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รายงานผลการปฏิบัติตามมาตรการป้องกันและแก้ไขผลกระทบสิ่งแวดล้อม และมาตรการติดตามตรวจสอบผลกระทบสิ่งแวดล้อม
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ภาคผนวกที่ 9

Maintenance and Inspection Management



PTT Exploration and Production Public Company Limited

S1 Production Operations

Maintenance Guideline


Maintenance and Inspection Management



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	0	New issue
26-Apr-04	1	Issued after company ownership change
26-Sep-06	1.1	2 Yearly review
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28-Mar-13	2	<ul style="list-style-type: none"> Reformatted document Aligned with new PTTEP SSHE MS, ISO14001:2022 and OHSAS18001:2007 requirement Updated organizational indicators from JGO to DSO
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02-Oct-22	4	<ul style="list-style-type: none"> Renamed from “Maintain Wells and Facilities” to “Maintenance and Inspection Execution Management” Renumbering per new S1 document numbering Combine contents from SMNT-PN-01, 02, 03 and 04 into one document per 2021 OTR-RAI audit findings

Table of Contents

1.0	INTRODUCTION.....	1
2.0	SCOPE	1
3.0	KEY REQUIREMENTS	1
3.1	WOK FLOW DESCRIPTION	1
4.0	STRATEGY AND APPROACH.....	2
5.0	PLANNING AND SCHEDULING	5
5.1	RESPONSIBILITY FOR PLANING AND SCHEDULING	6
5.2	MAINTENANCE AND INSPECTION PLAN	7
5.3	PLAN AND SCHEDULE PROCESS	10
6.0	EXECUTION	13
6.1	SITE PREPARATION AND INTEGRITY ASSURANCE	13
6.2	TASK UNDERTAKING.....	15
6.3	HAND-OVER PREPARATION.....	16
6.4	WORK ORDER CLOSE-OUT.....	17
7.0	REVIEW AND IMPROVEMENT	18
8.0	ROLES AND RESPONSIBILITIES	20
9.0	DEFINITIONS	21
9.1	LANGUAGE.....	21
9.2	TERMINOLOGY.....	21
9.3	COMMON ACRONYMS.....	22
10.0	DOCUMENT REFERENCE LIST	23

1.0 INTRODUCTION

This document describes more what and how process of maintenance and inspection manage at Sirikit Oil Field (S1) asset. This document cascades down from Maintenance and inspection guideline 13245-GDL-1-S1M-ALL-MMS-001.

2.0 SCOPE

This guideline covers the followings:

- Several sources and formations of the maintenance and inspection strategy by selecting the most appropriate approach for the asset
- Concept of the maintenance and inspection approaches with appropriate options plans and definition of the resources required and the impact on production targets.
- Planning layer cascaded and rolled over to scheduling into execution step.
- Recommended key performance indicators for maintenance and inspections after execution.

3.0 KEY REQUIREMENTS

3.1 WOK FLOW DESCRIPTION

Maintenance and Inspection Management can be described in 4 major stages: Strategy and Approach, Planning & Scheduling, Execution, and Review & Improvement.

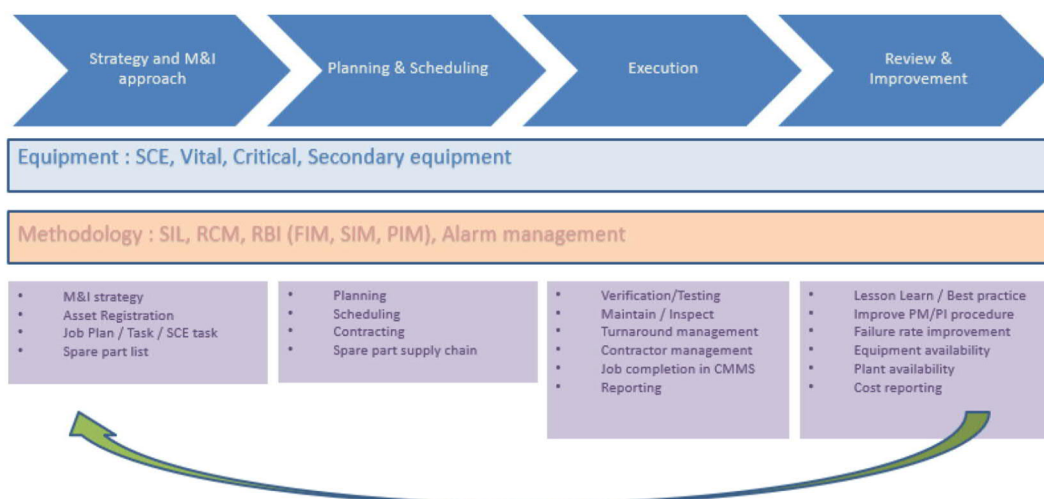


Figure 1 – Maintenance and Inspection Management

4.0 STRATEGY AND APPROACH

Maintenance Approach involves formulating maintenance and inspection strategies that conform to PTTEP objectives, reviewing, confirming, or updating requirements or assumptions.

Refer to high level maintenance and inspection direction well and facilities, the maintenance and inspection requirements are established the following approaches

4.1.1 The 5-Year Key-Activities roadmap

The 5-year key activities roadmap identifies key M&I activities that interrelated among other stakeholders to achieve mutual goals. MRP has been already incorporated.

Having been Integrated with RAI expectations, OMI co-KPI target, Production target, M&I cost, and manning strategy of S1 contributed by M&I, the 5-year key activities roadmap is purposefully used as reference to confirm whether approved budget is still adequate.

The 1st year is considered firm while the following years are changeable to suit business needs. However, maintenance and inspection activities that cause significant facility outage will require more detailed planning and integration into PTTEP Business Plans. The roadmap can be revised in yearly basis by default to ensure key M&I activities are addressed and well reconciled among stakeholders' needs.



Figure 2 – 5-Years key activities roadmap

4.1.2 Maintenance Reference Plan

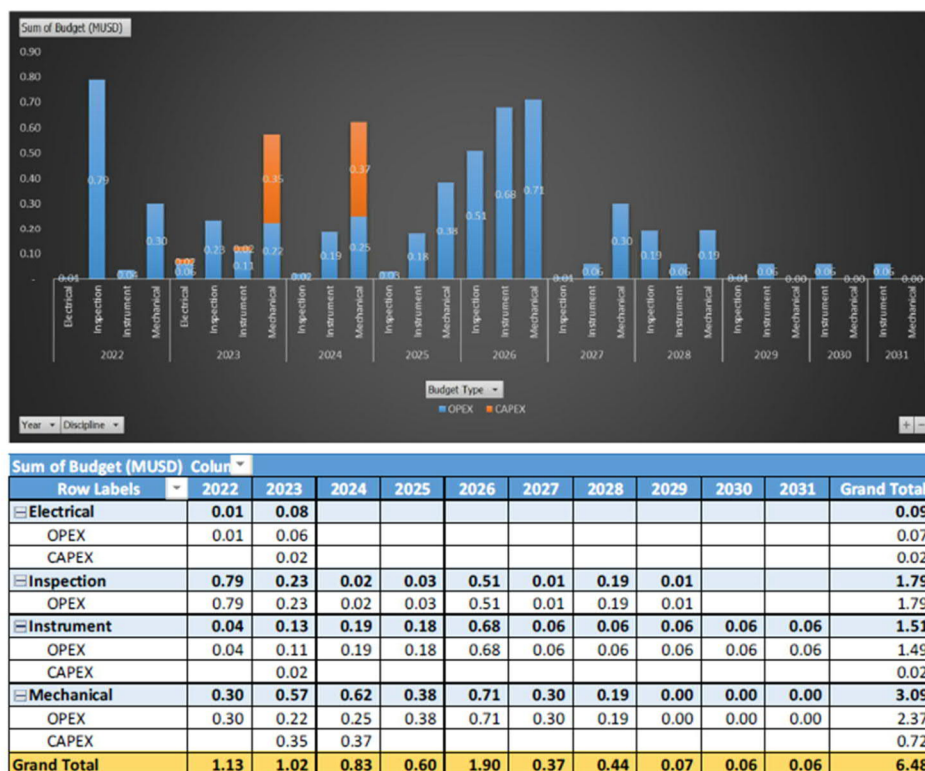
Maintenance Reference Plan (MRP) is another set of maintenance and inspection tasks look ahead in high level for 5-10 years magnitude of time scale, associated OPEX/CAPEX, implications for the plant and equipment. MRP incorporates all constraints and business requirements underlying with equipment current condition is another main portion of maintenance.

MRP often split apart from typical approach for non-routine M&I activities such as upgrade, obsolescence management, and MOC related with debottlenecking or plant major change.

MRP is based on “Operation Philosophy” and “Maintenance and Inspection Philosophy” and sets the way things will be done according to business direction (FDP), current equipment reliability, integrity, performance, and statutory requirements as key drivers underlying with OEMS framework. MRP provides information needed to implement of Cost, Time, and Resources requirement over a long-term period in budgetary scale; i.e. accuracy could be slipped in certain extent up to 20-30%; the closest to current year will be more precise.

MRP determines what needs to be achieved in the years ahead, typically 10-years ahead with a one-year firmed element, a four-year rolling element, and significant elements over the remaining life cycle. MRP can be updated either yearly, or any change based on field development and/or business plan catered for the original MRP.

S1 has recently reviewed its MRP in 2019 due to concession renewal via **12153-GDL-5-MMS-001**, and in 2022 LPG plant operating direction change via **13245-GDL-1-S1M-LKU-MMS-002**. **Figure 3** gives one example of MRP deliverables in cost perspective along the life of LPG plant.



Unit: Million USD

Figure 3 – MRP example: case of LPG review in 2022 till EOC.

4.1.3 Risk and Reliability Approach

Proactive approach drives via Criticality of Asset during Register. It is a list of the equipment on which maintenance and inspection activities are required and are maintained in CMMS. The high-level asset hierarchy is also represented in the Chart of Accounts (COA) structure. The asset register forms the common database for Maintenance Management Module, Inspection Management Module, Materials and Procurement Module, and is fully integrated with the Finance Package. Hierarchical structure of Asset is registered in compliance with ISO14224 and is in line with OEMS RAI requirements.

Refer to Reliability and Integrity Framework, a short summary of RAI guides how each group of equipment is managed based on its criticality ranking result.

Different criticality of equipment is treated and managed by different strategies and approaches. Therefore, assessment of asset criticality is the risk-based assessment and is the key process to determine how critical equipment is. The criticality will bring all what and how S1 manage its equipment.

For High criticality rank of asset register i.e. SCE 4 and some selective VITAL 3, Risk and Reliability Maintenance (RRM) tools are recommended approach. These tools are Reliability Centered Maintenance (RCM), Risk Based Inspection (RBI) and Safety Integrity Level Classification and Verification Review (SIL class, SIL ver; also called Instrumented Protective Function or IPF review).

- RCM: Typically well applied to rotating equipment
- RBI: Typically well applied to static equipment
- SIL: Typically well applied to instrumentation, control and safeguarding systems

The intermediate rank of criticality (remaining VITAL 3, and CRITICAL 2); unless otherwise specially required, the framework recommends to approach by Failure Modes and Effect Analysis (FMEA), OEM manual of M&I recommendations, experienced based maintenance strategy from similar kind of equipment specification/functionality.

The lowest rank of criticality; SECONDARY 1, run-to-fail approach is preferred as long as the consequence of failure is less than repair cost.

The selection of the maintenance and inspection strategies is also approached by Quantitative Risk Assessment (QRA) and any Statutory requirements e.g. Gas sale agreement, EIA, local authorities regulations, etc.

RRM which includes but not limited to RCM, RBI, IPF or SIL can be read its methodology in more detail: 10012-GDL-5-MMS-002 for RCM, 10015-PDR-4-PRS-056 RBI, and 10008-GDL-5-INS-005 SIL Verification Guideline

4.1.4 Strategy Implementation and Job Card Development

The right maintenance and inspection options are presented in Maintenance and Inspection Strategy documents. Include appropriate interval or frequency to carry out tasks, it will be M&I strategy: WHAT/WHEN; which could be run-hour or calendar basis.

Applicable options deployed into strategy and approaches:

Applicable M&I Options	Failure behavior	Common Examples
Time-Based Replacement	Wear & Tear with known lifetime or confident MTBF.	Rotating equipment: Gearbox, Belt, bearing, impeller, engine, compressor valves,
Condition-based Maintenance	Random	Complicated system, DCS, control system, Instrument,
Risk-Base Inspection	Wear or Corrosion rate dominated failure or LOPC	Stationary, Vessel, Flowlines, Pipelines
Failure Finding Function Test	Hidden failures	Safeguarding
Precision Based Maintenance	Infant failure Craftmanship and competency related failure	relocation, recommission, conversion, startup, major turnaround

Table 1 – Correlation between M&I Options, Failure Behavior, and common Equipment

From strategy, detailed procedures (Job Cards and/or Task Lists) are developed to provide steps or HOW to execute the maintenance and inspection task with respect to anticipated criteria (QA/QC) Specifications or standards (of pass or fail) required to be revised should be included. Total set of maintenance and inspection strategies and tasks are implemented in CMMS for further deployment and implementation.

5.0 PLANNING AND SCHEDULING

MRP consolidates with M&I strategy embedded in CMMS form the basis of the overall planned maintenance schedule and is used for making strategic decisions on Maintenance Management; and in most cases incorporated with impact of production and business direction.

Maintenance Reference Plan can give indirect view of downtime to project to production deferment which varies over period of time and the consumption of resources due to foreseen M&I activities. It determines what needs to be achieved in years ahead

With a one-year firmed element, a four-year rolling element, and significant elements over the remaining life cycle. MRP together with 52-week plan will be settled.

The medium-term plan contains a firm element of 3-months and a rolling element up to 1-year to proposed to 3-months IOP (integrated operation plan) look-ahead across stakeholders including drilling, well services, engineering etc. Normally when plan comes to the shorter and closer time in the period of 3-to-1 month usually confirmed upon IOP (integrated operation plan)

Scheduling will be rolling in magnitude of 1-month or 4-weeks lookahead with frontline production and maintenance team to simultaneously optimize and prioritize among various crew and resources to fit for actual daily production against situations at site.

Note that interval (5-yearly, 1-yearly, 3 monthly, 4-weekly, weekly, etc.) within hierarchical concept of planning could be timely adjusted based on dynamic of the asset production behavior.

The hierarchy of maintenance and inspection plans are conceptualized from upper level cascaded down to daily scheduling of work is depicted as below.

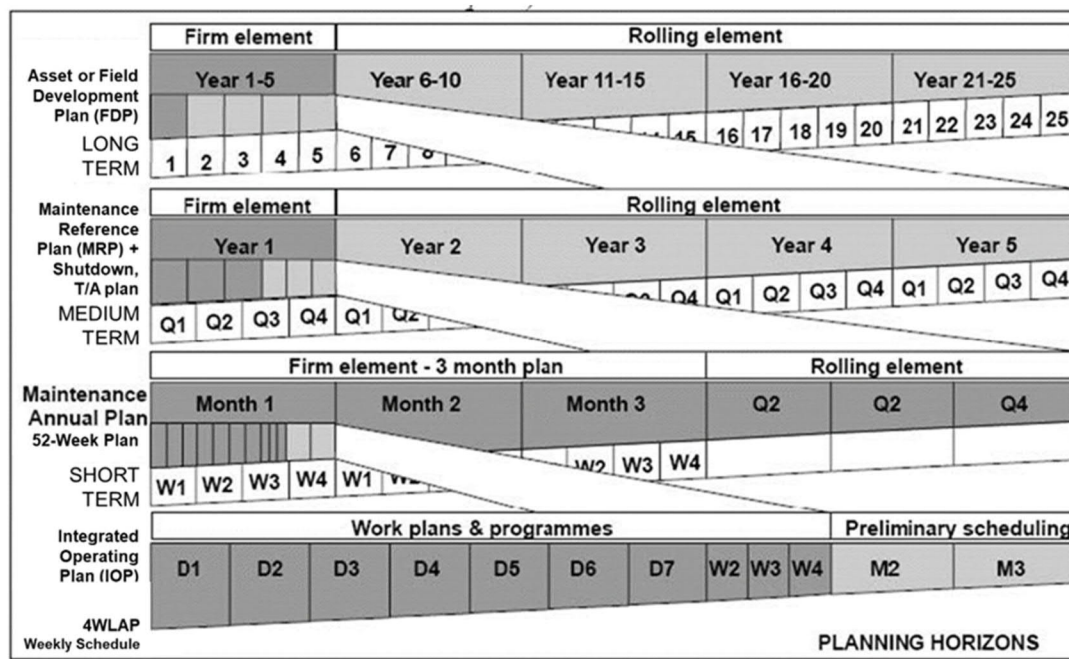


Figure 4 – Hierarchy of Maintenance and Inspection Plans

Scheduling is a time related process whereby the resources from pre-agreed plans are synchronized, sequenced, and converted into a detailed set of tasks to carry out within a discrete period. It essentially evolves around the development of the longer-term plans into weekly and daily work schedules.

The schedule should be continuously rolled forward with a time horizon of typically one-month firm and two-month rolling. **Figure 5** below illustrates correlation between maintenance and inspection planning types (refer to 10012-GDL-5-INT-008-R00, Maintenance and Inspection Planning Guideline).



Figure 5 – Correlation between Plan Types (from 10012-GDL-5-INT-008-R00)

5.1 RESPONSIBILITY FOR PLANING AND SCHEDULING

Responsibility of the preparation and approval of the various plans and schedules is shown in Table 2 below.

Plan and Schedule Type	Prepared by:	Approved by:	Notes
Field Development Plan	PTN/P	PTN	
Maintenance Reference Plan (MRP)	PS1/M and OMI	PS1	1
52-Week Look Ahead	PS1/M Supervisor PS1/M Scheduler	PS1/M and PS1/P	2, 3
3-Month Activity Plan (Integrated Operation Plan, IOP)	PS1/M Supervisor PS1/M Scheduler	PTN/P, PS1, PS1/T, PS1/P and PS1/M	4
2-Week Work Schedule	PS1/M Supervisor PS1/M Scheduler	PS1/P and PS1/M	5
Daily Work Schedule	PS1/M Team Leader PS1/M Scheduler	PS1/P and PS1/M	6

Notes:

1. PS1 approves MRP for further planning, deployment, and budget preparation.
2. To be per 52-week plan based on set strategy in CMMS. PS1/M Scheduler develops weekly look ahead, and PS1/M supervisor to review the plan.
3. Plan to incorporate maintenance, inspection and re-certification activities.
4. To be incorporated into IOP facilitated by PS1/T and presented in IOP monthly for review and approval.
5. PS1/M Supervisor and PS1/P to endorse 1-to-2 weekly work schedule.
6. PS1/P to endorse and revalidate via Permit-to-Work (PTW) to proceed M&I tasks.

Table 2 – Planning and Scheduling Responsibility Matrix

5.2 MAINTENANCE AND INSPECTION PLAN

5.2.1 52-Week Look-Ahead Plan

Regarding the 1st year of 5-Year Plan and MRP, they provides list of activities to be implemented within the year. It will be incorporated with routine 52-week maintenance and inspection plan. The 52-Week Look-Ahead Plan will form the high level plan. Performance will be judged against and form the basis for the more detailed 3-Month activity plans. The 52-Week Look-Ahead will also form the basis for the ordering of materials with long lead items, i.e., more than 3-Month Plan.

5.2.2 3-Month Activity Plan

This schedule is for the maintenance and inspection activities within 3-month period and are revised monthly on a rolling basis; they contain preventive and condition monitoring routines as well as approved corrective routines. Therefore, 1st month of the plan is considered firm, with the following 2 months tentatively agreed to enable the preliminary establishment and securing of manpower and materials. The 3-Month Activity Plan shall incorporate key equipment availability and resource utilization reports. The activities require partial or full facilities shutdown and/or having deferment potential included into the Integrated Operations Plan (IOP).

PS1/M IOP							
Departme	Period	Location	Activities	Start Date	Finish Date	Duration	
PS1/M	Aug-22	F/STN	PM ME (ENGINE + COMPRESSOR 1Y) K-3200 - Plan 08 - 11 August 2022 total 4 days.	8-Aug-22	11-Aug-22	4 Days	
PS1/M	Aug-22	F/STN	PM ME GAS COMP K-3550 2M	2-Aug-22	2-Aug-22	4 hrs.	
PS1/M	Aug-22	F/STN	PM ME GAS COMP K-3950 2M	28-Aug-22	28-Aug-22	4 hrs.	
PS1/M	Aug-22	F/STN	PM ME (ENGINE 6Y + COMPRESSOR 1Y) K-3750 - Plan 15-26 August 2022 total 12 days.	15-Aug-22	26-Aug-22	12 Days	
PS1/M	Aug-22	F/STN	PM ME (ENGINE + COMPRESSOR 1Y) K-3400 - Plan 29 August - 02 September 2022 total 5 days.	29-Aug-22	2-Sep-22	5 Days	
PS1/M	Aug-22	F/STN	P-2401-A, THREE MONTHLY, PREVENTIVE MAINTENANCE	3-Aug-22	3-Aug-22	4 hrs.	
PS1/M	Aug-22	F/STN	P-2402-A, THREE MONTHLY, PREVENTIVE MAINTENANCE	4-Aug-22	4-Aug-22	4 hrs.	
PS1/M	Aug-22	LKU-B	P-117A, THREE MONTHLY, PREVENTIVE MAINTENANCE (WS-B)	4-Aug-22	4-Aug-22	4 hrs.	
PS1/M	Aug-22	LKU-B	P-117B, THREE MONTHLY, PREVENTIVE MAINTENANCE (WS-B)	4-Aug-22	4-Aug-22	4 hrs.	
PS1/M	Aug-22	LKU-B	P-115A, THREE MONTHLY, PREVENTIVE MAINTENANCE (WS-B)	3-Aug-22	3-Aug-22	4 hrs.	
PS1/M	Aug-22	LKU-B	P-115B, THREE MONTHLY, PREVENTIVE MAINTENANCE (WS-B)	3-Aug-22	3-Aug-22	4 hrs.	
PS1/M	Aug-22	LKU-E	P-145-A, THREE MONTHLY, PM (WS-E)	4-Aug-22	4-Aug-22	4 hrs.	
PS1/M	Aug-22	LKU-E	P-145-B, THREE MONTHLY, PM (WS-E)	4-Aug-22	4-Aug-22	4 hrs.	
PS1/M	Aug-22	LKU-E	P-142-A, PREVENTIVE MAINTENANCE (WS-E)	4-Aug-22	4-Aug-22	4 hrs.	
PS1/M	Aug-22	LKU-E	P-143-A, PREVENTIVE MAINTENANCE (WS-E)	4-Aug-22	4-Aug-22	4 hrs.	
PS1/M	Aug-22	PTT-NGV	A-8000, YEARLY, PREVENTIVE MAINTENANCE	3-Aug-22	5-Aug-22	3 Days	
PS1/M	Aug-22	PTO-A	PTO-A GAS METERING 80-FPTR-652 YEARLY CALIBRATION	7-Aug-22	7-Aug-22	8 hrs.	
PS1/M	Aug-22	STN-A	STN-A GAS METERING 68-FPTR-657A/B and 68-FPTR-658A/B YEARLY CALIBRATION	8-Aug-22	8-Aug-22	8 hrs.	
PS1/M	Aug-22	NTM-A	NTM-A GAS METRING MONTHLY CALIBRATION	6-Aug-22	6-Aug-22	8 hrs.	
PS1/M	Aug-22	F/STN	CRUDE METERING MONTHLY PM	9-Aug-22	10-Aug-22	2 Days	
PS1/M	Aug-22	F/STN	T-306 CALIBRATION AND PREVENTIVE MAINTENANCE	11-Aug-22	11-Aug-22	8 hrs.	
PS1/M	Aug-22	NGV	OMA_NGV Online Moisture Analyser	3-Aug-22	3-Aug-22	8 hrs.	
PS1/M	Aug-22	BPR	BPR T-902 Tank calibration	12-Aug-22	12-Aug-22	8 hrs.	
PS1/M	Aug-22	NSG-A	PM IN NSG-A, ESD/OSD function test 1Y	4-Aug-22	4-Aug-22	2 hrs.	
PS1/M	Aug-22	NPG-A	PM IN NPG-A, ESD/OSD function test 1Y	11-Aug-22	11-Aug-22	2 hrs.	
PS1/M	Aug-22	NPG-E	PM IN NPG-E, ESD/OSD function test 1Y	18-Aug-22	18-Aug-22	2 hrs.	
PS1/M	Aug-22	LKU-M	PM IN LKU-M, ESD/OSD function test 1Y	25-Aug-22	25-Aug-22	2 hrs.	
PS1/M	Aug-22	F/STN	PM ME+EL+IN K-5801A 1YPM + Engine Change out + RGB	10-Aug-22	14-Aug-22	5 Days	
PS1/M	Aug-22	F/STN	PM ME+EL+IN K-5801B 1YPM	5-Aug-22	7-Aug-22	3 Days	
PS1/M	Aug-22	F/STN	PM EL K-5804C 2500 HRS PM	8-Aug-22	8-Aug-22	8 hrs.	

Figure 6 – 3-Month Activity Plan



5.2.3 2 Week Work Schedule

Derived from the firm plan for 1st month of 3-Month Activity Plan and updated on a weekly cycle. Concerns the maintenance and inspection activities for 14-days ahead, based on the activities on the monthly activity plan supplemented by work orders raised on an ad-hoc basis and required to be executed within 14-day timeframe. The 2-Week Work Schedule typically covers a period Monday-Sunday, with first 7 days firm and last 7 days tentative.

The following basic requirements applied to the 2-Week Work Schedule:

- Schedule is issued in MS Project or MS Excel
- Activities are grouped by location, i.e., Crude, LPG, well sites, outstations (essentially grouping by asset cost center)
- Activities are resourced in MS Project or MS Excel, including required trades, number of trade staffs and special resources (where required).
- Activities are assigned estimated duration, represented as grant chart.
- Activities are scheduled with due account given to operational constraints, i.e., LPG coolers to be starting in early morning, crude transfer pumps after morning production surge, etc.
- Planned resource usage is provided with schedule.

Maintenance Highlight Activity 15 - 28 August 2022

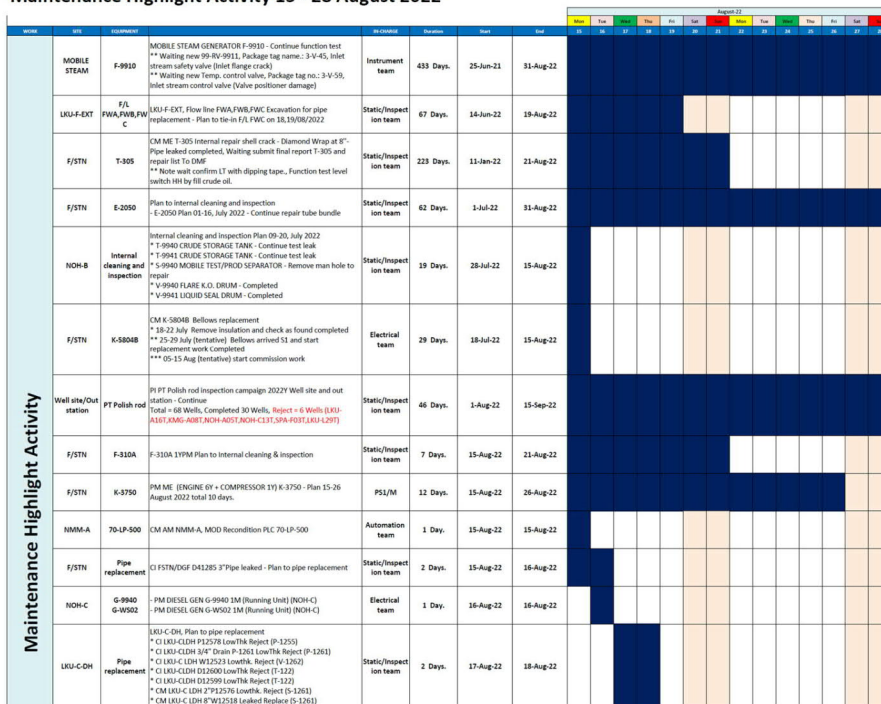


Figure 7 – 2-Week Work Schedule

5.2.4 DAILY-TO-WEEKLY WORK SCHEDULING

The Daily Work Schedule is a list of activities to be carried out the next day. It is not subjected to a separated approval; however, a review may be required at the morning of the workday itself for high priority work that may have been occurred overnight.



Item	Notification No.	Work Order No.	Location	Equipment	Job description	Type	Start date	Completed Date	Status	In-charge
1	100419325	500397412	Crude plant	SI-40-DC-01.ASY	PM EL 40-DC-01 Battery Room 2M	PM	4/Aug/22	4/Aug/22	Plan	Electrical team
2	100419315	500397402	Crude plant	SI-PWD-LSWG	PM EL 40-HV-02 & 40-LV-01 Cabin SWGR 2M	PM	4/Aug/22	4/Aug/22	Plan	Electrical team
3	100419317	500397404	Crude plant	SI-PWD-LSWG	PM EL 50-HV-01 Green Building SWGR 2M	PM	4/Aug/22	4/Aug/22	Plan	Electrical team
4	100419318	500397405	Crude plant	SI-PWD-LSWG	PM EL 50-HV-02 Green Building SWGR 2M	PM	4/Aug/22	4/Aug/22	Plan	Electrical team
5	100380412	500362162	Well site	SI-LKU-C067.PK	CL LKU-C M/F C067 / Elbow Drain Reject - Plan to M/F replacement	CI	4/Aug/22	4/Aug/22	Plan	Inspection team
6	100410502	500389375	Well site	Flow line	Flow line inspection at 8"-BL-XWA by TFM and take photo. (RTJ No.SI-RTJ-Maint-00021)	PI	4/Aug/22	6/Aug/22	Plan	Inspection team
7	100406084	500388687	Well site	Flow line	Flow line inspection at 3"-BL-GGA by TFM and take photo. (RTJ No.SI-RTJ-Maint-00021)	PI	4/Aug/22	6/Aug/22	Plan	Inspection team
8	100376469	500353384	Well site	Flow line	Flow line inspection at 3"-TRT-AGA by UTM / MFL and take photo. (RTJ No.SI-RTJ-Maint-00021)	PI	2/Aug/22	6/Aug/22	In progress	Inspection team
9	100376196	500358111	Well site	Flow line	Flow line inspection at 6"-BL-FXA by UTM / MFL and take photo. (RTJ No.SI-RTJ-Maint-00021)	PI	30/Jul/22	5/Aug/22	In progress	Inspection team
10	100377059	500358974	Well site	Flow line	Flow line inspection at 8"-BL-DWE by UTM / MFL and take photo. (RTJ No.SI-RTJ-Maint-00021)	PI	3/Aug/22	5/Aug/22	In progress	Inspection team
11	100366997	500491212	Well site	Flow arm & Manifold	Flow arm / Manifold 3 Month at NMM-F by VT,UTM and take photo. (RTJ No.SI-RTJ-Maint-00020)	PI	4/Aug/22	5/Aug/22	Plan	Inspection team
12	100365711	500348235	Well site	Flow arm & Manifold	Flow arm / Manifold 3 Month at TY-A by VT,UTM and take photo. (RTJ No.SI-RTJ-Maint-00020)	PI	4/Aug/22	5/Aug/22	Plan	Inspection team
13	100375726	500357641	Well site	Flow arm & Manifold	Flow arm / Manifold 3 Month at NMM-H by VT,UTM and take photo. (RTJ No.SI-RTJ-Maint-00020)	PI	2/Aug/22	5/Aug/22	In progress	Inspection team
14	100419272	500397359	Well site	NGV	PM IN GAS METERING A-8000 1M - Continue meter run#1	PM	3/Aug/22	5/Aug/22	In progress	Instrument Team
15	100423061	500401058	Well site	NSG-A	PM IN NSG-A, ESD/OSD function test 1Y	PM	4/Aug/22	4/Aug/22	Plan	Instrument Team
16	100419349	500397436	Well site	SI-LKU-M06.PK	P-4406, 4M, BEAM PUMP PM (WS-M06T)	PM	4/Aug/22	4/Aug/22	Plan	Artificial Lift Team
17	100419510	500397597	Well site	SI-LKU-M09.PK	PM EL BEAM PUMP P-4409 (LKU-M09) 4M	PM	4/Aug/22	4/Aug/22	Plan	Artificial Lift Team
18	100419511	500397598	Well site	SI-LKU-M12.PK	PM EL BEAM PUMP P-4412 (LKU-M12) 4M	PM	4/Aug/22	4/Aug/22	Plan	Artificial Lift Team
19	100419512	500397599	Well site	SI-LKU-M14.PK	PM EL BEAM PUMP P-4414 (LKU-M14) 4M	PM	4/Aug/22	4/Aug/22	Plan	Artificial Lift Team
20	100428871	500406272	Well site	SI-LKU-Z08.PK	PM EL ESP VSD PANEL LKU-Z08 6M	PM	4/Aug/22	4/Aug/22	Plan	Artificial Lift Team
21	100428872	500406273	Well site	SI-LKU-Z18.PK	PM EL ESP VSD PANEL LKU-Z18 6M	PM	4/Aug/22	4/Aug/22	Plan	Artificial Lift Team
22	100428873	500406274	Well site	SI-LKU-Z39.PK	PM EL ESP VSD PANEL LKU-Z39 6M	PM	4/Aug/22	4/Aug/22	Plan	Artificial Lift Team
23	100423084	500401081	Well site	LKU-E	PM ME PCP P-145A 3M	PM	4/Aug/22	4/Aug/22	Plan	Mechanical team
24	100423027	500401024	Well site	LKU-E	PM ME+EL+IN HSP P-142 1Y	PM	4/Aug/22	4/Aug/22	Plan	Mechanical team
25	100423039	500401036	Well site	LKU-E	PM ME+EL+IN HSP P-143 1Y	PM	4/Aug/22	4/Aug/22	Plan	Mechanical team
26	100423086	500401083	Well site	LKU-E	PM ME+EL+IN PCP P-145B 1Y	PM	4/Aug/22	4/Aug/22	Plan	Mechanical team
27	100423070	500401067	Well site	SI-P-5501A.PK	PM ME+EL+IN Vertical Inline Pump P-5501A 1Y - Repair mechanical seal leak	PM	4/Aug/22	4/Aug/22	Plan	Mechanical team
28	100423064	500401061	Well site	SI-P-5501B.PK	PM ME+EL+IN Vertical Inline Pump P-5501B 1Y	PM	4/Aug/22	4/Aug/22	Plan	Mechanical team
29	100423022	500401019	Well site	LKU-B	PM ME PCP P-115A 3M	PM	4/Aug/22	4/Aug/22	Plan	Mechanical team
30	100423012	500401009	Well site	LKU-B	PM ME PCP P-115B 3M	PM	4/Aug/22	4/Aug/22	Plan	Mechanical team
31	100423013	500401010	Well site	LKU-B	PM ME PCP P-117A 3M	PM	4/Aug/22	4/Aug/22	Plan	Mechanical team
32	100423041	500401038	Well site	LKU-B	PM ME PCP P-117B 3M	PM	4/Aug/22	4/Aug/22	Plan	Mechanical team
33	100419332	500397419	Well site	SI-W-TRTC-AUT	PM TRT-C AUTOMATION - RTU AND LOCAL CONTR	PM	3/Aug/22	4/Aug/22	In progress	Automation team
34	100415041	500393377	Well site	LKU-D-DH	PM EL WS-D Duty GROUND RESISTANCE 1Y	PM	4/Aug/22	4/Aug/22	Plan	Electrical team
35	100415038	500393374	Well site	LKU-D-DH	PM EL WS-D Duty TRANSFORMER 1Y	PM	4/Aug/22	4/Aug/22	Plan	Electrical team
36	100420799	500398860	Well site	LKU-D-DH	PM EL WS-D Duty OUTDOOR LIGHTING 12M	PM	4/Aug/22	4/Aug/22	Plan	Electrical team
37	100320424	500305619	Well site	LKU-D-DH	PM EL INSPECTION EX-PROOF EQ. LKU-D-DH 1Y	PM	3/Aug/22	4/Aug/22	In progress	Electrical team

Item	Notification No.	Work Order No.	Location	Equipment	Job description	Type	Start date	Completed Date	Status	In-Charge
1	100419330	500397417	Crude plant	SI-20-DC-01.ASY	PM EL 20-DC-01A/B Battery Room 2M	PM	3/Aug/22	3/Aug/22	Completed	Electrical team
2	100419333	500397410	Crude plant	SI-50-DCU-01.ASY	PM EL 50-DCU-01 Battery Room 2M	PM	3/Aug/22	3/Aug/22	Completed	Electrical team
3	100419324	500397411	Crude plant	SI-60-DCU-01.ASY	PM EL 60-DCU-01 Battery Room 2M	PM	3/Aug/22	3/Aug/22	Completed	Electrical team
4	100419329	500397416	Crude plant	SI-70-DCU-01.ASY	PM EL 70-DCU-01/02 Battery Room 2M	PM	3/Aug/22	3/Aug/22	Completed	Electrical team
5	100419331	500397418	Crude plant	SI-L-COM-UTL	PM EL 55-UPS-02 Battery Room 2M	PM	3/Aug/22	3/Aug/22	Completed	Electrical team
6	-	-	Crude plant	Glycol	CM IN New glycol 43-LT-4304 reading error - Flushing column level transmitter, Change parameter level offset from 8 cm. to 4 cm., Change parameter threshold from 40 to 60, Change parameter damping value from 10 s. to 2 s., Confirm reading 43-LT-4304 compare 43-LT-4303 normal	CM	3/Aug/22	3/Aug/22	Completed	Instrument Team
7	-	-	Crude plant	A-2500	CM IN A-2500, 03-LT-2524 and 03-LT-2520 Reading different - Continue check and investigation	CM	3/Aug/22	3/Aug/22	Completed	Instrument Team
8	100423075	500401072	Crude plant	SI-P-3801/2.PK	PM ME+EL+IN VS P-3801 1Y	PM	3/Aug/22	3/Aug/22	Completed	Mechanical team
9	100423078	500401075	Crude plant	SI-P-3801/2.PK	PM ME+EL+IN VS P-3802 1Y	PM	3/Aug/22	3/Aug/22	Completed	Mechanical team
10	100423081	500401078	Crude plant	SI-P-2401.PK	PM ME Twin Screw Pump P-2401 3M	PM	3/Aug/22	3/Aug/22	Completed	Mechanical team
11	100423082	500401079	Crude plant	SI-P-2402.PK	PM ME Twin Screw Pump P-2402 3M	PM	3/Aug/22	3/Aug/22	Completed	Mechanical team
12	100426030	500413669	Crude plant	SI-G-2350.PK	CM ME E-2350 Clean up sight glass - Clean up sight glass completed	CM	3/Aug/22	3/Aug/22	Completed	Mechanical team
13	-	-	Crude plant	DAF Unit	CM DAF Unit pipe PVC leaked - Remove PVC pipe for repair by welding at maintenance workshop and reinstall	CM	1/Aug/22	3/Aug/22	Completed	Mechanical team
14	-	-	Crude plant	Crude loading	CM ME Z-317 Handle valve seeping - Replace internal part and check leak completed	CM	3/Aug/22	3/Aug/22	Completed	Mechanical team
15	-	-	Crude plant	K-3600	CM ME K-3600 Cyl 1R/2R Abnormal noise - Replace hydraulic filter & valve rack adjustment.	CM	3/Aug/22	3/Aug/22	Completed	Mechanical team
16	100419480	500397567	Well site	SI-LKU-CB01.PK	PM EL BEAM PUMP P-3701 (LKU-CB01) 4M	PM	3/Aug/22	3/Aug/22	Completed	Artificial Lift Team
17	100419481	500397568	Well site	SI-LKU-CB08.PK	PM EL BEAM PUMP P-3708 (LKU-CB08) 4M	PM	3/Aug/22	3/Aug/22	Completed	Artificial Lift Team
18	100419479	500397566	Well site	SI-LKU-CB10.PK	PM EL BEAM PUMP P-3710 (LKU-CB10) 4M	PM	3/Aug/22	3/Aug/22	Completed	Artificial Lift Team
19	100419373	500397460	Well site	SI-LKU-DD03.PK	P-6303, 4M, BEAM PUMP PM (WSSD-03T)	PM	3/Aug/22	3/Aug/22	Completed	Artificial Lift Team
20	100419363	500397450	Well site	SI-LKU-DD06.PK	P-6306, 4M, BEAM PUMP PM (WSSD-06T)	PM	3/Aug/22	3/Aug/22	Completed	Artificial Lift Team
21	100419383	500397470	Well site	SI-LKU-DD07.PK	P-6307, 4M, BEAM PUMP PM (WSSD-07T)	PM	3/Aug/22	3/Aug/22	Completed	Artificial Lift Team
22	100428868	500406269	Well site	SI-LKU-Z03.PK	PM EL ESP VSD PANEL LKU-Z03 6M	PM	3/Aug/22	3/Aug/22	Completed	Artificial Lift Team
23	100428869	500406270	Well site	SI-LKU-Z11.PK	PM EL ESP VSD PANEL LKU-Z11 6M	PM	3/Aug/22	3/Aug/22	Completed	Artificial Lift Team
24	100428870	500406271	Well site	SI-LKU-Z15.PK	PM EL ESP VSD PANEL LKU-Z15 6M	PM	3/Aug/22	3/Aug/22	Completed	Artificial Lift Team
25	-	-	Well site	NGP-A09T	CM EL NGP-A09T, BP Trip VSD Failure - Replace VSD 1 set, Under observation	CM	3/Aug/22	3/Aug/22	Completed	Artificial Lift Team
26	100419439	500397526	Well site	SI-W-TRTC-AUT	PM IN TRC-2 AUTOMATION RTU & LOCAL CONTR	PM	3/Aug/22	3/Aug/22	Completed	Automation team
27	100419332	500397419	Well site	SI-W-TRTC-AUT	PM TRT-C AUTOMATION - RTU AND LOCAL CONTR	PM	3/Aug/22	3/Aug/22	In progress	Automation team
28	100415214	500393550	Well site	OHL	PM EL ALI OHL VISUAL INSPECTION 1M (Trim branches of tree and install snake guard OHL-1.6)	PM	1/Aug/22	31/Aug/22	In progress	Electrical team
29	100320424	500305619	Well site	LKU-D-DH	PM EL INSPECTION EX-PROOF EQ. LKU-D-DH 1Y	PM	3/Aug/22	3/Aug/22	In progress	Electrical team
30	100415042	500393378	Well site	LKU-D-DH	PM EL WSD Duty LIGHTNING PROTECT INSP 1Y	PM	3/Aug/22	3/Aug/22	Completed	Electrical team
31	-	-	Well site	LKU-L	* CL LKU-L P1922 Low Thk. Reject - Pipe replacement completed * CL LKU-L P1926 Low Thk. Reject - Pipe replacement completed	CI	3/Aug/22	3/Aug/22	Completed	Inspection team
32	100365729	500348253	Well site	Flow arm & Manifold	Flow arm / Manifold 3 Month at NMM-F by VT,UTM and take photo. (RTJ No.SI-RTJ-Maint-00020)	PI	2/Aug/22	3/Aug/22	Completed	Inspection team
33	100377111	500359027	Well site	Flow arm & Manifold	Flow arm / Manifold 3 Month at NMM-A by VT,UTM and take photo. (RTJ No.SI-RTJ-Maint-00020)	PI	2/Aug/22	3/Aug/22	Completed	Inspection team
34	100410553	500389420	Well site	Flow line	Flow line inspection at 8"-FSTN-WA by TFM and take photo. (RTJ No.SI-RTJ-Maint-00021)	PI	3/Aug/22	3/Aug/22	Completed	Inspection team
35	100419272	500397359	Well site	NGV	PM IN GAS METERING A-8000 1M - Meter run#2 completed	PM	3/Aug/22	5/Aug/22	In progress	Instrument Team

Figure 8 – Daily Work Schedule

5.2.5 Shutdown Plan

Shutdown or Turnaround Plan is specifically developed for maintenance and inspection activities requiring partial or full plant shutdown. These activities are typically grouped to take place in the same concurrent period; e.g. vessel internal inspection, and relief valve recertification, that cannot be carried out during plant normal operation which may cause high production deferment, mainly on process safeguarding and/or major vital equipment. Plant Turnaround approaches like project non routine works. S1 manages its shutdown activities in alignment with L3 Shutdown management 10012-PDR-5-MMS-003.

Year	2019	2020	2021	2022		2023	2024	2025	2026		2027	2028	2029	2030		2031
Plan				SD	OSD				SD	OSD				SD	OSD	
CUI	0	0	0	7	0	0	5	0	9	1	0	0	0	7	15	0
EXT	0	0	0	0	70	0	0	0	0	70	0	0	0	0	69	0
INT	0	0	0	5	0	0	0	0	63	0	0	0	0	5	0	0

Figure 9 – Shutdown Plan (driven by RBI)

5.3 PLAN AND SCHEDULE PROCESS

5.3.1 Plan and Review Cycles

Plans and schedules will have to be prepared and reviewed in a timely manner, consistent with PTTEP Sirikit Oil Field (S1) asset' other processes. The process is illustrated in Figure 10 below.

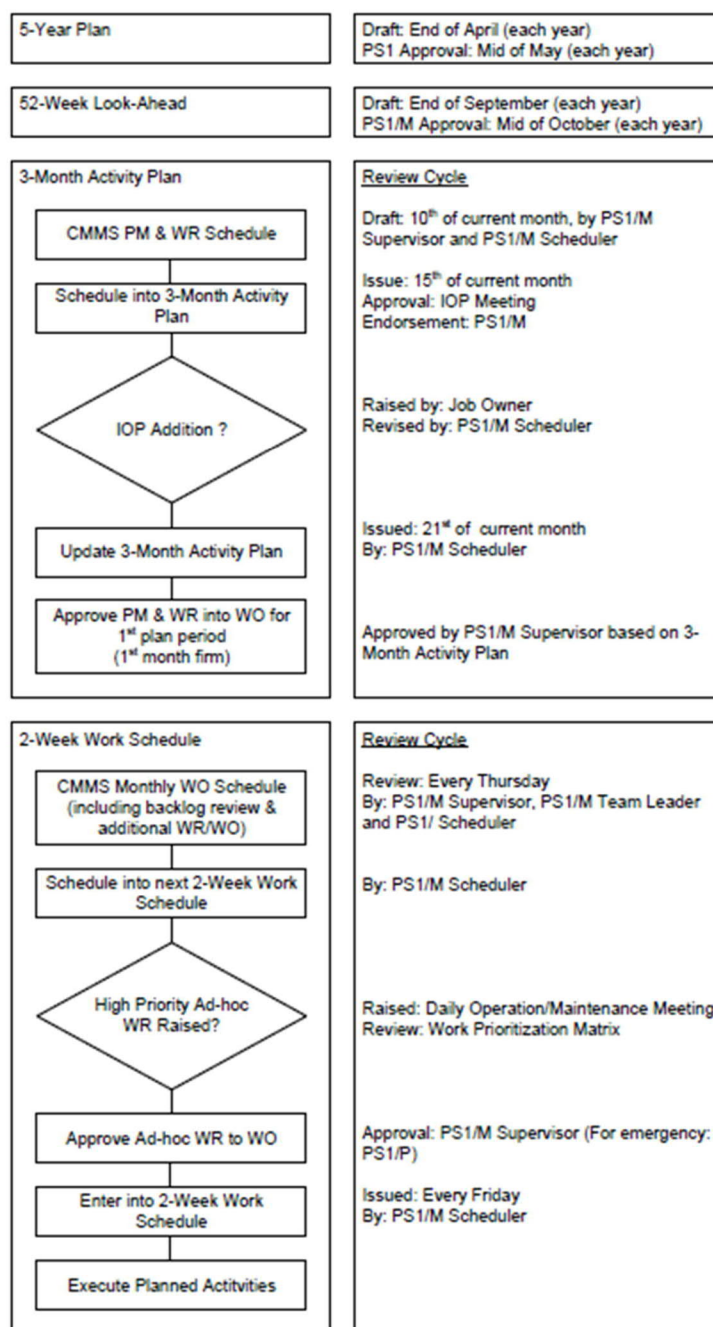


Figure 10 – Planning and Scheduling Process

5.3.2 Plan Review Meetings

Plans will be reviewed and updated on a regular basis to ensure plans reflect the latest work progress and changes to work scope.

- 1) **3-Month Activity Plan:** The 3-Month Activity Plan will be established in two (2) phases, to link the maintenance and inspection activities into S1 Integrated Operations Plan (IOP).

Phase 1 - Prior to IOP meeting, PS1/M, PS1/M Supervisor and PS1/M Scheduler will meet to:

- Obtain overview of maintenance activities in next 3-month period;
- Review priority setting of maintenance activities;
- Agree tentative plan (priorities, dates and resources) for next 3-month period;
- Prepare draft plan, clearly identifying deferment related activities and technical integrity related activities;
- Review work preparation plans and agree the list of actions.
- Proposed released date: Every 10th of the month

Phase 2 – The draft maintenance and inspection plan will be presented to IOP meeting for review and approval. The IOP meeting will be attended by delegates from Asset Planning, Reservoir, Production Planning, Maintenance and related sections. Proposed review date is Every 15th of the month.

- 2) **2-Week Work Schedule:** The 2-Week Work Schedule will be derived from the approved 3-Month Activity Plan, supplemented by approved work order's not featuring on the plan. The 2-Week Work Schedule will be reviewed on a weekly basis in order to:
- Review next week's planned activities against approved (monthly) plan;
 - Review progress against approved (monthly) plan;
 - Review maintenance backlog;
 - Review additional, non-planned activities;
 - Confirm maintenance activity prioritization;
 - Confirm next week's schedule.

The weekly review meeting will take place every Thursday afternoon and be attended by PS1/M, PS1/M Supervisors, PS1/M Team Leaders and PS1/M Scheduler with the final plan as established during the meeting issued on the same day. Although the 2-Week Work Schedule is considered firm, the opportunity exists for items to be added to the schedule later as requirements and/or opportunities arise. In order to ascertain the requirement for late changes to the agreed schedule, all requests for additional items to be added shall be reviewed as to its priority as further described in this document.

- 3) **Daily Work Schedule:** The Daily Work Schedule is for use by the maintenance executor in order to direct maintenance staffs. The Daily Work Schedule is produced in every afternoon before and issued to relevant persons; a copy of daily work list is provided. Daily Work Schedule is reviewed the operation/maintenance morning meeting, where further work requests may be identified. Depending on the priority of additional work requests, changes to the daily work list may be required.

5.3.3 Prioritization of Maintenance Activities

To ensure the timely execution of maintenance activities, it is essential that priorities are assigned to the various maintenance and inspection activities and these priorities are used to schedule the activities. The priorities are recognized by S1 which considered in CMMS. The general meaning of priority based on risk assessed is well applicable to CM or CI that recommends completion date of work order.

Unlike CM/CI WO, Recommended completion date defined for Priority will not be applicable to the other plannable WO types (PM/PI or GSM/GSI, or MD) because some are carried out as campaign whose the completion interval can be longer than 3 months e.g. flowline UT inspection campaign.

Due to this constraint, Priority definition in CMMS is however more effective work around via Planning because PM/PI or GSM/GSI is the prevention and validation approach; i.e., nature of the work is to prevent, validate, or assure rather than to recover or reinstate the functionality or integrity of equipment back to normal like CM/CI's working nature.

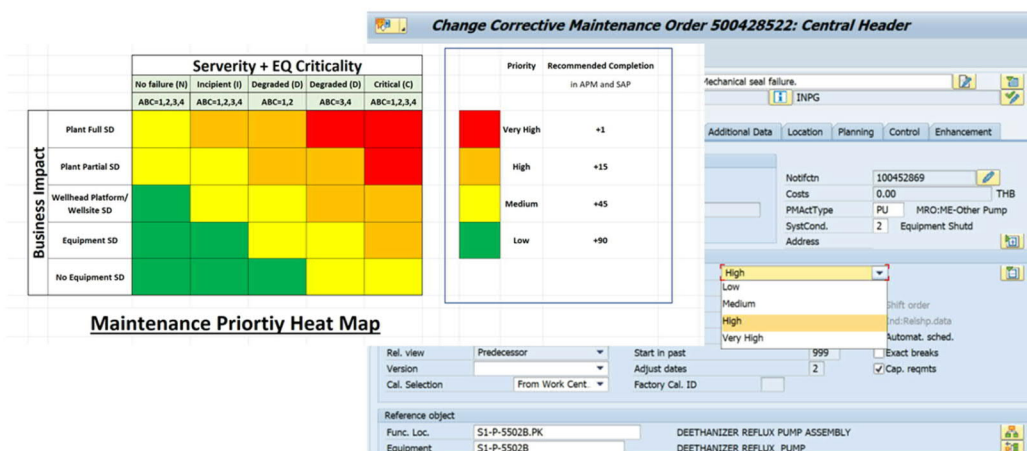


Figure 11 – Risk Based Priority corresponded to recommended completion date

6.0 EXECUTION

This is the only stage when field activities take place that is those directed at anything other than the acquisition and the processing of information. It is the part of the process which yields the return in the form of hydrocarbons and in which the physical implementation of planned activities takes place. Once the execution phase has been initiated, the activity management role changes from “Planning the work” to “Working the plan”. The ability to significantly influence the reduction of costs or schedule has passed and the focus shifts to keeping to the plan in order to avoid time and cost overruns. Work Order generated by CMMS at scheduling phase is how the on-site supervision gets its instructions and how it controls and feedbacks information to the schedulers.

Maintenance and Inspection Management of S1 Asset recognizes four (4) steps for the execution workflow in daily work which to be described in the following Clauses.

6.1 SITE PREPARATION AND INTEGRITY ASSURANCE

Upon identification of the activity to be executed, as detailed in the relevant Work Order), the activity is further detailed in separate steps inclusive of the preparation required before the actual work taking place. Typically, preparation of the site will be considered as part of the actual activity to be undertaken; however in some circumstances the site preparation scope will form a separate activity itself, then follow the general structure outlined in Figure 10. The below outline is controlled by PTTEP S1 Asset Permit-to-Work (PTW) system as described in 13247- PDR-SSHE-505/08, SSHE Rules and Requirement Procedure.

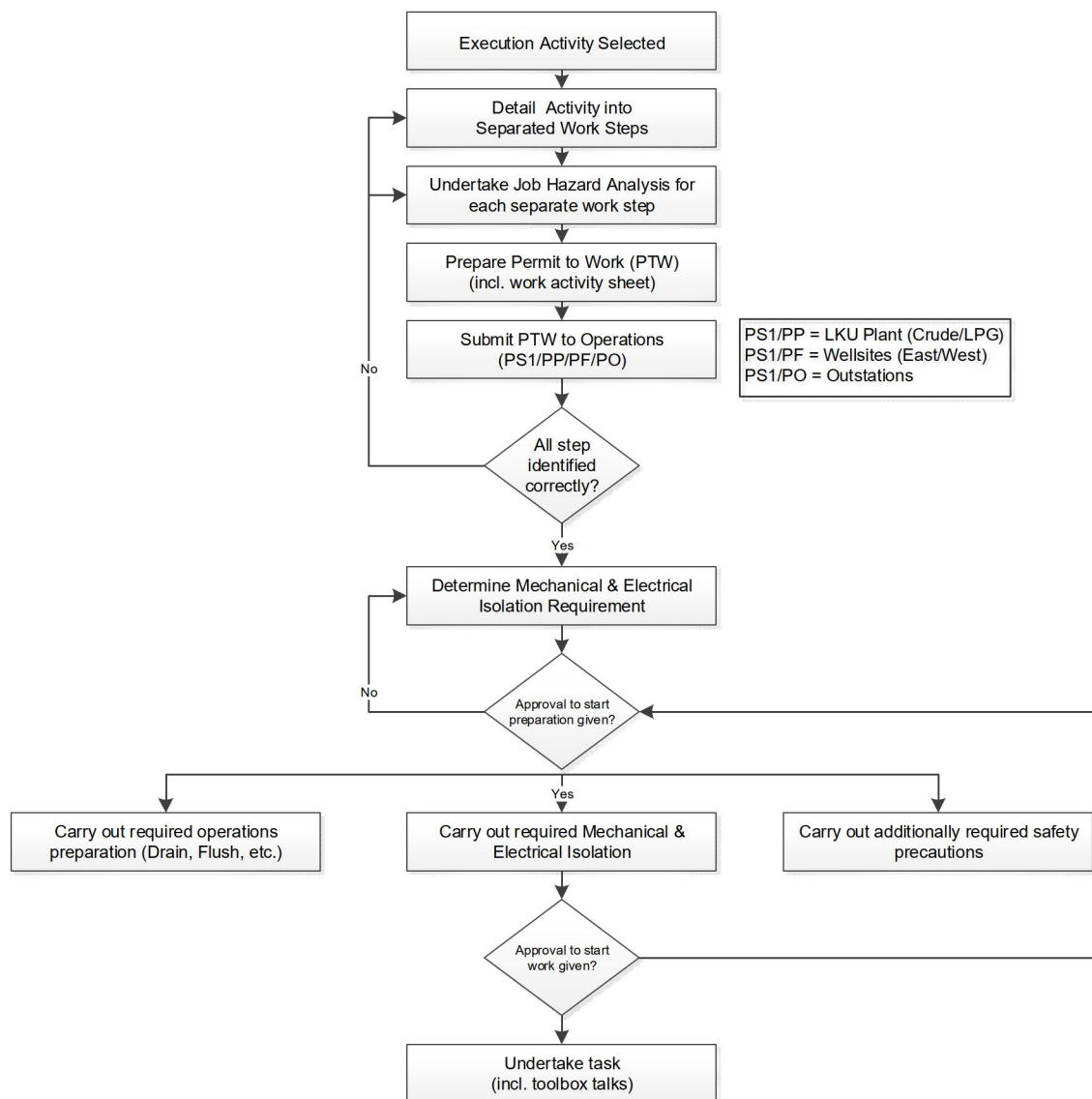


Figure 12 – Site Preparation and Integrity Assurance

Work Description	By	Notes
Detailed activity into separated work steps	Job executor, PS1/M Team Leader	1
Undertake job safety analysis for each separate work step	Job executor, PS1/M Team Leader (supported by Safety Officer)	1
Prepare permit to work (including work analysis sheet)	Job executor, PS1/M Team Leader	1
Submit permit to work to Production section for review	PS1/M Team Leader	
Determine mechanical and electrical isolation requirements	PS1/M Electrical, PS1/PP/PF/PO	2, 3
Carry out required operational preparation activities (drain, flush, etc.)	PS1/PP/PF/PO	
Carry out mechanical and electrical isolation	PS1/M Electrical, PS1/PP/PF/PO	3, 4
Carry out additionally required safety precautions	Job executor	
Undertake task (including toolbox talks)	Job executor	5
Notes: <ol style="list-style-type: none"> Maintenance jobs are normally executed by Maintenance/Inspection crews (under PS1/M Team Leader's supervision) who will be responsible for correctly identifying the separate work steps and permit requirements. For non-routine activities, the activity may be assisted by PS1/M Supervisor and/or Maintenance Discipline Engineers. Isolation requirements and additional safety precautions are established as per the requirements of PTW system and operation procedures. Electrical Isolation is carried out per Electrical Safety Rules procedures. Upon request, isolations may be brought in place by competent persons (typically PS1/M staffs) under the supervision of Production section. For electrical isolations, special requirement applied, as detailed in Electrical Safety Rules. Additionally required precautions (barriers, gas testers, etc.) are normally brought in place jointly by Maintenance/Inspection crews and Production section (PS1/PP/PF/PO), with ultimate approval of adequacy of these provided by Production section. Standard forms for toolbox talks to be used. 		

Table 3 – Responsibility for Site Preparation and Integrity Assurance

6.2 TASK UNDERTAKING

Once site preparation and integrity assurance are completed and approval to proceed work has been obtained as per the requirements of PTW system, actual task can be executed in accordance with the task description shown on the job cards and permit. A task is considered complete when all described tasks have been executed, the site has been re-instated, and the equipment worked on has been returned to a status in which it can safely resume operation.

For various maintenance and inspection activities, detailed procedures are available to provide further clarification to the activity described on the job card and to ensure the consistent execution of maintenance and inspection tasks. Relevant procedures are included in vendor manuals or separate PTTEP maintenance work procedures available from PTTEP's intranet.

Where a task involves the investigation of a failure, the conduct of this investigation and associated reporting shall follow the process outlined in the relevant S1 procedures including PTTEP maintenance work procedures.

6.3 HAND-OVER PREPARATION

This clause covers the process required to administer the resources used during the undertaking of the task, as well as the process to administer any relevant findings obtained during the undertaking of the task. This process exists of various separate steps as outlined in Figure 13.

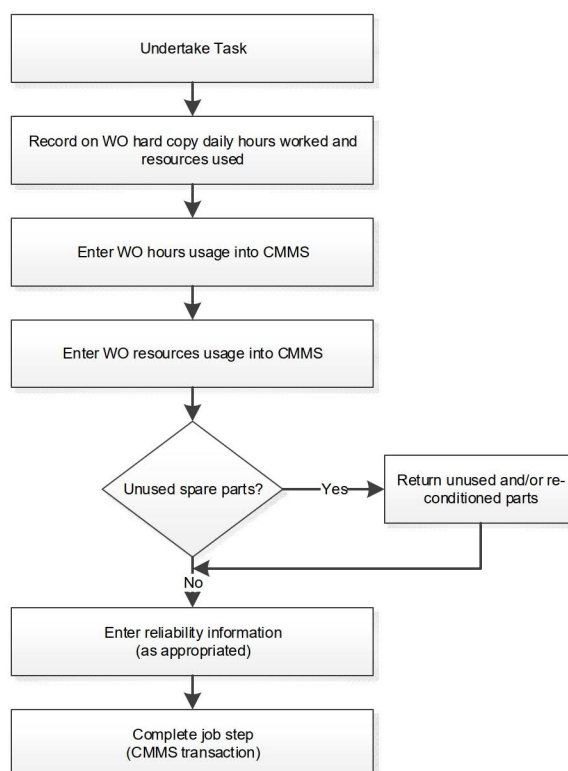


Figure 13 – Hand-over Preparation Process

6.3.1 Work Order Hardcopy Data Record

During the undertaking of tasks, usage of manpower resources (hour worked on WO per individually named person) and other resources are recorded on WO hardcopy on daily basis by the maintenance or inspection technicians. Upon completion of the work, the technicians return the WO hardcopy to their Foreman for entering the relevant data into CMMS.

6.3.2 WO Hours and Resource Usage Entering into CMMS

The information recorded on WO hardcopy is transferred to CMMS within two (2) working days of physical completion of the work, so called “posting of hours usage and resource usage”. It is important that timely entry of this data is strictly adhered to, as it forms the basis of an efficient and effective maintenance scheduling process. Furthermore, it provides the necessary input to the automatic accrual system and thus the link between work management and finance system.

6.3.3 Unused Part Return

All parts and/or consumables reserved or consumed during the undertaking of the task shall be properly balanced against the Work Order bill of materials.

Unused or excess material, spare parts, and/or consumables shall be returned to the material warehouse (5101 is warehouse designated for S1 Maintenance section).

Hint: Stuff replaced by new material but considered reusable if refurbished can also be returned to warehouse as long as they are stock registered and were drawn to use via the WO's bill of Material. Once they are refurbished/reconditioned, the process to return can be further proceeded to the same WO that has yet not technically completed (TECO) under "USED" code of stock – Seek advice from local warehouse personnel for returning "Used part" to Warehouse.

6.3.4 Reliability Information Recoding

In order to capture data on equipment failure modes and frequencies, performing activities and reliability data needs to be entered into CMMS for all corrective maintenance activities. The format adopted by PTTEP S1 asset complied with the requirement of ISO14224, standard for reporting of equipment reliability, and as such requires the following data to be entered:

- Symptom of problem (how did the problem manifest itself?)
- Equipment cause of failure
- Equipment downtime
- Equipment repair time
- Corrective action undertaken

Further details of the entry of reliability data is provided in the relevant PTTEP maintenance work procedure.

Signals completion of work and administrative effort as described in the earlier Clause of this guideline for the relevant job step, and as such a quality check to confirm work completion and correct entry of relevant manpower, resource and materials utilization data. With the approval of a job step to be complete, all transactions are deemed complete, and the WO is ready for close-out.

6.4 WORK ORDER CLOSE-OUT

This process covers the final process of execution process and serves to add deferment data and quality checking the job history data, including reliability data and close out the entire work order, i.e., confirms that all job steps on the subject work order have been completed. For all jobs related to deferment of production, the associated deferment shall be entered by Production Planning section (PS1/T). Deferment related jobs can be identified by the deferment code associated with the work order.

Notes:

1. Where the Work Order involves corrective maintenance, completion also signifies that reliability information has been entered into CMMS.
2. Where a certain job step has not been completed but cancelled, the job card can still be closed out. The relevant cancelled job step will; however, remain shown as cancelled instead of complete in CMMS.
3. WO final closure will be by relevant PS1/M supervisor, discipline engineer followed by PS1/M, dependent on WO scope of work, and its criticality.

7.0 REVIEW AND IMPROVEMENT

Review is the stage in which all the results obtained during execution are analyzed to determine asset status and its performance in various perspectives.

The main source of data for analysis stage is the completed fulfillment on Notifications and Work Orders (WO) via CMMS with relevant parameters and quality of data; both master data of asset and transaction data of execution in a single work order on such registered asset.

S1 adopts Corporate's framework of Maintenance and Inspection Management System underlying with OEMS RAI where every company within PTT Groups are mutually developed, revised, and agreed to conform to develop S1 asset master data structures while transactional fields are configured for user to input relevant parameters into CMMS.

S1 CMMS architecture is therefore built in common with other assets of PTTEP and using the same data catalogue in order that they can be benchmarkable when performing analysis.

Other sources of information including PDMS (Production Data Management System, PDMS), Process Indicator monitoring system (PI), etc.

The analysis results have 3 major categories of outputs. Asset performance, Asset integrity condition, and Work Performance and Effectiveness.

7.1.1 Asset Performance

This activity is concerned with the performance of the physical facilities including items of equipment of the asset. They all have purposes to deliver intended function in efficient and reliable performance within operating context.

Performance Indicators (PI's) used in this area are the equipment performance in term of

- Key equipment or plant availability
- Key equipment or plant efficiency
- Mean Time Between Failures (MTBF)
- Bad actor lists
- Trips of key equipment
- Plant unplanned shutdown
- Plant reliability Index (RI)

7.1.2 Asset Integrity Condition

This activity is concerned with the technical integrity and safety status. Most facilities usually have additional dedicated systems to safeguard, protect, prevent, terminate or retard escalation of undesired circumstances in case the facilities were failed or run out of safe operating envelop.

The dedicated systems: so called SCE or safety critical elements, which determine asset's technical integrity status:

- Structural integrity
- Process containment
- Ignition control
- Protection systems
- Detection systems
- Shutdown systems
- Emergency response systems
- Lifesaving systems

Asset technical integrity condition must also be analyzed in conjunction with performance and validity of the asset design intent under the current conditions. Technical Authorities and Performance standards substantially involves with this analysis.

Examples of asset integrity condition or status are exemplified below:

- Safety relief valve inspection and certification status
- Static equipment (vessel, heat exchanger, tanks, piping) inspection status
- Instrumented Protective Function testing (ESD test, F&G system test) status
- Known variations of Equipment (safeguards overrides, temporary repairs, run out of operating envelop)
- PM compliances
- SCE Backlogs
- Anomalies List
- Critical Alarm Rates
- Findings and corrective action management related to technical integrity
- Corrosion Rate and remaining useful life of process containment.

7.1.3 Work Performance and Effectiveness

This activity is concerned with execution efficiency and effectiveness of maintenance activities themselves. These will include cost, time, and resources consumption to achieve the various deliverables. This analysis of resource performance data is at the core of management information and will bear directly on all aspects of Maintenance and Inspection management.

The impact will range from plans, designs, practices, and procedures and the Cost Model in whole process of Maintenance and Inspection.

Typical Performance Indicators are exemplified below:

- Meantime to Repair (MTTR)
- Turnaround compliance
- PM:CM ratio
- Overdue or Ready Backlogs
- Manhour analysis (Actual and Planned Manhour)
- Cost Analysis (expenditure by asset, activity, WO type)
- Cost per asset replacement value

7.1.4 Feedback and Lesson Learned

Key performance indicators will highlight the improvements and gaps to be fulfilled for the planning, resources, execution tactic, crew competency.

The improvements can be started more upfront to M&I approach and strategy or even further to engineering and design. Enablers and Technologies should enrich to all stages of M&I work process. Life-Cycle-Cost and Risk-based Approach is always underlying of M&I work process as it is the heart and M&I continuous improvement process.

8.0 ROLES AND RESPONSIBILITIES

The following table outlines the roles and responsibilities associated with this document.

Roles	Responsibilities
Document Author	<p>The author of Maintenance and Inspection Execution Management is S1 Maintenance Superintendent or equivalent or person as assigned by Document Owner, with responsible for:</p> <ul style="list-style-type: none"> Investigate and plan of a document structure and its contents Create and/or update a document as planned Report to Document Owner on the progress of the work on a document Issue draft revision of a document for review, and embed all comments made by Document Reviewers to the document
Document Custodian	<p>The custodian of Maintenance and Inspection Execution Management is S1 Maintenance Superintendent or equivalent or higher level who assigned by Document Owner, with responsible for:</p> <ul style="list-style-type: none"> Identify deficiencies or potential improvements Initiate periodic revision Maintain revision history and document status register
Document Owner	<p>The owner of Maintenance and Inspection Execution Management is VP, S1 Production Operation Department, with responsible for:</p> <ul style="list-style-type: none"> Issue this document and its revisions
Document Reviewer	<p>The reviewer of Maintenance and Inspection Execution Management is Technical Authority in reliability and integrity engineering or equivalent or higher level, with responsible for:</p> <ul style="list-style-type: none"> Review the document contents to ensure adequate quality Provide comments and/or suggestions on document issued

9.0 DEFINITIONS

9.1 LANGUAGE

In this document, the following verbal forms are used.

May	Indicates a possible course of action or permission.
Must	Indicates a mandatory and regulatory course of action.
Shall	Indicates a mandatory course of action or requirement.
Should	Indicates a preferred/logical course of action or recommendation.

9.2 TERMINOLOGY

The following terms and definitions apply to this document.

Terminology	Description
Approval	The authority in writing given by COMPANY to Contractor on a procedure or to proceed with the performance of a specific part of the work without releasing in any way the Contractor from any of his obligations to conform with the technical specifications, requisitions, etc. The words "Approve", "Approved" and "Approval" shall be constructed accordingly.
Asset	Any physical facilities used in the exploration, production, processing or transportation of oil and gas, and any supporting facilities or equipment.
Asset Integrity (AI)	The ability of an asset to perform its required function efficiently and effectively whilst safeguarding life and the environment.
Availability	The ability of an item to performs its required function under given conditions at a given instant of time or during a given time interval. The availability of an item does no necessarily imply that it is performing, but it is a state to perform.
Barrier	Measure which reduces the probability of releasing a hazard's potential for harm or which reduces its consequences. The hierarchy of barriers is prevention, detection, control, mitigation and emergency response.
Company	PTT Exploration and Production Public Company Limited PTTEP Siam Limited
Contractor	Any company PTTEP has signed a contract with for the Engineering, Procurement, Construction, Installation, Maintenance and Inspection of a part of service work.
Major Accident Event (MAE)	Any incident that results in multiple fatalities or equivalent damage, production loss, environment impact as per the risk matrix.
Quantitative Risk Assessment (QRA)	QRA is the evaluation of the extend of risk arising, with incorporation of calculations based upon the frequency and magnitude of hazardous events.

Reliability	The ability of an item to perform a required function under give conditions for a given period of time. This is document it is used as "Reliability Performance" and refers to probability of failure.
S1 Asset	Sirikit Oil Field under PTTEP Siam Limited
Safety Critical Element (SCE)	Safety Critical Elements are any part of the installation, plant or computer programs whose failure will either cause or contribute to an MAE, or the purpose of which is to prevent or limit the effect of an MAE.
Technical Authority (TA)	PTTEP personnel responsible for technical standards, providing advice on issues relating to their discipline and Four Pillars of integrity as defined in CMS. There are two levels of TA as defined in CMS.
Technical Integrity	Technical soundness, within E&P context it is "The technical integrity of a facility is achieved when, under specified operating conditions, there is no foreseeable risk of failure endangering the safety of personnel, environment or asset value".

9.3 COMMON ACRONYMS

Set out below in alphabetical order are common acronyms as found within this document.

AI	Asset Integrity
CM	Corrective Maintenance
CMMS	Computerized Maintenance Management System
COA	Chart of Accounts
CPFT	Critical Proof Function Test
ESD	Emergency Shutdown
F&G	Fire and Gas System
FMEA	Fault Modes and Effect Analysis
IOP	Integrated Operations Plan
IPF	Instrument Protective Function
MRP	Maintenance Reference Plan
MS	Microsoft Software
MTBF	Mean Time Between Failure
OMI	Maintenance and Inspection Department
QRA	Quantitative Risk Assessment
PI	Performance Indicator
PM	Preventive Maintenance
PS1	S1 Production Operations Department
PS1/M	S1 Maintenance and Inspection Section

PS1/P	S1 Production Section
PS1/T	S1 Production Support Section
PTN/P	S1 Asset Planning Department
PTW	Permit to Work
RAM	Risk Assessment Matrix
RBI	Risk Based Inspection
RCM	Reliability Centered Maintenance
RRM	Risk and Reliability Maintenance
S1	Sirikit Oil Field
SCE	Safety Critical Element
SSHE	Safety, Security, Health and Environment
TA	Technical Authority
WO	Work Order
WR	Work Request

10.0 DOCUMENT REFERENCE LIST

PTTEP internal references, international codes and standards, provincial legislation, and other references pertinent to this document are indicated in the table below.

Document Code	Document Title
PTTEP internal references	
10012-GDL-5-INT-008-R00	Maintenance and Inspection Planning Guideline
10017-PDR-5-MMS-001-R00	Maintenance and Inspection Approach
13245-GDL-1-S1M-ALL-MMS-001-R04	S1 Maintenance and Inspection Guideline
10015-STD-4-PRS-006-R00	Reliability and Asset Integrity Management Standard
HQ.2020.01082.3	Reliability and Integrity MGT Framework
12153-GDL-5-MMS-001-R00	S1 MRP 2019-2031
13245-GDL05-MMS-002-R00	S1 MRP LPG 2022-2031
International codes and standards, provincial legislation, and other references	
ISO 14224	Petroleum, Petrochemical and Natural Gas Industries – Collection and Exchange of Reliability and Maintenance Data for Equipment



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บริษัท ปตท.สผ. สยาม จำกัด

รายงานผลการปฏิบัติตามมาตรการป้องกันและแก้ไขผลกระทบสิ่งแวดล้อม และมาตรการติดตามตรวจสอบผลกระทบสิ่งแวดล้อม
โครงการติดตั้งท่อก๊าซจากฐานผลิตปิโตรเลียมหนองตม-เอ (NTM-A) ไปยังฐานผลิตทุ่งใหญ่-เอ (TYI-A) แปลงเอส 1
จังหวัดพิษณุโลก และสุโขทัย
ฉบับเดือนมกราคม - ธันวาคม พ.ศ.2565

ภาคผนวกที่ 10

Flowline and Well Gas Lift Line



PTT Exploration and Production Public Company Limited

APPROVAL REGISTER	
Document Title:	FLOWLINE AND WELL GAS LIFT LINE
Document Reference No:	SMNT-MS-M-05
Prepared By:	Samatcha Panthuvichien
Document Owner:	Sarayut Niamrit (PS1/M)
Division/Department:	PTN/PNO

Document Custodian			
Name	Title	Signature	Date
Samatcha Panthuvichien	TA1		07 Jul 2016

Technical Review			
Name	Title	Signature	Date
Sarayut Niamrit	PS1/M		13-07-2016
Geerati Pombunmee	PS1/F		30-07-16

Revision History			
Rev	Description of Revision	Authorised by	Date
1	New issue Issued after company ownership change		25/03/2008
2	Change document No. A72 to SMNT		28/08/2009
3	(1) Reformatted from SMNT-MS-M-05: FLOWLINES AND WELL GAS LIFT LINES (2) Aligned with new PTTEP SSHE MS, ISO14001:2004 and OHSAS18001:2007 requirement (3) Updated Organizational Indicators from JGO to DSO	DSO/M	18/10/2010
4	Updated Organizational Indicators from DSO/M to DSF/M	DSF/M	18/10/2013
5	(1) Change document to corporate format and revise section /Department Abbreviate (2) Update Strategy (3) Added Thickness Monitoring Location Guideline	PS1/M	01/07/2016



PTT Exploration and Production Public Company Limited

PTTEP Procedure



FLOWLINE AND WELL GAS LIFT LINE

Document No: SMNT-MS-M-05

Revision No: 05



PTT Exploration and Production Public Company Limited

Document Approvals			
		Signature	Date
Author:	Samatcha Panthuvichien		18 AUG 2016
Document Owner:	Sarayut Niamrit (PS1/M)		18-08-2016

THIS DOCUMENT WILL BE REVIEWED 5 YEARS FROM DATE OF APPROVAL
OR REVISED EARLIER IF NECESSARY



TABLE OF CONTENTS

1.0	PURPOSE	1
2.0	SCOPE	1
3.0	REFERENCES	1
4.0	DEFINITIONS	1
5.0	ROLES AND RESPONSIBILITIES	2
6.0	STRATEGY	2
7.0	APPENDIX	4



1.0 PURPOSE

The objectives of the maintenance strategy are:

- To demonstrate and maintain the technical integrity of (safety critical) assets
- To fulfil maintenance activities in the most business-efficient manner by effective and efficient deployment and use of resources
- To improve asset reliability, availability and performance and optimise maintenance efforts such that company targets in terms of product quantity, quality and unit maintenance cost can be met
- To have in place and operate an auditable system of asset performance and maintenance controls
- To comply with all applicable legislation and company SSHE policies

2.0 SCOPE

This generic maintenance strategy is written to cover well flowlines and well gas lift lines in perimeter of PTTEP Siam, S1 Asset. The term “flowline” is used to define line from wellhead to the first common manifold including the part of the manifold, which is directly connected to the well (i.e. the section after the choke valve).

3.0 REFERENCES

3.1 PTTEP CONTROLLING DOCUMENTS

Document Number	Document Title
S1.SMNT.PH.00	PTTEP S1 Maintenance Philosophy
EP 2000-5008	Carbon Steel Pipeline Corrosion Engineering Manual

3.2 OTHER REFERENCE DOCUMENTS

Document Number	Document Title
API 570	Piping Inspection Code
NACE Standard RP0274-98	High Voltage Electrical Inspection of Pipeline Coating
NACE Standard RP0169-96	Control of External Corrosion on Underground or Submerged Metallic Piping Systems
ASME B31.3	Process Piping
ASME B31.8	Gas Transmission and Distribution Piping System

4.0 DEFINITIONS

Terminology	Description
Flowline	B31.3 Process piping between wellhead to manifold



4.1 COMMON ACRONYMS

Set out below are common specific terms presented in alphabetical order:

SAP	PTTEP Computerized Maintenance Management System
PI	Planned Inspection (Work Order Type)
CI	Corrective Inspection (Work Order Type)

5.0 ROLES AND RESPONSIBILITIES

5.1 OWNERSHIP OF THE DOCUMENT: PS1/M

The owner of the document is Superintendent, Maintenance with responsibilities for:

- Issuing the FLOWLINE AND WELL GAS LIFT LINE INSPECTION Procedure and its revisions
- Ensuring effective implementation of the procedure

5.2 CUSTODIAN OF THE DOCUMENT: TA1

The custodian of the document is TA1, In-service Inspection and Corrosion with responsibilities for:

- Identifying deficiencies or potential improvements
- Initiating periodic revision
- Maintaining revision history and document status register

6.0 STRATEGY

The need for the regular inspection of flowlines on PTTEP facilities to assure integrity in service is identified in PTTEP Maintenance Philosophy and also in Statutory Regulations.

6.1 FLOWLINE

In PTTEP the wells are drilled from common well site locations and grouped in manifolds after a short distance from wellhead.

A. INTERNAL CORROSION

Currently the field operates with low carbon dioxide contents (approx. 1.5% mole) and minor amount of hydrogen sulphide. The water cut averages at 50% across the field with some wells producing up to 90% water. With the introduction of the water flooding of the reservoir the water cut will increase more rapidly than before.

B. SAND EROSION

Some wells are producing high volume of sand and sand erosion takes place at flow direction change location such as elbow, and tee junction.

C. EXTERNAL CORROSION

A large portion of the flowline is underground. That section is protected against external corrosion by protective wrapping. No cathodic protection is applied. In some well locations that section of the flowline is routed through open concrete trench and some have no protective coating, as such they are more vulnerable to external corrosion.



6.2 WELL GAS LIFT LINES

A. EXTERNAL CORROSION

Same as well flowlines

B. INTERNAL CORROSION

The lift gas is generally dry. However with the introduction of wet gas wells directly to the gas lift system there is an increasing risk of internal corrosion.

6.3 INSPECTION FREQUENCIES

Since well fluid condition of each well is changed with hardly to notice and re-evaluate inspection frequencies on time. Therefore, thickness monitoring frequency of each flowline is 3 monthly as campaign basis on February, May, August and November.

SAP shall regularly generated PI Work Order of each well site accordingly. Thickness monitoring location for each flowline and manifold shall be followed Appendix II using Ultrasonic Thickness Measurement to find minimum thickness of each location.

In case possibility of high wall thickness loss due to well fluid condition changing such as high sand alert from lab sampling, CI Work Order shall be manually created in SAP for the concerned well to monitor thickness ASAP.



7.0 APPENDIX

7.1 APPENDIX I: CALCULATION OF MINIMUM ALLOWABLE PIPING WALL THICKNESS

A. The Final retirement thickness for piping is based on the higher of two thicknesses:

- Pressure design thickness under internal pressure - Wall thickness required for pressure competency can be calculated with the following formula (as per ANSI B31.3)

$$t = P * D / [2(SE+PY)]$$

Where

D= Nominal outside diameter of pipe, mm

P= Operating pressure, barg

S= Stress value at design temperature, MPa

E= Quality factor

Y= Coefficient

t= Pressure Design thickness, mm

- Wall thickness required to cover other loading on the pipe, besides internal pressure, e.g. support loading, third party damage, vibration etc., which are very difficult to quantify, often called the "Structural retirement thickness"

NPS (in)	Recommended retirement Thickness (mm)
0.5 - 3	2.50
4	3.00
6	3.75
8	4.50
10	4.75
12	4.75

B. Line standards

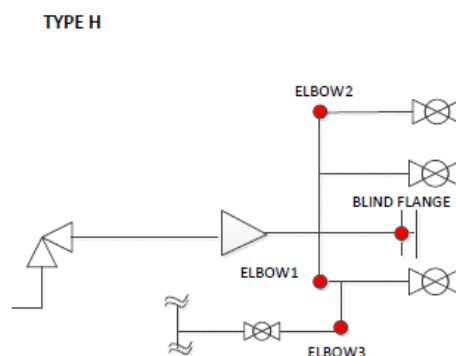
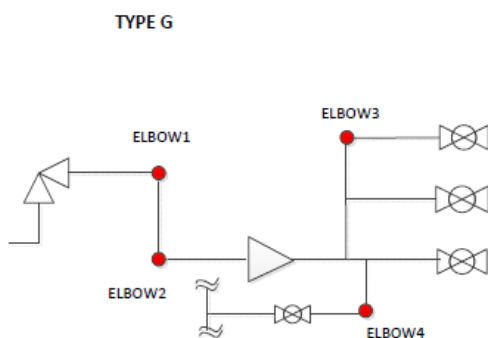
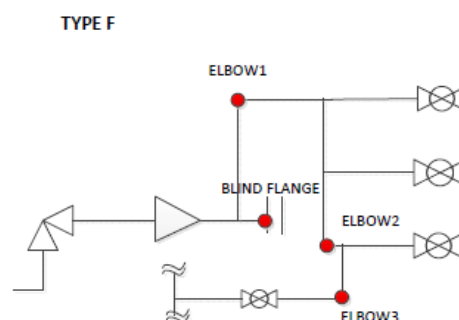
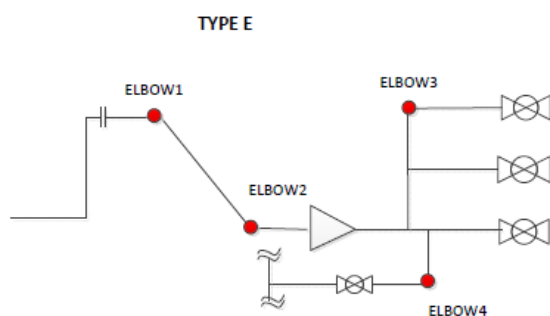
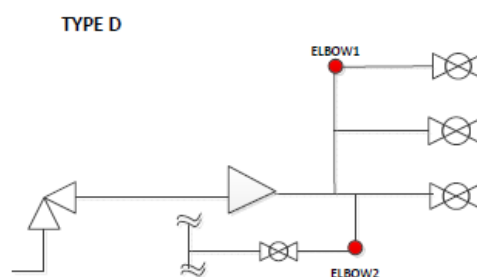
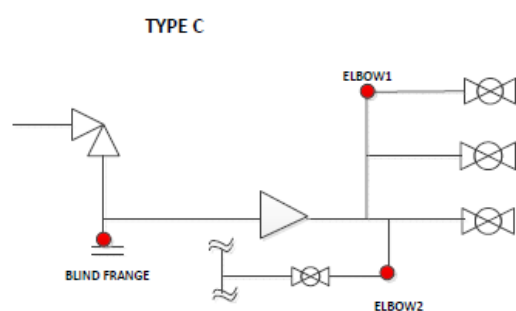
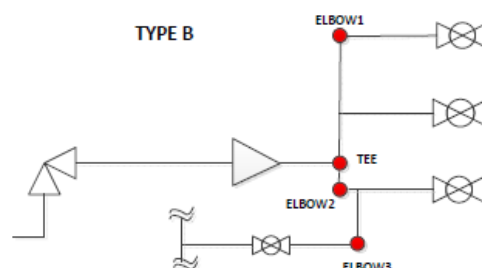
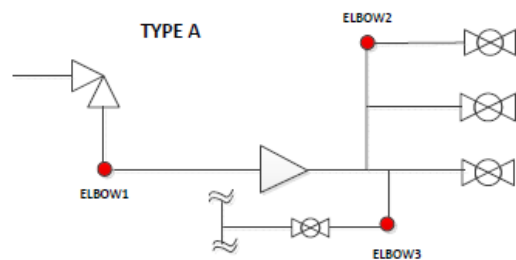
A standard well flowline consist of the following sections:

- 3"- SCH 160 line pipe and elbows, material API 5L Grade B (Yield Strength 241 MPa), from X-mas tree until the choke valve
- 3"- SCH 80 line pipe and elbows, material API 5L Grade B, from choke valve to the manifold
- 1"- SCH 80 line pipe and elbows, material API 5L Grade B, drain line after choke valve
- Gas lift lines are 2" SCH 80 line pipe, material API 5L Grade B

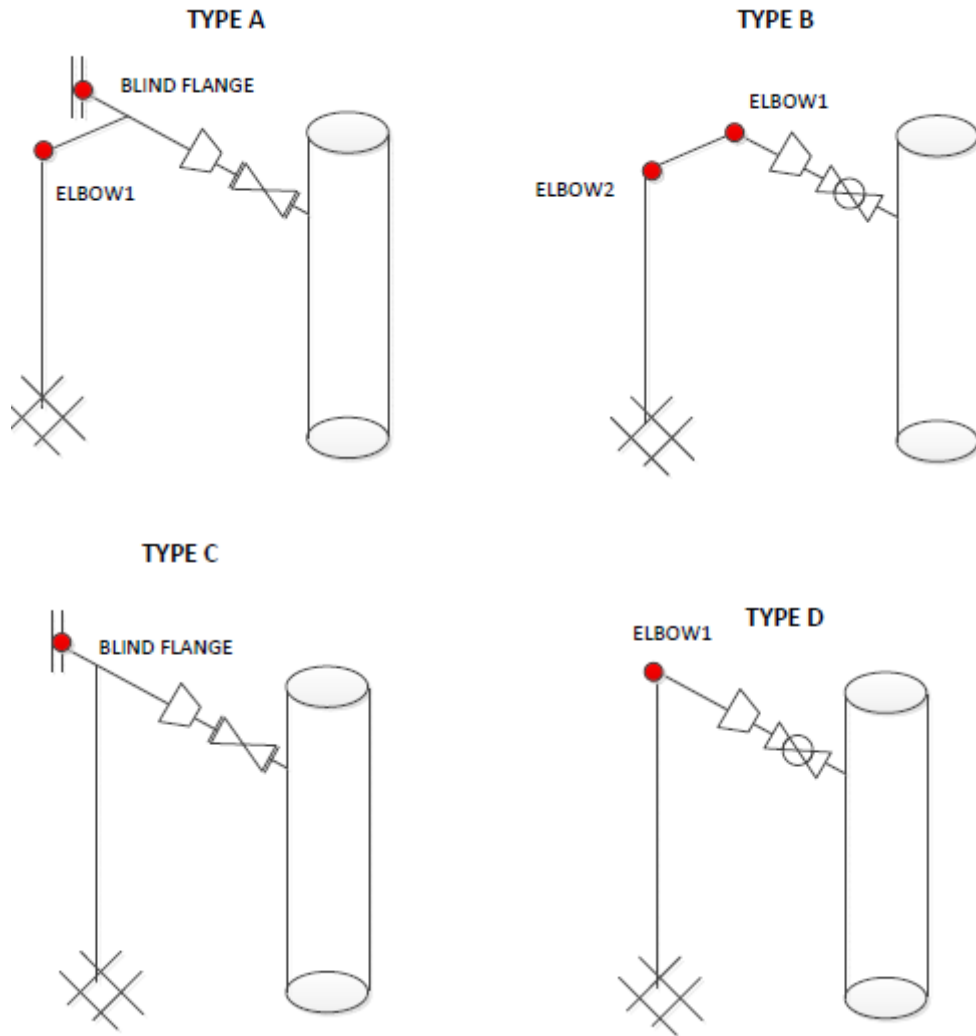
NPS (in)	SCH	OD (mm)	WT (mm)
1	80	33.4	4.55
2	80	60.3	5.54
3	80	88.9	7.62
3	160	88.9	11.13



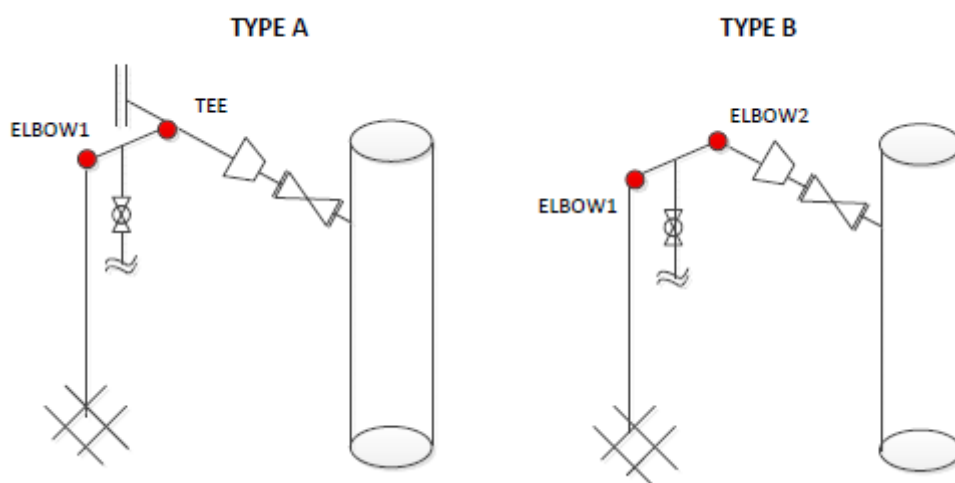
7.2 APPENDIX I: THICKNESS MONITORING LOCATION GUIDELINE

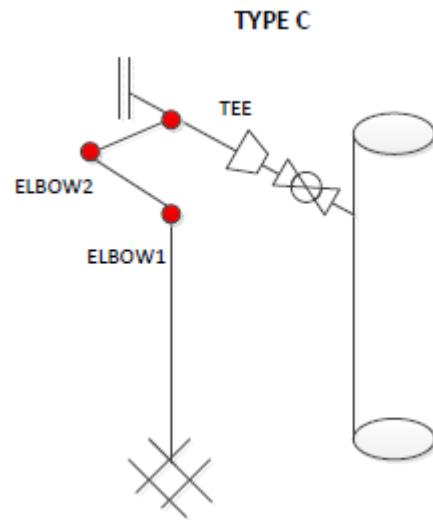


Manifold Thickness Monitoring Location



Crude Flowline Monitoring Location





Water Flowline Monitoring Location



บริษัท ปตท.สผ. สยาม จำกัด

รายงานผลการปฏิบัติตามมาตรการป้องกันและแก้ไขผลกระทบสิ่งแวดล้อม และมาตรการติดตามตรวจสอบผลกระทบสิ่งแวดล้อม
โครงการติดตั้งท่อก๊าซจากฐานผลิตปิโตรเลียมหนองตุม-เอ (NTM-A) ไปยังฐานผลิตทุ่งใหญ่-เอ (TYI-A) แปลงเอส 1
จังหวัดพิษณุโลก และสุโขทัย
ฉบับเดือนมกราคม – ธันวาคม พ.ศ.2565

ภาคผนวกที่ 11
ตัวอย่างเอกสารอนุญาตการทำงาน
(Permit to Work)

ตัวอย่างเอกสารอนุญาตการทำงาน (Permit to Work)

PTTEP MAIN HOT WORK PERMIT		Continue from previous permit no	S1-HWP-2022-19691	Permit no.	S1-HWP-2022-20240									
SECTION 1 : Work Description Site name: <u>S1</u> Area/Platform: <u>LKU Plant (Maintenance Simple)</u> Location: <u>LKU Crude process</u> Operation unit: <u>Gas Compressor</u> Unit no.: <u>N/A</u> Equipment: <u>Safety Relief Valve</u> Tag no.: <u>K-3450</u> PTW is related to MOC <input type="checkbox"/> Yes (MOD/Deferral/Derogation/Downgrade Situation No.) <input checked="" type="checkbox"/> No Work/Task Description: Working Date 18-24 Nov 2022, PA: Thanit K. Phone. 089-2686633 Tel. 6152 PM Field Instrument: K-3450 PM Instrument - PM IN K-3450 RELEIF VALVE 4Y														
Hazard Identification: <input type="checkbox"/> Naked Flame Hot Work <input checked="" type="checkbox"/> Non-Naked Flame Hot Work 1 Area classification <input checked="" type="checkbox"/> Hazardous area <input type="checkbox"/> Unclassified area / Non-Hazardous area 2 Hazard classification <input checked="" type="checkbox"/> Process hydrocarbon <input checked="" type="checkbox"/> Pressure hazard <input checked="" type="checkbox"/> Dust/Fume/Smoke <input type="checkbox"/> Radiography <input type="checkbox"/> Flammable material <input type="checkbox"/> Working at height <input type="checkbox"/> Hot/Cold surface <input checked="" type="checkbox"/> Loud Noise <input type="checkbox"/> Mercury/Toxic gas <input type="checkbox"/> Insufficient light <input type="checkbox"/> Ergonomic hazard <input type="checkbox"/> Vibration <input type="checkbox"/> Hazardous chemical <input checked="" type="checkbox"/> Biological hazard <input checked="" type="checkbox"/> Slipping/tripping <input type="checkbox"/> Spill <input type="checkbox"/> Equipment with moving/rotating part <input checked="" type="checkbox"/> Pinch point/sharp object <input type="checkbox"/> Ignition Source <input type="checkbox"/> Explosive <input type="checkbox"/> Crane/Lifting/Rigging <input type="checkbox"/> Critical lift <input type="checkbox"/> Routine/Simple lift <input type="checkbox"/> Electricity <input type="checkbox"/> HV (> 1kV.) <input type="checkbox"/> LV <input type="checkbox"/> Asphyxiation/Confined space/Water mist/FM200/CO2 release <input type="checkbox"/> Work on edge/over water <input checked="" type="checkbox"/> Falling/Dropped/Flying objects <input type="checkbox"/> Environmental hazard (weather, temp.) <input type="checkbox"/> Other Complementary permit : Complementary PTW No. <input checked="" type="checkbox"/> Process/Mech./Inst. Isolation <u>S1-CPI-2022-02107</u> <input type="checkbox"/> Self <input type="checkbox"/> Isolation cross reference (ICR) <input type="checkbox"/> HV <input type="checkbox"/> LV Electrical isolation <input type="checkbox"/> Self <input type="checkbox"/> Confined space entry <input type="checkbox"/> Radiography <input type="checkbox"/> Diving <input type="checkbox"/> ROV <input type="checkbox"/> Man <input type="checkbox"/> Anchoring/De-anchoring <input type="checkbox"/> Excavation <input type="checkbox"/> Pressure testing Other attachment: <input checked="" type="checkbox"/> JIMS S1 JOINT..... <input checked="" type="checkbox"/> Sketch/Drawing <u>K-3450_1Y.PM.RV.pdf</u> <input checked="" type="checkbox"/> JSA/Procedure/Plan <u>P.M.IN.Gas</u> <input type="checkbox"/> Lifting Plan <input type="checkbox"/> Other:														
Material / Tool / Work requirements: <input type="checkbox"/> Scaffolding/Ladder <input checked="" type="checkbox"/> Hand tool <input type="checkbox"/> Mobile Engine: Gen./Comp. <input type="checkbox"/> Ex. Elect./Battery/Pneum./Hyd.Tool <input type="checkbox"/> Gas/Pressurized cylinder <input checked="" type="checkbox"/> Non-Ex. Elect./Battery Tool <u>Instrument Tool</u> <input type="checkbox"/> Crane/Lifting <input checked="" type="checkbox"/> Other <u>Camera with out flash</u>														
Performing Authority Name: <u>Thanit Kamkaew</u> Position: <u>Senior Technician</u> Department: <u>PS1/M</u> Signature: <u>Thanit Kamkaew</u> Date: <u>2022.11.17 08:34:32</u>														
SECTION 2 : Safety Precautions (The undersigned certifies that all requirements fulfilled and job can be started)														
Precautionary Requirements	Day 1		Day 2		Day 3		Day 4		Day 5		Day 6		Day 7	
	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
Process System Requirements:														
Equipment electrically isolated, locked and tagged	<input checked="" type="checkbox"/>													
Emergency stop latched and tagged	<input checked="" type="checkbox"/>													
Equipment isolated by valve / spade / blind, locked, tagged	<input checked="" type="checkbox"/>													
Equipment fully depressurized / flushed / fully drained	<input checked="" type="checkbox"/>													
Equipment inerted / purged / ventilated	<input checked="" type="checkbox"/>													
System inhibit / override / bypass (See section 3)	<input checked="" type="checkbox"/>													
Other	<input checked="" type="checkbox"/>													
Safety Requirements:														
Equipment / Area free of flammables / combustibles	<input checked="" type="checkbox"/>													
No HC release in working area / Close JB before venting HC	<input checked="" type="checkbox"/>													
Whip check & safety pin installed on hose connection	<input checked="" type="checkbox"/>													
Equipment integrity check / emergency stop test before use	<input checked="" type="checkbox"/>													
Available of Work Plan / Procedure / Program on site	<input checked="" type="checkbox"/>													
Gloves: rubber / leather / high volt / welding / hyflex.....	<input checked="" type="checkbox"/>													
Hearing protection / Safety goggles / Face shield / Cold suit	<input checked="" type="checkbox"/>													
Air supply / Half mask / Full face mask: Type N95.....	<input checked="" type="checkbox"/>													
Disposable coveralls: Chemical / Mercury protection	<input checked="" type="checkbox"/>													
Safety harness with: double life lines/inertia reel/fall arrester	<input checked="" type="checkbox"/>													
Work vest / Life buoy / Standby boat	<input checked="" type="checkbox"/>													
Limit the working hours / Rotate worker every hour(s)	<input checked="" type="checkbox"/>													
Fire extinguisher / Fire hose & nozzle run-out / Fire blanket	<input checked="" type="checkbox"/>													
Spark, Slag, Dust containment / Habitat / Pressurized habitat	<input checked="" type="checkbox"/>													
Warning sign / Barrier tape / Scaffold / Secure ladder	<input checked="" type="checkbox"/>													
Protection guard / Cover / Frame / Lanyard / Finger saver	<input checked="" type="checkbox"/>													
Stay clear of: moving / rotating part / line of fire / hot surface	<input checked="" type="checkbox"/>													
Additional ventilation / Safety lighting: zone.....	<input checked="" type="checkbox"/>													
Spill containment / Absorbents / Earth wire connected	<input checked="" type="checkbox"/>													
Standby Operator/ Technician/ Firewatch/ Rescuer/ Safety	<input checked="" type="checkbox"/>													
Working under inclement weather criteria/requirements	<input checked="" type="checkbox"/>													
Available of JSA / Risk assessment / SDS on site	<input checked="" type="checkbox"/>													
Toolbox talk / Pre-job safety meeting	<input checked="" type="checkbox"/>													
Correct handling/working posture/Use lifting aid/Lifting plan	<input checked="" type="checkbox"/>													
Personal / Stand alone gas detector in place	<input checked="" type="checkbox"/>													
Gas check: Prior to starting / Frequency <u>record in 2 hr</u>	<input checked="" type="checkbox"/>													
Oxygen / LEL / Toxic:	<input checked="" type="checkbox"/>													
Inform concerned parties	<input checked="" type="checkbox"/>													
Maintain good housekeeping	<input checked="" type="checkbox"/>													
Other	<input checked="" type="checkbox"/>													
Operating Authority Name: <u>Nakhorn Karthawong</u>		Safety Authority Name: <u>Panupong Piwpan</u>		*In case NFHW and Safety Critical Task										
Signature: <u>Nakhorn</u> Date / Time: <u>2022.11.17 15:00:16</u>		Signature: <u>Panupong Piwpan</u> Date / Time: <u>2022.11.17 15:03:46</u>		Area Authority Name: (*) Signature: Date / Time:										
Permit Validity	Date: (DD/MM/YY) <u>18/11/22</u>	Time: <u>07:00:00</u>	TO	Date: (DD/MM/YY) <u>25/11/22</u>	Time: <u>07:00:00</u>									

PTTEP	PTTEP MAIN HOT WORK PERMIT	Continue from previous permit no	Permit no. S1-HWP-2022-22302				
SECTION 1 : Work Description							
Site name: ..S1..... Area/Platform: ..Bueng Phra Depot (Maintenance)..... Location: ..Bueng Phra Rail Loading..... Operation unit: ..N/A..... Unit no.: ..N/A..... Equipment: ..RTW Loading pump... Tag no.: ..P-913, P-914.....							
PTW is related to MOC <input checked="" type="checkbox"/> Yes (MOD/Deferral/Derogation/Downgrade Situation No.) <input type="checkbox"/> No							
Work/Task Description: ขอเริ่มงานวันที่ 20-26 Dec 2022 (Prasert.S. 02-5376420) P-913, P-914, P-915 Carry out to 3M PM ตรวจเช็คอุปกรณ์ทั่วไป ,เปลี่ยนสายน้ำมันเกียร์ ,ตรวจเช็คสภาพ coupling ความแข็งแรงของโครงสร้าง ,ตรวจสอบความสามารถในการ flow rate ,pressure ,ตรวจจั่นกระแสไฟฟ้า							
Material / Tool / Work requirements: <input type="checkbox"/> Scaffolding/Ladder <input checked="" type="checkbox"/> Hand tool <input type="checkbox"/> Mobile Engine: Gen./Comp. <input type="checkbox"/> Ex. Elect./Battery/Pneum./Hyd.Tool <input type="checkbox"/> Gas/Pressurized cylinder <input checked="" type="checkbox"/> Non-Ex. Elect./Battery Tool ..multimeter..... <input type="checkbox"/> Crane/Lifting <input type="checkbox"/> Other							
Hazard Identification: 1 Area classification <input checked="" type="checkbox"/> Hazardous area <input type="checkbox"/> Unclassified area / Non-Hazardous area 2 Hazard classification <input checked="" type="checkbox"/> Process hydrocarbon <input type="checkbox"/> Pressure hazard <input checked="" type="checkbox"/> Dust/Fume/Smoke <input type="checkbox"/> Radiography <input type="checkbox"/> Flammable material <input type="checkbox"/> Working at height <input type="checkbox"/> Hot/Cold surface <input checked="" type="checkbox"/> Loud Noise <input type="checkbox"/> Mercury/Toxic gas <input type="checkbox"/> Insufficient light <input checked="" type="checkbox"/> Ergonomic hazard <input type="checkbox"/> Vibration <input checked="" type="checkbox"/> Hazardous chemical ..Used oil..... <input checked="" type="checkbox"/> Biological hazard <input checked="" type="checkbox"/> Slipping/tripping <input checked="" type="checkbox"/> Spill <input type="checkbox"/> Equipment with moving/rotating part <input checked="" type="checkbox"/> Pinch point/sharp object <input type="checkbox"/> Ignition Source <input type="checkbox"/> Explosive <input type="checkbox"/> Crane/Lifting/Rigging <input type="checkbox"/> Critical lift <input type="checkbox"/> Routine/Simple lift <input type="checkbox"/> Electricity <input type="checkbox"/> HV (> 1kV.) <input checked="" type="checkbox"/> LV <input type="checkbox"/> Asphyxiation/Confined space/Water mist/FM200/CO2 release <input type="checkbox"/> Environmental hazard (weather, temp.) <input type="checkbox"/> Work on edge/over water <input type="checkbox"/> Falling/Dropped/Flying objects <input type="checkbox"/> Other							
Complementary permit : <input checked="" type="checkbox"/> Process/Mech./Inst. Isolation <input type="checkbox"/> Self <input type="checkbox"/> Isolation cross reference (ICR) <input checked="" type="checkbox"/> HV <input checked="" type="checkbox"/> LV Electrical isolation <input type="checkbox"/> Self <input type="checkbox"/> Confined space entry <input type="checkbox"/> Radiography <input type="checkbox"/> Diving <input type="checkbox"/> ROV <input type="checkbox"/> Man <input type="checkbox"/> Anchoring/ De-anchoring <input type="checkbox"/> Excavation <input type="checkbox"/> Pressure testing		Complementary PTW No. S1-CPI-2022-03561, S1-CPI- S1-CEI-2022-07477, S1-CEI-					
Other attachment: <input type="checkbox"/> JIMS <input type="checkbox"/> Sketch/Drawing <input checked="" type="checkbox"/> JSA/Procedure/Plan ..BPR loading pump <input type="checkbox"/> Lifting Plan <input checked="" type="checkbox"/> Other: ..P.T.T. Gear Oil EP.68..100.150.220							
Performing Authority Name: ..Prasert Sophaphinitron..... Position: ..Senior Technician, Mechanical... Department: ..PS1/M..... Signature: Prasert Sophaphinitron..... Date: 2022-12-16 14:21:25							
SECTION 2 : Safety Precautions (The undersigned certifies that all requirements fulfilled and job can be started)							
Precautionary Requirements	Day 1 Day Night	Day 2 Day Night	Day 3 Day Night	Day 4 Day Night	Day 5 Day Night	Day 6 Day Night	Day 7 Day Night
Process System Requirements: Equipment electrically isolated, locked and tagged <input checked="" type="checkbox"/> Emergency stop latched and tagged <input type="checkbox"/> Equipment isolated by valve / spade / blind, locked, tagged <input checked="" type="checkbox"/> Equipment fully depressurized / flushed / fully drained <input checked="" type="checkbox"/> Equipment inerted / purged / ventilated <input type="checkbox"/> System inhibit / override / bypass (See section 3) <input type="checkbox"/> Other <input type="checkbox"/>							
Safety Requirements: Equipment / Area free of flammables / combustibles <input checked="" type="checkbox"/> No HC release in working area / Close JB before venting HC <input checked="" type="checkbox"/> Whip check & safety pin installed on hose connection <input type="checkbox"/> Equipment integrity check / emergency stop test before use <input type="checkbox"/> Available of Work Plan / Procedure / Program on site <input type="checkbox"/> Gloves: rubber / leather / high volt / welding / hyflex..... <input checked="" type="checkbox"/> Hearing protection / Safety goggles / Face shield / Cold suit <input checked="" type="checkbox"/> Air supply / Half mask / Full face mask: Type ..R95..... <input checked="" type="checkbox"/> Disposable coveralls: Chemical / Mercury protection <input type="checkbox"/> Safety harness with: double life lines/inertia reel/fall arrester <input type="checkbox"/> Work vest / Life buoy / Standby boat <input type="checkbox"/> Limit the working hours / Rotate worker every hour(s) <input type="checkbox"/> Fire extinguisher / Fire hose & nozzle run-out / Fire blanket <input type="checkbox"/> Spark, Slag, Dust containment / Habitat / Pressurized habitat <input type="checkbox"/> Warning sign / Barrier tape / Scaffold / Secure ladder <input type="checkbox"/> Protection guard / Cover / Frame / Lanyard / Finger saver <input checked="" type="checkbox"/> Stay clear of: moving / rotating part / line of fire / hot surface <input checked="" type="checkbox"/> Additional ventilation / Safety lighting: zone..... <input type="checkbox"/> Spill containment / Absorbents / Earth wire connected <input checked="" type="checkbox"/> Standby Operator/ Technician/ Firewatch/ Rescuer/ Safety <input type="checkbox"/> Working under inclement weather criteria/requirements <input type="checkbox"/> Available of JSA / Risk assessment / SDS on site <input checked="" type="checkbox"/> Toolbox talk / Pre-job safety meeting <input checked="" type="checkbox"/> Correct handling/working posture/Use lifting aid/Lifting plan <input checked="" type="checkbox"/> Personal / Stand alone gas detector in place <input type="checkbox"/> Gas check: Prior to starting / Frequency <input type="checkbox"/> Oxygen / LEL / Toxic: <input type="checkbox"/> Inform concerned parties <input type="checkbox"/> Maintain good housekeeping <input checked="" type="checkbox"/> Other <input type="checkbox"/>							
Operating Authority Name: ..Ukrit Uthako..... Signature: ..Ukrit Uthako..... Date / Time: 2022-12-16 15:23:25	Safety Authority Name: ..Sarawut Nongluang..... Signature: ..Sarawut Nongluang..... Date / Time: 2022-12-19 15:11:49			*In case NFHW and Safety Critical Task Area Authority Name: (*) Signature: Date / Time:			
Permit Validity	Date: (DD/MM/YY) ..20/12/22	Time: 07:00:00	TO	Date: (DD/MM/YY) ..27/12/22	Time: 07:00:00		



PTTEP MAIN HOT WORK PERMIT

Continue from
previous permit no

Permit no. S1-HWP-2022-17091

SECTION 1 : Work Description

Site name: S1 Area/Platform: LKU Plant (Maintenance Simple)
Location: LKU Crude process Operation unit: Glycol Unit
Unit no.: N/A Equipment: Glycol pump Tag no.: P-4301AB

PTW is related to MOC

☐ Yes (MOD/Deferral/Derogation/Downgrade Situation No.) ☒ No

Work/Task Description:

ขอเพิ่มงานวันที่ 05/10/22 (PA AnuchitK 025376295)
P-4301AB 6M PM
เปลี่ยนถ่ายน้ำมันเกียร์ , ตรวจสอบความสามารถในการ flow rate , pressure
, ตรวจจันกระแสไฟฟ้า

Material / Tool / Work requirements:

☐ Scaffolding/Ladder ☒ Hand tool ☐ Mobile Engine: Gen./Comp.
☒ Ex. Elect./Battery/Pneum./Hyd.Tool ☐ Gas/Pressurized cylinder
☒ Non-Ex. Elect./Battery Tool ☒ multimeter ☐ Crane/Lifting
☐ Other

☐ Naked Flame Hot Work☒ Non-Naked Flame Hot Work

Hazard Identification:

1 Area classification

☒ Hazardous area ☐ Unclassified area / Non-Hazardous area

2 Hazard classification

☐ Process hydrocarbon ☐ Pressure hazard ☐ Dust/Fume/Smoke ☐ Radiography
☐ Flammable material ☐ Working at height ☐ Hot/Cold surface ☐ Loud Noise
☐ Mercury/Toxic gas ☐ Insufficient light ☐ Ergonomic hazard ☐ Vibration
☒ Hazardous chemical ☒ Used oil ☒ Biological hazard ☒ Slipping/tripping ☐ Spill
☐ Equipment with moving/rotating part ☒ Pinch point/sharp object ☐ Ignition Source ☐ Explosive
☐ Crane/Lifting/Rigging ☐ Critical lift ☐ Routine/Simple lift ☐ Electricity ☐ HV (> 1kV.) ☒ LV
☐ Asphyxiates/Confined space/Water mist/FM200/CO₂ release
☐ Environmental hazard (weather, temp.) ☐ Work on edge/over water ☐ Falling/Dropped/Flying objects
☐ Other

Complementary permit :

Complementary PTW No.

☒ Process/Mech./Inst. Isolation ☐ Self ☐ Isolation cross reference (ICR)
☒ HV ☒ LV Electrical isolation ☐ Self

☐ Confined space entry ☐ Radiography
☐ Diving ☐ ROV ☐ Man
☐ Anchoring / De-anchoring
☐ Excavation ☐ Pressure testing

Other attachment: ☐ JIMS
☐ Sketch/Drawing
☒ JSA/Procedure/Plan Crude, L.P.G. Plant.
☐ Lifting Plan
☒ Other: P.T.T. Gear, Oil, EP, 68, 100, 150, 220

Performing Authority Name: Anuchit Kesornsin Position: Senior Technician, Mechanical Department: P.S1/M Signature: Anuchit Kesornsin Date: 2022-09-30 12:30:38

SECTION 2 : Safety Precautions (The undersigned certifies that all requirements fulfilled and job can be started)

Precautionary Requirements	Day 1		Day 2		Day 3		Day 4		Day 5		Day 6		Day 7	
	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
Process System Requirements:														
Equipment electrically isolated, locked and tagged	<input checked="" type="checkbox"/>													
Emergency stop latched and tagged	<input type="checkbox"/>													
Equipment isolated by valve / spade / blind, locked, tagged	<input checked="" type="checkbox"/>													
Equipment fully depressurized / flushed / fully drained	<input checked="" type="checkbox"/>													
Equipment inerted / purged / ventilated	<input type="checkbox"/>													
System inhibit / override / bypass (See section 3)	<input type="checkbox"/>													
Other	<input type="checkbox"/>													
Safety Requirements:														
Equipment / Area free of flammables / combustibles	<input checked="" type="checkbox"/>													
No HC release in working area / Close JB before venting HC	<input checked="" type="checkbox"/>													
Whip check & safety pin installed on hose connection	<input checked="" type="checkbox"/>													
Equipment integrity check / emergency stop test before use	<input checked="" type="checkbox"/>													
Available of Work Plan / Procedure / Program on site	<input type="checkbox"/>													
Gloves: rubber / leather / high volt / welding / hyflex	<input checked="" type="checkbox"/>													
Hearing protection / Safety goggles / Face shield / Cold suit	<input checked="" type="checkbox"/>													
Air supply / Half mask / Full face mask: Type: กรองคาร์บอน	<input checked="" type="checkbox"/>													
Disposable coveralls: Chemical / Mercury protection	<input type="checkbox"/>													
Safety harness with: double life lines/inertia reel/fall arrester	<input type="checkbox"/>													
Work vest / Life buoy / Standby boat	<input type="checkbox"/>													
Limit the working hours / Rotate worker every hour(s)	<input type="checkbox"/>													
Fire extinguisher / Fire hose & nozzle run-out / Fire blanket	<input type="checkbox"/>													
Spark, Slag, Dust containment / Habitat / Pressurized habitat	<input type="checkbox"/>													
Warning sign / Barrier tape / Scaffold / Secure ladder	<input type="checkbox"/>													
Protection guard / Cover / Frame / Lanyard / Finger saver	<input type="checkbox"/>													
Stay clear of: moving / rotating part / line of fire / hot surface	<input type="checkbox"/>													
Additional ventilation / Safety lighting: zone	<input type="checkbox"/>													
Spill containment / Absorbents / Earth wire connected	<input checked="" type="checkbox"/>													
Standby Operator/ Technician/ Firewatch/ Rescuer/ Safety	<input type="checkbox"/>													
Working under inclement weather criteria/requirements	<input type="checkbox"/>													
Available of JSA / Risk assessment / SDS on site	<input checked="" type="checkbox"/>													
Toolbox talk / Pre-job safety meeting	<input checked="" type="checkbox"/>													
Correct handling/working posture/Use lifting aid/Lifting plan	<input checked="" type="checkbox"/>													
Personal / Stand alone gas detector in place	<input type="checkbox"/>													
Gas check: Prior to starting / Frequency	<input type="checkbox"/>													
Oxygen / LEL / Toxic:	<input type="checkbox"/>													
Inform concerned parties	<input type="checkbox"/>													
Maintain good housekeeping	<input checked="" type="checkbox"/>													
Other	<input type="checkbox"/>													

Operating Authority Name: Kongyot Deeduangpak Safety Authority Name: Kowan Boonruangjak Area Authority Name: (*)
Signature: Kongyot Date / Time: 2022-09-30 14:54:38 Signature: Kowan Date / Time: 2022-10-04 15:05:45 Signature: Date / Time:

Permit Validity Date: (DD/MM/YY) 05/10/22 Time: 07:00:00 TO Date: (DD/MM/YY) 12/10/22 Time: 07:00:00

	PTTEP MAIN HOT WORK PERMIT	Continue from previous permit no	Permit no. S1-HWP-2022-17664				
SECTION 1 : Work Description		<input checked="" type="checkbox"/> Naked Flame Hot Work <input checked="" type="checkbox"/> Non-Naked Flame Hot Work					
Site name: <u>S1</u> Area/Platform: <u>Construction-MPF (Construction)</u> Location: <u>WMG-B</u> Operation unit: <u>N/A</u> Unit no.: <u>N/A</u> Equipment: <u>MPF-04</u> Tag no.: <u>MPF-04</u>		Hazard Identification: <input checked="" type="checkbox"/> Area classification <input type="checkbox"/> Hazardous area <input checked="" type="checkbox"/> Unclassified area / Non-Hazardous area <input checked="" type="checkbox"/> Hazard classification <input type="checkbox"/> Process hydrocarbon <input type="checkbox"/> Pressure hazard <input type="checkbox"/> Dust/Fume/Smoke <input type="checkbox"/> Radiography <input type="checkbox"/> Flammable material <input type="checkbox"/> Working at height <input type="checkbox"/> Hot/Cold surface <input type="checkbox"/> Loud Noise <input type="checkbox"/> Mercury/Toxic gas <input type="checkbox"/> Insufficient light <input type="checkbox"/> Ergonomic hazard <input type="checkbox"/> Vibration <input type="checkbox"/> Hazardous chemical <input checked="" type="checkbox"/> Biological hazard <input checked="" type="checkbox"/> Slipping/tripping <input type="checkbox"/> Spill <input type="checkbox"/> Equipment with moving/rotating part <input checked="" type="checkbox"/> Pinch point/sharp object <input type="checkbox"/> Ignition Source <input type="checkbox"/> Explosive <input type="checkbox"/> Crane/Lifting/Rigging <input type="checkbox"/> Critical lift <input type="checkbox"/> Routine/Simple lift <input checked="" type="checkbox"/> Electricity <input type="checkbox"/> HV (> 1kV.) <input checked="" type="checkbox"/> LV <input type="checkbox"/> Asphyxiation/Confined space/Water mist/FM200/CO ₂ release <input type="checkbox"/> Environmental hazard (weather, temp.) <input type="checkbox"/> Work on edge/over water <input type="checkbox"/> Falling/Dropped/Flying objects <input type="checkbox"/> Other					
PTW is related to MOC <input checked="" type="checkbox"/> Yes (MOD/Deferral/Derogation/Downgrade Situation No.) <input checked="" type="checkbox"/> No		Complementary permit : <input type="checkbox"/> Process/Mech./Inst. Isolation <input type="checkbox"/> Self <input type="checkbox"/> Isolation cross reference (ICR) <input checked="" type="checkbox"/> HV <input checked="" type="checkbox"/> LV Electrical isolation <u>S1-CEI-2022-05717</u> <input type="checkbox"/> Self <input type="checkbox"/> Confined space entry <input type="checkbox"/> Radiography <input type="checkbox"/> Diving <input type="checkbox"/> ROV <input type="checkbox"/> Man <input type="checkbox"/> Anchoring/De-anchoring <input type="checkbox"/> Excavation <input type="checkbox"/> Pressure testing					
Work/Task Description: 11-15 Oct 22 (WMG-B MPF-04) -งานจ่ายไฟทดสอบระบบ MPF เช่น ระบบแสงสว่าง,heat tracing,utility,air com,loading pump,transfer pump -งาน internal function test MPF-04 PA:PairatS087-1977851 TESCO ๐๙๐๘ 092-0419617		Other attachment: <input type="checkbox"/> JIMS <input checked="" type="checkbox"/> Sketch/Drawing <u>WMGB-1-02-001.pdf</u> <input checked="" type="checkbox"/> JSA/Procedure/Plan <u>O/S</u> <input type="checkbox"/> Lifting Plan <input type="checkbox"/> Other:					
Material / Tool / Work requirements: <input type="checkbox"/> Scaffolding/Ladder <input checked="" type="checkbox"/> Hand tool <input type="checkbox"/> Mobile Engine: Gen./Comp. <input type="checkbox"/> Ex. Elect./Battery/Pneum./Hyd.Tool <input type="checkbox"/> Gas/Pressurized cylinder <input checked="" type="checkbox"/> Non-Ex. Elect./Battery Tool <u>multi meter</u> <input type="checkbox"/> Crane/Lifting <input checked="" type="checkbox"/> Other <u>multimeter</u>							
Performing Authority Name: <u>Pairat Santiwong</u> Position: <u>Supervisor, Construction</u> Department: <u>ECMN</u> Signature: <u>Pairat Santiwong</u> Date: <u>2022-10-10 14:37:54</u>							
SECTION 2 : Safety Precautions (The undersigned certifies that all requirements fulfilled and job can be started)							
Precautionary Requirements	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
Process System Requirements:	Day	Night	Day	Night	Day	Night	Day
Equipment electrically isolated, locked and tagged	<input checked="" type="checkbox"/>						
Emergency stop latched and tagged	<input type="checkbox"/>						
Equipment isolated by valve / spade / blind, locked, tagged	<input type="checkbox"/>						
Equipment fully depressurized / flushed / fully drained	<input type="checkbox"/>						
Equipment inerted / purged / ventilated	<input type="checkbox"/>						
System inhibit / override / bypass (See section 3)	<input type="checkbox"/>						
Other	<input checked="" type="checkbox"/>						
Safety Requirements:							
Equipment / Area free of flammables / combustibles	<input checked="" type="checkbox"/>						
No HC release in working area / Close JB before venting HC	<input checked="" type="checkbox"/>						
Whip check & safety pin installed on hose connection	<input type="checkbox"/>						
Equipment integrity check / emergency stop test before use	<input checked="" type="checkbox"/>						
Available of Work Plan / Procedure / Program on site	<input checked="" type="checkbox"/>						
Gloves: rubber / leather / high volt / welding / hyflex	<input checked="" type="checkbox"/>						
Hearing protection / Safety goggles / Face shield / Cold suit	<input type="checkbox"/>						
Air supply / Half mask / Full face mask: Type	<input type="checkbox"/>						
Disposable coveralls: Chemical / Mercury protection	<input type="checkbox"/>						
Safety harness with: double life lines/inertia reel/fall arrester	<input type="checkbox"/>						
Work vest / Life buoy / Standby boat	<input type="checkbox"/>						
Limit the working hours / Rotate worker every hour(s)	<input type="checkbox"/>						
Fire extinguisher / Fire hose & nozzle run-out / Fire blanket	<input type="checkbox"/>						
Spark, Slag, Dust containment / Habitat / Pressurized habitat	<input type="checkbox"/>						
Warning sign / Barrier tape / Scaffold / Secure ladder	<input checked="" type="checkbox"/>						
Protection guard / Cover / Frame / Lanyard / Finger saver	<input type="checkbox"/>						
Stay clear of: moving / rotating part / line of fire / hot surface	<input checked="" type="checkbox"/>						
Additional ventilation / Safety lighting: zone	<input type="checkbox"/>						
Spill containment / Absorbents / Earth wire connected	<input type="checkbox"/>						
Standby Operator/ Technician/ Firewatch/ Rescuer/ Safety	<input type="checkbox"/>						
Working under inclement weather criteria/requirements	<input type="checkbox"/>						
Available of JSA / Risk assessment / SDS on site	<input checked="" type="checkbox"/>						
Toolbox talk / Pre-job safety meeting	<input checked="" type="checkbox"/>						
Correct handling/working posture/Use lifting aid/Lifting plan	<input type="checkbox"/>						
Personal / Stand alone gas detector in place	<input type="checkbox"/>						
Gas check: Prior to starting / Frequency	<input type="checkbox"/>						
Oxygen / LEL / Toxic:	<input type="checkbox"/>						
Inform concerned parties	<input type="checkbox"/>						
Maintain good housekeeping	<input checked="" type="checkbox"/>						
Other	<input type="checkbox"/>						
Operating Authority Name: <u>Sophat Panrom</u> Signature: <u>Sophat Panrom</u> Date / Time: <u>2022-10-11 09:05:19</u>		Safety Authority Name: <u>Pimphun Sanhachariya</u> Signature: <u>Pimphun</u> Date / Time: <u>2022-10-11 15:58:21</u>		*In case NFHW and Safety Critical Task Area Authority Name: (*) Signature: Date / Time:			
Permit Validity	Date: (DD/MM/YY) <u>11/10/22</u>	Time: <u>07:00:00</u>	TO	Date: (DD/MM/YY) <u>18/10/22</u>	Time: <u>07:00:00</u>		



PTTEP MAIN HOT WORK PERMIT

Continue from
previous permit no

Permit no. **S1-HWP-2022-15273**

SECTION 1 : Work Description

Site name: S1 Area/Platform: Outstation (Well Service and Drilling
Location: PTQ-D Operation unit: N/A
Unit no.: N/A Equipment: Camera Tag no.:

PTW is related to MOC

☐ Yes (MOD/Deferral/Derogation/Downgrade Situation No.) ☒ No

Work/Task Description:

site survey for preparing drilling rig operation

Material / Tool / Work requirements:

- ☐ Scaffolding/Ladder ☐ Hand tool ☐ Mobile Engine: Gen./Comp.
☐ Ex. Elect./Battery/Pneum./Hyd.Tool ☐ Gas/Pressurized cylinder
☒ Non-Ex. Elect./Battery Tool camera ☐ Crane/Lifting
☐ Other

☐ Naked Flame Hot Work

☒ Non-Naked Flame Hot Work

Hazard Identification:

- 1 Area classification ☐ Hazardous area ☒ Unclassified area / Non-Hazardous area
2 Hazard classification
☐ Process hydrocarbon ☐ Pressure hazard ☐ Dust/Fume/Smoke ☐ Radiography
☐ Flammable material ☐ Working at height ☐ Hot/Cold surface ☐ Loud Noise
☐ Mercury/Toxic gas ☐ Insufficient light ☒ Ergonomic hazard ☐ Vibration
☐ Hazardous chemical ☐ Biological hazard ☒ Slipping/tripping ☐ Spill
☐ Equipment with moving/rotating part ☐ Pinch point/sharp object ☐ Ignition Source ☐ Explosive
☐ Crane/Lifting/Rigging ☐ Critical lift ☐ Routine/Simple lift ☐ Electricity ☐ HV (> 1kV.) ☐ LV
☐ Asphyxiates/Confined space/Water mist/FM200/CO₂ release
☒ Environmental hazard (weather, temp.) ☐ Work on edge/over water ☒ Falling/Dropped/Flying objects
☐ Other

Complementary permit :

Complementary PTW No.

☐ Process/Mech./Inst. Isolation

☐ HV ☐ LV Electrical isolation

☐ Confined space entry

☐ Radiography

☐ Diving ☐ ROV ☐ Man

☐ Anchoring/ De-anchoring

☐ Excavation ☐ Pressure testing

☐ Self ☐ Isolation cross reference (ICR)

☐ Self

Other attachment: ☐ JIMS

☐ Sketch/Drawing

☒ JSA/Procedure/Plan Site survey for

☐ Lifting Plan

☐ Other:

Performing Authority Name: Rig.GW80M Position: Rig Department: OTN/D Signature: Rig.GW80M Date: 2022-09-02 18:18:54

SECTION 2 : Safety Precautions (The undersigned certifies that all requirements fulfilled and job can be started)

Precautionary Requirements	Day 1		Day 2		Day 3		Day 4		Day 5		Day 6		Day 7	
	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
Process System Requirements:														
Equipment electrically isolated, locked and tagged	<input type="checkbox"/>													
Emergency stop latched and tagged	<input type="checkbox"/>													
Equipment isolated by valve / spade / blind, locked, tagged	<input type="checkbox"/>													
Equipment fully depressurized / flushed / fully drained	<input type="checkbox"/>													
Equipment inerted / purged/ ventilated	<input type="checkbox"/>													
System inhibit / override / bypass (See section 3)	<input type="checkbox"/>													
Other	<input type="checkbox"/>													
Safety Requirements:														
Equipment / Area free of flammables / combustibles	<input checked="" type="checkbox"/>													
No HC release in working area / Close JB before venting HC	<input checked="" type="checkbox"/>													
Whip check & safety pin installed on hose connection	<input type="checkbox"/>													
Equipment integrity check / emergency stop test before use	<input type="checkbox"/>													
Available of Work Plan / Procedure / Program on site	<input checked="" type="checkbox"/>													
Gloves: rubber / leather / high volt / welding / hyflex.....	<input checked="" type="checkbox"/>													
Hearing protection / Safety goggles / Face shield / Cold suit	<input checked="" type="checkbox"/>													
Air supply / Half mask / Full face mask: Type.....	<input type="checkbox"/>													
Disposable coveralls: Chemical / Mercury protection	<input type="checkbox"/>													
Safety harness with: double life lines/inertia reel/fall arrester	<input type="checkbox"/>													
Work vest / Life buoy / Standby boat	<input type="checkbox"/>													
Limit the working hours / Rotate worker every hour(s)	<input type="checkbox"/>													
Fire extinguisher / Fire hose & nozzle run-out / Fire blanket	<input type="checkbox"/>													
Spark, Slag, Dust containment / Habitat / Pressurized habitat	<input type="checkbox"/>													
Warning sign / Barrier tape / Scaffold / Secure ladder	<input type="checkbox"/>													
Protection guard / Cover / Frame / Lanyard / Finger saver	<input type="checkbox"/>													
Stay clear of: moving / rotating part / line of fire / hot surface	<input type="checkbox"/>													
Additional ventilation / Safety lighting: zone.....	<input type="checkbox"/>													
Spill containment / Absorbents / Earth wire connected	<input type="checkbox"/>													
Standby Operator/ Technician/ Firewatch/ Rescuer/ Safety	<input type="checkbox"/>													
Working under inclement weather criteria/requirements	<input type="checkbox"/>													
Available of JSA / Risk assessment / SDS on site	<input checked="" type="checkbox"/>													
Toolbox talk / Pre-job safety meeting	<input checked="" type="checkbox"/>													
Correct handling/working posture/Use lifting aid/Lifting plan	<input type="checkbox"/>													
Personal / Stand alone gas detector in place	<input checked="" type="checkbox"/>													
Gas check: Prior to starting / Frequency	<input checked="" type="checkbox"/>													
Oxygen / LEL / Toxic:	<input checked="" type="checkbox"/>													
Inform concerned parties	<input type="checkbox"/>													
Maintain good housekeeping	<input type="checkbox"/>													
Other	<input type="checkbox"/>													

Operating Authority Name: Auan Petchsawat

Signature: Auan Petchsawat Date / Time: 2022-09-03 06:56:46

Safety Authority Name: Saralasm Thavornchareonsukho

Signature: Saralasm Date / Time: 2022-09-03 12:00:52

*In case NFHW and Safety Critical Task

Area Authority Name:

Signature:

Date / Time:

Permit Validity

Date: (DD/MM/YY) 02/09/22

Time: 07:00:00

TO

Date: (DD/MM/YY) 09/09/22

Time: 07:00:00

PTTEP MAIN HOT WORK PERMIT

Continue from previous permit no
S1-HWP-2022-15132

Permit no.
S1-HWP-2022-15364

SECTION 1 : Work Description

Site name: S1 Area/Platform: Well Site (Construction Simple Job)
Location: LKU-E Operation unit: N/A
Unit no.: N/A Equipment: LKU-E (DGF-DSD) Tag no.:

PTW is related to MOC
☒ Yes (MOD/Deferral/Derogation/Downgrade Situation No.) ☐ No

Work/Task Description:
9-15 Sep 22 LKU-E DGF&DSD Commissioning & Start up (Continue HWP-4169)
(PA-PAIRAT S. 087-1977851)

1. To monitor / reading 72hrs DGF&DSD package after commissioning by VENDER (ESQ)

Material / Tool / Work requirements:
☐ Scaffolding/Ladder ☒ Hand tool ☐ Mobile Engine: Gen./Comp.
☐ Ex. Elect./Battery/Pneum./Hyd.Tool ☐ Gas/Pressurized cylinder
☒ Non-Ex. Elect./Battery Tool ☐ Crane/Lifting
☒ Other Toolbox

☒ **Naked Flame Hot Work** ☒ **Non-Naked Flame Hot Work**

Hazard Identification:
1 ☒ Area classification ☒ Hazardous area ☐ Unclassified area / Non-Hazardous area
2 ☒ Hazard classification
☐ Process hydrocarbon ☐ Pressure hazard ☐ Dust/Fume/Smoke ☐ Radiography
☐ Flammable material ☐ Working at height ☐ Hot/Cold surface ☐ Loud Noise
☐ Mercury/Toxic gas ☐ Insufficient light ☐ Ergonomic hazard ☐ Vibration
☐ Hazardous chemical ☐ Biological hazard ☐ Slipping/tripping ☐ Spill
☐ Equipment with moving/rotating part ☒ Pinch point/sharp object ☐ Ignition Source ☐ Explosive
☐ Crane/Lifting/Rigging ☐ Critical lift ☐ Routine/Simple lift ☐ Electricity ☐ HV (> 1kV.) ☒ LV
☐ Asphyxiation/Confined space/Water mist/FM200/CO₂ release
☒ Environmental hazard (weather, temp.) ☐ Work on edge/over water ☐ Falling/Dropped/Flying objects
☐ Other

Complementary permit : **Complementary PTW No.**
☐ Process/Mech./Inst. Isolation ☐ Self ☐ Isolation cross reference (ICR)
☐ HV ☐ LV Electrical isolation ☐ Self
☐ Confined space entry
☐ Radiography
☐ Diving ☐ ROV ☐ Man
☐ Anchoring/ De-anchoring
☐ Excavation ☐ Pressure testing

Other attachment: ☐ JIMS
☒ Sketch/Drawing Overall layout, Start Up
☒ JSA/Procedure/Plan W.S. (PRO-MOD)
☐ Lifting Plan
☐ Other:

Performing Authority Name: Pairat Santiwong Position: Supervisor, Construction Department: ECM/N Signature: Pairat Santiwong Date: 2022-09-06 19:24:47

SECTION 2 : Safety Precautions (The undersigned certifies that all requirements fulfilled and job can be started)

Precautionary Requirements	Day 1		Day 2		Day 3		Day 4		Day 5		Day 6		Day 7	
	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
Process System Requirements:														
Equipment electrically isolated, locked and tagged	<input checked="" type="checkbox"/>													
Emergency stop latched and tagged	<input type="checkbox"/>													
Equipment isolated by valve / spade / blind, locked, tagged	<input type="checkbox"/>													
Equipment fully depressurized / flushed / fully drained	<input type="checkbox"/>													
Equipment inerted / purged / ventilated	<input type="checkbox"/>													
System inhibit / override / bypass (See section 3)	<input type="checkbox"/>													
Other	<input type="checkbox"/>													
Safety Requirements:														
Equipment / Area free of flammables / combustibles	<input checked="" type="checkbox"/>													
No HC release in working area / Close JB before venting HC	<input checked="" type="checkbox"/>													
Whip check & safety pin installed on hose connection	<input checked="" type="checkbox"/>													
Equipment integrity check / emergency stop test before use	<input checked="" type="checkbox"/>													
Available of Work Plan / Procedure / Program on site	<input type="checkbox"/>													
Gloves: rubber / leather / high volt / welding / hyflex.....	<input checked="" type="checkbox"/>													
Hearing protection / Safety goggles / Face shield / Cold suit	<input type="checkbox"/>													
Air supply / Half mask / Full face mask: Type.....	<input type="checkbox"/>													
Disposable coveralls: Chemical / Mercury protection	<input type="checkbox"/>													
Safety harness with: double life lines/inertia reel/fall arrester	<input type="checkbox"/>													
Work vest / Life buoy / Standby boat	<input type="checkbox"/>													
Limit the working hours / Rotate worker every hour(s)	<input type="checkbox"/>													
Fire extinguisher / Fire hose & nozzle run-out / Fire blanket	<input type="checkbox"/>													
Spark, Slag, Dust containment / Habitat / Pressurized habitat	<input type="checkbox"/>													
Warning sign / Barrier tape / Scaffold / Secure ladder	<input type="checkbox"/>													
Protection guard / Cover / Frame / Lanyard / Finger saver	<input type="checkbox"/>													
Stay clear of: moving / rotating part / line of fire / hot surface	<input checked="" type="checkbox"/>													
Additional ventilation / Safety lighting: zone.....	<input type="checkbox"/>													
Spill containment / Absorbents / Earth wire connected	<input type="checkbox"/>													
Standby Operator/ Technician/ Firewatch/ Rescuer/ Safety	<input checked="" type="checkbox"/>													
Working under inclement weather criteria/requirements	<input type="checkbox"/>													
Available of JSA / Risk assessment / SDS on site	<input checked="" type="checkbox"/>													
Toolbox talk / Pre-job safety meeting	<input checked="" type="checkbox"/>													
Correct handling/working posture/Use lifting aid/Lifting plan	<input checked="" type="checkbox"/>													
Personal / Stand alone gas detector in place	<input checked="" type="checkbox"/>													
Gas check: Prior to starting / Frequency	<input checked="" type="checkbox"/>													
Oxygen / LEL / Toxic:	<input checked="" type="checkbox"/>													
Inform concerned parties	<input type="checkbox"/>													
Maintain good housekeeping	<input checked="" type="checkbox"/>													
Other	<input type="checkbox"/>													

Operating Authority Name: Sukhakong Akrayatanabondee
Signature: Sukhakong Date / Time: 2022-09-07 06:48:45

Safety Authority Name: Pimphun Sanhachariya
Signature: Pimphun Date / Time: 2022-09-07 15:44:37

*In case NFHW and Safety Critical Task
Area Authority Name: (*)
Signature: Date / Time:

Permit Validity Date: (DD/MM/YY) 09/09/22 Time: 07:00:00 TO Date: (DD/MM/YY) 16/09/22 Time: 07:00:00



PTTEP MAIN HOT WORK PERMIT

Continue from
previous permit no

Permit no. S1-HWP-2022-15051

SECTION 1 : Work Description

Site name: S1 Area/Platform: Drilling Rig GW158
Location: N/A Operation unit: N/A
Unit no.: Drilling Rig Equipment: Hammer Tag no.:

PTW is related to MOC

☒ Yes (MOD/Deferral/Derogation/Downgrade Situation No.) ☒ No

Work/Task Description:

Check mud pump and change liner

Material / Tool / Work requirements:

☐ Scaffolding/Ladder ☐ Hand tool ☐ Mobile Engine: Gen./Comp.
☐ Ex. Elect./Battery/Pneum./Hyd.Tool ☐ Gas/Pressurized cylinder
☐ Non-Ex. Elect./Battery Tool ☐ Crane/Lifting
☒ Other Hammer

☐ Naked Flame Hot Work☒ Non-Naked Flame Hot Work

Hazard Identification:

1 Area classification ☐ Hazardous area ☒ Unclassified area / Non-Hazardous area
2 Hazard classification
☐ Process hydrocarbon ☒ Pressure hazard ☐ Dust/Fume/Smoke ☐ Radiography
☐ Flammable material ☐ Working at height ☒ Hot/Cold surface ☒ Loud Noise
☒ Mercury/Toxic gas H2S ☐ Insufficient light ☒ Ergonomic hazard ☐ Vibration
☒ Hazardous chemical SBM ☐ Biological hazard ☒ Slipping/tripping ☒ Spill
☐ Equipment with moving/rotating part ☒ Pinch point/sharp object ☐ Ignition Source ☐ Explosive
☒ Crane/Lifting/Rigging ☒ Critical lift ☐ Routine/Simple lift ☐ Electricity ☐ HV (> 1kV.) ☐ LV
☐ Asphyxiates/Confined space/Water mist/FM200/CO₂ release ☐ Work on edge/over water ☒ Falling/Dropped/Flying objects
☐ Environmental hazard (weather, temp.) ☐ Other

Complementary permit :

Complementary PTW No.

☐ Process/Mech./Inst. Isolation
☐ HV ☐ LV Electrical isolation
☐ Confined space entry
☐ Radiography
☐ Diving ☐ ROV ☐ Man
☐ Anchoring/ De-anchoring
☐ Excavation ☐ Pressure testing

☐ Self ☐ Isolation cross reference (ICR)
☐ Self

Other attachment: ☐ JIMS☒ Sketch/Drawing☒ JSA/Procedure/Plan Maintenance.mud.☐ Lifting Plan☐ Other:Performing Authority Name: Rig GW158 Safety Position: Safety Department: OTND Signature: Rig GW158 Safety Date: 2022-08-30 17:56:29

SECTION 2 : Safety Precautions (The undersigned certifies that all requirements fulfilled and job can be started)

Precautionary Requirements	Day 1		Day 2		Day 3		Day 4		Day 5		Day 6		Day 7	
	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
Process System Requirements:														
Equipment electrically isolated, locked and tagged	<input type="checkbox"/>													
Emergency stop latched and tagged	<input type="checkbox"/>													
Equipment isolated by valve / spade / blind, locked, tagged	<input type="checkbox"/>													
Equipment fully depressurized / flushed / fully drained	<input type="checkbox"/>													
Equipment inerted / purged / ventilated	<input type="checkbox"/>													
System inhibit / override / bypass (See section 3)	<input type="checkbox"/>													
Other	<input type="checkbox"/>													
Safety Requirements:														
Equipment / Area free of flammables / combustibles	<input type="checkbox"/>													
No HC release in working area / Close JB before venting HC	<input type="checkbox"/>													
Whip check & safety pin installed on hose connection	<input type="checkbox"/>													
Equipment integrity check / emergency stop test before use	<input type="checkbox"/>													
Available of Work Plan / Procedure / Program on site	<input checked="" type="checkbox"/>													
Gloves: <u>rubber</u> / <u>leather</u> / high volt / welding / hyflex.....	<input checked="" type="checkbox"/>													
Hearing protection / Safety goggles / Face shield / Cold suit	<input checked="" type="checkbox"/>													
Air supply / Half mask / Full face mask: Type.....	<input checked="" type="checkbox"/>													
Disposable coveralls: <u>Chemical</u> / Mercury protection	<input checked="" type="checkbox"/>													
Safety harness with: double life lines/inertia reel/fall arrester	<input type="checkbox"/>													
Work vest / Life buoy / Standby boat	<input type="checkbox"/>													
Limit the working hours / Rotate worker every hour(s)	<input type="checkbox"/>													
Fire extinguisher / Fire hose & nozzle run-out / Fire blanket	<input checked="" type="checkbox"/>													
Spark, Slag, Dust containment / Habitat / Pressurized habitat	<input type="checkbox"/>													
Warning sign / Barrier tape / Scaffold / Secure ladder	<input checked="" type="checkbox"/>													
Protection guard / Cover / Frame / Lanyard / Finger saver	<input type="checkbox"/>													
Stay clear of: moving / rotating part / line of fire / hot surface	<input type="checkbox"/>													
Additional ventilation / Safety lighting: zone.....	<input type="checkbox"/>													
Spill containment / Absorbents / Earth wire connected	<input checked="" type="checkbox"/>													
Standby Operator/ Technician/ Firewatch/ Rescuer/ Safety	<input type="checkbox"/>													
Working under inclement weather criteria/requirements	<input type="checkbox"/>													
Available of JSA / Risk assessment / SDS on site	<input checked="" type="checkbox"/>													
Toolbox talk / Pre-job safety meeting	<input checked="" type="checkbox"/>													
Correct handling/working posture/Use lifting aid/Lifting plan	<input type="checkbox"/>													
Personal / Stand alone gas detector in place	<input checked="" type="checkbox"/>													
Gas check: <u>Prior to starting</u> / Frequency	<input checked="" type="checkbox"/>													
<u>Oxygen</u> / LEL / Toxic: <u>H2S</u>	<input checked="" type="checkbox"/>													
Inform concerned parties	<input type="checkbox"/>													
Maintain good housekeeping	<input checked="" type="checkbox"/>													
Other	<input type="checkbox"/>													

Operating Authority Name:

Signature: Date / Time:

Safety Authority Name:

Signature: Date / Time:

*In case NFHW and Safety Critical Task

Area Authority Name: (*)

Signature: Date / Time:

Permit Validity

Date: (DD/MM/YY) 30/08/22Time: 07:00:00

TO

Date: (DD/MM/YY) 06/09/22Time: 07:00:00



บริษัท ปตท.สผ. สยาม จำกัด

รายงานผลการปฏิบัติตามมาตรการป้องกันและแก้ไขผลกระทบสิ่งแวดล้อม และมาตรการติดตามตรวจสอบผลกระทบสิ่งแวดล้อม
โครงการติดตั้งท่อก๊าซจากฐานผลิตปิโตรเลียมหนองตูม-เอ (NTM-A) ไปยังฐานผลิตทุ่งใหญ่-เอ (TYI-A) แปลงเอส 1
จังหวัดพิษณุโลก และสุโขทัย
ฉบับเดือนมกราคม – ธันวาคม พ.ศ.2565

ภาคผนวกที่ 12
S1 Emergency Response Plan



PTTEP

PTT Exploration and Production Public Company Limited

S1 Emergency Response Plan









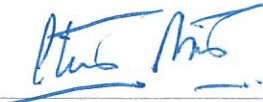

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November 2019

Approval Register

Document Subject	S1 Emergency Response Plan
Document Code	13247-PDR-SSHE-501/08-R03
Document Owner	S1 Production Operations Department (PS1)
Prepared by	Putchaya Thunhapran, SSHE Engineer
Effective Date	November 2019

Review and Approve

	Name	Signature	Date
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	PS1/O		
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	ETN (ETN Workshop)		
Document Owner	Veerawat Aumsoi		13/12/19
	PS1		
Approval Authority	Veerawat Aumsoi		13/12/19
	PS1		

THIS DOCUMENT WILL BE REVIEWED EVERY 5 YEARS FROM DATE OF APPROVAL OR REVISED EARLIER IF NECESSARY.

TABLE OF CONTENTS

INTRODUCTION	1
1. PURPOSE.....	1
2. SCOPE.....	2
REQUIREMENTS	4
3. EMERGENCY MANAGEMENT	4
3.1 PTTEP EMERGENCY AND CRISIS CLASSIFICATION.....	4
3.2 S1 EMERGENCY RESPONSE TEAM ORGANIZATION.....	6
3.3 ROLES AND RESPONSIBILITIES	17
3.4 EMERGENCY RESPONSE ACTION	33
3.5 COMMUNICATION DURING EMERGENCY	34
3.6 MUSTER POINT	37
3.7 FACILITIES	38
3.8 PRESS RELEASE	43
3.9 DEACTIVATION AND POST EMERGENCY ACTIONS.....	44
3.10 TRAINING AND EXERCISE	46
3.11 S1 DUTY ROSTER GUIDELINE	46
APPENDICES	51
APPENDIX A: EMERGENCY CALL MESSAGE FROM LKU TELECOM OFFICER	51
APPENDIX B: INITIAL EMERGENCY REPORT FORM.....	52
APPENDIX C: EMERGENCY LOG SHEET	53
APPENDIX D: LOCATION OF PREDETERMINED MUSTER POINTS	55
APPENDIX E: EXAMPLES OF COMMUNICATION TOOLS.....	61
APPENDIX F: EXAMPLE OF S1 DUTY ROSTER.....	65
APPENDIX G: INCIDENT GUIDELINE FOR EMERGENCY SITUATIONS	66
ROLES AND RESPONSIBILITIES	67
DEFINITION AND ACRONYMS	68
REFERENCES	71
REVISION HISTORY	72

INTRODUCTION

1. PURPOSE

In the context of S1 Emergency Response Plan (herein referred to as “Plan”), an emergency is any event, happening with or without advance warning, causing, or which may cause, death or injury, damage to property or the environment or disruption to the community and/ or business within PTTEP S1 onshore operation premises.

The plan is developed for guiding S1 asset personnel to clearly understand the roles and responsibilities of the S1 Emergency Response Team (ERT) during an actual or potential emergency that could cause an impact to S1 asset and its associated stakeholders, especially staff, contractors and surrounding communities. The emergency response shall be actioned to align with the plan as well as related Thai laws and regulations. Apart from S1 ERT member roles and responsibilities and their responsive actions outlined in this document, the emergency preparedness, resources, training and competency, drills & exercises, and recovery/mitigation measures should be also included in this document for ensuring effective emergency management.

- The objectives of emergency response are to:-
- prevent fatalities and injuries;
- reduce damage to plants, facilities, and equipment;
- protect the communities and the environment; and
- accelerate the resumption of normal operations.

The development of the Emergency Response Plan (ERP) begins with a vulnerability assessment. The results of study:-

- Identifies the emergency situations likely to occur and threaten life, environment, community, and S1 operations;
- Identifies means and resources necessary for a given emergency situation;
- Defines S1 emergency organization and key personnel involved with their roles & responsibilities;
- Defines the actions to be taken by S1 ERT members for the emergency preparedness and response;
- Defines the actions to be taken by S1 Community & Media Response Team (CMRT) and Relative Response Team (RRT) for emergency preparedness and response;
- Defines the correct and clear lines of command and reporting in an emergency;
- Describes the guidelines for community handlings in an emergency; and
- Defines interface between S1 ERT and PTTEP corporate Emergency Management Team (EMT) and Crisis Management Team (CMT) and other external parties.

The plan should ensure an integrated response at the appropriate level to any related emergency situations and to minimize the potential impact on People, Environment, Legal Compliance, Asset & Property, and Reputation.

The response of S1 ERT at all levels of the organization will follow the following priorities.

1. Protection of People
2. Protection of Environment
3. Protection of Asset and Property (including infrastructure, machinery, equipment, and facilities)
4. Protection of Reputation and Business

2. SCOPE

This plan applies to all emergency situations occurred within PTTEP S1 and L22/43 Operation premises owned or controlled by PTTEP subsidiaries.

This also includes other relevant agencies that may be requested to provide assistance or expertise to cope with PTTEP S1 emergency situations.

Scope of S1 emergency response covers all operating areas of S1 asset and L22/43 concession areas as well as the activities outside the owned premises, but under the responsibility of S1 asset e.g. land or rail transports, accommodating facilities, etc.

The areas which S1 ERP shall cover are:-

- LKU flow station including crude process area, LPG process, spheres & loading area, and LKU crude depot;
- Production sub-stations including NTM-A, STN-A, and NSG-A;
- Active production well locations;
- Non-productive well locations;
- Flow lines connecting to well locations;
- Bung Pra depot;
- S1 well services workshop;
- S1 material yard and material storage locations;
- Chong Non See (CNS) rail tanker inspection and maintenance workshop; and
- PHS housing compounds.

The activities which S1 ERP shall cover are:-

- Production operation;
- Brownfield construction project activities;

- Drilling activities;
- Well service activities;
- Maintenance & inspection activities;
- Land transports including oil movement, materials and personnel transportation; and
- Other emergency situations which may arise e.g. community concerns, security concerns, natural disasters, etc.

Pertaining to other operations in S1 concession area e.g. drilling, greenfield construction, seismic survey, rig camps, etc. within the scope of S1 concessionaire's liability that have their own emergency organization, they shall establish their own On-Scene Commander (OSC) and responsive team.

The OSC shall report all incidents to S1 Emergency Response Team (ERT) primarily via S1 telecom officer. In any case when situation becomes uncontained by site emergency response organization, S1 ERT comes to take over the command. The OSC constantly report to Deputy Emergency Team Leader (DERTL).

Note: All appendices of this document shall cover:-

- Appendix A: Emergency Call Message from LKU Telecom Officer
- Appendix B: Initial Emergency Report Form
- Appendix C: Emergency Log Sheet
- Appendix D: Locations of Predetermined Muster Points
- Appendix E: Examples of Communication Tools
- Appendix F: Example of S1 Duty Roster
- Appendix G: Incident Guideline for Emergency Situations
- Appendix H: Prompt Cards
- Appendix I: Emergency Contact Lists and Numbers

All appendices of this document shall be reviewed and endorsed by the document owner, Vice President (VP) of S1 Production Operations Department. The appendices will be amended and added without requirements for the document's revision and approval endorsement.

REQUIREMENTS

3. EMERGENCY MANAGEMENT

3.1 PTTEP EMERGENCY AND CRISIS CLASSIFICATION

With reference to the 3-Tier definition of Emergency & Crisis in PTTEP Emergency Crisis Management Standard (SSHE-106-STD-500), emergency covers the situations in tier 1 and tier 2; whereas, a crisis situation is classified as and treated by **a tier 3 response level**.

Tier 1:

- The situation involves a problem, which has limited impact and minimal potential for escalating, poses a threat to the safety & the environment **and poses no threat to the general public**.
- The situation can be handled by the on OSC with the site operation team and/or intervention team within a reasonable timeframe. Tier 1 emergency response can be totally managed by DERTL, being appointed based on the area affected by an incident. After tier 1 emergency situation can be managed and resumed to normal operation, the situation and response details shall be reported to the duty officer and ERTL respectively.

Examples of tier 1 emergency situations in the S1 operation area are, but not limited to, the following.

- Small manageable fires and/or gas leaks, accidents or safety & security threats;
- No hazard to the public in adjacent areas exists;
- Minor injuries may have occurred (treatable through first aid); and
- Danger to the environment is minimal, however, the potential for escalation exists.

Tier 2:

- The situation involves an emergency with greater magnitude and major severity in nature or has the potential to escalate and continue for a significant period of time, or cause a significant impact to public or environment that requires sophisticated implications with external parties.
- The situation involves damage to S1 facilities/assets and/or impact on 3rd parties and may pose a significant threat to safety, environment, and facilities/assets.
- The situation may request external assistance from local authorities in the affected areas i.e. local fire brigade, Sub-district Administrative Office (SAO), local hospital/public health center, Oil Industry Environment Safety Group Association of Thailand (IESG) or the nearby external organizations, and etc.
- The situation may result in the activation of S1 Asset EMT in BKK.

For tier 2 emergency situations, ERT will respond to the emergency site while S1 asset EMT in BKK may be established to manage and provide relevant support to the S1 ERT and/or the affected site.

S1 asset EMT members should include the top management/authorized person of the S1 asset and other key positions from various disciplines that are, but not limited to, the following.

1. EMT Leader – Thai Onshore Asset Senior Vice President (SVP) acts as EMT Leader;
2. Common members such as BKK S1 asset duty, logistic duty, SSHE duty, corporate RRT duty, communication team, IT duty, administration team duty, event logger, etc.
3. Specific members such as drilling duty, construction duty, well operation duty, etc.

Examples of tier 2 emergency situations in S1 operation area are the followings:

- Employees, contractors, service providers, visitors, community, the environment, property, facilities (or any combination of these) are exposed to a significant hazard.
- Non-essential personnel in adjacent areas of S1 operating areas such as LKU flow station, production sub-stations, active well sites, flow lines, BPR depot and etc will need to be evacuated.
- Deaths, and/or multiple serious injuries may have occurred (ambulance and/or medivac may be required).
- There may be significant environmental impacts such as the large volume of hydrocarbon leaks to site surrounding areas.

Tier 3:

- Involves a catastrophic scenario resulted in multiple injuries, fatalities, major fires, environmental damage, toxic gas release, significant business interruption and poses a significant threat to the environment or damage to PTTEP assets and finally brings in significant media attention.
- Requests external assistance from aboard or international resources i.e. the Oil Spill Response Limited Company (OSRL) and the East Asia Response Limited Company (EARL), etc.
- Results in the activation of CMT.

The CMT members consist of the PTTEP top management at the Corporate Level and other supporting functions. Their responsibilities and procedures are defined in the PTTEP CMP (12148-PDR-SSHE-501).

PTTEP Risk Assessment Matrix (RAM) demonstrated in appendix D of PTTEP SSHE risk management standard (11038-STD-SSHE-401) can be used as a guideline to consider the initial appropriate levels of response to any particular event.

3.2 S1 EMERGENCY RESPONSE TEAM ORGANIZATION

S1 production operations are governed by Vice President (VP) of S1 Production Operations Department with a total of six (6) sections of the followings:

1. Production Section (PS1/P);
2. Maintenance Section (PS1/M);
3. Oil Movement and Transportation Section (PS1/O);
4. Production Operations Support Section (PS1/T);
5. Land Acquisition, Permits & Operation Services Section (PS1/L); and
6. Safety, Security, Health, and Environment (SSHE) Section (PS1/S).

Additionally, there are eight (8) support functions providing supports to S1 production operations. These support functions consist of:

1. Public Affairs Section (PTN/A)
2. Operations Training Center Section (HRC/O)
3. Onshore Construction Execution Section (ECM/N)
4. Drilling Operations Section (ETN/D)
5. Well Services Section (ETN/W)
6. Well Services Workshop (ETN)
7. Lan Krabue Support Base Section (PLG/M)
8. Lifting Equipment & Services (PLG/L)

An organigram of S1 production operations is illustrated in **Figure 1**.

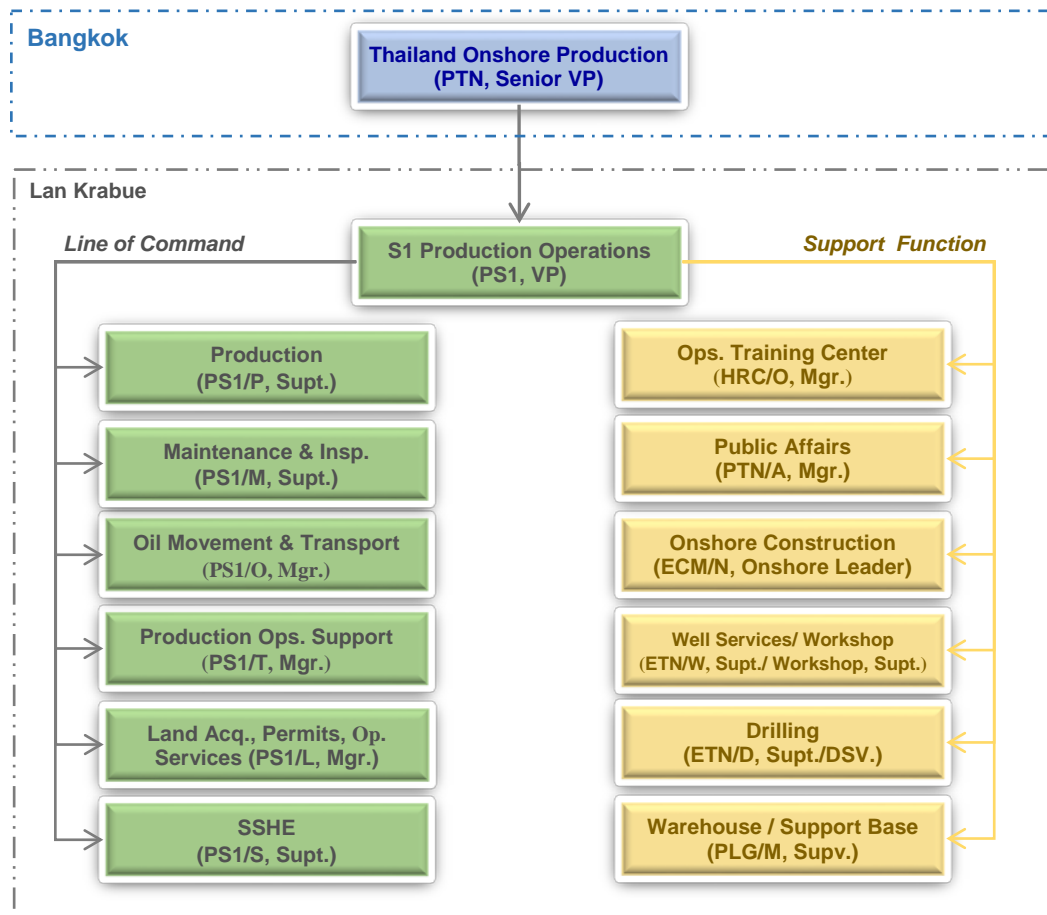


Figure 1: Organigram of S1 production Operations

S1 production operations management team including VP, section heads and representatives from support functions specified in the above organigram is assigned to take roles and responsibilities in ERT depicted in the following paragraphs of this document.

ERT is lead by VP and consists of staff with roles and responsibilities necessary for responding to emergency situations likely to occur in S1 production operations as well as with the conjoined activities e.g. drilling, well workover, project construction, road transport, etc.

ERT assesses the occurring emergency situation & consequences, then determines & prioritize the potential impacts and responsive actions to ensure that emergency operations are conducted in a safe manner while the given emergency situation is sufficiently contained and controlled. To do so, ERT directs, supports and collaborates with the on-scene responsive team, concerned external parties e.g. local authorities, local communities, media, staff's relatives, contractors, customers, etc. In parallel, ERT communicates and collaborates with S1 asset duty person and EMT.

ERT members are:-

1. Emergency Response Team Leader (ERTL) – Vice President of S1 production operations department;
2. Deputy Emergency Response Team Leader (DERTL) – appointed by ERTL, by default the top authority of the area affected by the given emergency situation otherwise specifically appointed by ERTL;
3. Duty Officer – S1 production superintendent otherwise specifically appointed by ERTL;
4. S1 SSHE Advisor – S1 SSHE superintendent or his delegate;
5. Event Logger – S1 production engineer;
6. Muster Logger / Deputy Muster Checker – S1 SSHE officer (operational safety);
7. Muster Checkers – the trained persons assigned to the given muster points;
8. On-scene Commander (OSC) – appointed persons in charge of site location affected by the given emergency situation;
9. Site Operation Team – Normally regular staff who are working at site location;
10. Intervention Team/Firefighting Team – Trained staff who are competent in emergency, fire and rescue operations appointed by ERTL;
11. Medical Team – LKU Doctor/Nurse, Ambulance, and Stretcher Team;
12. LKU Telecommunication Officer (24/7); and
13. On-call Support Team – includes transportation/logistic, drilling, well service, construction, maintenance, IT/Telecom, spill response team, medical response team (CMRT), relative response team (RRT), security, and administration & finance.

The organigram of S1 ERT is illustrated in **Figure 2**.

ERT member assignments for the areas under S1 premise are illustrated in **Table 1 - 5**.

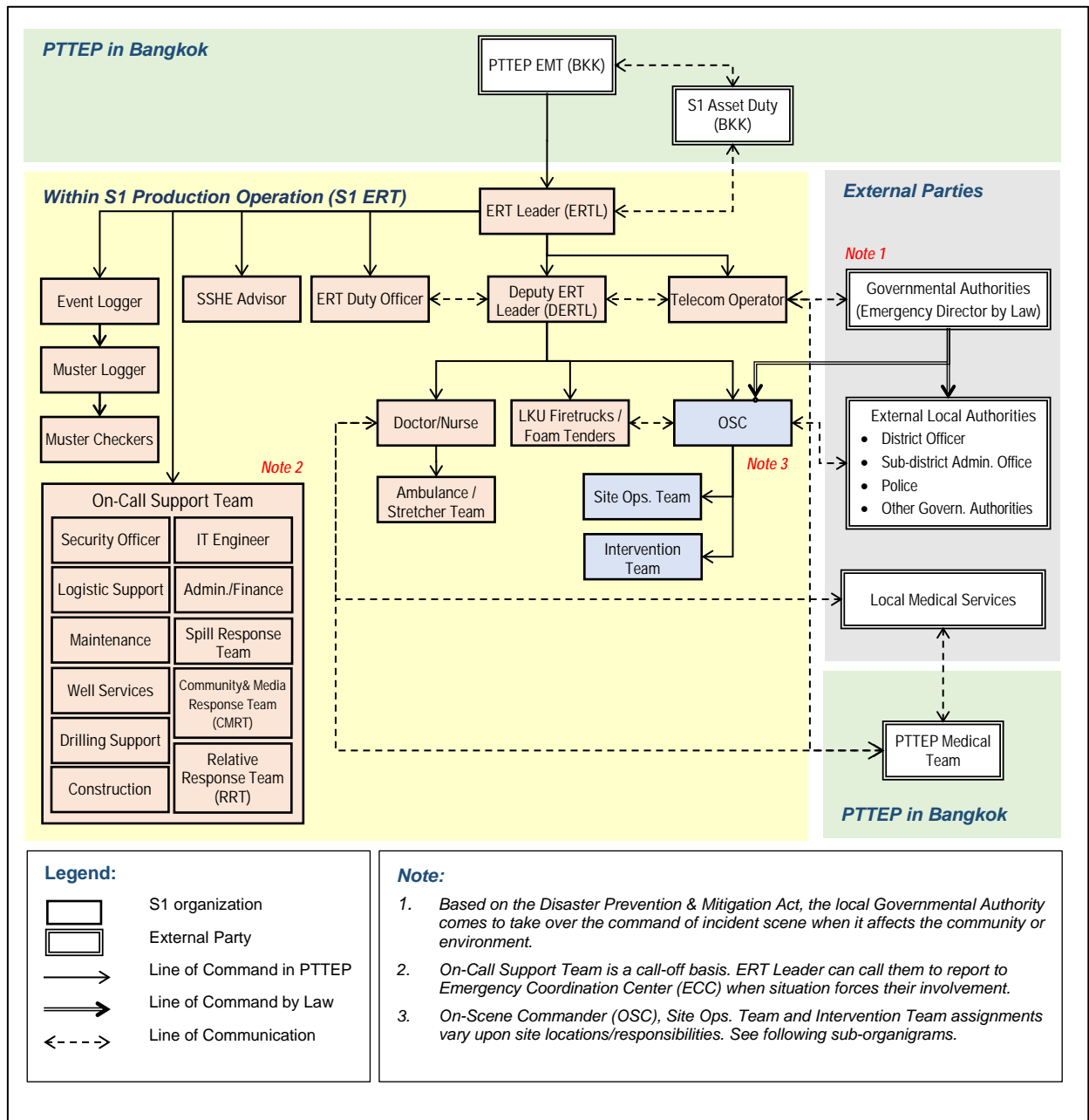


Figure 2: Overall S1 Emergency Response Team Organization

Table 1: ERT Assignment for LKU Flow Station, Workshops and Offices

ERT Assignment for LKU Flow Station, Workshops and Offices		
Role	Assigned to:	Primary Master Point
ERT Leader	VP, S1 Production Operations	ECC
ERT Duty Officer	Production Superintendent	ECC
Deputy ERT Leader	Production Superintendent Workshop Superintendent (Well Service Workshop)	ECC
SSHE Advisor	SSHE Superintendent	ECC
Telecom Operator	On duty telecom Operator	Telecom Room
Event Logger	Production Engineer	ECC
<u>LKU Flow Station and Offices</u>		
On-Scene Commander (OSC)	LKU Plant Supervisor	LKU CCR
Main Muster Logger	SSHE Officer (operation safety)	ECC
Muster Checker 1	Wellsite Supervisor 2	Main Muster Point @ Fire station
Muster Checker 2	Public Affairs Officer	Muster Point #2 @ PNEC Building
Muster Checker 3	LKU Plant Foreman	Muster Point #3 @ LKU CCR
<u>Well Services Workshop</u>		
On-Scene Commander (OSC)	Workshop Supervisor	Well Services Workshop
Area Muster Logger	Workshop Team Leader	Well Services Workshop
Muster Checker	Snr. Tech. (Workshop and General Services)	Muster Point @ In front of the workshop
<u>Material Yard and Material Storage Locations</u>		
On-Scene Commander (OSC)	LKU Support Base Supervisor	Material Yard
Area Muster Logger	Warehouse & Material Yard Team Leader	Material Yard
Muster Checker	Snr. Store Keeper	Muster Point @ In front of the material yard
ERT Assignment Details		
Doctor/Nurse	Doctor/Nurse	Clinic
Ambulance	On duty Ambulance Driver	Clinic
LKU Fire Truck FT01	SSHE Officer (Emergency)	Fire Station
LKU Fire Truck FW01	SSHE Senior Tech. (Emergency)	Fire Station
LKU Foam Tender Truck 1	LKU Depot Operator #1	LKU Depot
LKU Foam Tender Truck 2	LKU Depot Operator #2	LKU Depot
Site Operations Team: <ul style="list-style-type: none"> - Production Supervisor - Power Plant Operator - Panel Operator 	LKU Plant Supervisor Maintenance Power Plant Operator Lead Production Operator (CCR) Senior Production Operator (CCR)	LKU CCR LKU Switchgear Room LKU CCR LKU CCR

ERT Assignment for LKU Flow Station, Workshops and Offices		
Intervention Team: Fire Chief Fireteam Leader 1 - Fireteam 1 member - Fireteam 1 member Fireteam Leader 2 - Fireteam 2 member / Crude/LPG Fire Pump - Fireteam 2 member Fireteam Leader 3 (Backup – F/S) - Fireteam 3 member - Fireteam 3 member Fireteam Leader 4 (Backup – West Well Sites) - Fireteam 4 member - Fireteam 4 member Fireteam Leader 5 (Backup – East Well Sites) - Fireteam 5 member - Fireteam 5 member - Fireteam 5 member	Lead Production Operator (LKU Flow Station) On-duty Production Operator #1 On-duty Production Operator #2 On-duty Production Operator #3 On-duty Production Operator #4 On-duty Production Operator #5 On-duty Lab Technician Off-duty Production Operator #1 Off-duty Production Operator #2 Off-duty Production Operator #2 On-duty Production Operator #1 On-duty Production Operator #2 On-duty Production Operator #3 On-duty Production Operator #1 On-duty Production Operator #2 On-duty Production Operator #3 On-duty Production Operator #4	LKU CCR LKU Flow Station LKU Flow Station LKU Flow Station LKU Flow Station LKU Flow Station LKU Flow Station LKU Accommodation LKU Accommodation LKU Accommodation West Well Sites West Well Sites West Well Sites East Well Sites East Well Sites East Well Sites East Well Sites
On-Call Support Team: - Security Officer - IT Engineer - Logistics Support - Admin./Finance - Construction - Maintenance - Spill Response Team - Community & Media Response Team - Relative Response Team	GGI security Supervisor IT and Telecommunications Supervisor Oil Movement and Transportation Manager Cost Coordination Officer Onshore Execution Team Leader Maintenance Superintendent BRK Intertransport Co., Ltd. Public Affairs Manager Operations Training Center Manager	LKU Gate 1 Officer Main Muster Point @ Fire Station Main Muster Point @ Fire Station Main Muster Point @ Fire Station Main Muster Point @ Fire Station Main Muster Point @ Fire Station BRK Office Main Muster Point @ Fire Station Main Muster Point @ Fire Station

Table 2: ERT Assignment for Well Sites and MPFs (West, East & North)

ERT Assignment for Well Sites and MPFs (West, East & North) including DDC training center		
Role	Assigned to:	Primary Master Point
ERT Leader	VP, S1 Production Operations	ECC
ERT Duty Officer	Production Superintendent	ECC
Deputy ERT Leader	Production Superintendent	ECC
SSHE Advisor	SSHE Superintendent	ECC
Telecom Operator	On duty telecom Operator	Telecom Room
Event Logger	Production Engineer	ECC
Muster Logger	SSHE Officer (operation safety)	ECC
Muster Checker	Assigned Operator	Affected Well Site / MPF
Doctor/Nurse	Doctor/Nurse	Clinic
Ambulance	On duty Ambulance Driver	Clinic
LKU Fire Truck FT01 LKU Fire Truck FW01	SSHE Officer (Emergency) SSHE Senior Tech. (Emergency)	Fire Station
LKU Fire Truck FT02 LKU Fire Truck FW02	Fire Truck Driver (Emergency) Fire Truck Driver (Emergency)	NTM-A
LKU Foam Tender Truck 1 LKU Foam Tender Truck 2	LKU Depot Operator #1 LKU Depot Operator #2	LKU Depot LKU Depot
On-Scene Commander (OSC)	Affected Area Supervisor (Field Supervisors – North, East, West)	LKU Office
Site Operations Team: <ul style="list-style-type: none"> - Production Supervisor - Production Operator - LKU CAO Operator - NTM CCR Operator - STN CCR Operator 	Field Supervisors (North including NTM-A & STN/A, East, West) Affected Area Operators (MPFs) Lead Production Operator (CAO) Production Operator (CAO) Production Operator (NTM-A) Production Operator (STN-A)	LKU Office Affected Well Site / MPF CAO Room NTM-A STN-A
Intervention Team (Well Sites): <ul style="list-style-type: none"> - Fire Chief - Fireteam Leader 1 <ul style="list-style-type: none"> - Fireteam 1 member - Fireteam 1 member - Fireteam Leader 2 (Back-up – Well Sites) <ul style="list-style-type: none"> - Fireteam 2 member - Fireteam 2 member - Fireteam 2 member - Fireteam Leader 3 (Back-up – Well Sites) <ul style="list-style-type: none"> - Fireteam 3 member 	Well Sites in a radius of 30 km from LKU Flow Station including DDC training center Lead Production Operator (Well Sites) On-duty Production Operator #1 On-duty Production Operator #2 On-duty Production Operator #3 On-duty Production Operator #1 On-duty Production Operator #2 On-duty Production Operator #3 On-duty Production Operator #4	Affected Well Sites Affected Well Sites Affected Well Sites Affected Well Sites Other Well Sites Other Well Sites Other Well Sites Other Well Sites Other Well Sites LKU Accommodation

ERT Assignment for Well Sites and MPFs (West, East & North) including DDC training center		
<ul style="list-style-type: none"> - Fireteam 3 member - Fireteam 3 member 	Off-shift duty Production Operator #1 Off-shift duty Production Operator #2 Off-shift duty Production Operator #3 Off-shift duty Production Operator #4	LKU Accommodation LKU Accommodation LKU Accommodation
Intervention Team (NTM-A): <ul style="list-style-type: none"> - Fire Chief - Fireteam Leader 1 <ul style="list-style-type: none"> - Fireteam 1 member - Fireteam 1 member - Fireteam 1 member - Fireteam 1 member - Fireteam 2 member 	Lead Production Operator (NTM-A) On-duty Production Operator #1 Off-shift duty Production Operator #1 Off-shift duty Production Operator #2 Off-shift duty Production Operator #3 Off-shift duty Production Operator #4 Operators assigned to LKU Flow Station, E&W well sites	NTM-A NTM-A NTM-A Accommodation NTM-A Accommodation NTM-A Accommodation NTM-A Accommodation LKU Flow Station, East/West Well Sites
Intervention Team (STN-A): <ul style="list-style-type: none"> - Fire Chief <ul style="list-style-type: none"> - Fireteam 3 member 	On-duty Production Operator #1 Production Operators assigned to NTM-A, east & west well sites	STN-A East/West Well Sites, NTM-A
Intervention Team (MPFs):	Request support by nearby production hub and/or external local authorities	The other production hub
On-Call Support Team: <ul style="list-style-type: none"> - Security Officer - IT Engineer - Logistics Support - Admin./Finance - Construction - Maintenance - Spill Response Team - Community & Media Response Team - Relative Response Team 	GGI security Supervisor IT and Telecommunications Supervisor Oil Movement and Transportation Manager Cost Coordination Officer Onshore Execution Team Leader Maintenance Superintendent BRK Intertransport Co., Ltd. Public Affairs Manager Operations Training Center Manager	LKU Gate 1 Officer Main Muster Point @ Fire Station Main Muster Point @ Fire Station Main Muster Point @ Fire Station Main Muster Point @ Fire Station Main Muster Point @ Fire Station BRK Office Main Muster Point @ Fire Station Main Muster Point @ Fire Station

Table 3: ERT Assignment for Bung Pra (BPR) Depot

ERT Assignment for Bung Pra (BPR) Depot		
Role	Assigned to:	Primary Master Point
ERT Leader	VP, S1 Production Operations	ECC
ERT Duty Officer	Production Superintendent	ECC
Deputy ERT Leader	Oil Movement and Transportation Manager	ECC
SSHE Advisor	SSHE Superintendent	ECC
Telecom Operator	On duty telecom Operator	Telecom Room
Event Logger	Production Engineer	ECC
Main Muster Logger	SSHE Officer (operation safety)	ECC
Affected Area Muster Logger	BPR Depot Operator	BPR Depot
Muster Checker (Road Side)	BPR Depot Senior Security Guard	Muster Point @ In front of T-904
Muster Checker (Rail Side)	BPR Depot Security Guard	Muster Point @ In front of security guardhouse
Doctor/Nurse	Doctor/Nurse	Clinic
Ambulance	On duty Ambulance Driver	Clinic
LKU Fire Truck FT01 LKU Fire Truck FW01	SSHE Officer (Emergency) SSHE Senior Tech. (Emergency)	Fire Station
NTM Fire Truck FT02 NTM Fire Truck FW02	Fire Truck Driver (Emergency) Fire Truck Driver (Emergency)	NTM-A
LKU Foam Tender Truck 1 LKU Foam Tender Truck 2	LKU Depot Operator #1 LKU Depot Operator #2	LKU Depot LKU Depot
On-Scene Commander (OSC)	BPR Depot Supervisor	BPR Depot
Site Operations Team: - Depot Supervisor	BPR Depot Supervisor	BPR Depot
Intervention Team: - Fire Chief - Fireteam Leader 1 - Fireteam 1 member - Fireteam 1 member - Fireteam 1 member - Fireteam 1 member - Fireteam Leader 2 - Fireteam 1 member - Fireteam 1 member - Fireteam 1 member - Fireteam 1 member - Fire Water Pump Operator - First Aider	BPR Depot Operator Rail Side Loader Foreman Rail Side Loader North #1 Rail Side Loader North #2 Rail Side Loader North #3 Rail Side Loader North #4 Rail Side Loader South #1 Rail Side Loader South #2 Rail Side Loader South #3 Rail Side Loader South #4 Road Side Loader Road Side Loader Foreman Tractor Driver	BPR Depot BPR Depot (Rail Side) BPR Depot (Rail Side) BPR Depot (Rail Side) BPR Depot (Rail Side) BPR Depot (Rail Side) BPR Depot (Rail Side) BPR Depot (Rail Side) BPR Depot (Rail Side) BPR Depot (Rail Side) BPR Depot (Rail Side) BPR Depot (Road Side) BPR Depot (Rail Side)
On-Call Support Team: - Security Officer	GGI security Supervisor	LKU Gate 1 Officer

ERT Assignment for Bung Pra (BPR) Depot		
- IT Engineer	IT and Telecommunications Supervisor	Main Muster Point @ Fire Station
- Logistics Support	Oil Movement and Transportation Manager	Main Muster Point @ Fire Station
- Admin./Finance	Cost Coordination Officer	Main Muster Point @ Fire Station
- Construction	Onshore Execution Team Leader	Main Muster Point @ Fire Station
- Maintenance	Maintenance Superintendent	Main Muster Point @ Fire Station
- Spill Response Team	BRK Intertransport Co., Ltd.	BRK Office
- Community & Media Response Team	Public Affairs Manager	Main Muster Point @ Fire Station
- Relative Response Team	Operations Training Center Manager	Main Muster Point @ Fire Station

Table 4: ERT Assignment for CNS Rail Tanker Inspection and Maintenance Workshop

ERT Assignment for CNS Rail Tanker Inspection and Maintenance Workshop		
Role	Assigned to:	Primary Master Point
ERT Leader	VP, S1 Production Operations	ECC
ERT Duty Officer	Production Superintendent	ECC
Deputy ERT Leader	Oil Movement and Transportation Manager	ECC
SSHE Advisor	SSHE Superintendent	ECC
Telecom Operator	On duty telecom Operator	Telecom Room
Event Logger	Production Engineer	ECC
Main Muster Logger	SSHE Officer (operation safety)	ECC
Affected Area Muster Logger	CNS Site Manager (contractor)	CNS
Muster Checker	CNS Safety Officer (contractor)	Muster Point @ In front of security guardhouse
Doctor/Nurse	Doctor/Nurse	-
On-Scene Commander (OSC)	Depot Supervisor (BCP/ TOC/ PTTGC) or CNS Site Manager (contractor)	CNS
Intervention Team	Request support by external local authorities such as BKK metropolitan officer, sub-district office, local medical services, police and/or other government authorities	External local authorities
On-Call Support Team: <ul style="list-style-type: none"> - Security Officer - IT Engineer - Logistics Support - Admin./Finance - Construction - Maintenance - Spill Response Team - Community & Media Response Team - Relative Response Team 	GGI security Supervisor IT and Telecommunications Supervisor Oil Movement and Transportation Manager Cost Coordination Officer Onshore Execution Team Leader Maintenance Superintendent BRK Intertransport Co., Ltd. Public Affairs Manager Operations Training Center Manager	LKU Gate 1 Officer Main Muster Point @ Fire Station Main Muster Point @ Fire Station Main Muster Point @ Fire Station Main Muster Point @ Fire Station Main Muster Point @ Fire Station BRK Office Main Muster Point @ Fire Station Main Muster Point @ Fire Station

Table 5: ERT Assignment for PHS Housing Compounds

ERT Assignment for PHS Housing Compounds		
Role	Assigned to:	Primary Master Point
ERT Leader	VP, S1 Production Operations	ECC
ERT Duty Officer	Production Superintendent	ECC
Deputy ERT Leader	Production Superintendent	ECC
SSHE Advisor	SSHE Superintendent	ECC
Telecom Operator	On duty telecom Operator	Telecom Room
Event Logger	Production Engineer	ECC
Main Muster Logger	SSHE Officer (operation safety)	ECC
Affected Area Muster Logger	Security Guard	PHS Housing Compounds
Muster Checker	Security Guard	Muster Point @ In front of security guardhouse
Doctor/Nurse	Doctor/Nurse	Clinic
Ambulance	On duty Ambulance Driver	Clinic
LKU Fire Truck FT01 LKU Fire Truck FW01	SSHE Officer (Emergency) SSHE Senior Tech. (Emergency)	Fire Station
NTM Fire Truck FT02 NTM Fire Truck FW02	Fire Truck Driver (Emergency) Fire Truck Driver (Emergency)	NTM-A
On-Scene Commander (OSC)	Operation Services Supervisor	LKU office
Intervention Team	Request support by external local authorities such as district officer, -sub-district office, -local medical services, -police and/or -other government authorities	External local authorities
On-Call Support Team: <ul style="list-style-type: none"> - Security Officer - IT Engineer - Logistics Support - Admin./Finance - Construction - Maintenance - Spill Response Team - Community & Media Response Team - Relative Response Team 	GGI security Supervisor IT and Telecommunications Supervisor Oil Movement and Transportation Manager Cost Coordination Officer Onshore Execution Team Leader Maintenance Superintendent BRK Intertransport Co., Ltd. Public Affairs Manager Operations Training Center Manager	LKU Gate 1 Officer Main Muster Point @ Fire Station Main Muster Point @ Fire Station Main Muster Point @ Fire Station Main Muster Point @ Fire Station Main Muster Point @ Fire Station BRK Office Main Muster Point @ Fire Station Main Muster Point @ Fire Station

3.3 ROLES AND RESPONSIBILITIES

This section advises each S1 ERT member of their roles and responsibilities in dealing with emergency situations.

Emergency Response Team Leader (ERTL)	
Responsible Person	Vice President of S1 Production Operations Department
Work Station	S1 LKU Emergency Coordination Centre (ECC) room
Responsibilities	<p>Protect life, environment, plant, production, and reputation by taking effective actions; managing the S1 ERT and collaborating with PTTEP EMT and necessary external parties to ensure the potential for escalation and risk of injury and damage is minimised. S1 ERT leader shall:-</p> <ul style="list-style-type: none"> • Ensure all ERT, CMRT & RRT have received adequate training to cope with their assignments; • Maintain a state of readiness; • Assess the situation; • Take effective actions; • Maintain communication; • Delegate authorities to act; • Manage team performance; and • Deal with stress.
Key Actions	<ul style="list-style-type: none"> • Establish early contact with PTTEP EMT and S1 asset duty persons; • Consider to activate Emergency Coordination Centre (ECC) and call in the ERT members and the On-Call Support Team as deemed necessary. • Manage and coordinate the activities of all S1 ERT members; • Develop an incident response strategy; • Control the incident to prevent escalation; • Maintain communications with PTTEP EMT, SVP of S1 asset, and necessary external parties; • Minimize risk to personnel including intervention team, S1 staff, contractors, and 3rd parties; • Minimize impact on the environment; • Ensure sufficient resources are available to support all response teams; • Plan the delegations of ERT members for rests if the emergency situation has been prolonged; • Plan and prepare for safe evacuation when necessary; • Keep closely informed and monitor the emergency situation, response, and recovery; • Provide any advice and support requested by the operating site;

Emergency Response Team Leader (ERTL)	
	<ul style="list-style-type: none"> • Be a focal point to report and update the emergency situation to BKK S1 Asset Duty by phone as specified in the S1 weekly duty roster or direct report to BKK PTTEP EMT; • Maintain records of events through Event Logger; • Utilise "Time Outs" to update EMT of ongoing situation including: <ul style="list-style-type: none"> - The exact status of the event at the accident scene and evacuation details. - Status and priority of supports provided to the site such as firefighting, medical evacuation, transportation, etc. - Brainstorming and resolving key issues/problems faced. <p>For Tier 2 and 3 other than above:</p> <ul style="list-style-type: none"> • Activate S1 Emergency Coordination Center (ECC) and call in all ERT members and necessary On-Call Support Team. <p>In case of a press release to local media or communities:</p> <ul style="list-style-type: none"> • Call in CMRT to support in dealing with media and community; • Consult with the Crisis Communication Team (CCT) Leader on the general approach to be taken when speaking to the media; • Be a spokesperson for disclosure of information and public statement to local media or communities; • Represent the company externally, in interviews, and at a press conference; • Ensure aid materials (charts, maps, etc) & Technical Advisor are available; • Assess the effectiveness of the press conference with the CCT Leader; and • Log own actions, messages on communication, involved party, and time on the log sheet and pass it to event logger.

ERT Duty Officer	
Responsible Person	The person appointed by ERTL, or by default, the S1 Production Superintendent
Responsibilities	<ul style="list-style-type: none"> • Take a role and responsibility as ERTL until his/her arrival (see ERTL responsibility); and • Keep ERTL informed of the emergency situation, response, and recovery.
Key Actions	<ul style="list-style-type: none"> • Act as ERTL until his/her arrival (see Roles and Responsibilities of ERTL); • Share workloads of ERTL as directed; and • Direct and approve for the mobilization of ambulance, firetrucks, and Spill Response Team.

Deputy Emergency Response Team Leader (DERTL)	
Responsible Person	<p>The person appointed by ERTL based on the area affected by an incident.</p> <ul style="list-style-type: none"> • PS1/P for LKU flow station, well sites, MPF locations, workshops, offices, material yard and material storage locations, PHS housing compounds and DDC training center. • PS1/O for BPR depot in Phitsanulok Province and CNS rail tanker inspection and maintenance workshop in BKK.
Responsibilities	<ul style="list-style-type: none"> • Minimise injury, environmental pollution, asset/property damage and reputation; • Assist ERTL to manage and direct actions of the emergency response team, medical team, and incident support function to contain and control the emergency situation; • Collaborate with local external parties; and • Coordinate with RRT and CMRT when necessary.
Key Actions	<ul style="list-style-type: none"> • Update the situation with OSC and assess for the effective response strategy; • Provide the resources e.g. manpower, fire/foam trucks, spill response team, financial support, etc. required for the emergency response to OSC, medical team and affected area; • Provide technical advice to OSC, ERTL/ERT Duty Officer; • Closely report to and take constant directions from ERTL/ERTL Duty Officer for uninterrupted and effective management of the emergency situation. • Communicate, directly or through Telecom Operator, with local external parties e.g. governmental authorities, community, etc involving in the emergency situation; • Support in collaboration between OSC and external parties; • Communicate and collaborate with CMRT and RRT when the situation requires; and • Log own actions, messages on communication, involved party, and time on the log sheet and pass it to event logger.

On-scene Commander (OSC) or Deputy OSC		
Responsible Person	The person appointed by DERTL based on the area affected by an incident.	
	Location	OSC
	LKU flow station, workshops, offices	LKU Plant Supervisor
	Well sites and MPFs including DDC training center	Affected Area Supervisors (Field Supervisors – West, East & North)
	Well services workshop	Workshop Supervisor
	Material yard and material storage locations	LKU Support Base Supervisor
	BPR Depot	BPR Depot Supervisor
	CNS rail tanker inspection and maintenance workshop	Depot Supervisor (BCP/ TOC/ PTTGC) or CNS Site Manager (contractor)
	PHS housing compounds	Operation Services Supervisor
Responsibilities	<ul style="list-style-type: none"> • Protect personnel including staff, contractors, community, intervention & medical teams; • Minimise the impact to environment and community in the vicinity; • Assess the situation and establish the tactical response; • Take commands of all immediate responsive activities on the incident scene; • Report to and provide constant updates of the situation to DERTL; • Collaborate with involving local authorities; and • Maintain records of events. 	
Key Actions	<ul style="list-style-type: none"> • Assess the current emergency situation, associated hazards, impacts, and their potentials; • Establish tactical response plan e.g. isolation, blowdown, spill containment, evacuation, intervention, etc; • Command the site operation, intervention & medical teams on the scene; • Provide necessary resources to site operation, intervention and medical teams; 	

On-scene Commander (OSC) or Deputy OSC	
	<ul style="list-style-type: none"> • Ensure all personnel are adequately protected against arising hazards, especially site operation and intervention teams; • Regularly call “time out” to update and assess the current status of the situation and changes, then direct site operation, intervention, & medical teams as appropriate; • Initiate site evacuation if necessary; • Provides necessary initial information to immediate local authority e.g. SAO, police, hospital, etc; • In consultation with PTN/A (public affairs), assess the impacts and inform the nearby community as necessary; • In consultation with DERTL, consider community evacuation if situation deemed dangerous or has potential to cause danger; • Plan the staff change over for site operation, intervention and medical teams if the situation is prolonged; • Keep DERTL updated with situation, changes, progress, and potentials; and • Log own actions, messages on communication, involved party, and time on the log sheet and pass it to event logger. <p>According to the “Disaster Prevention and Mitigation Act”, when emergency situation poses or has potential to pose the significant danger to community and environment, the governmental authority of the affected area will overtake the command of overall emergency response as “Emergency Director”.</p> <ul style="list-style-type: none"> • When a situation deemed as in the above condition, provides initial information on the emergency situation to the local authority; • When local authority comes to take over the command, report to Emergency Director, and in parallel collaborate with ERT for effective emergency response and recovery; and • Provide necessary technical advice to the Emergency Director and teams.

Site Operation Team	
Responsible Person	The staff assigned by OSC to operate and/or control the affected facility and area. In an emergency, they assist OSC to recover or make safe the facility and area by operating the facility, isolating & removing the arising hazards and providing necessary supports to the intervention team to contain the situation.
Responsibilities	<ul style="list-style-type: none"> • Be under command of the OSC; • Operate/control/stabilize the affected facility and area; and • Support the intervention and medical teams.
Key Actions	<ul style="list-style-type: none"> • Provide detailed current status of facility and area to the OSC e.g. process & area condition, process safety system, F&G system, firefighting system, etc; • Control and stabilize the facility and area e.g. shutdown, isolation, blowdown, inhibit/override of system, removal of hazards, etc; • Maintain safe conditions of facilities and area throughout emergency situation; • Notify hazards associated with process, facility, and area to OSC and intervention team; • Keep OSC updated with changes in conditions of the process, facilities, and area; and • Log own actions, messages on communication, involved party, and time on the log sheet and pass it to event logger as applicable.

Intervention Team Leader (ITL)	
Responsible Person	The person assigned to lead the intervention team and direct tactical intervention activities e.g. firefighting, rescue, recovery of distressed personnel, etc.
Responsibilities	<ul style="list-style-type: none"> • Provide a frontline response to the incident scene as directed by OSC; • Lead intervention team in coordination with site operation and medical teams.
Key Actions	<ul style="list-style-type: none"> • Update the status of situation and potential with OSC and intervention team; • Take priority on the safety of the intervention team and others; • Consider the hazards and potentials of a gas cloud, oil spill, fire, boil over, BLEVE, collapse of structure & vessel, traffic, etc.; • Size up the situation and establish tactical frontline action plan; • Utilize automatic system e.g. fire pumps, monitor, deluge, etc. • Ensure adequate and effective communication amongst the intervention team and with others; • Establish the forward control point for intervention and medical teams as necessary; • Collaborate with other supporting teams e.g. site operation & medical team, and others e.g. fire brigade, police, etc.; • Brief the intervention team on the situation, potentials, target of achievement, and tactical action plan; • Direct the intervention team to accomplish the tactical action plan; • Monitor closely the intervention actions and assess the result. The intervention action plan may change upon the upcoming changes with the situation; • Make regular contact with the intervention team and OSC for updates and changes; and • Request external supports and resources when necessary.

Intervention / Fire Team Member	
Responsible Person	The persons assigned as an intervention team member shall be adequately trained and competent to conduct the hand-on intervention activities e.g. firefighting, rescue, oil spill response, etc.
Responsibilities	<ul style="list-style-type: none"> • Ensure the safety of own and others; • Under command of ITL • Provide frontline responsive actions on the emergency situation as directed.
Key Actions	<ul style="list-style-type: none"> • Wear adequate and proper PPE to conduct the assigned task e.g. firefighting, rescue, chemical intervention, oil spill, etc.; • Receive a briefing on the situation, hazards, preventive measures and responsive action plan from ITL; • Conduct the actions assigned by ITL in a safe manner that may involve: <ul style="list-style-type: none"> - Reconnaissance of incident scene; - Operating the automatic firefighting device; - Conducting firefighting task; - Conducting rescue, extraction, recovery, and handling of casualties; and - Assisting in control of traffic and access.

Medical Team	
Responsible Person	Medical Team consists of <ol style="list-style-type: none"> 1. LKU Doctor/Nurse 2. Ambulance Driver 3. Off-shift Duty Ambulance Driver 4. Stretcher Team
Responsibilities	<ul style="list-style-type: none"> • Safety of own and others; • Size up the situation and activate the appropriate medical procedure; • Stabilize the casualties and initiate the transfer of casualty to hospital/medical centre in a safe manner as necessary; • Assess the extents of injuries and provide advice to the DERTL and/or OSC for appropriate treatment and further supports and resources required; • Assist in arranging medical evacuation/referral; • Coordinate with the PTTEP medical team and casualty-receiving hospitals; and • Log all actions, communication made, detail & number of injury, time, etc. on the log sheet.

Medical Team	
Key Actions	<p>LKU Nurse</p> <ul style="list-style-type: none"> • Make ready, at all times, the medical equipment, and supplies at the clinic, in portable packs, and on the ambulance required for emergency response; • Size up the situation and take appropriate actions and give adequate first aid/initial medical treatment; • Utilize the available supporting staff in casualty handling e.g. intervention team, stretcher team, etc.; • For multiple casualties, consider to activate triage procedure and request for support from the selected hospital and medical service centre; • Seek advice from PTTEP medical team when necessary; • Assess and advise on the appropriate medical evacuation/referral to OSC and/or DERTL; • Coordinate with PTTEP medical team and hospital receiving the casualty to ensure the appropriate treatment and followup; and • Keep records of casualties and treatments. <p>On-Duty Ambulance Driver</p> <ul style="list-style-type: none"> • Have undergone the defensive driving and advanced first aid training courses; • Have ensured the ambulance is in ready & clean condition with adequate fuel (minimum half a tank); • Get familiarized with the routes for transport; • Drive the ambulance in a safe manner based on defensive driving principle; • Assist the handling of casualties under supervision of doctor/nurse; and • Make entries into a driving log. This information includes injured persons'/ patients' names and addresses, trip times, mileage, and services performed. <p>Off-Duty Ambulance Driver</p> <ul style="list-style-type: none"> • Assist doctor/nurse to provide first aid treatment and handling of casualties. <p>Stretcher Team</p> <ul style="list-style-type: none"> • Assist medical team in manual transfer of casualty. <p>Remark: In case of PTTEP ambulance absence, a back-up van having medical equipment as equal to the ambulance should be available.</p>

SSHE Advisor	
Responsible Person	Superintendent, SSHE of S1 Asset or his delegation
Responsibilities	<ul style="list-style-type: none"> • Advise ERTL, DERTL, ERT duty officer, OSC, etc on SSHE matters and procedures relevant to emergency response & management; • Observe the situation, taken actions, deficiencies, gaps for improvement, and advise ERTL & ERT duty officer; • Ensure the procedure and actual practice are consistent and appropriate to regulations; and • Collect all information for the summary report to be further issued.
Key Actions	<ul style="list-style-type: none"> • Evaluate the hazards and potentials of the incident and impacts; • Provide necessary information to ERTL, ERT duty officer and other members in ECC room; • Observe the ERP, relevant legislations, and the actual actions taken along with the emergency response process, then identify discrepant and deficiency and inform ERTL and/or DERTL; • Take note of all observations; • Support and liaise with event logger to ensure all necessary information and correct timeline are logged; • Ensure personnel accountability including those deployed to the emergency scene; • Provide technical advice on equipment, resources, and method to control, contain, and prevent the emergency situation, escalation & impact; • Communicate with and seek advice from corporate SSHE division as necessary; • Call in other members of S1 SSHE staff to support as necessary; • After the emergency is over, collect all information, papers, photographs, other evidence of the emergency and response process. Compile a summary report for Vice president of S1 production operations department; and • Log own actions, messages on communication, involved party, and time on the log sheet and pass it to event logger.

Telecom Officer	
Responsible Person	Telecommunication Operator
Responsibilities	<ul style="list-style-type: none"> Be available, at all times, to receive an emergency call; Make accurate communication with internal and external parties as specified in ERP and instructed by ERTL; and Record details of all calls made in and out with the timeline.
Key Actions	<ul style="list-style-type: none"> Maintain up-to-date emergency contact numbers for all internal and external parties; Make weekly call tests with S1 duty roster numbers; Ensure all telecommunication equipment in telecommunication room is readily available at all times; Upon receiving the emergency information, immediately report to ERT duty officer, ERTL, OSC, SSHE duty respectively; Upon confirmation from ERTL or ERT duty officer, report to EMT duty person; Upon request from ERTL or ERT duty officer, call in ERT members to report to ECC room; Support ERT in making calls to internal and external parties; and Log details of calls received and made on the log sheet.

Event Logger	
Responsible Person	S1 Production Engineer
Responsibilities	<ul style="list-style-type: none"> Log details of the situations and actions on the event log boards/sheets; and Ensure the logged information logged are accurate and adequate with what, when, where, who, whom & how questions principle.
Key Actions	<ul style="list-style-type: none"> Liaise with all ERT members to obtain significant and accurate information; Observe and listen to the communication made in ECC and take necessary information; Avoid interrupting ERT members when they are occupied with work; Log the received information in the chronological order on the event log boards/sheets in an accurate and clear manner; Update the status board e.g. mustering, mobilization of firetrucks & other resources, etc.; Maintain the trailing records and update the current information of the situation; and Assist ERTL or ERT duty officer to feed necessary information in "time out".

Muster Logger / Deputy Muster Checker	
Responsible Person	S1 SSHE Officer (Operational Safety)
Responsibilities	<ul style="list-style-type: none"> Obtain and consolidate the personnel counts from each muster point (muster checkers); Communicate with muster points; Monitor and record the movements of personnel when called for duty;
Key Actions	<ul style="list-style-type: none"> Communicate with all muster checkers to obtain personnel counts; Together with muster checkers, identify the missing person; Update status of personnel counts to event logger; Coordinate with muster checkers for evacuations; Log own actions, messages on communication, involved party, and time on the log sheet and pass it to event logger; and Assist event logger for event logs.

Muster Checker	
Responsible Person	Persons appointed to responsible muster points
Responsibilities	<ul style="list-style-type: none"> Personnel counts at the designated muster point; Identifying missing person; Ensure safety and order of personnel at the muster point to be in order; Control and lead the evacuation of the designated muster point; and Communicate with a muster logger.
Key Actions	<ul style="list-style-type: none"> Ensure the mustered personnel are safe and remain in order; If the designated muster point is not safe, coordinate with muster logger for alternative muster point; Take a headcount of personnel at the designated muster point and report the result to muster logger; Identify the missing person with muster logger; Observe the mustered personnel for illness or injury and provide necessary supports; Coordinate with muster logger for personnel called from muster point for duty during an emergency; Encourage mustered personnel to calm down and be positive; Release persons for specific duty as requested by ER Team Leader and Muster Logger informed of this update/change; and

Muster Checker

	<ul style="list-style-type: none"> Ensure all personnel remains at muster point during an emergency, it is not safe or receives instruction from ERTL, ERT duty officer or DERTL.
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Fire Warden (Building)

Responsible Person	Persons working in building assigned to take the role of fire warden.
Responsibilities	In evacuation, ensure all personnel leaves area in a safe manner to muster points
Key Actions	<ul style="list-style-type: none"> Direct all personnel in the designated area to leave the area for musters in a safe manner using appropriate routes and exits; Assist handicaps e.g. elderlies, children, injured, pregnant, disable, etc. Check all accessible spaces in their area, including the bathroom, store, pantry, etc, to make sure everyone has evacuated – this should be done on the way out of the building so that the fire warden does not put himself/herself at risk by re-entering the evacuated area; Close doors to help suppress or hinder the fire; Guide personnel to the muster points and assist in checking personnel having arrived safely at muster points; and Update with the list of staff stationed in the building given by PS1/S (emergency team).

On-Call Support Team	
Responsible Person	The persons selected are the representatives of each discipline to support ERT when needed.
Responsibilities	<p>The On-Call Support Team comprises of representatives from a number of various disciplines. They are specialized and act as advisors and communication links.</p> <p>The On-Call Support Team consists but not limited to the following members:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Logistic Support; <input type="checkbox"/> Well Service; <input type="checkbox"/> Maintenance; <input type="checkbox"/> Security Supervisor; <input type="checkbox"/> Community & Media Response Team; <input type="checkbox"/> Relative Response Team. <input type="checkbox"/> Drilling; <input type="checkbox"/> Construction; <input type="checkbox"/> IT/ Telecom Supervisor; <input type="checkbox"/> Spill Response Team;
Key Actions	<ul style="list-style-type: none"> • Be ready on call, able to report to ECC within 2 hours when called by ERTL or ERT duty officer; • Be the link of communication between ERT and their assigned sections, departments, contractors; • Advise ERT on their specialized matters; • Collaborate with the assigned discipline on request; • Execute the task to support emergency response requested by ERT; • Receive briefing from ERTL or delegation; • Advise ERT members on matters relating to their discipline matters; • Call in or consult with other staff in their disciplines as required; • Provide support to ERT members as required; and • Log own actions, messages on communication, involved party and time on the log sheet and pass it to event logger.

Community & Media Response Team (CMRT)	
Responsible Person	Manager, Public Affairs Section and Team
Responsibilities	<p>Act as a point of contact and advise on all press related issues in supporting ERTL for appropriate communication with media and community.</p> <p>Note: Mobilize the team to Communication & Media Response Room (CMRR) at LKU Building #1 Room #2 when Tier 2 and 3 emergency level is activated.</p>
Key Actions	<ul style="list-style-type: none"> • Establish a proactive media liaison and public affairs strategy; • Seek advice, work closely and maintain communication with PTTEP Crisis Communication Team (CCT) for information review prior to delivering a response to local media and community; • Brief ERTL on local media interest, issues developing and requests from the media for information; • Assist in developing/delivering a response to the local media and community as directed by ERTL; • Maintain a log of media activity identifying the line of questioning being adopted by the media and issues developing and pass this information to ERTL; • Maintain a personal log of events undertaken during the incident life cycle and pass completed log sheets to Event Logger; • Ensure that Event Logger has a record of all contact with authorities; • Establish contact numbers where the media can call for information; • Pass any press releases to ERTL for approval process; • Update ERTL on all media and external affairs issues; • Monitor media related to an emergency; and • Liaise with ERTL if there is a requirement to confront any press interviews/conference.

Relative Response Team (RRT)	
Responsible Person	Manager, Operations Training Center Section and Team
Responsibilities	<p>Act as a point of contact and advise on all human resources related issues.</p> <p>Provide support for human resource issues handling.</p> <p>Note: Mobilize the team to Relative Response Room (RRR) at LKU Building #2 Meeting Room when Tier 2 and 3 emergency level is activated.</p>
Key Actions	<ul style="list-style-type: none"> • Have information on staff's selected relative's contact number for emergency; • Seek advice, work closely and maintain communication with PTTEP HR department for the information on the status of staff injuries, company welfare, legal concerns, and additional support required; • Advise ERTL on personnel and welfare issues relating to staff. • Hold the information on the status of ERT members, staff and contractors affected by the incident and emergency e.g. injured, deceased, locations, etc. • Coordinate with PTTEP HHR (Human resources) division; • Coordinate with hospitals for treatment of injured persons and provide the additional support required; • Consider mobilising RRT to interface with family or relatives of the impacted staff; • Make a note and maintain a personal log of all relevant information received and the consequential activity performed and pass each note to Event Logger; • Assist the Event Logger in tracking personnel on the status boards and ensure accuracy of information; and • Establish the requirement for counselling services for those affected by the emergency (open to all employees and contractors).

Each ERT member shall record the details of message/events upon receiving in to the emergency log sheet form (**Appendix C**).

3.4 EMERGENCY RESPONSE ACTION

The response action of an emergency situation occurring at S1 operating sites can be summarized in flowing details.

1. When an emergency occurs, OSC with the site operation team and intervention team responds to the emergency situation as soon as possible.
2. OSC will evaluate the tier of emergency in consultation with the ERT duty officer.
 - a. Even though the emergency situation is within tier 1, localized and can be handled by site staff (OSC, site operation, intervention, and medical team), yet OSC shall immediately report to ERT duty officer for further justification;
 - b. If the emergency falls into tier 2,
 - i. Upon receiving the emergency information, ERTL or ERT duty officer shall activate ERT and ECC room. LKU telecom officer shall immediately call the duty persons of S1 ERT (see Section 3.2) to meet together at the S1 ECC room.
 - ii. ERTL or ERT duty officer shall lead ERT, in responding to the emergency situation.
 - iii. ERTL or ERT duty officer shall immediately contact BKK S1 asset duty and/or EMT Leader (SVP.). EMT will be established to manage and provide relevant supports to the asset in the tier 2 emergency situation.
 - iv. ERTL or ERT duty officer reported the emergency situation to the local governmental authority of the affected area.
 - v. DERTL or OSC may establish direct contacts for supports with external parties in the area e.g. SAO, police, hospital, medical service centers, provincial electricity authority, etc.
 - vi. The affected local government authority takeovers the emergency management by acting as Emergency Director (ED) if the emergency significantly affects the community or environment according to the Disaster Prevention and Mitigation Act.
 - vii. Even though OSC takes the command from ED, OSC yet carries on with emergency response on the scene in an effective way. The ED could be the executive chief of affected SAO or higher.
 - viii. OSC, while taking command from ED, collaborates with ERT for supports and information updates.
 - c. If the emergency escalates to tier 3, the situation goes beyond the capability of EMT, ERT & OSC to handle, the CMT shall be established in BKK. Emergency response and management shall be conducted according to PTTEP Emergency and Crisis Management Standard (SSHE-106-STD-500) and Crisis Management Plan (SSHE-106-PDR-501).

In case of emergency with S1 external organization in S1, but not directly under responsibility of S1 production operations department (PS1), e.g. new drilling site, new construction site, seismic survey, etc., the Company Site Representative (CSR) shall act as OSC for their responsible location and report directly to S1 DERTL.

Apart from the normal function line reporting procedure, CSR as OSC shall report all incidents to S1 telecom officer and ERT duty officer.

The Emergency Tier Evaluation & Response Flowchart is shown in **Figure 3**.

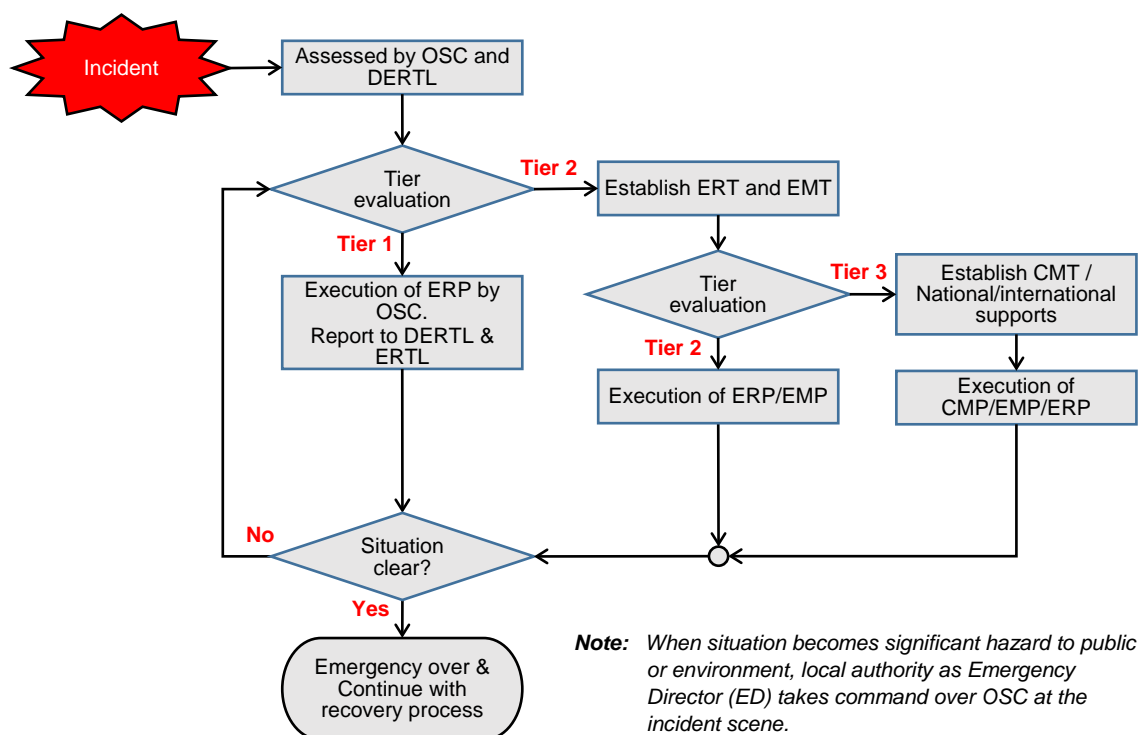


Figure 3: Emergency Tier Evaluation & Response Flowchart

3.5 COMMUNICATION DURING EMERGENCY

During an emergency, communications can be executed by the following methods.

- Radio;
- Landline Telephone;
- Mobile Phone;
- E-mail; or
- Fax

Portable radios (VHF) are provided to S1 operational staff and assigned as the primary option for emergency communication. In normal situations, all handheld radio users are on channel 15. In emergency situations, telecom operator broadcasts to all stations involving an emergency e.g. ERT, OSC, affected site operation, intervention & medical teams to switch to channel 16 for emergency communication. Others not related to emergency may remain on channel 15 for their normal operational communication.

Besides, the external and internal telephone numbers are provided to support both normal and emergency communication. The S1 emergency numbers (external: 055 731 150, internal: 33) are provided at the telecom room which is manned 24 hours every day for all emergency calls from S1 internal and from external parties e.g. community, governmental bodies, etc. Telecom operator is responsible to respond to all calls, take & log precise messages on the given log sheet and relay it to responsible persons (see roles and responsibilities of telecom operator in section 3.3).

The formal emergency call messages that need to be informed to Emergency Response Team, on-call support team and involved parties by LKU Telecom. Operator are shown in **Appendix A**. The emergency report form which will be logged by LKU Telecom. Operator on receiving notification of emergency is illustrated in **Appendix B**.

Email; LKUtelexRoom@pttep.com and fax; 02 537 6212 are available to support informative communication e.g. text, photographs, etc.

Most of the emergency cases, they begin with the incidents then escalate into an emergency. Therefore, the appropriate and timely notification of incidents can improve the responsive actions to the incident and attenuate the situation not to become an emergency. The initial emergency communication flow is illustrated in **Figure 4**.

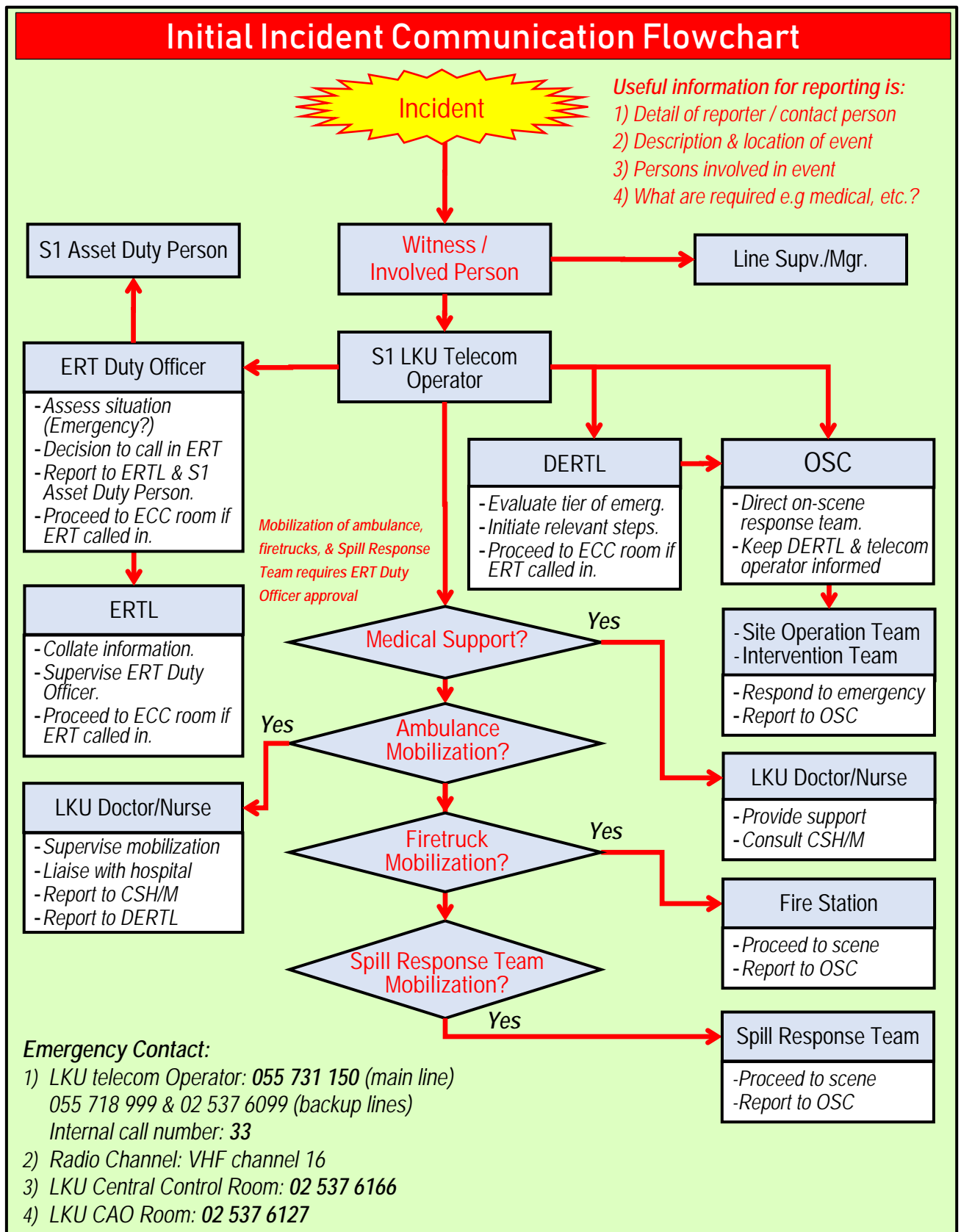


Figure 4: S1 Initial Incident Communication Flowchart

3.6 MUSTER POINT

The muster point is the predetermined place where is at a safe distance from the potential hazards and with adequate space for gathering and counting personnel in an emergency situation.

3.6.1 Type of Muster Point

a) Primary Muster Point

The primary muster points are for personnel to take an initial assembly when the emergency situation requests to muster e.g. LKU CCR is a primary muster point for flow station operation & intervention teams, ECC room is a primary muster point for ERT, area behind fire station is a primary point for all personnel not involving the emergency response actions. The assigned muster checker (and backup muster checker) shall be present to keep muster in order, for personnel movement control, for personnel counts, and for communication with muster logger.

b) Backup Muster Point

The backup muster point is the secondary muster point where personnel gathers in case they cannot safely proceed to the primary muster points. The backup muster point is not always necessary for all locations if alternative escape routes to primary muster point can be assured.

Depending on emergency situation, the predetermined muster points of all S1 locations are displayed in **Appendix D**.

3.6.2 Mustering Action

All personnel at S1 shall be briefed on their designated muster point and action to take at muster point that shall include, but not limited to:

For all personnel:

- On hearing/knowning mustering alarm or notification, make worksite safe proceed to the designated muster point. Walk fast and do not run;
- Observe the safety of the passage. Take the fastest route to proceed to the designated primary muster point. If it is not safe, take an alternative route;
- If there is no safe alternative route, proceed to the predetermined backup muster point, call S1 emergency number 055 731 150 or radio VHF channel 15, and standby for instruction; and
- At the primary muster point, stay calm and keep noise low. Respond to the muster checker and report any information necessary to emergency handling.

Note: Security guards on duty at all gates remain at gates and support access control during emergency otherwise it is not safe to do so.

For muster checker:

- At the muster point, stay calm and take control of the muster;
- Initiate the predetermined personnel count procedure;
- Observe and provide support to the mustered persons e.g. injury, fear, panic, etc.;
- Report the number of mustered persons, missing persons, injury, etc. to the muster logger when requested;
- Maintain muster in order and ensure the comfort of mustered persons as practical. No person should leave the muster point without instruction from ERT. Take record of mustered person movement when called out by ERT;
- When the muster point is deemed unsafe, consult the muster logger to move the muster point to the safe place as practical; and
- Only when the muster logger instructs, release the mustering.

The locations of predetermined muster points, positions of Muster Checker and Muster logger of each S1 operating location are summarized in **Appendix D**.

3.7 FACILITIES

The facilities shall be provided to support activities by the OSC team, ERT, CMRT, and RRT. These facilities shall be adequately equipped for the effective performance of the designed team, especially for communication and information management. All ICT equipment in those rooms shall be well maintained and checked by PS1/M (ICT) to ensure all ICT equipment is always readily available and fully functioning. All materials and documents in those rooms are prepared and made ready for prompt use by the PS1/S section.

At LKU office, 4 separate rooms are provided for:-

1. Emergency Coordination Centre (ECC) room for ERT to occupy for their duties;
2. Relative Response Room (RRR) for RRT to occupy for their duties;
3. Communication and Media Response Room (MRR) for CMRT to occupy for their duties;
and
4. Press Release Room (PRR) for the press release and media interfaces.

Other than the aforementioned rooms, the LKU CCR and CAO rooms are to be ready with ICT, materials, and documents ready for emergency response as well. PS1/P section is in charge of ensuring they are readily available.

3.7.1 Emergency Coordination Centre (ECC)

ECC is located at LKU building #1 meeting room #1. The ECC is arranged for S1 ERT and on-call support team to gather and use for their emergency duties.

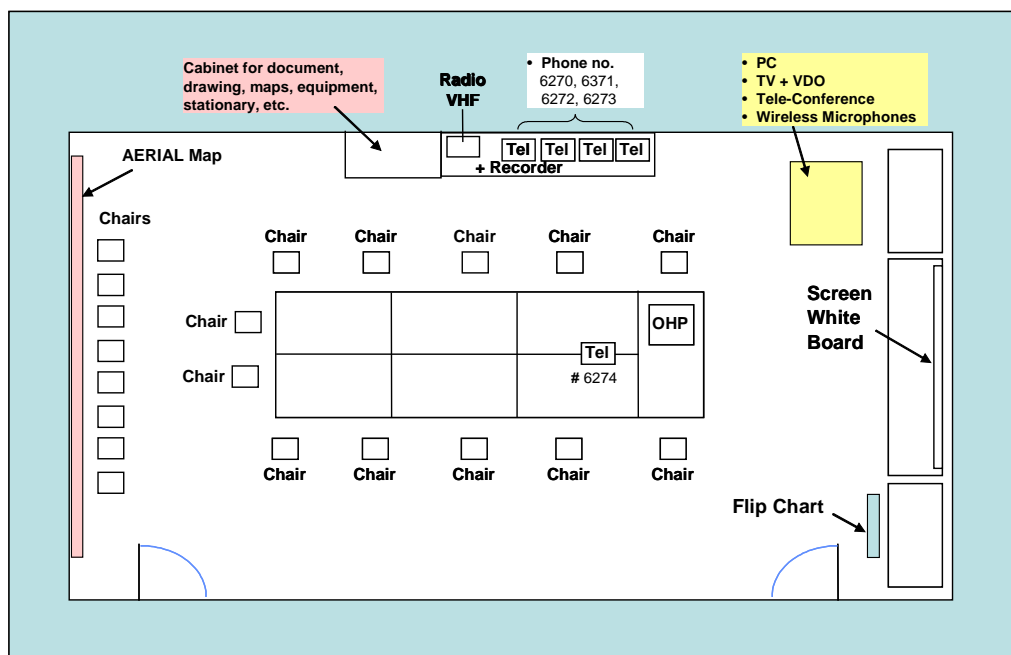


Figure 5: Simplified Layout of Emergency Control Room

Emergency Coordination Centre (ECC) – First In Actions

- Shift the magnet bar for register/muster;
- Switch on and ensure that the PC is working correctly;
- Lower the projection screen and turn on the digital projector;
- Log on the main PC using appropriate user name & password (kept in the cupboard);
- Check that all telephones are working correctly;
- Checks all required documents are available and updated (tel. directory, duty roster list, drawings, etc.);
- Take the briefing from ERTL or ERT duty officer and refer to individual role checklists.

ECC Equipment List

Telephones:	5 PABX telephone extensions {810-6270, 6272, 6273, 6274, 6371}
Display boards:	Casualties' status, the sequence of events, POB status, weather condition, and status of emergency resources.
Information Board:	1 board showing POB information, authorised delegates, Duty Rosters, stationery and forms
Documentation:	<ol style="list-style-type: none"> 1. Corporate Emergency Management Plan 2. Corporate Crisis Management Plan 3. S1 Emergency Response Plan 4. Key Site Drawings of Facilities and Installations 5. Emergency Log Sheets 6. Telephone directory 7. S1 Emergency Reporting Flowchart 8. S1 Duty Roster List

In case the ECC room at LKU building #1 meeting room #1 cannot be utilized when an emergency occurs such as fire or bomb threat at the office building, flooding, road blockage, the predetermined alternative venues are:

1. The meeting room at well services workshop; and
2. PHS housing.

Upon such a situation, ERTL or ERT duty officer announces to all ERT members to report to an alternative ECC room.

3.7.2 Community and Media Response Room (CMRR)

CMRR is located at LKU Building #1 Room #2 for CMRT to utilize for their emergency duties e.g. information preparation, press compilation, communication, etc. S1 Public Affairs (PTN/A) staff take roles and responsibilities as CMRT.

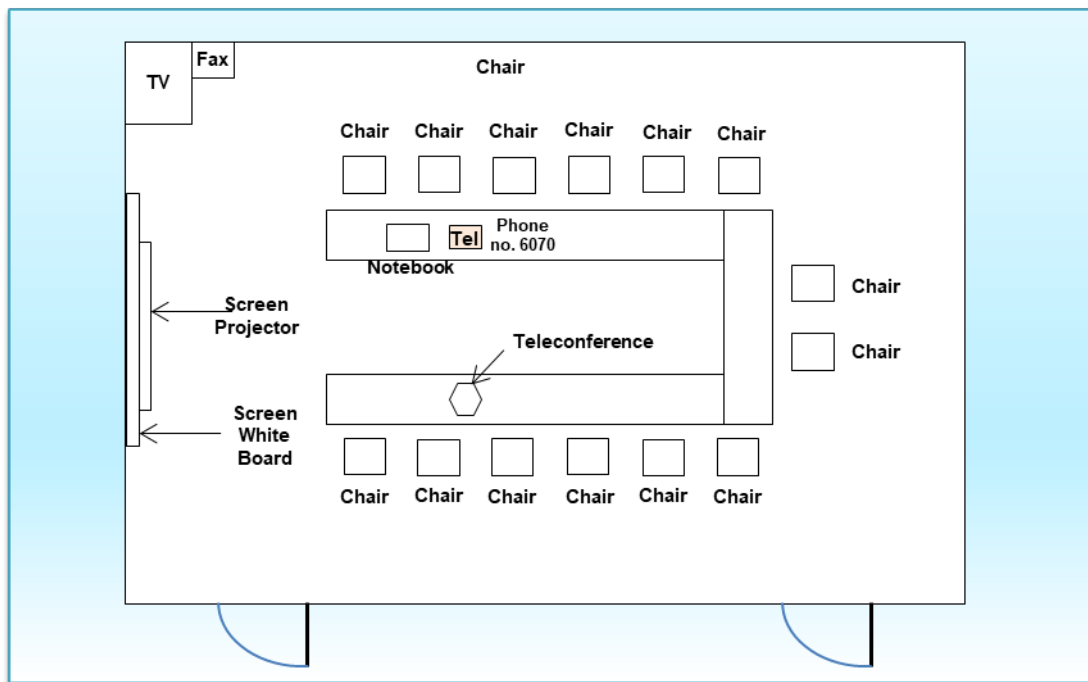


Figure 6: Simplified Layout of Media Response Room (MRR)

Community and Media Response Room (CMRR) – First In Actions

- Ensure that the PC is working correctly;
- Log on the main PC using appropriate user name & password (kept in the cupboard);
- Ensure all required document e.g. emergency contact list, community contact list, etc. are available;
- Check that all telephones are working correctly;
- Await the briefing from Manager, Public Affairs Section.

CMRR Equipment List

- Telephones:** 1 PABX telephone extensions No. 810-6070
- Information Board:** 1 board for preparation on the media press release
- Documentation:**
1. S1 Emergency Response Plan
 2. List of local media with telephone directory
 3. List of Corporate Community & Media Response Team with telephone directory
 4. S1 Emergency Reporting Flowchart
 5. S1 Duty Roster List

3.7.3 Relative Response Room (RRR)

Relative Response Room (RRR) is located at LKU Building #2 Meeting Room. RRR is arranged for the Relative Response Team (RRT) for preparation on information and coordination with relatives of staff and contractors who are injured or deceased. Operations Training Center (HRC/O) staff take roles and responsibilities as RRT.

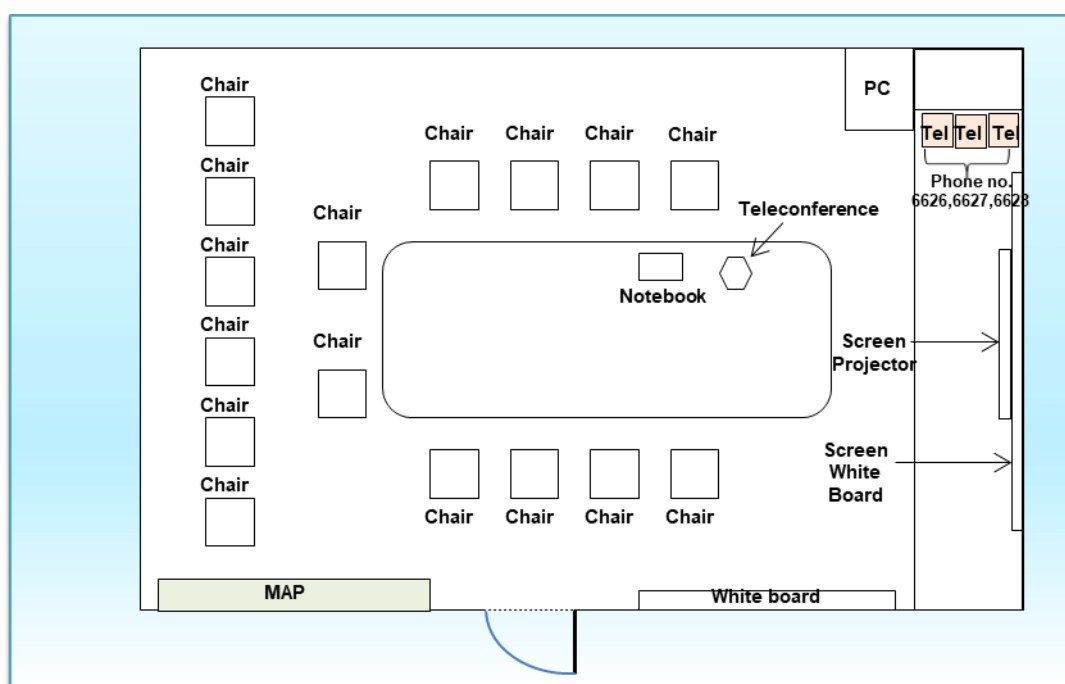


Figure 7: Simplified Layout of Relative Response Room (RRR)

Relative Response Room (RRR) – First In Actions

- Ensure that the PC is working correctly;
- Ensure accessibility to staff database and contract holder list;
- Log on the main PC using appropriate user name & password (kept in cupboard);
- Check that all telephones are working correctly;
- Await the briefing from manager, Operations Training Center Section

RRR Equipment List

- Telephones:** 3 PABX telephone extensions {810-6626, 6627, 6628}
- Information Board:** Staff and contractor status board
- Documentation:**
1. S1 Emergency Response Plan
 2. List of focal point of S1 department staff and contractors with telephone directory
 3. List of Corporate Relative Response Team with telephone directory
 4. S1 Emergency Reporting Flowchart
 5. S1 Emergency Duty Roster List

3.7.4 Press Release Room (PRR)

Press Release Room (PRR) is located at a room of 1st floor, 30th Year Building. The room is used for information disclosure and issuing public statements to local media or communities in case of emergency.



Figure 8: Photo of Press Release Room (PRR)

3.8 PRESS RELEASE

In the event of an emergency and/or a crisis, a special communication task force is to be set up. The team comprises, at least, a media spokesperson and the Crisis Communications Team (CCT). Their responsibilities include communication with external audiences that are media, authorities, and local communities.

According to PTTEP Delegation of Authority & Signature (DAS), only the President and Chief Executive Officer (CEO) and/or designated representatives of the organization are authorized to disclose information and issue public statements in case of an emergency. The level of spokesperson shall be as the following chart.



In case of an emergency at S1 asset, VP of S1 Production Operations Department (ERTL) or designated representative has the authority as a media spokesperson for disclosure of information and public statement to local media or communities, according to Crisis Communication Guideline (12145-GDL-004-R04) and PTTEP DAS. The information and/or public statement is prepared by S1 CMRT and reviewed & approved by PTTEP Crisis Communication Team (CCT) and EMT Leader prior to the press release. ERTL will provide the press release to local media or communities at Press Release Room (PRR) located at S1 SSHE Induction Room.

Examples of communication tools (as follows) are illustrated in **Appendix E**.

- Key Messages
- Media Release Template
- 1st Telephone Message to Answer Media and Investor Enquiries
- Holding Statement

3.9 DEACTIVATION AND POST EMERGENCY ACTIONS

3.9.1 Deactivation

The EMT Leader, in consultation with S1 ERTL, is the sole authority for deactivating an emergency declaration. Deactivation should only be called when S1 ERTL and EMT Leader agree that the emergency has been contained, and satisfactorily safe in all respects.

The activities and procedures which must be undertaken to recover from an emergency, the EMT Leader shall ensure the conducting of the following activities include, but are not limited to:

- The cleanup, maintenance, and testing of equipment;
- The re-commissioning of facilities, plant, and equipment;
- The replenishment of stocks (such as firefighting foam, spill clean-up materials, replacement parts);
- The accounting for all expenses incurred as a result of the incident;
- The filing of insurance claims; and
- Preparation and dispatch of final reports to relevant Shareholders, Government, and Local Authorities.

3.9.2 Emergency End and Final Actions

Once a decision has been made that no further actions are outstanding and that an emergency is over, many issues need to be considered before standing down. There is a need to consider the following:

- If the severe impact taken place with the production continuity as a result of incident, the S1 Business Continuity Plan (BCP) shall be activated referring to Thai Onshore Asset (PTN) Business Continuity Plan (BCP) (Document Code: 63984.1/2017)
- Ascertain the current position of each team member as regards their role, responsibilities and any ongoing/ outstanding actions;
- Identify and assign any outstanding actions including debriefing of interested external parties, such as authorities, community, etc;
- Put in place an emergency situation review to ensure the completion of outstanding actions;
- Understand any outstanding human resource issues and ensure that the necessary information is provided and the appropriate steps are being taken;
- Ensure that all staff are aware of the emergency close out and update them regarding the short and long-term issues affecting the company (if known);
- Ensure that all information has been captured and recorded;

- Have a team debrief before staff leave or return to normal duties;
- Ensure the plan of a future debrief time when all actions can be analysed. This can usually be within 24 - 48 hours of emergency closeout. Consider including the participation of independent reviewers; and
- This review should also address the sensitivity of the report information and determine the most appropriate means of secure storage.

After the review, a closeout report should be prepared. The report should cover the following:

- Understand and document the cause(s) of the emergency;
- Document all involved parties and details of participating personnel;
- Analyse the response and identify any learning points to be incorporated into the appropriate procedures and/or to be shared with other parts of the Business;
- Incorporate a full picture of the costs incurred as a result of the incident; and
- Review the effectiveness of all actions taken.

3.9.3 Incident Investigation

Incident investigation shall be conducted in accordance with Incident Management Standard (SSHE-106-STD-600) as soon as possible and when safe to do so. It should be conducted right after the emergency situation has been cleared in order to collect all evidence & facts and capture actual causes of the incident for proper analysis to define the effective mitigations and improvements for recurrence prevention and emergency/crisis response strategy.

3.9.4 Post Emergency Review

A post-emergency review is required for conducting to examine the response to the emergency. The EMT Leader and/or S1 ERTL should convene an emergency review meeting. Those attending the review meeting shall include the EMT & ERT members, and all other support team members. Minutes of the review meeting shall be recorded and archived for future analysis. The review meeting shall determine (but not limited to) the following:

- Were employees properly informed of S1 ERP and relevant corporate standards/procedures?
- Did employees respond according to S1 ERP and relevant corporate standards/procedures?
- Were employee's responses timely?
- Were the procedures adequate?
- What were the problems encountered during the response activities?
- What can be improved?

- How can similar events be avoided in the future?

If public emergency services were involved, they shall be invited to participate in the critique.

3.10 TRAINING AND EXERCISE

All concerned personnel who are assigned as the emergency response team shall be trained and have competency for their emergency response roles and responsibilities. Training requirements for personnel involving emergency response are illustrated in S1 SSHE Training and Competency Procedure (13247-PDR-SSHE-305/01) and PTTEP SSHE Training and Competency Standard (SSHE-106-STD-340).

Emergency exercise shall be regularly performed by S1 emergency response team members according to the set plan agreed by S1 management. These emergency exercises and drills are to enhance the knowledge & skills of the members and to test the effectiveness of existing ERP for improvement.

3.11 S1 DUTY ROSTER GUIDELINE

The S1 duty roster is designed to provide effective support around the clock for resolving the emergency situation. The duty persons are appointed by the ERT members in each discipline to act on their behalf when they are not readily available to respond to emergency calls. They shall be trained and competent to respond to emergency in their given discipline's roles.

All duty persons are expected to be contactable at all times during their duty period. All duty persons shall respond to all emergency call and take their given roles to support the emergency. When called in, they shall proceed to their designated emergency station the soonest within 2 hours.

The ERT duty persons shall act in emergency response until released by the ERT member in the given discipline.

The duty roster consists of two groups as follows:

3.11.1 ERT Duty Roster

ERT Essential Duty Group:

The ERT essential duty group is the main group that will always be called in when emergency tier 2 & 3 is initiated. The ERT essential duty group comprises the following persons:

- Domestic Onshore Asset Duty (S1, PTTEP1 and SPH)
- Duty Officer
- Event Logger
- SSHE Officer
- SSHE Duty
- Logistics Duty

- Maintenance Duty
- IT/ Telecom Services
- Security Services
- Medical Team
- Community & Media Response Team (CMRT) Duty
- Relative Response Team (RRT) Duty

For the essential duty group, the duty officer (S1 Production Superintendent) is a key person for coordination with other duty persons including on-call support team on emergency supports.

On-Call Support Team Duty Persons:

The On-Call Support Team Duty Group will be assigned from various disciplines' representatives working within S1 operation premise. The selected persons will be called in when their related discipline has sustained an emergency or ER Team Leader / EMT requires assistance. The On-Call Support Team Duty Group is comprised of (but not limit to) the following groups:

- Drilling Duty – ETN SSHE
- Well Services Duty
- Construction Duty
- Material Yard Duty

In addition to above duty groups, the register of S1 duty roster shall include other support staffs of S1 operation department for fulfilling support on emergency situation as required.

Depending on the different roles and responsibilities of duty staff, mobilization time to LKU office for support emergency are varied as follows:

- Available immediately (restricted to shift staff working on facilities including duty officer, event logger, SSHE officer, security services, medical team, well services duty);
- Within 2 hours (key support staff e.g. SSHE duty, logistic duty, maintenance duty, CMRT duty, RRT duty, drilling duty, construction duty, material yard duty, IT/Telecom).

The example of S1 duty roster for emergency response as per duty group classification and mobilization period is illustrated in **Appendix F**.

Back-up Duty Roster Team:

If an emergency takes long time to last, ER Team Leader and/or Duty Officer shall consider having a relieve team. The Duty Roster Team in a later week will be called for backup.

In the event of two emergencies happen at the same time, the Back-up Team will be called.

3.11.2 Duty Roster Nomination

Staff are nominated by their line managers/supervisors for duty roster for a period 7 consecutive calendar days, starting on Monday at 12:00 hrs. The duty roster will be updated to all duty staff and Corporate SSHE division by S1 SSHE department as per weekly basis. The roster will be distributed every Thursday to the following week's duty holders, and the personnel who will be on duty during the following weeks. This will include key personnel such as Telecom Officer. The assigned Department Focal Points are responsible for providing the Corporate SSHE Division with information regarding the forward planning of the Duty Roster. Changes during a Duty Roster Week are allowed, but it shall be the responsibility of the person scheduled for duty. The change must be amicably agreed by the nominated recipient and shall be communicated, by the person requesting the change, to S1 SSHE Department focal point (Officer, Data Management (SSHE) or assigned person). The requested change shall only be to another qualified duty person in the group.

3.11.3 Communication for Duty Roster Personnel

Staff on Duty Roster will receive an Emergency Duty Book which consists of a log book and contact list. Details of all calls, received and transmitted, should be entered into the log book. The Emergency Duty Book must be handed over to the next person of duty.

1. DUTY ROSTER MOBILE PHONE TEST

The Duty Roster mobile phone will be tested by LKU Telecom Officer every Monday at 13:00 hrs. The message will be;

- "Duty Telephone Test, please confirm it is working ... over".

(ทดสอบการติดต่อโทรศัพท์ ครับ ไม่ทราบชัดเจนหรือไม่ ครับ)

This is to ensure that the mobile phones are workable and also to remind duty persons that they are on duty.

If by 16.00 hrs. the Duty Person has not been phoned, he/ she must ring LKU Telecom Officer and report that they did not receive the test call.

The Operator, Telecom Services will then test that number again.

2. GENERIC DUTY ROSTER RESPONSIBILITIES

- Be available and be within the mobilization time radius of LKU Office at all times;
- Carry the duty mobile phone at all times;
- Ensure that the mobile telephones are always working;
- Be aware of specific responsibilities during an emergency;
- When receiving an emergency call, respond as directed by the call message;
- Immediately report any problems with duty communications equipment to Operator, Telecom Services;

- Inform S1 SSHE Department focal point (Officer, Data Management (SSHE)) of any changes to the published duty roster;
- Must not have a blood alcohol level above the National legal limit;
- Notify S1 SSHE Department focal point (Officer, Data Management (SSHE)) of any changes in mobile telephone numbers.

3. DUTY ROSTER PERSONNEL QUALIFICATION REQUIREMENT

The Duty Roster personnel shall be qualified and be approved by SVP, Thai Onshore Asset (EMT Leader). Each discipline is required to have the following qualifications;

- Duty Roster Team members shall be assigned from experience and competence personnel of each discipline;
- Expertise in their areas of responsibility, including knowledge and experience;
- Understand the PTTEP EMP and S1 Emergency Response Plan and know the response process under his/her responsibilities;
- Bilingual – Fluent in both written & spoken Thai & English;
- Has no record of disabilities that may impair his/her ability to perform the functions assigned to them;

All Duty Roster Personnel shall receive training and participate in the emergency response exercise as indicated **Table 6**.

Table 6: Training Requirement and Exercises of S1 Duty Roster

Training Course	Recommended for	Frequency	Responsible Parties
PTTEP Emergency Management Plan (EMP) Introduction and Incident Command Introduction	All new Duty Roster personnel	Yearly	Corporate Security Section
S1 Emergency Response Plan Introduction	All new Duty Roster personnel	Yearly	S1 SSHE Department
Exercise	Recommended for	Frequency	Responsible Parties
Table Top	Selected from Weekly Duty Roster personnel	As appropriated or at least yearly	S1 SSHE Department
Tier 2	Selected from Weekly Duty Roster Team	Yearly	Corporate Security Section and S1 SSHE Department
Tier 3	Duty Roster Team and Crisis Management Team	Yearly	Corporate Security Section and S1 SSHE Department
Note: For table top exercises, to ensure that all duty persons understand and confidence to deal with the real emergency, the frequency of table top exercises shall be more frequency. The exercises can be both informing in advance and surprising without advance informed.			

APPENDICES

APPENDIX A: EMERGENCY CALL MESSAGE FROM LKU TELECOM OFFICER

The emergency call messages that need to be informed to Emergency Response Team, on-call support team and involved parties by LKU Telecom Officer are as follows:

- Tier 1 Emergency at.....For information and standby.
(ขณะนี้เหตุการณ์ฉุกเฉิน ระดับ 1 ที่.....แจ้งเพื่อทราบ และเตรียมความพร้อม)
- Tier 2 Emergency at.....Go to S1 Emergency Coordination Centre (ECC) immediately.
(ขณะนี้เหตุการณ์ฉุกเฉิน ระดับ 2 ที่..... กรุณามาที่ศูนย์ประสานงานเหตุฉุกเฉินทันที)
- Tier 3 Emergency at.....Go to S1 Emergency Coordination Centre (ECC) immediately.
(ขณะนี้เหตุการณ์ฉุกเฉิน ระดับ 3 ที่..... กรุณามาที่ศูนย์ประสานงานเหตุฉุกเฉินทันที)
- Emergency is over. (ขณะนี้เหตุการณ์เข้าสู่ภาวะปกติ)

APPENDIX B: INITIAL EMERGENCY REPORT FORM

This form will be completed by LKU Telecom. Operator on receiving notification of an emergency.

แบบฟอร์มการแจ้งเหตุการฉุกเฉินเบื้องต้น				
รายละเอียดผู้แจ้งเหตุฉุกเฉิน				
ชื่อผู้แจ้งเหตุ:		เบอร์โทรศัพท์ผู้แจ้งเหตุ:		
วันและเวลาที่แจ้งเหตุ:				
รายละเอียดเหตุฉุกเฉิน				
วันและเวลาที่เกิดเหตุ:				
สถานที่เกิดเหตุ:				
ประเภทของเหตุฉุกเฉิน	<input type="checkbox"/> ไฟไหม้ <input type="checkbox"/> ระเบิด <input type="checkbox"/> ก๊าซรั่วไหล <input type="checkbox"/> สารเคมี/น้ำมันรั่วไหล <input type="checkbox"/> อุบัติเหตุทางถนน <input type="checkbox"/> การก่อการร้าย <input type="checkbox"/> อื่นๆ โปรดระบุ			
รายละเอียดของเหตุฉุกเฉิน:				
ผู้แจ้งเหตุต้องการความช่วยเหลือหรือไม่	<input type="checkbox"/> ใช่ <input type="checkbox"/> ไม่ใช่			
ความช่วยเหลือที่ต้องการ	<input type="checkbox"/> การช่วยทางการแพทย์ <input type="checkbox"/> การค้นหาผู้สูญหาย/การช่วยชีวิต <input type="checkbox"/> การตอบสนองต่อการรั่วไหล <input type="checkbox"/> การช่วยเหลือด้านเทคนิค <input type="checkbox"/> อื่นๆ โปรดระบุ			
รายละเอียดด้านบุคคล				
รายละเอียด	พนักงาน ปตท.สม.	ผู้รับเหมา	บุคคลที่สาม	ไม่ทราบ/ไม่สามารถระบุได้
จำนวนผู้เสียชีวิต				
จำนวนผู้บาดเจ็บ				
จำนวนผู้สูญหาย				
รายละเอียดด้านสิ่งแวดล้อม				
ระบุชื่อวัสดุที่รั่วไหล				
ปริมาณการรั่วไหล (ถ้ามี)				
รายละเอียด ณ จุดเกิดเหตุ				
มีตัวแทนของบริษัทฯ อยู่ ณ จุดเกิดเหตุหรือไม่	<input type="checkbox"/> มี <input type="checkbox"/> ไม่มี ถ้ามี โปรดระบุ ชื่อ _____ เบอร์ติดต่อกลับ _____			
การดำเนินการ ณ จุดเกิดเหตุ				
ชื่อผู้บันทึกเหตุ	วันและเวลาที่บันทึกเหตุ:			



APPENDIX C: EMERGENCY LOG SHEET

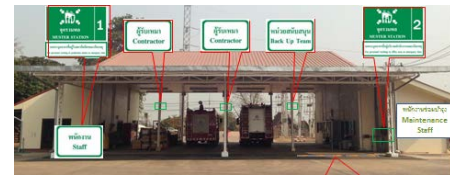


See next page.



รายละเอียดเหตุการณ์			ชื่อผู้บันทึก: ตำแหน่งผู้บันทึก: วันที่:	
เวลา	ข้อความ		รายละเอียดของเหตุการณ์	หมายเหตุ
	จาก	ถึง		




APPENDIX D: LOCATION OF PREDETERMINED MUSTER POINTS




The locations of predetermined muster points, positions of Muster Checker and Muster logger of each S1 operating location are shown in below table.


Table 1: The muster points, positions of Muster Checker and Muster logger of each S1 operating location

No.	S1 Operating Location	Location of Muster Point	Mustered Person	Position of Muster Checker	Position of Muster Logger	Photo of Muster Point
1	LKU Flow Station, accommodation, maintenance workshop, officer	Behind Fire Station Building	Emergency Response Team, personnel working in LKU Flow Station, personnel working in the office area, maintenance workshop, visitors	Well Site Supervisor #2	S1 SSHE Officer (Shift)	
		In front of CCR	Emergency Response Team within LKU Flow Station	LKU Plant Foreman	S1 SSHE Officer (Shift)	
		In front of Piyachat Nithat (PNEC) Building	Persons working at PNEC building and their visitors Persons working at OJT center building and their visitors	Public Affair Staff	S1 SSHE Officer (Shift)	

No.	S1 Operating Location	Location of Muster Point	Mustered Person	Position of Muster Checker	Position of Muster Logger	Photo of Muster Point
2	NTM-A	By the security guardhouse at the main gate.	Persons working at NTM-A, contractors, visitors	NTM-A Security Guard	NTM-A Production Lead Operator	
		In front of NTM-A control room	Site Operation Team/ Emergency Response Team	NTM-A Production Operator	NTM-A Production Lead Operator	-
3	STN-A	Beside security guardhouse by the main gate.	Persons working in STN-A, contractors, visitors	STN-A Security Guard	STN-A Production Operator	
		In front of STN-A control room	Site Operation Team/ Emergency Response Team	STN-A Production Operator	STN-A Production Operator	-

No.	S1 Operating Location	Location of Muster Point	Mustered Person	Position of Muster Checker	Position of Muster Logger	Photo of Muster Point
4	Well Sites	Outside by the main gate	Persons working within well sites, contractors, visitors	Security Guard	Area Operator	
5	BPR Depot	In front of T-904 (Road tanker area)	Emergency Response Team, persons working at road tanker area within BPR Depot, visitors	Security Guard (Road tanker area)	BPR Depot Operator	
		In front of the security guardhouse (Rail tanker area)	Emergency Response Team, persons working at rail side area within BPR Depot, visitors	Security Guard (Rail tanker area)	BPR Depot Operator	

No.	S1 Operating Location	Location of Muster Point	Mustered Person	Position of Muster Checker	Position of Muster Logger	Photo of Muster Point
6	Well Service Workshop	In front of the main gate	Persons working within well service workshop, visitors	Senior Technician (workshop)	Well Service Supervisor	
7	Material Yard	In front of the main gate	Persons working within the material yard, visitors	Senior Store Keeper	Team Leader, Warehouse and Material Yard	
8	PHS Housing Compounds	Car park area	Persons living in PHS housing compounds, persons working (gardeners, housekeepers), visitors	Security Guard	Security Guard	

No.	S1 Operating Location	Location of Muster Point	Mustered Person	Position of Muster Checker	Position of Muster Logger	Photo of Muster Point
9	CNS Rail Tanker Maintenance Workshop	In front of the security guardhouse	Persons working CNS rail tanker maintenance workshop, visitors	CNS Contractor (JS TECH) SSHE Officer	CNS Contractor (JS TECH) Site Manager	

APPENDIX E: EXAMPLES OF COMMUNICATION TOOLS

1. Key Messages

These key messages should be conveyed in all communications to all stakeholders of PTTEP.

- In conducting exploration and production of petroleum and other activities in accordance with its mission, PTTEP, strives at all times to achieve a manner ensures that incidents affecting the health and safety of its employees, contractors and member of the public, the environment and the integrity of its assets shall not occur.
- PTTEP's primary concern in all incidents of this nature is for the people involved. PTTEP staff have been trained to strictly follow the emergency plan to ensure maximum safety for themselves, partners and rescue workers.
- The nature of PTTEP's business demands the most stringent Safety, Security, Health, and Environmental standards and the company remains committed to maintaining the highest possible standards in this vital area in all its activities.


ข้อความการสื่อสารหลัก

ข้อความการสื่อสารหลักสำหรับผู้มีส่วนได้ส่วนเสียของ ปตท.สผ. กลุ่มต่างๆ

- ในการดำเนินการสำรวจและผลิตปิโตรเลียมรวมทั้งกิจกรรมอื่นๆ ปตท.สผ. มีแนวทางปฏิบัติเพื่อป้องกันมิให้เกิดเหตุการณ์ที่จะส่งผลกระทบต่อสุขภาพและความปลอดภัยของพนักงานบริษัทฯ ผู้รับเหมาและบุคคลทั่วไป รวมทั้งสภาพแวดล้อมและทรัพย์สินของบริษัทฯ
- ในสถานการณ์ดังกล่าว ปตท.สผ. ห่วงใยในสวัสดิภาพของพนักงานที่เกี่ยวข้อง อย่างไรก็ตาม พนักงานของ ปตท.สผ. ทุกคนได้ผ่านการฝึกฝนให้ปฏิบัติตามแผนการในภาวะฉุกเฉินโดยเคร่งครัด เพื่อให้เกิดความมั่นใจ
- ในความปลอดภัยสูงสุดของพนักงาน พันธมิตรธุรกิจ และเจ้าหน้าที่กู้ภัย ด้วยลักษณะของธุรกิจของ ปตท.สผ. บริษัทฯ ยึดถือหลักเกณฑ์และมาตรฐานที่เข้มงวดที่สุดด้านสุขภาพ ความปลอดภัย และสิ่งแวดล้อม บริษัทฯ มุ่งมั่นปฏิบัติตามหลักการดังกล่าวมาโดยตลอด เพื่อรักษามาตรฐาน สูงสุดในการปฏิบัติงานด้านดังกล่าว

2. Media Release Template

The Media Release Template gives an overview of the structure and content of a press release or a statement, in line with the common way press releases are written. Using this template helps the Writer develop a press release or a statement quickly and in a consistent way. The Writer and Media Relations Team work closely together to ensure they receive all information as per the template.



News Release

ข่าวประชาสัมพันธ์

Date : _____
Time : _____

Headline (subject matter)


What happened : _____
Where it happened : _____
When did it happen (date, time) : _____
Services involved : _____
Current situation as verified by facts : _____
Effect on stakeholders (JVs, partners, government, suppliers, public) : _____
Status of investigation/recovery : _____
Which government agencies are involved : _____
Any additional information : _____

For further information, please contact : _____
Contact details
Name and designation _____
Tel : _____
Fax : _____
Email : _____

Disclaimer
The information, statements, forecasts and projections contained herein reflect the Company's current views with respect to future events and financial performance. These views are based on assumptions subject to various risks. No assurance is given that these future events will occur, or that the Company's future assumption are correct. Actual results may differ materially from those projected.

บริษัท ปตท.สำรวจและผลิตปิโตรเลียม จำกัด (มหาชน)
PTT Exploration and Production Public Company Limited

www.pttep.com



ปตท.สำรวจและผลิตปิโตรเลียม จำกัด (มหาชน) | Passion to Explore for a Sustainable Future

3. 1st Telephone Message to Answer Media and Investor Enquiries

Based on the latest report on _____(date) at _____(time 24 hours) we obtained, there was a/an _____ at _____. The cause of the incident is still unclear. However, the company is doing its best (to evacuate all staff) (and extinguish then fire/control the spill). Please tell me your name, the publication you represent, the telephone number and email address. For any further update on this situation, please visit www.pttep.com. Thank you.

ข้อความแรกในการตอบโทรศัพท์สื่อมวลชน

จากรายงานที่บริษัท ปตท.สำรวจและผลิตปิโตรเลียม จำกัด (มหาชน) ได้รับเมื่อเวลา_____วันที่_____ได้เกิดเหตุ _____ ขึ้นที่ _____ สาเหตุของอุบัติเหตุยังไม่ทราบแน่ชัด อย่างไรก็ตาม บริษัทฯ กำลังดำเนินการอย่างเต็มที่เพื่อ _____ (อพยพพนักงาน และดับเพลิง หรือกำจัดคราบน้ำมัน) ขอทราบชื่อของคุณ ชื่อสื่อที่สังกัด หมายเลขโทรศัพท์ และ e-mail ทั้งนี้ คุณสามารถติดตามรายละเอียดความคืบหน้าของเหตุการณ์ได้ที่เว็บไซต์ www.pttep.comค่ะ/ครับ

4. Holding Statement

Tips on Writing a Holding Statement

- Three paragraphs
 - Keeps to facts
 - What is being done
 - Some context about the company
- Keep it short and factually accurate
- Avoid emotive language
- Don't prompt further questions
- Avoid digging holes which you can fall into later
- Don't commit to anything - unless it is your intention to do so
- State date (time) and contact details

Note:

Never make statements like "There was no loss of life or injury to staff members resulting from the incident." unless this is confirmed.

Such statements made prematurely will reflect badly on the company if ultimately deaths and/or injuries have occurred.

If not yet confirmed, say something like: "Up till now, we have not received reports of any loss of life or injuries." Then you may add: "Information is still coming in and we will update you as and when we get it."

หมายเหตุ:

ไม่ควรระบุว่า "ไม่มีการบาดเจ็บหรือเสียชีวิตจากเหตุการณ์ที่เกิดขึ้น" จนกว่าจะมีการยืนยันแน่นอน มิฉะนั้นจะส่งผลเสียอย่างมากต่อบริษัท หากยังไม่ได้รับการยืนยันที่แน่นอนว่า มีผู้เสียชีวิต และ/หรือ ผู้บาดเจ็บจริง ควรชี้แจงว่า "จนถึงขณะนี้ เรายังไม่ได้รับรายงานเกี่ยวกับผู้เสียชีวิตหรือผู้บาดเจ็บ" และเสริมว่า "ข้อมูลเพิ่มเติมจะมาถึงในเร็วๆ นี้" และบริษัทฯ จะแจ้งความคืบหน้าให้ท่านทราบทันทีที่ได้รับข้อมูล"

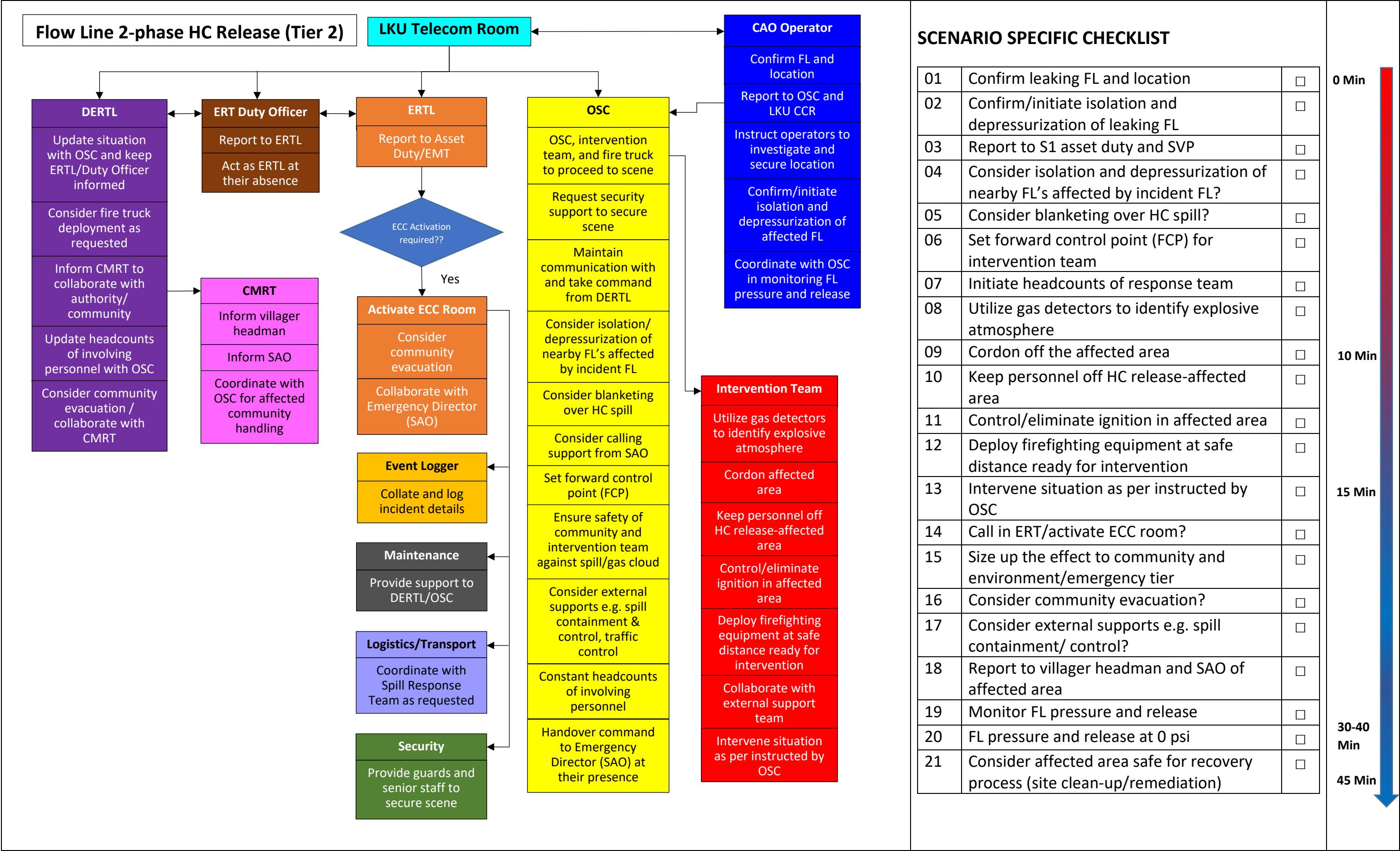
APPENDIX F: EXAMPLE OF S1 DUTY ROSTER

S1 Duty Roster for Emergency Response					
	24-Jun-2019		To	01-Jul-2019	
Operator, Telecom. Services (LKU)					
First point of call	LKU Office			055-731150, 055-718-999, 02-537-6099 Internal line 33 or 810-6099	
ERT Main Duty Group					
Pool Field (Available immediately in the Field)					
Role	From	To	Name	Office	Mobile
Duty Officer	24/06/19	1/7/2019	Nakrop P.	810-6238	081-7855476
Event Logger	24/06/19	1/7/2019	Tattanan P.	810-6187	-
SSHE Officer	24/06/19	1/7/2019	Charun C.	810-6100, 810-6163	084-387-9416
Security Services	-	-	-	810-6045, 810-6069	-
Medical Team (LKU Nurse/Ambulance)	-	-	-	810-6038	081-2817664
Contactable 24 hours, Mobilize in 2 hours					
Role	From	To	Name	Office	Mobile
Domestic Onshore Asset Duty	24/06/19	1/7/2019	Noppadol B.	800-4616	097-4964975
SSHE Duty	24/06/19	1/7/2019	Ronachai F.	810-6298	089-7711212
Logistics Duty	24/06/19	1/7/2019	Vuthichai K.	810-6190	081-9949340
Maintenance Duty	24/06/19	1/7/2019	-	810-6150 (Officer hour)	098-2710948 (After office hour)
IT/Telecom Services	24/06/19	1/7/2019	Jirasak T.	6304	081-7855485
Community & Media Response Team (CMRT) Duty	24/06/19	1/7/2019	Panlop L.	810-4507	089-9681219
Relative Response Team (RRT) Duty	24/06/19	1/7/2019	Jantana N.	810-6292	XXXXXXX
On-Call Support Team Duty Persons					
Pool Field (Available immediately in the Field)					
Role	From	To	Name	Office	Mobile
Well Services (Superintendent)	24/06/19	1/7/2019	Chalit D.	810-6082, 810-6006	081-7855487
ETN SSHE Duty	24/06/19	1/7/2019	Saralrasm T.	810-6118	098-8297650
Contactable 24 hours, Mobilize in 2 hours					
Construction Duty	24/06/19	1/7/2019	Teerayut I.	810-6168	089-9618611
Material Yard Duty	24/06/19	1/7/2019	-	810-6064	081-7519345



APPENDIX G: INCIDENT GUIDELINE FOR EMERGENCY SITUATIONS

<< File embedded in PDF >>



ROLES AND RESPONSIBILITIES

Roles	Responsibilities
Document Owner	<p>The owner of the S1 Emergency Response Plan is VP, S1 Production Operations Department, with responsibilities for:-</p> <ul style="list-style-type: none"> ■ Issuing the S1 Emergency Response Plan and its revisions; ■ Issuing the S1 Emergency Response Plan and its revisions; and ■ Ensuring effective implementation of the plan.
Document Custodian	<p>The custodian of the S1 Emergency Response Plan is Superintendent, SSHE, with responsibilities for:-</p> <ul style="list-style-type: none"> ■ Identify deficiencies or potential improvements; ■ Initiating periodic revision; and ■ Maintaining revision history and document status register.

DEFINITION AND ACRONYMS

Set out below are common specific terms presented in alphabetical order:

Term	Definition
Asset	Refers to an operating Asset, site, or location within a respective Function Group.
Corporate	Refers to the PTTEP business groups hierarchically above Asset level, and located in the PTTEP headquarters, Bangkok.
Division	A business group may have one or more distinct groups within its hierarchy. These are referred to as Divisions.
Department	A subgroup within a Function Group, Division or Asset.
Function Group	Refers to a corporate level business group. These may have associated Divisions, Departments, or operational Assets within their hierarchy.
Crisis	<p>is a major or catastrophic event (out of control emergency). A crisis could result in sustained national impacts over a prolonged period of time; almost immediately exceeds resources normally available to the company, local authorities, and country in the impacted area; and significantly interrupts governmental operations and emergency services to such an extent that national security could be threatened. The crisis may challenge the ability and capacity of the company, community, and country to achieve a timely recovery.</p> <p>Crisis situations include terrorism that results in extraordinary levels of mass casualties, damage, or disruption severely affecting the population, infrastructure, environment, economy, company reputation, national morale, and/ or government functions. In PTTEP, a crisis situation is treated by a tier 3 response level.</p>
Crisis Management Team (CMT) Leader	The Chief Executive Officer (CEO) of the company who has the top authority to the overall management of a group/ company impact related to any crisis situations. He has the authority to activate the Corporate Crisis Management Team and work closely with the Asset Emergency Management Team Leader.
Emergency	is an occurrence or event, natural or human-caused, that requires an emergency response under the determination of affected asset leader or acting person, to protect life, environment, property, and reputation or to lessen or avert the threat of a major or catastrophe in any part of the company premises. The external assistance may or may not be needed to supplement the company's efforts and

Term	Definition
	<p>capabilities to save lives, environmental, protect property, public health and safety.</p> <p>Emergency situations can, for example, include major disasters, emergencies, terrorist attacks, terrorist threats, fires, floods, oil, and hazardous material spills, marine vessels and aircraft accidents, earthquakes, tropical storms, typhoon, war-related disasters, an outbreak of diseases and medical emergencies, and etc.</p> <p>In PTTEP emergency situations can be evaluated and treated by using a tier 1 – 2 response level.</p>
S1 Emergency Management Team Leader (EMT Leader)	<p>S1 asset's SVP or the acting person who has overall authority and responsibility for supporting and providing tactical advice, activities, and action plans to the S1 ERT or On-Scene Commander (OSC), including the development of strategic objectives. EMT leader also sets priorities and defines the organization of the EMT and the overall action plans for a particular response. He/she has to work closely with asset EMT.</p>
S1 Emergency Response Team Leader (ERT Leader)	<p>S1 VP with responsibility for all onsite responses, especially providing directions and onsite tactical operations and always retaining the authority to determine the appropriate course of response actions. S1 ERT leader has the authority to activate the S1 ERT.</p>

Acronyms	Description
DERTL	S1 Deputy Emergency Response Team Leader
ECC	Emergency Coordination Centre
ERP	S1 Emergency Response Plan
ERT	S1 Emergency Response Team
ERTL	S1 Emergency Response Team Leader
CMRT	S1 Community & Media Response Team
OSC	S1 On-Scene Commander
RRT	S1 Relative Response Team
EMT	S1 Asset Emergency Management Team
CMT	PTTEP Crisis Management Team
SAO	Sub-district Administrative Office
OSRL	Oil Spill Response Limited Company
EARL	East Asia Response Limited Company
IESG	Oil Industry Environment Safety Group Association of Thailand
LKU	Area of Lan Krabue District, Kampanget Province
ITL	Intervention Team Leader
NTM	Nong Tum Sub-district, Kong Krai Lad District, Sukhothai Province
PHS	Phitsanulok Province
CNS	Chong Nonsi, Bangkok
CCT	PTTEP Crisis Communication Team
CMRR	Communication and Media Response Room
VP.	Vice President

Acronyms	Description
SVP.	Senior Vice President
CSR	Company Site Representative

REFERENCES

Document Code	Document Title
PTTEP SSHE Controlling Documents	
11038-STD-SSHE-000	PTTEP SSHE Management System
11038-STD-SSHE-401	PTTEP SSHE Risk Management Standard
SSHE-106-STD-500	PTTEP Emergency and Crisis Management Standard
12148-PDR-SSHE-501	PTTEP Crisis Management Plan
SSHE-106-PDR-502	PTTEP Emergency Management Plan
SSHE-106-STD-340	PTTEP SSHE Training and Competency Standard
11003-GDL-SSHE-501-003	PTTEP Medical Emergency Management Guideline
12145-GDL-004-R04	PTTEP Crisis Communications Guideline
13247-PDR-SSHE-305/01	S1 SSHE Training and Competency Procedure
63984.1/2017	Thai Onshore Asset (PTN) Business Continuity Plan (BCP)
Other Reference Documents	
-	Disaster Prevention and Mitigation Act B.E.2550 พรบ.ป้องกันและบรรเทาสาธารณภัย พ.ศ. 2550

REVISION HISTORY

Rev.	Description of Revision
0	<p>Authorized by: -, Date: -</p> <p>New issue.</p>
1	<p>Authorized by: DSA, Date: August 2010</p> <p>Key changes from the previous version are as follows:-</p> <ul style="list-style-type: none"> ■ Re-formatted from SSHE-ER-01, S1 Emergency and Crisis Response Plan; ■ Aligned with new PTTEP SSHE MS, ISO14001:2004 and OHSAS18001:2007 requirements; ■ Current ERC (PS1/P) is changed to OSC (On-Scene-Commander) as per corporate guideline; ■ Current OSC is changed to Intervention Team Leader(s); ■ Added emergency plan for Protesting/Demonstration & Terrorist; and ■ Updated Organizational Indicators.
2	<p>Authorized by: DSA, Date: November 2013</p> <p>Key changes from the previous version are as follows:-</p> <ul style="list-style-type: none"> ■ Assigned new document code; ■ Aligned with Corporate Emergency and Crisis Management Standard and Plan; ■ Changed back OSC to be at the incident scene; ■ S1 IC is to be at ECC; ■ Revised role & responsibilities; and ■ Updated emergency contact numbers.
3	<p>Authorized by: PS1, Date: November 2019</p> <p>Major amendment of the whole procedure. Key changes from the previous version are as follows:-</p> <ul style="list-style-type: none"> ■ Aligned with the Corporate Emergency Management Plan and Crisis Management Plan; ■ Revised S1 Emergency Response Team Organization with their roles and responsibilities; ■ Revised emergency response action; and ■ Included sections of S1 duty roster guideline, must points and press release.