.

14.3 Supervisor Feedback form on Training Effectiveness (Kirkpatrick Level 2)

Form 3.

This form contains a questionnaire comprising of 6 questions. It can be completed by hand or using the MS Excel native file form and should be returned to the Training Coordinator for analysis. The top of the form contains sections on the candidate's name and job title, the course name/title, attendance dates and venue, etc.

Level 2 training effectiveness survey questions

The following questions are to be answered by the candidate's immediate line supervisor shortly after training attendance. It is intended to provide an indication of perceived improvement in skills or knowledge demonstrated by the candidate. Normally only used for development or specialist training.

Question #1. Has the recently trained employee shown any improvement in the areas covered by the training?

Narrative required with examples of positive and/or negative impacts of the training.

Question #2. Has the recently trained employee taken on or been assigned any additional responsibilities or demonstrably contributed more in the areas covered by the training?

Narrative response required with examples.

Question #3. Does this recently trained employee, demonstrate abilities beyond those of his peer group who have not yet been trained. Were these pre-existing or recent improvement?

Narrative response required.

Question #4. If in your opinion, the training has been of benefit to the employee, would you recommend it to others in the employees peer group or specific individuals?

Narrative response required.

Question #5. Should the employee receive additional training in the subject at a higher level?

Narrative required.

Question #6. For this employee, when do you think the training should be refreshed or does it need to be repeated?

Narrative response required.

End Note.

Completion of this feedback form should be agreed between both Supervisors before submission and therefore probably cannot be submitted until possibly 3 months after the training.

15.0 PERSONAL IMPROVEMENT PLAN (PIP)

It is recognised that special training may be necessary for under-performers in an attempt to prompt improvement but this may not be beneficial in the long term and an under-performer needs to be first counselled and have a Personal Improvement Plan (PIP) prepared with established goals, objectives, expected outcomes, understood and agreed consequences of further low-performance issues.

As this is a sensitive issue when staff positions are involved, the HR department and / or relevant Manager / Director should be consulted. It is also of the utmost importance to establish why the employee has underperformed. There are a number of potential causes, including; training and mentoring issues, peer pressure, low ambition, physical or mental inability, etc.

A PIP must be approved by line management and agreed with the employee before it is initiated and very clear and measurable goals must be set in order that the PIP is relevant and the outcomes can be determined objectively. In effect the PIP lists actions to be taken and expected outcomes with effectiveness checks. A carefully prepared and effective PIP should result in an employee being developed to adequately function in the current role but is not expected to be a sufficient tool to result in converting an under-performer into a High Potential Employee (HPE). In fact under-performers satisfactorily completing a PIP may only result in retaining employment in the current grade.

16.0 TRAINEE RESPONSIBILITIES

Attendance on training courses, whether mandatory, compulsory or developmental, should never be seen as an inconvenient necessity. Employees should look at training as being of value to themselves and the business and should always approach it as a work opportunity, of personal benefit.

When required, trainees must complete the pre and post training assessments to the best of their abilities.

Trainees shall attend training on time, for the full duration and actively participate in all discussions, exercises or examinations.

Training courses shall be attended after adequate rest, should be treated as work days and therefore alcohol must be avoided, at nights, before each training day. The employees' full and undivided attention is required, to maximise individual gain.

Personnel who abuse training opportunities are likely to be subjected to employment rules, may forfeit their chances of individual development and advancement or may be reprimanded to the extent permissible by HR or contract conditions of employment.

Where an employee (or group) believe that he/she/they would benefit from training not normally required, from within the compulsory matrix, he/she/they may make a justified request for such training, through line management. This would normally be done during annual appraisal discussions but may be raised at any suitable time. Such a request may not always be approved.

17.0 APPENDICES



The forms attached below in 17.1 and 17.2 are also made available as Native copies, in EDMS, for ease of use.



They are numbered as follows.



YGG-OM-FM-03-04-0001 Training effectiveness form 1 / 2 / 3)

YGG-OM-FM-03-04-0001 Personal Improvement Plan (PIP) forms

17.1 Forms 1, 2 & 3: Training Effectiveness

	Training Effectiveness Evaluation Check: Question set (Kirkpatrick Level 1)										
Training expectations survey questions Form 1.											
<p>This form contains an 8 question set to be completed by the trainee, before attendance on any course (if requested). It can be completed by hand or using the MS Excel native file form available in EDMS and should be returned to the Training Coordinator for analysis and records.</p>											
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Job Title:											
Course title:											
Course Venue:											
Training Dates:											
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	Training Effectiveness Evaluation Check: Question set (Kirkpatrick Level 1)															
Level 1. Post training effectiveness survey questions		Form 2.														
<p>This form contains a 14 question set to be completed by the trainee, after attendance on any course (if requested). It can be completed by hand or using the MS Excel native file form available in EDMS and should be returned to the Training Coordinator for analysis and records.</p>																
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	Training Effectiveness Evaluation Check: Question set (Kirkpatrick Level 1)	
Level 1. Post training effectiveness survey questions		<i>Page 2 of 2.</i> Form 2.

Question #8. How would you rate the quality of the instructor?

Mark the box score (5 is outstanding/perfect and 1 is unacceptable).

	1	2	3	4	5
a What was the instructor's level of content knowledge? (1 to 5)					
b How was the speed of delivery? (1 to 5)					
c How would you rate their organization and preparation? (1 to 5)					
d How was their enthusiasm? (1 to 5)					
e Was the Instructors' Language clear and concise? (1 to 5)					

'Please provide any additional feedback relating to the instructor(s).'

Question #9. Did you learn anything new? YES ☐ NO ☐

If your answer is YES then what did you learn. If the answer is NO, please state why.

Question #10. Was the training relevant to your needs?

Mark the box score (5 is outstanding/perfect and 1 is unacceptable).

	1	2	3	4	5
a The training relevancy was;					

'Please provide any additional feedback relating to the relevancy of the training.'



Question #11. Will the course learning outcomes be suitable and easy for you to apply at work - Why?

Question #12. Would you (course participant) recommend the training to colleagues? YES ☐ NO ☐

Question #13. Do you have any suggestions to improve this course?

Question #14. If there was an examination associated with this training, how difficult was it?

End Note. Candidates are encouraged to complete the form honestly. There are no correct or incorrect responses. Individual responses are kept confidential and will only be used to improve training or improve PIC training needs selection etc. Nothing in the effectiveness evaluation system reflects on an employees' abilities nor will it be used in any personnel appraisal etc.

	Supervisor Feedback form on Training Effectiveness (Kirkpatrick Level 2)											
<p>Level 2 training effectiveness survey questions Form 3.</p> <p>This form contains a questionnaire comprising of 6 questions. It can be completed by hand or using the MS Excel native file form and should be returned to the Training Coordinator for analysis. The top of the form contains sections on the candidates name and job title, the course name/title, attendance dates and venue, etc.</p>												
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 20%;">Name:</td><td></td></tr> <tr><td>Job Title:</td><td></td></tr> <tr><td>Course title:</td><td></td></tr> <tr><td>Course Venue:</td><td></td></tr> <tr><td>Training Dates:</td><td></td></tr> </table>	Name:		Job Title:		Course title:		Course Venue:		Training Dates:		<div style="border: 1px solid black; padding: 5px;"> <p>The following questions are to be answered by the candidates' immediate line supervisor shortly after training attendance.</p> <p>It is intended to provide an indication of perceived improvement in skills or knowledge demonstrated by the candidate.</p> <p>Normally only used for development or specialist training.</p> </div>	
Name:												
Job Title:												
Course title:												
Course Venue:												
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<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 60%;">Discipline Supervisor 1: Name</td> <td style="width: 40%;">Date:</td> </tr> <tr> <td>Discipline Supervisor 2: Name</td> <td>Date:</td> </tr> </table>	Discipline Supervisor 1: Name	Date:	Discipline Supervisor 2: Name	Date:								
Discipline Supervisor 1: Name	Date:											
Discipline Supervisor 2: Name	Date:											
<p>Question #1. Has the recently trained employee shown any improvement in the areas covered by the training?</p> <div style="border: 1px solid black; height: 50px; margin-top: 5px;"></div>												
<p>Question #2. Has the recently trained employee taken on or been assigned any additional responsibilities or demonstrably contributed more in the areas covered by the training?</p> <div style="border: 1px solid black; height: 50px; margin-top: 5px;"></div>												
<p>Question #3. Does this recently trained employee, demonstrate abilities beyond those of his peer group who have not yet been trained. Were these pre-existing or recent improvement?</p> <div style="border: 1px solid black; height: 50px; margin-top: 5px;"></div>												
<p>Question #4. If in your opinion, the training has been of benefit to the employee, would you recommend it to others in the employees peer group or specific individuals?</p> <div style="border: 1px solid black; height: 50px; margin-top: 5px;"></div>												
<p>Question #5. Should the employee receive additional training in the subject at a higher level?</p> <div style="border: 1px solid black; height: 50px; margin-top: 5px;"></div>												
<p>Question #6. For this employee, when do you think the training should be refreshed or does it need to be repeated?</p> <div style="border: 1px solid black; height: 50px; margin-top: 5px;"></div>												
<p>End Note. Supervisors; Completion of this feedback form should be agreed between both (back-to-back) Discipline Supervisors before submission and therefore probably cannot be submitted until possibly 3 months after the training.</p>												

17.2 Performance Improvement Plan (PIP) Example

	Performance Improvement Plan (PIP)	
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Employee Name		Job Title		Employee No	
Supervisors		Department		Date	

AREAS OF CONCERN

In which areas has the employee not met expectations?

PREVIOUSLY ADDRESSED ISSUES

Provide details of any previously addressed issues, the context, and the outcome of discussions, mentoring, guidance or training.

OBSERVATIONS


PREVIOUS DISCUSSIONS OR COUNSELLING

IMPROVEMENT GOALS

Provide specific goals as they relate to areas of concern to be addressed and improved upon

GOAL	GOAL DISCRIPTION	GOAL ACHIEVED Date and Signatures.

ADDITIONAL TRAINING OR MENTORING REQUIRED

posco INTERNATIONAL	Performance Improvement Plan (PIP)	
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SITE MANAGEMENT EXPECTATIONS

To demonstrate progress toward improvement goal achievement, the following performance standard expectations must be met.

EXPECTATION DESCRIPTION

GOAL ACHIEVEMENT ACTIVITIES

List activities that will aid to achieve the improvement goals set above.

GOAL	ACTIVITY	START DATE	COMPLETION DATE

RESOURCES


List resources available to complete goal activities; for example, training, peer mentoring, management support etc.

RESOURCE	DESCRIPTION OF RESOURCE

TIMELINE FOR IMPROVEMENT, CONSEQUENCES AND EXPECTATIONS

Provide a summary of any stipulations placed upon the performance improvement plan, consequence of insufficient effort or final lack of competency.

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	<h2>Performance Improvement Plan (PIP)</h2>	
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ACKNOWLEDGEMENT OF THE FOREGOING

I, _____, have read and understood the foregoing and will do my utmost, over the period _____ to _____, to demonstrate _____

SIGNED: _____	DATE: _____
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PROGRESS MONITORING

Provide an evaluation schedule to monitor progress of activities and improvement.

DATE	ACTIVITY	CONDUCTED BY	SIGNATURES

FINAL WRITTEN PRECIS AND RECOMMENDATION

Provide a short summary of achievement or areas where success has not been achieved, with probable reasons for any failure to meet expectations (if relevant).

Continue on separate sheet, if necessary.

FINAL SIGNATURES

EMPLOYEE NAME	EMPLOYEE SIGNATURE	DATE
SUPERVISOR NAME	SUPERVISOR SIGNATURE	DATE
OIM	OIM SIGNATURE	DATE

To be copied to O&M Manager after each Progress Monitoring Review and O&M Director and HR Manager on final completion.