

เอกสารแนบที่ 73

เอกสารสัญญาดำเนินการของโครงการฯ กับ บริษัทผู้รับเหมาหลักในการก่อสร้างติดตั้งแท่นหลุมผลิต
(Bundled Phases 2 EPCI of Wellhead Platforms,
Associated Pipelines, and Tie-ins; PTTEP&PTTEPI/NSENGI)

- Drug and Alcohol and Water testing
- Air purifiers, fans and extraction systems
- Naked Flame Habitats
- Environmental response kits
- Approved and spark arrested plant, tools and equipment for use within hydrocarbon zone rated environments
- Helicopter crash kits
- In vehicle response kits
- Explosion Proof systems
- Escape Hoods
- Security Equipment
- etc.

TASK 95: Refer to Task 66, CONTRACTOR shall provide its Onshore and Offshore CSE list for approval

22.0 ENVIRONMENT IMPACTS MONITORING

22.1 Environmental Impacts

CONTRACTOR shall set up and implement any appropriate procedures, required by but not limited to the EIA and the present EXHIBIT L, to ensure that performance of WORK does avoid any deviation from the COMPANY environmental policy, objectives and targets.

CONTRACTOR shall also refer to and comply with the requirements of the following COMPANY SSHE Documents;

- Environmental Management SSHE-106-STD-520
- SSHE-106-PDR-401 Environmental Impact Assessment for E&P
- Waste Management SSHE-106-GDL-521

22.2 Environmental Monitoring

CONTRACTOR shall monitor the effect of his WORK on the environment and take corrective actions on nonconformity with norms reviewed during the SSHE risk evaluation (refer to Article 3). The effect to be considered include, but not limited to, CONTRACTOR shall provide the impact assessment, contingency and mitigation as well as details of monitoring program to COMPANY for review and approval:

- Emissions to the atmosphere
- Discharge into water (for sunken items Refer to Article 31.0)
- Waste Management
- Soil Contamination
- Use of raw material and natural resources

- Other local environment issues such as noise, vibration, odour, dust, visual impact
- Social and Community impacts
- Wildlife, Cattle, Animal Stocks
- Agriculture

22.3 Environmental Management Plan

CONTRACTOR shall utilise the impact assessment to develop its Environmental Management Plan (EMP) covering the EHISA constructs–requirements as necessary. The CONTRACTORS EMP shall be issued to COMPANY for Approval and based on COMPANYs latest EHISA/ EIA.

As minimum, the following parts shall be included in the EMP and the relevant procedures developed:

- Laws, regulations, standards
- Roles and responsibilities
- Waste Management Plan
- Chemical Management Plan
- Environmental Emergency Response Plan
- Local Stakeholders Socio Economic Plan
- Employment arrangements; health and accident insurance, PPE and transportation
- Corrective Action Plan
- Training and Awareness Plan
- Monitoring and Analysis Program
- Site Restoration Methods and Plan

TASK 96: Offshore and designated areas Onshore CONTRACTOR shall prove to COMPANY for review and approval its Environmental Management Plan based on the latest COMPANY or where required by CONTRACTORS EHISA/ EIA Reports

22.4 Corrective Action Plan

CONTRACTOR shall monitor the impacts from his activities onto environment and carry out adequate corrective actions.

CONTRACTOR shall issue a detailed description of the appropriate corrective measures together with implementation schedule and responsibilities.

This plan shall refer to the Environmental Baseline Survey (EBS) and an Environmental Impact Assessment (EIA) as either developed by COMPANY or CONTRACTOR, depending on Contractor articles. It may cover the following subjects (not-exhaustive list):

- Air quality and emissions and dust control
- Water quality
- Storm and run off water management
- Noise pollution control, within working area and within the neighbouring population

- Smell / Odours
 - Visual impact
- Nature Reserves and Fishing Grounds
- Vegetation and Fauna protection
 - Wildlife Cattle, Animal Stocks
 - Agriculture
 - Community relations, (*health care, consultation, compensation, training, employment, schooling, water and infrastructure programs*)
 - Soil erosion

22.5 Monitoring Program

CONTRACTOR shall develop a monitoring program to monitor the effects of WORK on the environment and take corrective actions if necessary.

CONTRACTOR shall issue the monitoring program including the following contents: purpose, responsibilities, locations, frequency and method of monitoring/sampling, equipment used, reporting of monitoring results within CONTRACTOR organization and to COMPANY.

This plan shall include the following subjects (non-exhaustive list):

- Water quality,
- Liquid discharges,
- Emissions to the atmosphere,
- Noise,
- Soil erosion
- Fauna, Wildlife, Fish and ECO systems
- Community Improvements
- Protection systems; design and maintenance thereof
- Engagement of Third Party Specialists
- And the like.

TASK 97: CONTRACTOR Environmental Management Plan (EMP) shall include an action and impact monitoring system and key benchmarks and Monthly and specific Survey reports. Corrective actions shall be included in the SSHEAMS/ Continuous Improvement Register and adequately tracked by appropriate action holder who shall ensure close out in the assigned time frame.

TASK 98; CONTRACTOR remote onshore working arrangements shall include minimum SSHE and Employment requirements for local workers to ensure they are provided with standard employment terms and conditions, fair remuneration, health and accident insurance, Fit to Work certification and health monitoring, adequate and sufficient PPE. Personnel Transportation arrangements shall meet with COMPANY standards and International Labour Organisation guidance. Details of the minimum SSHE requirements shall be provided to COMPANY for review and approval

22.6 Premises and Housing

CONTRACTOR shall inspect living quarters, camps and offices supplied to his PERSONNEL and where provided SUBCONTRACTOR and COMPANY, prior to occupation and on a regular basis and ensure they remain fit for PERSONNEL's assured health, Security and wellbeing.

Weekly offshore and bi-weekly onshore Health and Hygiene led inspections by competent persons or on site Medical Practitioner, Hygiene Specialist included in his Audit and Inspection Program. Reports and rating score shall be trended for improvement and action close out followed up by the Accommodation / Camp Boss, Yard Services lead.

A pre-mobilisation Health and Hygiene Audit shall be undertaken of facilities, accommodation and Barges to act as a baseline for future audits. Assessments shall give due consideration to washing, showering and toilet provisions, catering, health and competency of PERSONNEL involved in preparing and handling, suppliers of foods and water, and the procedural management systems employed.

There shall be sufficient showering facilities for personnel especially for remote working, provisions shall be provided for storage and cleaning of PPE

OSHA toilets "Owner provides urinals for male employees. Mandates that urinals cannot make up more than 1/3 of the total toilets provided" "Every washroom must have either hot and cold or tepid running water. Employers must also provide hand soap and paper or cloth towels or hot air blowers". "Must also consider Gender" 111-150 employees: 6 toilets 1 additional toilet for every 40 persons Provide Adequate washing and cleaning facilities for washing and hand drying with soap etc. Establish Routine daily cleaning and sanitation plan.

Toilet provisions shall include western standard male and female that are lockable and there shall be a two door barrier between toilets and offices/ kitchens.

Program will include the sampling and analysis of water in meeting with both International and W.H.O guidelines.

Adequate shelter to be provided for rain, cold, heat, provisions of adequate drinking water. Offices shall have adequate lighting including natural, heating, air conditioning, laundry and cleaning, safe access and egress and sufficient security arrangements including personnel.

Accommodation, Offices and Camps facilities shall have adequate emergency arrangements including fire detection, alarms and response, emergency lighting, spill equipment and medical response arrangements in line with COMPANY Standards

Separate sheltered areas shall be provided for eating, with hand washing facilities.

CONTRACTOR shall establish adequate maintenance, inspection systems to ensure that arrangements remain fit for purpose and safe.

Food Provisions shall be from approved sources, container shipments shall be fumigated before shipment and comply with the Lifting Regulation of COMPANY. CONTRACTOR shall undertake regular inspections of suppliers and catering arrangements, and spot checks of personnel to ensure cleanliness, PPE and HACCP compliance, health certification and training.

TASK 99: CONTRACTORS Health and Hygiene Audit Form shall include a rating system and be reviewed and approved by COMPANY

TASK 100: CONTRACTOR shall establish rules for accommodation and catering facilities that promote maintenance of personnel well-being, hygiene and health. Remote and Offshore Camps, Accommodation and Offices CONTRACTOR shall provide a plan and operational procedures for COMPANY review and approval based on Security, SSHE Risk and EHISA assessments and requirements related to Reference Documents and PTTEP SSHE Standards

22.7 Reference Documents

CONTRACTOR shall use, as reference documents for audits and inspections, the latest edition of all relevant standards, codes and norms referred to in the CONTRACT, and in particular the relevant SSHE documents issued by organizations such as:

- OPPBTP, the Professional Organization of Prevention for Buildings and Public WORKS (FRANCE)
- BEC, the building Employers' Confederation (United Kingdom)
- OSHA, the Occupational Safety and Health Administration (United States of America)
- ISO, the International Standards Organization
- OGP, International Oil and Gas Producers association
- IMCA, International Marine Contractors Association
- OPITO, Offshore Oil and Gas Industry Minimum Industry Safety Training Standard
- ILO International Labour Organisation
- IMO International Marine Authority (& associated regulations)
- SOLAS Safety of Life at Sea

22.8 Records / Corrective Actions

CONTRACTOR shall keep the record of all the audits and inspections in the proper log books. CONTRACTOR shall integrate his corrective action report into the SSHE improvement plan, action tracking register, SSHEAMS that is reviewed periodically with COMPANY to ensure effective tracking and close out. The CONTRACTOR PROJECT Manager shall remain responsible for ensuring close out of actions as recorded.

Such Records shall form part of the Final PROJECT or Campaign Dossier and Corrective actions shall be included in the SSHEAMS/ Continuous Improvement Register

22.9 COMPANY's Rights

If COMPANY determines that CONTRACTOR or any SUBCONTRACTOR is not performing WORK safely and/or in accordance with the requirements of this EXHIBIT, COMPANY may, at its sole option, direct CONTRACTOR to stop WORK immediately, remove non-complying PERSONNEL, materials, equipment and supplies from the WORKSITE(S) and take whatever other actions COMPANY deems necessary to ensure CONTRACTOR performs the WORK safely and in accordance with such requirements. Any and all costs or delays resulting from failure to conduct the WORK in a safe manner in accordance with the CONTRACT or arising as a result of any direction issued by COMPANY to CONTRACTOR in accordance with the

foregoing shall be for CONTRACTOR account and CONTRACTOR shall have no entitlement to claim any extension of time or claim any additional cost and expense.

COMPANY reserves the right to mitigate and remedy for the deficiency in SSHE-MS and deliverable implementation, any such mitigation will be at CONTRACTOR's risk

22.10 **Start / Suspension of Work or Services**

CONTRACTOR shall ask COMPANY to audit CONTRACTOR on completion of the activities undertaken in the mobilization period as per the agreed CONTRACT BRIDGING DOCUMENT and fill in the SSHE Commencement Certificate (SSHE-106-PDR-310 APPENDIX I –SSHE CONTRACT REQUIREMENT FORM) ANNEX 1 where required.

COMPANY will sign off the SSHE Commencement Certificate (ANNEX1) when satisfied with CONTRACTOR's effort and compliance with the requirements as written in this document.

TASK 101: CONTRACTOR shall not commence the Services until COMPANY has issued the SSHE Commencement Certificate, as part of the procedure within SSHE Contractor Management Procedure. This certificate will be prepared by CONTRACTOR in review of CONTRACTORs Project SSHE-MS preparation and establishment and close out status of the actions assigned under Yard, Accommodation and vessel/ barge SSHE audits preparation requirements. WORKS shall not commence for each phase of the Onshore work and Campaign for Offshore work until the certificate is issued, in addition on completion a reinstatement Certificate shall be prepared and issued.

23.0 **HEALTH PROGRAM**

23.1 **Generally**

CONTRACTOR will establish a health program based on a Health Risk Assessment in considering the health and welfare of its PERSONNEL, SUB-CONTRACTORS, Communities and Public who may be affected by activities. The complexity of the program will be dependent on the PROJECT scope, location, and activities being undertaken as a minimum it shall include:

- Working hours, Shift working and Rotations
- Occupational risks
- Water analysis
- PPE wearing and fit to individual
- Hazardous Substance and exposure
- HACCP and Food Handling systems
- Fit to Work pre-employed discipline specific and periodic
- Working hours and
- Rehabilitation and approval to return to work after absence from ill health or injury
- Health impacts from the Environmental / Weather/ Heat and cold
- Impacts from wildlife, pests, vermin
- Management and detection of communicable diseases

เอกสารแนบที่ 74

ตัวอย่างเอกสารการตรวจสอบ Kuroshio II Suitability Survey Report



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Instruction Date : 22-Dec-20
Job No. : TH-M3-0050
Report No. : TH-M3-0050-R0150| Rev.0
Report Date : 22-Jan-21

“KUROSHIO II” / DERRICK LAY BARGE


SUITABILITY AND OPERATIONAL CONDITION INSPECTION

FOR THE PURPOSE OF OFFSHORE PIPELAY AND
OFFSHORE PLATFORM INSTALLATION

UNDERTAKEN ON BEHALF OF
NIPPON STEEL ENGINEERING CO., LTD.

“KUROSHIO II” / DERRICK LAY BARGE : SUITABILITY AND OPERATIONAL CONDITION
INSPECTION. REPORT NO. TH-M3-0050-R0150| REV.0

REPORT AMENDMENT RECORD

Rev	Description of Amendment	Author	Checked	Approved	Signed
0	Issue for Client use	RAB	RS	MS	

DISTRIBUTION LIST

Name	Title	Company
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Internal File		AqualisBraemar (Thailand) Limited

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TABLE OF CONTENTS

SECTION	PAGE
1 INTRODUCTION.....	6
2 PROPOSED USE OF THE NON-PROPELLED DERRICK LAY BARGE.....	6
3 ATTENDANCE.....	6
4 DESCRIPTION, PARTICULARS AND DOCUMENTATION.....	7
4.1 DESCRIPTION.....	7
4.2 PARTICULARS.....	7
4.3 LIFTING CAPACITY / DECK CARGO CARRYING AND OPERATIONAL AREAS / TANK CAPACITY.....	8
4.4 CERTIFICATES.....	8
4.5 DOCUMENTATION.....	9
4.6 COMPANY POLICIES.....	10
5 HULL, WATERTIGHT INTEGRITY AND FITTINGS.....	10
5.1 EXTERNAL.....	10
5.2 INTERNALS.....	10
5.3 WATERTIGHT INTEGRITY.....	11
6 DECKS.....	11
6.1 MAIN DECK AND OTHER DECKS.....	11
6.2 HELIDECK.....	12
7 ENGINE ROOM MACHINERY.....	13
7.1 AUXILIARY MACHINERY.....	13
7.2 MAIN SWITCHBOARD.....	13
7.3 SPARE PARTS.....	14
7.4 BALLAST SYSTEM.....	14
8 MOORING WINCH SYSTEM, MOORING EQUIPMENT / WIRES / BUOYS.....	15
8.1 MOORING WINCH.....	15
8.2 MOORING EQUIPMENT.....	16
8.3 MOORING WIRE / BUOYS.....	17
8.4 COMMENTS.....	17
9 CRANES MACHINERY AND EQUIPMENT.....	17
9.1 HEAVY LIFT / DERRICK CRANE.....	17
9.2 COMMENTS.....	18

9.3 OTHER CRANES.....	19
10 PIPELAY EQUIPMENT.....	19
10.1 GENERAL DESCRIPTION.....	19
10.2 CONTROL STATIONS.....	19
10.3 PIPE HANDLING FACILITY.....	19
10.4 BEVELLING SYSTEM.....	20
10.5 WELDING STATIONS.....	20
10.6 X-RAY / NDT STATION.....	20
10.7 GRIT BLASTING STATION.....	20
10.8 FIELD JOINT COATING & FOAM INFILL STATION.....	20
10.9 TENSIONERS.....	21
10.10 PIPE HANDLING DAVITS.....	21
10.11 STINGER.....	21
10.12 PIPELINE ABANDON & RECOVERY WINCH.....	21
11 TOWING EQUIPMENT AND ARRANGEMENT.....	22
11.1 MAIN TOWING EQUIPMENT AND ARRANGEMENT.....	22
11.2 EMERGENCY TOWING ARRANGEMENT.....	22
11.3 NAVIGATION LIGHTS AND TOWING SHAPE.....	23
12 FIRE FIGHTING CAPABILITY.....	23
12.1 MACHINERY.....	23
12.2 EQUIPMENT.....	23
13 NAVIGATION EQUIPMENT.....	24
13.1 EQUIPMENT.....	24
14 COMMUNICATIONS.....	25
14.1 EQUIPMENT.....	25
15 LIFESAVING EQUIPMENT.....	26
15.1 LIFEBOATS AND RAFTS.....	26
15.2 EQUIPMENT.....	26
15.3 RESCUE CAPABILITY.....	27
15.4 MEDICAL FACILITIES.....	27
16 ACCOMMODATION.....	28
16.1 LIVING QUARTERS.....	28

16.2	CHARTERERS / CLIENT OFFICE / FACILITIES	28
16.3	GALLEY AND MESSROOM	29
16.4	WASH PLACES / TOILETS AND LAUNDRY	29
16.5	AIR CONDITIONING.....	29
17	VESSEL AND CREW CAPABILITIES	30
17.1	SPECIALISED CAPABILITIES	30
17.2	PAST RECORD OF THE UNIT.....	30
17.3	BARGE MASTER'S EXPERIENCE	30
17.4	BARGE ENGINEER'S EXPERIENCE	30
17.5	OTHER OPERATIONAL PERSONNEL EXPERIENCE	30
18	SHORE MANAGEMENT	30
18.1	TECHNICAL SUPERINTENDENCY	30
18.2	SPARE PART PROCUREMENT	30
18.3	BARGE MASTER / ENGINEER / OTHER OPERATIONAL PERSONNEL TOUR OF DUTY AND REPATRIATION	31
19	CONCLUSION	31

APPENDIX I – PTTEP CHECKLIST

APPENDIX II - DIGITAL IMAGES

1 INTRODUCTION

The Attending Surveyor for **AqualisBraemar (Thailand) Limited, Thailand** acting on behalf of the Undermentioned Principal(s) and behalf of **Interested Parties** did attend on board the vessel named below in order to establish the **Suitability and Operational Condition** of the unit and report as follows:

Acting on behalf of:

Messrs NIPPON & STEEL ENGINEERING CO., LTD.

Vessel Name : **“KUROSHIO II”**

2 PROPOSED USE OF THE NON-PROPELLED DERRICK LAY BARGE

2.1 Suitability and Operational Condition survey of the Derrick Lay Barge / Derrick Barge **“KUROSHIO II”** is conducted for the following specific proposed use for PTTEP Bundle Phase 2 Project (A3D, AWP39 G1 / G2) :-

- Installation of Pipeline
- Installation of Platforms

2.2 The Pipelay Equipment installed onboard the Non-Propelled Derrick Lay Barge is basically adopting the conventional S-Lay method for Pipelay operations.

2.3 The proposed use of the unit is for the contemplated operation was advised to commence within the month of March 2021 for a duration to be advised.

3 ATTENDANCE

3.1 Captain Ridwan Abu Bakar attended on board on the 14 and 15 January 2021 at Keppel Gul Shipyard, Gul Road, Singapore and together with the Vessel's stand in Barge Master, Barge Engineer and Barge Superintendent carried out the survey.

4 DESCRIPTION, PARTICULARS AND DOCUMENTATION

4.1 DESCRIPTION

4.1.1 The unit is a non-propelled, pipe laying derrick barge with a spoon bow and a square stern. A superstructure is constructed at the forward end, surmounted with a helideck. Along the centre of the barge is ranged a pipe laying system.

4.1.2 The hull is divided by several longitudinal and several transverse watertight bulkheads so forming various spaces for machinery, fuel oil tanks, potable water tanks, void tanks and water ballast tanks.

4.1.3 The unit has 10 points mooring system with accommodation superstructure incorporating a helideck forward and a derrick-revolving crane aft centre.

4.2 PARTICULARS

Ex-Name	:	Not applicable
Owners/Managers	:	Nippon Steel Engineering Marine Pte Ltd / Nippon Steel Engineering Co. Ltd.
Registry	:	Panama
IMO Number	:	8757396
Call Sign	:	3EOH7
Length (LOA)	:	140.00 metres
Breadth (Moulded)	:	34.00 metres
Depth (Moulded)	:	9.00 metres
Summer Loadline (Draft)	:	5.52 metres
Summer Freeboard	:	500 mm
Maximum Deadweight	:	Not applicable
Gross / Net Tonnage	:	13518 / 5055
Built By	:	Awazu Shipbuilding Co. Ltd., Tokushima, Japan
Year of Delivery (Built)	:	1976
Class By	:	American Bureau of Shipping (A.B.S)
Class Notation	:	✱ A1, Barge (E)
Accommodation Capacity	:	316 berths
Maximum Operating Water Depth	:	No information given
Minimum Operating Water Depth	:	Reported 4 metre underkeel clearance
Operational Limits		
- Wind	:	25 knots
- Sea	:	2.0 metres

- Swell : 2.0 metres
- Roll /Pitch : No information given

The above particulars were confirmed correct, as best as possible, with information made available on board.

4.3 LIFTING CAPACITY / DECK CARGO CARRYING AND OPERATIONAL AREAS / TANK CAPACITY

Clear Main Deck Space	:	No information given
Clear Main Deck Area	:	1907 metres ²
Deck Strength	:	6.0 – 13.0 tonnes / metres ²
Maximum Deck Cargo Capacity	:	Not applicable
		943 tonnes fixed over the stern @ 24.40
Main Block Capacity	:	metres
		725 tonnes fully revolving @ 27.40 metres
Auxiliary Block Capacity	:	272 tonnes @ 54.90 metres
Whip Block Capacity	:	45 tonnes @ 85.30 metres
Pipe Capacity on Deck	:	No information given
Maximum Pipe Size	:	48-inch diameter
Minimum Pipe Size	:	8-inch diameter
Fuel Oil Capacity	:	1717 metres ³ (100 %)
Fresh Water Capacity	:	2242 metres ³ (100 %)
Ballast Water Capacity	:	11736 metres ³ (100 %)

4.4 CERTIFICATES

	ISSUED BY	DATED	VALID	ENDORSED
Registry	Panama	15 May 2019	14 May 2024	-
Minimum safe Manning	Panama	27 June 2019	Permanent	-
Class	A.B.S	10 Dec 2020	31 Jan 2025	-
Loadline	A.B.S	10 Dec 2020	31 Jan 2025	-
Safety Construction	PMDS	10 Dec 2020	01 Apr 2024	-
Safety Equipment				
Safety Radio				
Int'l Oil Pollution Prevention	A.B.S	10 Dec 2020	31 Jan 2025	-
Int'l Air Pollution Prevention	A.B.S	10 Dec 2020	31 Jan 2025	-
Int'l Sewage Pollution Prevention	A.B.S	10 Dec 2020	31 Jan 2025	-

ISM Document of Compliance	Panama	11 Sept 2019	26 Aug 2024	-
ISM Safety Management System	Panama	10 Sept 2019	02 Sept 2024	-
Int'l Ship Security	Panama	18 Oct 2018	02 Sept 2024	-
Maritime Labour	Panama	11 Sep 2019	01 Sep 24	-
International Anti-fouling	A.B.S	10 Dec 2015		

4.5 DOCUMENTATION

Stability booklet including inclining experiment	: Endorsed by A.B.S dated 11 June 2012
Intact and Damage Stability Booklet available?	: No
Does it include condition for Lifting and Pipelay	: Yes
Does it include condition for Crawler Crane on Deck	: No
Date of last / next docking	: December 2020 / 2025
Date of last / next Special Survey	: No information
SOPEP / SMPEP	: Endorsed by A.B.S dated 04 April 1995
Garbage Management Plan and record book	: Updated
Cargo Securing Manual endorsed by Flag /Class	: Not applicable
Oil Record Book (Part 1) and record book entry	: New entry stated on 13 January 2021
Class Survey Status Report	: Printed on 10 January 2021
Register of Lifting Appliance	: Available in filing
Ship's Operations Manuals / Procedures onboard	: Available on board
(e.g. Mooring, Pipelay, Heavy Lift Operations)	
Last Flag / Port State Control Report (if applicable)	: No record of inspection carried out
Ballast Management Plan (if applicable)	: Available dated 13 February 2019

4.6 COMPANY POLICIES

- Is the company Health, Safety, Security and Environmental (HSSE) Policy on board : Yes
- Are there written procedures on board for Work Expected : Yes
- Are there signed company policies posted on board for HSSE, Drug and Alcohol : Yes

5 HULL, WATERTIGHT INTEGRITY AND FITTINGS

5.1 EXTERNAL

Both sides readily sighted	: From jetty and adjacent barge
Steel Fenders fitted	: Not fitted
Rubber Fenders fitted	: Not fitted
Wooden Fenders Fitted	: Yes, at each side hull
General Condition Steel/Rubber/Wooden Fenders	: Satisfactory
General Condition of Hull	: Satisfactory
General Condition of Hull Paint Work	: Generally intact
General Condition of Bulwarks / Railings	: Satisfactory
Marine growth worthy of note	: Slight marine growth

5.1.1 COMMENTS

Hull condition generally sound and intact.

5.2 INTERNALS

5.2.1 Tanks were not considered essential to enter on a manned Non-Propelled Derrick Lay Barge however, where could be sighted internally, from opened tank manholes, machinery spaces and store room etc., they were generally noted to be in satisfactory condition.

5.2.2 COMMENTS

Thickness gauging report of inspection carried out between 08 October 2020 to 23 November 2020 sighted on board.

5.3 WATERTIGHT INTEGRITY

Watertight door seals / sealing rims in good condition	: Satisfactory
Watertight door dogs securing arrangements operable	: Satisfactory
Tank ventilators in satisfactory condition / gauze fitted	: Yes
Sounding pipe valves / covers / caps in place	: Yes
Tank manhole covers properly secured (nuts / bolts / gasket)	: Yes, satisfactory
Windows and portholes intact and closable	: Yes, satisfactory
Watertight door indicator panel fitted / operable / tested	: Fitted
Deck hatch covers operable (if applicable)	: Yes, manually operated

5.3.1 COMMENTS

- Watertight door indicator fitted at control tower for sliding watertight door, tested and found satisfactory condition.
- Watertight integrity generally intact provided all watertight doors closed while at sea.

6 DECKS

6.1 MAIN DECK AND OTHER DECKS

Main Deck	: Timber sheathing open deck aft of the superstructure
Main Deck Steel Cladding	: Satisfactory
Main Deck with damage worthy of note	: None sighted
Main Deck Timber Sheathing condition	: Satisfactory
Other Decks well maintained	: Yes, satisfactory
All Decks painted with anti-slip paint	: Yes
Cargo Rails Height / Condition	: Satisfactory

6.1.1 COMMENTS

Generally in satisfactory condition.

6.2 HELIDECK

Location	: Forward above superstructure
Dimensions	: 22.00 metres x 22.00 metres octagonal shape
Maximum Load Capacity	: 9.50 tonnes
General Condition	: Satisfactory
Suitable for Helicopter Type	: Sikorsky S61N
Deck Markings	: Apparent
Deck painted with anti-slip paint	: Yes
Safety Net (Well Rigged / Condition)	: Not fitted
Helicopter Beacon	: Available in radio room
Lighting	: Satisfactory
Communication	: Satisfactory
Fire Fighting / Safety Equipment	: As per the fire plan and ready for immediate use
Re-fuelling Capabilities	: Yes
Valid Aviation Authority Certificate	: Not sighted

6.2.1 COMMENTS

Helicopter Landing Officer (HLO) and Helicopter Landing Assistance (HLA) will be assigned on board prior to mobilization, HLO and HLA certificate will be available onboard prior to mobilization.

7 ENGINE ROOM MACHINERY

7.1 AUXILIARY MACHINERY

7.1.1	Diesel Generator Prime Mover	: Daihatsu 6DK-26
	Alternator Make / Type	: Nishishiba Electric
	No. of Diesel Generators	: Four (4)
	Output	: 1500 kW @ 450 v, 3 ph 60 Hz
	Running Hours Since Last Overhaul	: All generator just completed full overhaul
	Machinery Tested (Parallel / Synchronised)	: Yes
	Emergency Trips and Alarms Operable	: Not tested, reported operational and tested weekly
	Critical and Major Spares carried	: Yes, as reported by the Chief Engineer (ship Inventory for critical and major equipment)
	Emergency Generator Fitted / Operable	: Yes, operational condition
	Location of Emergency Generator	: Aft crane deck
	Planned Maintenance in Operation	: Yes, computer based in house system
	Review of Log Book	: Complete entry and updated

7.1.2 COMMENTS

All the Diesel Engine Generators just completed full overhaul, tested and found generally working condition.

7.2 MAIN SWITCHBOARD

7.2.1	Main Switchboard Make	: Terasaki
	Gauges / Meters functional and clearly labelled	: Yes
	Earth Fault	: No
	Rubber mats on deck (front and rear)	: Yes
	Unshielded liquid pipework in close vicinity	: No
	Switchboard cabinets clear of obstruction	: Yes
	Ventilation Adequate	: Yes
	Synchronisation Tested	: Yes

7.2.2 COMMENTS

Reported in satisfactory operational condition.

7.3 SPARE PARTS

7.3.1	Spare parts for machinery / equipment carried on board are noted to be sufficient operating in remote areas for the duration of the proposed charter.
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7.4 BALLAST SYSTEM

7.4.1	Total Number of Ballast Tanks	: 21 tanks
	Total Ballast Tanks Capacity	: 11732 metre ³
	Maximum Ballast Pumping Rate	: 1100 metre ³ @ 100% capacity
	Ballasting Manual / Procedure onboard	: Yes / No
	Ballast Control Station	: Remote / Local / Location

Ballast Pumps

Make / Type / Model	: Electric motor driven
Number of Units	: Two
Capacity	: 550 metre ³ / hr each
Location	: Machinery space
Control	: Remote and Local

Ballast System Mimic Diagram

Available Onboard	: Yes at Ballast Control Station
Tank Level / Capacity Indicators	: Yes, Operational (Just fitted at Keppel Shipyard)
Valve Position Indicators (Open / Close)	: Yes, Operational
Draft Indicator	: No not fitted
Trim Indicator	: Not fitted
List Indicator	: Clinometer
Pump Suction & Discharge Gauges	: Yes, Operational
Ballast Tanks Level Gauging System	: Remote at Engineer office
Ballast Tanks Level / Capacity Sensors	: Yes, Operational
Ballast Valves Last Calibration Date	: System just fitted at Keppel Shipyard
Ballast Valves Tested (Remote / Local)	: No applicable. Manual valve
Ballast Pump Capacity Sufficient for Operation	: Local
Ballast Pump Function Tested	: Yes
Ballast Pumps Capacity Test carried out	: Yes, Operational
Communication for all Stations satisfactory	: Yes, Satisfactory
Ballast System Maintenance Record Available	: Yes

8 MOORING WINCH SYSTEM, MOORING EQUIPMENT / WIRES / BUOYS

8.1 MOORING WINCH

Make / Type (self-tensioning)	: Kitazawa single Drum Electro Hydraulic
Numbers	: Ten (10) set
Location	: Below main deck
Holding Capacity	: 270 tonnes
Stalling Capacity	: 138 tonnes
Hauling Speed / Load	: Max 60 tonnes at 15 m/min Min 3.5 tonnes at 210 m/min
Fleet Angles	: Fitted with swivel fairlead
Line Tension Meter Installed and Tested	: Yes, not tested
Line Tension Meter Calibration Certificate	: Last dated 05 January 2015
Wire Length Payout Meter Installed and Tested	: Yes, not tested
Line Payout Meter Calibration Certificate	: Last dated 05 January 2015
Normal Working Tension	: 15 to 20 tonnes
Pre Tension	: 30 tonnes
Brake System Tested	: Not tested
Spooling System Installed and Tested	: Yes, not tested
Tension Sheave/Swivel Fairlead well mounted	: Yes, satisfactory
Tension Sheave/Swivel Fairlead well maintained	: Yes, satisfactory
Control Station and Alarm System	: Remote, not tested
CCTV Monitor of Winch Operation	: Yes, Operational
Review of Maintenance and Test Record	: Computer base and updated
Sufficient Spares carried onboard	: Yes
General Condition	: Satisfactory

8.1.1 COMMENTS

Due to work activity while barge at shipyard, function test of the mooring winches and associated equipment cannot be carried out.

8.2 MOORING EQUIPMENT

Mooring Anchor Manufacturer / Type	: Delta Flipper type
Mooring Anchor Numbers / Size / Capacity	: 4 x 12000 kg on deck
Mooring Anchor Rack General Condition	: Satisfactory
Mooring Bollards (Numbers / Location)	: Eight (8) double bitts at each side Three (3) double bitts at stern
Mooring Bollards securely mounted on Deck	: Yes, satisfactory
SWL of Mooring Bollards marked	: Yes, rated at 50 tonnes SWL
Mooring Bollards well maintained	: Yes, satisfactory
Mooring Fairleads (Numbers / Location)	: None fitted
Mooring Fairleads securely mounted on Deck	: Not applicable
Mooring Fairleads well maintained	: Not applicable
Mooring Ropes (No. / Size / Condition)	: 12 / 10 ins circumference / satisfactory
Anchor Windlass (Type / Make / Condition)	: Shimonoseki Electrohydraulic
Weight of Barge Anchors (Port & Starboard)	: Port – 5610 kg Stbd – 5610 kg
Length of Barge Anchor Chain (Port & Starboard)	: Port – 12 Shackles length Stbd – 12 Shackles length
Spare Anchor Carried	: No
Capstan Port (Type / Make / Condition)	: None
Capstan Starboard (Type / Make / Condition)	: None
Tugger Winch Port (Type / Make / Condition)	: None
Tugger Winch Starboard (Type / Make / Condition)	: None
Chain Locker Capacity / Condition	: No information given
Yokohama Fenders Available Onboard	: Yes, stowed above the firing line

8.2.1 COMMENTS

Generally in a satisfactory condition.

8.3 MOORING WIRE / BUOYS

Type / Diameter / Socket Type	:	See comments
Spare Mooring Wire (Nos. / Size / Condition)	:	Not sighted
Storage of Spare Wire	:	Not applicable
Number & Type of Buoys	:	None
Ease in Change out of Spare Mooring Wire	:	Yes
Anchor Recovery Pennant Wires	:	Not sighted

8.4 COMMENTS

Mooring wires reported will be replaced with new prior to mobilization.

9 CRANES MACHINERY AND EQUIPMENT

9.1 HEAVY LIFT / DERRICK CRANE

Make / Type / Model	:	Clyde 60 pedestal crane
Rated Capacities (S.W.L) Main Hoist	:	943 tonnes fixed over the stern @ 24.40 metres 725 tonnes fully revolving @ 27.40 metres
Auxiliary	:	272 tonnes @ 54.90 metres
Whip	:	45 tonnes @ 85.30 metres
Boom Length	:	Main Hoist 70.10 metres Auxiliary Hoist 79.20 metres
Limitation of Single Hook Lifts	:	No information given
Wire Certificate (main hoist)	:	Available on board
Wire Certificate (auxiliary hoist)	:	Available on board
Crane Location	:	Aft Centre
Hook Height Curves	:	Posted at crane cabin
Lift Chart (Max. & Min) vs Radius	:	Posted at crane cabin
Derating Crane For Weather	:	Calculated in the monitoring system in crane cabin
Crane Winch Reeving Arrangement	:	28 parts for the Main block 8 parts for the Auxiliary block 2 parts for the Whip block
Heave Compensation Capability	:	No
Maximum Hook Travel (Main / Aux)	:	75.00 metre / 85.00 metre

Limiting Fleet Angles For Hook	:	1° transverse and 4° longitudinal
Slewing Speeds	:	No information given
Crane Storage / Hook Lay Down	:	Boom rest and hook bucket
Display Panel in Crane Cabin	:	Satisfactory
Communication & Lighting	:	Operational
Equipment	:	
Load Chart Posted	:	Yes
Radius Angle Indicator Operable	:	Not tested
Load Indicator Operable	:	Not tested
Load Indicator Last Calibration Date	:	Last dated 06 January 2015
Limit Switch / Audible & Visual Alarm	:	Operational
Man Riding Certification	:	No
Maintenance Record (Review)	:	As part of the Planned maintenance System
Last Load Test (Issued by/Date)	:	23 February 2018
Last Annual Examination	:	23 February 2019
Lifting Wire Last Change Out Date	:	Wire certificate dated 12 September 2017
Past Lift Records	:	Last lifting operation in 2018 for PTTEP platform installation
Crane Function Tested / Condition	:	Not tested
Tie-Back Capability	:	Fitted with two (2) Tie-Back
Tie-Back Winch Condition	:	Satisfactory
Tie-Back Winch Foundation	:	Satisfactory
Tie-Back Block Strong Point	:	Satisfactory
Condition	:	
Tugger Winches Capacity / Condition	:	Four (4) tugger winches of 10 tonne pull and 15 tonne brake holding

9.2 COMMENTS

The main crane was not tested due to shipyard restriction and no certified crane operator on board.

9.3 OTHER CRANES

Crawler Crane Make / Type / Model : HSC Cranes SCX1800A-3
Rated Capacity (S.W.L) : 175 tonnes @ 4.1 metre radius
Crane Location : Main deck starboard side
General Condition : New
Crane Storage/Hook Lay : Boom rest and hook secured by wire just
Down/Securing : to starboard and below the helideck

10 PIPELAY EQUIPMENT

10.1 GENERAL DESCRIPTION

10.1.1 The Pipelay Equipment installed onboard is basically adopting the conventional S-Lay method for Pipelay operations in relatively shallow waters to water depth of 120 metres.

10.2 CONTROL STATIONS

Stinger Monitoring : Stinger control room at stern main deck
Tensioner Control Panel : Stinger control room at stern main deck
Tensioner Control interfaces with DP system and range of setting (DP Vessel) : Not applicable
CCTV Monitors : Yes fitted
Pipe Handling Monitoring : Yes fitted

10.3 PIPE HANDLING FACILITY

Storage Area (Capacity) : Starboard side main deck
Maximum Pipe Size : 48 ins OD
Minimum Pipe Size : 8 ins OD
Longitudinal Conveyor : Satisfactory
Transverse Conveyor : Satisfactory
Transfer Car : Not fitted yet
Pipe Handling Davit : Overhead chain block
Line Up Station : Not being fitted yet

10.4 BEVELLING SYSTEM

Beveling Station : Not yet been set up at main deck
Beveling Facing Machine : Not yet been fitted
Power Pack Unit : Not yet been fitted

10.5 WELDING STATIONS

Pre-Heating Station : Station 1
Number of Welding Stations : Four (4)
Welding Machine - Type : Not yet been fitted
- Model : Not applicable
- Nos. : Not applicable
- Condition : Not applicable

10.6 X-RAY / NDT STATION

NDT Equipment Calibrated : Not yet been fitted
NDT Equipment in good condition : Not yet been fitted
Approved NDT Procedure : Not applicable
Qualification of NDT Personnel : No
Dark Room fully Equipped : Not yet been fitted

10.7 GRIT BLASTING STATION

Machinery / Equipment : Not yet been fitted
Power Pack Unit : Not yet been fitted

10.8 FIELD JOINT COATING & FOAM INFILL STATION

Field Joint Corrosion Coating Equipment : Will be provided by sub-contractor
Field Joint Corrosion Applicator Skilled : Will be provided by sub-contractor
Field Joint Infill : Will be provided by sub-contractor
Field Joint Infill Equipment : Will be provided by sub-contractor
"Holiday Detector" available onboard : Will be provided by sub-contractor
"Holiday Detector" Operators Skilled : Will be provided by sub-contractor

10.9 TENSIONERS

Make / Type / Model	: Westech LPT 165S
Description	: Hydraulic operated
Number of Units	: Two
Maximum Tension	: 75 tonnes
Maximum Laying Speed	: No information given
Length	: No information given
Height	: No information given
Width	: No information given
Weight	: No information given
Pipe Squeeze Rollers / Rubber Pads	: Satisfactory
Airbag for Squeeze Rollers for Pipe	: Satisfactory
Power Pack	: Satisfactory
Tensioner Last Load Test	: No record of last test
Last Loadcell Calibration Certificate	: No record of last calibration

10.10 PIPE HANDLING DAVITS

- 10.10.1 Not fitted with pipe handling davits. Barge provided with crawler crane for pipe handling.

10.11 STINGER

- 10.11.1 No stinger sighted on board.

10.12 PIPELINE ABANDON & RECOVERY WINCH

Make / Type	: <u>Westech 350</u>
Location	: Main deck port side forward
Load Capacity	: 160 tonnes
Power Pack	: Satisfactory
Wire Length / Capacity / Certificate	: 75 mm diameter x 1000 metre
Load Test Certificate	: Not sighted
Load Cell Calibration Certificate	: Not sighted
Control System	: Control tower
General Condition	: Not tested

11 TOWING EQUIPMENT AND ARRANGEMENT

11.1 MAIN TOWING EQUIPMENT AND ARRANGEMENT

11.1.1 Main Towing Brackets

100 mm thickness (50 mm main plate and 25 mm cheek plate at each side) and 120 mm diameter pin hole are installed forward, on doubler plate, 2.80 metres and 7.50 metres inboard from the bow and side shell respectively, noted in satisfactory condition. The Minimum Breaking Load (MBL) was not advised.

11.1.2 Main Towing Fairleads

Two Panama type fairleads on doubler plates are fitted forward of the tow pad eye, noted in satisfactory condition.

11.1.3 Main Towing Bridle

Not fitted.

11.1.4 Bridle Recovery

Not fitted.

11.2 EMERGENCY TOWING ARRANGEMENT

11.2.1 Emergency Towing Brackets

100 mm thickness (50 mm main plate and 25 mm cheek plate at each side) and 120 mm diameter pin hole are installed forward, on doubler plate, 2.90 metres and 6.60 metres inboard from the bow and side shell respectively, noted in satisfactory condition. The Minimum Breaking Load (MBL) was not advised.

11.2.2 Emergency Towing Fairleads

Not fitted.

11.2.3 Emergency Towing Bridle

Not fitted.

11.2.4 Emergency Pick Up Lines

Not fitted.

11.3 NAVIGATION LIGHTS AND TOWING SHAPE

11.3.1 Navigation light stands and screens were noted in satisfactory condition and correctly placed.

11.3.2 Navigation lights were of the required pattern, correct arc of visibility was fitted.

11.3.3 Power source for the navigation lights is from the unit main electrical source and panel at control tower.

11.3.4 The International shape for a vessel under tow available onboard and ready to be hoist and prominently display.

12 FIRE FIGHTING CAPABILITY

12.1 MACHINERY

12.1.1	Main Fire Pump	: 90 metres ³ / hr @ 70 metres hd
	Emergency Fire Pump	: 90 metres ³ / hr @ 70 metres hd
	Water / Foam Monitors	: Two (2) at helideck
	Fifi Pump	: Not fitted
	Water Curtain	: Not fitted

12.2 EQUIPMENT

12.2.1	Fixed Fire Fighting System (Type)	: CO ₂ system
	System Last service	: 26 February 2020
	System Operating Instruction Posted	: Yes
	System Maintenance / Inspection Records	: Updated
	Fire Detection Systems (Type)	: Heat and Smoke
	Fire Detection Systems Alarm Tested	: Not tested
	Portable Extinguishers (No. / Type / Capacity)	: As per the Fire & Safety Plan
	Portable Extinguishers last serviced	: 26 February 2020
	Fire Axe	: As per Fire & Safety Plan

Fireman's outfit With Lifeline	: 12 complete sets
Breathing Apparatus With Spare Bottles	: 12 complete sets
Air Compressor / Approved Filter	: Fitted on board
Emergency Escape Breathing Devices (EEBD)	: Provided as per the Fire & Safety Plan
International Shore Connection	: Complete with gasket and bolts and nuts
Fire Control Plan	: Posted at common area
Hydrants	: Satisfactory
Hoses and Nozzles (Jet / Spray)	: As per the Fire & Safety Plan
Fire Fighting Appliances Maintenance Record	: Updated

12.2.2 COMMENTS

The Fight Fighting equipment reported will be serviced by shore contractor prior to mobilization.

13 NAVIGATION EQUIPMENT

13.1 EQUIPMENT

Radar	: Furuno FAR 2127-20AF
Gyro Compass	: Tokimec ES110
Gyro Repeaters	: One at control tower
Magnetic Compass	: Daiko Standard Compass
Magnetic Compass Deviation Card	: Not available
GPS	: Furuno GP-31 Furuno GP-32 Furuno GP-33
Navtex Receiver	: Not fitted
Weather Fax	: Not fitted
Charts for Area of Operations	: To be provided
Publications	: To be provided
Sextant	: None
Echo Sounder	: JRC JFE-380
Clear View Screen	: Not fitted
Navigation Lights	: Satisfactory
Binoculars	: 2 pairs
AIS	: Furuno FA-150
Anemometer	: Koshin Denki
Barometer	: Wall mounted gauge type

13.1.2 COMMENTS

Weather forecast received by third party weather routings.

14 COMMUNICATIONS

14.1 EQUIPMENT

Sat. Comm. Inmarsat “M”	:	870-762-928-1100 (Tel) 870-762-928-111 (Fax)
Sat. Comm. Inmarsat “B”	:	873 335209310 (Tel) 873 335209312 (Fax)
Sat. Comm. Inmarsat “F”	:	870-764-357944 (Tel)
Are DSC's GPS linked	:	Yes
Single Side Band (SSB)	:	JRC JSB-171
VHF 1)	:	JRC JHV-227
2)	:	ICOM IC-M59 (Two (2) units)
3)	:	ICOM IC-M45
Portable VHF / Radio	:	20 x Motorola
Portable VHF (GMDSS) + spare battery	:	3 x McMurdo
EPIRB 406/121.5mhz	:	Not sighted
S.A.R.T.	:	Not sighted
Aldis Lamp/Portable Battery Box	:	Available
Signal Flags	:	Complete set
International Code Book	:	Edition 2005
GMDSS Handbook	:	Not on board
GMDSS Shore Based Maintenance	:	No certificate issued
Bell/Horn	:	Air horn
Internet Access Available and Operational	:	Yes

14.1.2 COMMENTS

EPIRB and SART were reported kept for safekeeping while barge in shipyard.

15 LIFESAVING EQUIPMENT

15.1 LIFEBOATS AND RAFTS

15.1.1	Number of Lifeboats	:	None on board
	Date lifeboats last lowered / engine started	:	Not applicable
	Lifeboat davit falls well-greased / maintained	:	Not applicable
	State of lifeboat equipment	:	Not applicable
	Number / Capacity of Liferrafts	:	Not on board
	Date of Last service of Liferrafts	:	Serviced ashore
	Liferrafts easily launched / thrown overboard	:	Life raft cradle provided
	Are hydrostatic releases correctly fitted	:	Not fitted
	Hydrostatic releases expiry date	:	Not fitted
	Embarkation Ladder (No. / Condition)	:	One at each side and satisfactory

15.1.2 COMMENTS

Life raft sent ashore for annual servicing.

15.2 EQUIPMENT

15.2.1	Lifebuoys with	1) Light and MOB Smoke	:	Two (2) sets
		2) With Light	:	Six (6) sets
		3) With Line	:	Eight (8) sets
		4) Others	:	Six (6) sets without light and line
	Lifejackets (125%)	:		Total of 419 set
	Line throwing apparatus	:		Total of 4 sets
	Pyrotechnics (Type / No. / Expiry date)	:		Parachute / 4 / April 2021
		:		Hand Flare / 6 / October 2021
		:		Orange Smoke / 2 / May 2021
	Survival Suits	:		None on board
	Immersion Suits	:		None on board
	Search Lights (No. / Watt / Location)	:		Two (2) x 2000 watts

15.2.2 COMMENTS

Generally in satisfactory condition and ready for use.

15.3 RESCUE CAPABILITY

15.3.1	Man Overboard Boat / Fast Rescue Craft	: Sent ashore for servicing
	Launching & Recovery System for MOB / FRC	: Launching davits
	MOB / FRC Equipment	: Sent ashore for servicing
	Search and Rescue Manual	: Not sighted
	Cutting / Burning / Welding Equipment	: Available on board
	Salvage / Submersible Pumps (c/w Hoses)	: Available on board

15.3.2 COMMENTS

Rescue board sent ashore together with the life rafts for servicing.

15.4 MEDICAL FACILITIES

15.4.1	Hospital	: Below main deck with one berth
	Medical Equipment	: Reported sufficient for vessel operation
	Pharmacist Certification	: To be renewed
	Stretcher (Paraguardtype)	: Available on board
	Portable First Aid Kit	: Three (3) sets
	Oxygen Resuscitator	: Complete set with spare bottles
	Defibrillator	: None
	Medic available onboard	: No

15.4.2 COMMENTS

Doctor / medic will be on board prior to mobilization.

16 ACCOMMODATION

16.1 LIVING QUARTERS

16.1.1	Number of single cabins	: Four (4) cabins
	Number of double cabins	: Twenty-six (26) cabins
	Number of 4 / 6 / 8 berth cabins	: Sixty-five (65) cabins x 4 berths
	Total Berths	: Three hundred sixteen (316) berths
	State of cleanliness	: Satisfactory
	Signs of cockroach infestation	: None sighted
	State of cabin mattresses	: Satisfactory
	Bunk reading lights operable	: Operational
	Hospital	: Below main deck with 1 berth
	Gymnasium and Recreation Room	: Control tower deck
	Maximum Manning on Safety Equipment Cert.	: Three hundred sixteen (316) persons

16.1.2 COMMENTS

Generally satisfactory housekeeping maintained.

16.2 CHARTERERS / CLIENT OFFICE / FACILITIES

Project Office Size / Location / Furnishing	: Available with soft furnishing
OIC Office Size / Location / Furnishing	: Available with soft furnishing
Conference Room Size / Location / Furnishing	: Available with soft furnishing
Internet Access Available and Operational	: Yes

16.2.2 COMMENTS

Generally in a satisfactory condition.

16.3 GALLEY AND MESSROOM

16.3.1	State of Cleanliness	: Satisfactory
	Signs of cockroach infestation	: None sighted
	All Galley equipment operable	: Yes
	Fire Blanket / Fire Extinguisher provided	: Available in galley
	State of compressors for Chiller / Freezer	: Satisfactory
	Temperature of Chiller / Freezer	: 5 deg. C / -15 deg. C
	Chiller / Freezer Capacity	: No information given
	Alarm fitted / doors open from inside	: Yes and operational
	Seating capacity messroom	: 60 persons

16.3.2 COMMENTS

Generally satisfactory housekeeping maintained.

16.4 WASH PLACES / TOILETS AND LAUNDRY

16.4.1	How many separate wash places / toilets	: All cabins in superstructure have attached toilets, below main deck two common bathrooms
	State of cleanliness	: Satisfactory
	All Toilets / Showers operable	: Yes, where randomly inspected
	Hot / Cold water available	: Yes
	No. of Domestic / Industrial washing machines	: Three (3) industrials
	No. of Domestic / Industrial driers	: Three (3) industrials

16.4.2 COMMENTS

Washing and drying carried out by the stewards, joining prior to mobilization.

16.5 AIR CONDITIONING

16.5.1	Compressor and Air Handling Unit operable	: Satisfactory
	Sufficient spare parts and gas onboard	: Yes

17 VESSEL AND CREW CAPABILITIES

17.1 SPECIALISED CAPABILITIES

The unit is a pipe lay barge with heavy lift crane for offshore installation.

17.2 PAST RECORD OF THE UNIT

17.2.1 The unit had been engaged for pipeline installation, platform installation and commissioning task for same proposed area.

17.2.1 COMMENTS

As far as we could be determined, based on available information onboard, all the above projects were successfully executed with no incident or loss reported.

17.3 BARGE MASTER'S EXPERIENCE

Barge Master will be assigned prior to mobilization.

17.4 BARGE ENGINEER'S EXPERIENCE

Barge Engineer will be assigned prior to mobilization.

17.5 OTHER OPERATIONAL PERSONNEL EXPERIENCE

Full marine crew and project personnel not been assigned yet due to local COVID restriction, however will be on board prior to mobilization.

18 SHORE MANAGEMENT

18.1 TECHNICAL SUPERINTENDENCY

Technical instruction and information from Singapore based office.

18.2 SPARE PART PROCUREMENT

Requisition forward to Singapore based office and be arranged for supply at convenient port.

18.3 BARGE MASTER / ENGINEER / OTHER OPERATIONAL PERSONNEL TOUR OF DUTY AND REPATRIATION

Barge Master / Engineer - 2 months on / 1 month off
Other Operational Personnel - 2 months on / 1 month off

18.3.1 COMMENTS

Tour of duty and repatriation varies, taking into consideration of the vessel operation schedule and location.

19 CONCLUSION

19.1 With the information presently made available and subsequent to our physical inspection, we have found Derrick Lay Barge "KUROSHIO II" to be suitable for the proposed operations, within the vessel's design criteria and operational limitations, provided the following Technical Aspects are satisfactorily reviewed and approved by our office:

- 1) Offshore Installation (i.e. all the relevant offshore lifting, offshore upending, offshore piling etc.) procedures and analyses.
- 2) Offshore Pipelay related procedure and analyses.
- 3) Tow Manual

19.2 With regards to the Marine Aspect, the following list of observations / recommendations are to be satisfactorily complied with:

- 19.2.1 Helicopter Landing Approval Certificate issued by the local Aviation Authority may be require for the proposed operating area.
- 19.2.2 Mooring winches to be function test including the brake holding to ensure satisfactory operational condition.
- 19.2.3 Mooring wire length and tension monitoring system last calibrated on 05 January 2015. These to re-calibrated and certificate to be made available on board.
- 19.2.4 New mooring wires reported will be installed. Certificates of the new mooring wires to be made available onboard including certificates for the socket.

19.2.5 Anchor buoys, together with recovery pennant to be provided on board. Certificate of the leak test to be kept on board and the anchor buoys to be kept on board away from seas and properly secured.

19.2.6 Main crane and the crawler crane to be function test to ensure satisfactory operational condition.

19.2.7 Last annual inspection for the main crane dated 23 February 2019. Due for annual inspection.

19.2.8 Manriding certificate / approval for both the main and crawler crane to be provided.

19.2.9 The pipe laying bevelling equipment, welding equipment, X-ray equipment, grit blasting and join coating equipment not yet been fitted with including procedure.

19.2.10 Life rafts sent ashore for inspection and service, to be returned on board and secured to the cradle with hydrostatic release unit attached prior to mobilization.

19.2.11 Fire Fighting equipment due for annual servicing in February 2021. To be kept in date.

19.2.12 To provide up-to-date nautical charts and publication for the proposed area of operation.

19.2.13 EPIRB annual test to be carried out and to ensure that the Battery and Hydrostatic release unit are valid.

19.2.14 Upon completion the work on the bottom frame and re installed the Oily Water Separator, simulation test to be carried out to ensure in operational condition. The overboard discharge valve to be positively closed and warning notice to be posted.

19.2.15 Pharmacist certificate not sighted. A copy of the certificate to be kept on board.

19.2.16 The following to be discussed and agreed to between the "KUROSHIO II" and towing vessel/s but not limited to;

- Towing gear arrangement and connecting procedure
- Towing route
- Common communication channel and working language
- Contingency plan

19.2.17 To fit a main towing bridle consisting of chafing chain and wire bridle plus forerunner pennant, all these to have a minimum breaking strength of 3:1 to the bollard pull of the proposed tug:

- 2 x chafing chains of sufficient length to satisfactorily clear the deck edge.
- 2 x wire pennants with hard eyes at each end and of a minimum length equal to the distance between the towing brackets.
- A delta plate and/or shackles at the apex.
- A forerunner pennant wire of a minimum length equal to the wire pennant.

19.2.18 To fit an emergency towing bridle consisting of chafing chains and wire pennants plus **forerunner pennant wire**. All these to have a minimum breaking strength ratio 3:1 to the bollard pull of the tug and comprised of the following:


- 2 x chafing chains of sufficient length to satisfactorily clear the deck edge.
- 2 x wire pennants with hard eyes at each end and of a minimum length equal to the distance between the towing brackets.
- A delta plate and/or shackles at the apex.
- A forerunner pennant wire of minimum length $\frac{3}{4}$ the length of the barge to be connected the apex lead along one side of the unit and soft lashed to the deck edge.
- A polypropylene pick up line of a minimum length of 50.0 metres, attached to the end of the forerunner pennant wire and similarly lead along the side of the unit and soft lashed.
- A Norwegian buoy with light line, attached to the end of the polypropylene pick up line, ready to be floated astern on the departure of the unit.

19.2.19 The minimum size of connecting shackles for the towing equipment to have a minimum breaking strength ratio of 3:1 to the bollard pull of the tug.

19.2.20 Certificates of the towing gears to be made available to the attending surveyor.

APPENDIX I

PTTEP CHECKLIST

	Marine Inspection Check List	Vessel Name: KUROSHIO II
		Port: Keppel Gul Shipyard, Singapore
		Date: 14-15 January 2021
		Page: 1 of 1

Item	Description	Yes	No	N/A	Comments
1	Conventional Mooring				
1.1	Anchor Type and weight	✓			4 x 12 tonnes Delta flipper on eck
1.2	The fluke/shank angle of anchor	✓			
1.3	Anchor spare is available and note for amount with type and weight		✓		
1.4	Mooring lines materials (wire rope, chain)			✓	New mooring wire will be installed
1.5	Mooring wire length and size (diameter)			✓	New mooring wire will be installed
1.6	Mooring winch capacity / break capacity			✓	New mooring wire will be installed
1.7	Latest tested date of mooring winch and break			✓	New mooring wire will be installed
1.8	Mooring equipment, brakes, wires and lines are in good condition			✓	Anchor Winch cannot be tested at shipyard
1.9	Fairleads, rollers, bitts are in satisfactory condition	✓			
1.10	Emergency release is regularly tested			✓	No record of testing since last assignment in 2018
1.11	Grooved drum is in satisfactory condition	✓			
1.12	Tensionmeter is operational and note of latest calibration date		✓		To be re calibrated
1.13	Pay out length meter is operational and note of latest calibration date			✓	
1.14	Connecting elements (shackle, swivel, etc.) are in satisfactory condition	✓			Shackles rusted but still in intact condition
1.15	Certificate of mooring accessories are available			✓	New wire to be installed
1.16	Winch seating and connections to deck is sound	✓			
1.17	Spare mooring lines are available			✓	Will be newly supplied
1.18	Pennant wire amount in use and spare			✓	Not sighted
1.19	Pennant wire length and size (diameter)			✓	Not sighted
1.20	Anchor buoy amount in use and spare			✓	Not sighted
1.21	Anchor buoy type, size and reserved buoyancy			✓	Not sighted
1.22	Damage prevention buoy amount in use and spare			✓	Not sighted
1.23	Damage prevention buoy type, size and reserved buoyancy			✓	Not sighted
1.24	Central control of mooring winch is provided	✓			
1.25	CCTV are installed and all are operational	✓			

APPENDIX II

DIGITAL IMAGES

Remarks:

The unit moored alongside at Keppel Shipyard, Gul Road, Singapore carrying out general work on deck and maintenance on machinery.

Same time in preparation for mobilization.

Reported will shift to POE Yard for further mobilization work to be carried out.

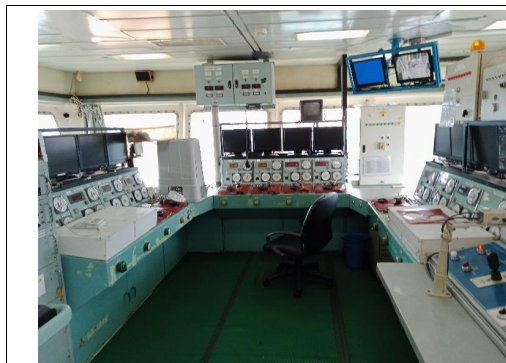
Testing and calibration of equipment will be carried out prior to mobilization.



1) General view of the main deck starboard side.



2) General view of the main deck port side.



3) General view of the control tower.



4) General view of Main crane.



5) General view of Crawler crane.



6) Anchor mooring winch console station at control tower.



7) Anchor mooring winch at below main deck.



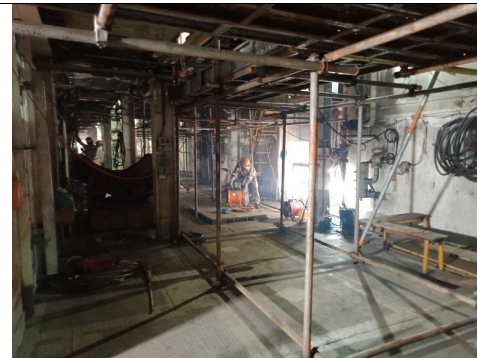
8) Anchor mooring winch.



9) Pipeline lining up station.



10) Overhead crane at pipeline lining up station.



11) Bevelling station, equipment to be fitted.



12) Pipeline guide in the firing line.



13) Pipelay tensioner.



14) Firing line view from stern.



15) Pipelay tensioner console at control tower.



16) Ballast pump.



17) Newly fitted ballast tank level monitor.



18) Main generator.



19) Ballast tank valve.



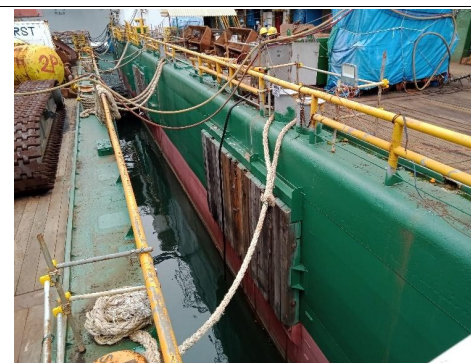
20) Switchboard in machinery space.



21) General view of the helideck.



22) General view of the starboard hull.



23) General view of the port hull.



24) General view of the stern.



25) Main and emergency towing pad eye at forward.



26) Towing pad eye and fairlead.




27) Fire pump in machinery space.

เอกสารแนบที่ 75

ตัวอย่างแผนและผลการดำเนินงานติดตั้ง

Offshore Installation Schedule for Platforms in 2021 Installation Campaign

PTTEP Bundled-2(A3D) 3PFs+AWP39+ Bongkot 4PFs

2

เอกสารแนบที่ 76

ตัวอย่างรายงาน Daily Report

NIPPON STEEL ENGINEERING CO.,LTD.**EPCI FOR ARTHIT PHASE 3D, AWP-39, G2/61 Phase 1A**

DAILY PROGRESS REPORT

FILE NO. : PTTEP 2021 DLBK2-DPR139
 DATE : 05-Oct-21
 BARGE : DLB KUROSHIO-2
 MODE : WP47 PLATFORM INSTALLATION & TIE-IN
 CLIENT : PTTEP
 LOCATION : GREAT BONGKOT NORTH
 WATER DEPTH : 77M
 COMPANY SITE REPRESENTATIVE : WUTTIPONG POUNGTHIP
 BARGE SUPERINTENDENT : KASAMATSU SHIMPEI
 ASSISTANT BARGE SUPERINTENDENT : UNOZAWA KUNITAKA
 CONSTRUCTION MANAGER : SASAKI SHIGETA
 FIELD ENGINEER : SAKAMOTO YUGO, MUHD NAZHIM, LINUS KOH JINJIE, YAMADA YUUKI, TACHIZAKI RIKU
 BARGE FOREMAN : ANGGA ANAK JALUCK, BILLY ANAK RAONG

01. POSITION AND WEATHER REPORTS:

Description	0600HRS	1200HRS	1800HRS	2400HRS
Latitude	08°10.581' N	08°10.573' N	08°10.572' N	08°10.609' N
Longitude	102°13.737' E	102°13.718' E	102°13.711' E	102°13.711' E
Barge Hdg	270.2°	270.0°	270.0°	270.0°
Wind (dir/spd)	WNW / 18~21kts	WNW / 13~14kts	W / 20~22kts	WNW / 15~20kts
Sea / Swell (Height)	Moderate / 0.8~1.0m	Moderate / 0.9~1.0m	Moderate / 1.0~2.2m	Moderate / 0.9~2.2m
Weather	Rainy	Rainy	Partly Cloudy	Cloudy
Visibility	4~5 nm	5~6 nm	6~7 nm	5~6 nm

1.1 TEMPORARY MOORING SYSTEM POSITION:

Latitude:	08°13.170'N / 909655m	Longitude:	102°10.890'E / 850913m	Relocated on 23rd September 2021
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1.2 GL39 PL DMA MOORING SYSTEM POSITION:

Latitude:	07°55.595'N / 877784m	Longitude:	102°47.128'E / 917854m	Deployed on 21st July 2021
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1.3 GL26R PL DMA MOORING SYSTEM POSITION (added on 27-September):

Latitude:	07°57.040'N / 880423m	Longitude:	102°45.401'E / 914651m	Relocated by K1 on 19th Aug 2021
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1.5 SL47 PL DMA MOORING SYSTEM POSITION:

Longitude:	08°08.430'N / 900979m	Longitude:	102°15.765'E / 859947m	Deployed on 22nd September 2021
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02. DAILY HSE REPORT:**2.1. HSE STATISTICS:**

EPCI FOR ARTHIT PHASE 3D, AWP-39, G2/61 Phase 1A					
Item	Description	Today	Previous	Accumulative	Remarks
1	Day Without LTI	1	138	139	
2	Lost Time Injury (LTI)	0	0	0	
3	Non-Lost Time Injury (Non-LTI)	0	0	0	
4	Incident (HIPO)	0	0	0	
5	Medical Treatment Case (MTC)	0	1	1	11.09 (Eye Injury)
6	First Aid Case (FAC)	0	4	4	25.06(Finger Laceration), 12.07(Fell from Ladder), 09.08(Calf Laceration) 21.09 (Abrasion Wound at Head)
7	Restricted Work Case (RWC)	0	0	0	
8	Medevac / Casevac	0	0	0	
9	Property Damage/ Property Loss	0	2	2	23.06(Tugger Line Parted), 11.07(Holding Line Parted),
10	Environmental Case	0	0	0	
11	Near Miss	0	1	1	30.09 - Barrier tape scalded
12	Occupational Illness	0	0	0	
PTTEP Man-hours		72	9276	9348	
NSE+TNS Man-hours (DLB-K2)		3240	441528	444768	
NSE Man-hours (Vessel spreads)		552	97596	98148	
Total Man-hours		3864	548400	552264	
Total Man-hours WORKED INSIDE 500M ZONE OF PTTEP FACILITIES		0	35384	35384	
Total Man-hours WORKED OUTSIDE 500M ZONE OF PTTEP FACILITIES		3864	513016	516880	

2.2. ACT / ANOMALY STATISTICS:

Item	Description	Today	Previous	Accumulative	Remarks
1	UNSAFE CONDITION	4	977	981	
2	UNSAFE ACT	3	806	809	
3	SAFE OBSERVATION	18	1443	1461	
Total		25	3226	3251	
Item	Description	Today	Previous	Accumulative	Remarks
1	HRC	0	2	2	24.07, 23.08

2.3. DRILL & EXERCISE

Item	Description	Today	Previous	Accumulative	Remarks
1	- Emergency Fire Rescue & Stretcher Drill	0	4	4	22.06, 10.07, 23.08, 21.09
2	- HRC/ Diver Rescue drill	0	1	1	03.07
3	- Man Overboard Drill	0	2	2	13.07, 29.09
4	- Helicopter Emergency Drill	0	2	2	22.06, 21.09

5	- Medical Evac. & Handling of Casualties Drill / COV	0	1	1	Combined CS & Medical Drill-07.05.2021
6	- Oil Spill Drill	0	2	2	07.05, 25.09
7	- Ship Security Drill	0	2	2	07.05, 18.08
8	- Abandon Ship Drill	0	4	4	19.06, 03.08, 09.09
9	- Muster Drill	0	5	5	19.06, 10.07, 03.08, 09.09
10	- Radiation Drill	0	1	1	14.07
11	- Desktop Drill / Soft Test Communication Drill	0	2	2	19.05, 02.07
12	- Gangway Drill	0	0	0	
Total		0	26	26	
1	- Safety Stand up	0	0	0	
2	- Management Walkthrough Audit	0	17	17	04.06, 18.06, 25.06, 02.07, 09.07, 16.07, 24.07, 30.07, 07.08, 13.08, 21.08, 26.08, 03.09, 10.09, 17.09, 24.09, 01.10
Total		0	17	17	
1	- Hygiene & Sanitary Inspection	0	18	18	04.06, 14.06, 19.06, 23.06, 30.06, 07.07, 14.07, 21.07, 28.07, 04.08, 11.08, 18.08, 25.08, 01.09, 08.09, 15.09, 22.09, 29.09
Total		0	18	18	

2.4. PRE-TASK MEETING/DAILY TOOL BOX TALK

Item	Department	Today	Previous	Accumulative	Remarks
1	- RIGGING	2	248	250	Safety Moment : Safety First
2	- WELDING	2	248	250	Safety Moment : Safety First
3	- ENGINE DEPARTMENT	2	248	250	Safety Moment : Safety First
4	- SURVEYOR (Fugro)	2	248	250	Safety Moment : Safety First
5	- DIVERS (OWA)	2	230	232	Safety Moment : Safety First
6	- ROV (PAGEO)	2	230	232	Safety Moment : Safety First
7	- NDT (OTI)	2	248	250	Safety Moment : Safety First
8	- CATERING (SPF)	2	248	250	Safety Moment : Safety First
9	- AUTO WELD	2	248	250	Safety Moment : Safety First
10	- SSHE	2	248	250	Safety Moment : Safety First
11	- FIELD JOINT COATING (RAE)	2	248	250	Safety Moment : Safety First
12	- SOMESHA (Pile Monitoring)	1	56	57	Safety Moment : Safety First
Total		23	2748	2771	

2.5 HSE Activities

2.5.1	Applied new, revalidated and closed NSENGI PTW for works carried out onboard (Rigging, Welding, Engine Dept & Sub-cons).
2.5.2	Attended Daily Progress meeting.
2.5.3	Input daily ACT cards submission for the day and follow up on the close out.
2.5.4	Facilitated daily SSHE Department meeting.
2.5.5	Attended Supervisor meeting and Toolbox talk meeting with work team, highlighted SSHE Statistics, awareness and conducted Daily SSHE Rules briefing.
2.5.6	Monitored SSHE Compliance for all activities on board K2.
2.5.7	Conducted SSHE Awareness training with topic "Electrical Safety Awareness for Non-Electrical Workers".
2.5.8	Facilitated Monthly SSHE Committee Meeting for the Month of September 2021 (B-shift and Night-shift).
2.5.9	Conducted Weekly Personal Transfer Basket Inspection.
2.5.10	Conducted Weekly LSI Compliance Check (Inspection).
2.5.11	Conducted Bi-Weekly Work Vest Inspection.
2.5.12	Conducted Bi-Weekly Full Body Harness Inspection.
2.5.13	Facilitated Weekly ACT & Monthly Safety Campaign Awarding ceremony @ 1150 hrs, at port side muster station.
2.5.14	Launched the October Monthly Safety Campaign "Electrocution & Burning Injury Free".
2.5.15	Made poster for weekly ACT and monthly campaign winners and posted at notice board.
2.5.16	Monitor the incoming/outgoing of personnel and transfer of cargos from CB TMS8 to K2 deck (vice versa).
2.5.17	Assisted Medical Team for the face recognition registration of first timer onboard personnel.
2.5.18	Give SSHE induction and PTTEP Complacency Awareness to newly onboard personnel.
2.5.19	Updated muster list and deployed muster/remote tag as per crew movement.
2.5.20	Coordinated with BQP for PTW activation.

03. PROGRESS NARRATIVE: 05-Oct-21

FROM	TO	Work Description	D/T (hours)
		WP47 PLATFORM INSTALLATION & TIE-IN	
0:00	0:08	Continue shift K2 position for deploying 5P and 6P after clear off platform	
0:08	0:53	AHT Ena Treasure reconnect 5P anchor socket, run to target and deployed.	
0:53	1:25	AHT Ena Griffin reconnect 6P anchor socket, run to target and deployed.	
1:25	1:30	Shift K2 position toward SL47 PL flooding location at KP=-0.082, OT=75.2m Hdg=270°	
1:28	1:40	Preparation SAT bell launch for SL47 PL flooding and Spool installation	
1:40	1:57	SAT Bell in the water, left surface and launch to bottom.	
1:57	2:31	SAT Divers, lock out then move to SL47 Laydown Head location and set downline.	
2:07	2:19	Attached single hoist lifting wire onto 4" Flooding hose then bring to port stern and hold.	
2:31	2:44	SAT Divers, disconnect 4" blind flange of Laydown head then installed the 4" extension elbow.	
2:34	2:45	Lower down 4" Flooding Hose toward Laydown Head location assist guide by SAT Divers.	
2:45	3:02	SAT Divers, connect the 4" Flooding hose onto 4" extension elbow of SL47 Laydown Head.	
3:02	3:15	Deck crew setup flooding hoses onto water pump and chemical pump at K2 stern.	
3:15	5:12	SAT Divers, open valve and start flooding SL47 PL by pumping treated sea water. Chemical injection is performed with chemical pump.	

4:11	4:33	SAT Divers, loosen bolts and nuts of SL47 Pipeline Laydown Head (Partially removed)	
5:12	5:38	Completed SL47 PL Flooding, SAT Divers disconnect 4" Flooding hoses and recovered to surface.	
5:23	6:03	SAT Divers, removed all the remaining studbolts of SL47 Laydown Head then set recovery Rigging.	
5:38	5:49	De-rig Right single hoist block and set wire to Left Single hoist then attached 30m extension wire.	
5:49	6:12	Lower down 30m extension wire and SAT Divers connect to Laydown Head then recover to deck.	
6:05	6:27	SAT Divers, cleaning flange face of SL47 Pipeline flange and installed rope protector.	
6:12	6:26	Lower down Diver Tool box into the water by crane and set on seabed assist guide by SAT Divers	
6:26	6:36	SAT Divers, disconnect lifting wire off Diver Tool box and disconnect downline.	
6:36	6:40	Shift K2 position for transfer remote crews to WP47 Platform at KP=-0.051, OT=74.9m Hdg=270°	
6:40	6:56	Transferred remote crews from K2 deck to WP47 PF upperdeck by derrick crane via personnel basket.	
6:56	7:00	Shift K2 position toward Tie-in Spool #2 installation location at KP=-0.068, OT=84m Hdg=270°	
6:58	7:05	Rig-up Spool #2 lifting sling onto 30MT snatch block connect to Single hoist (Left & Right).	
7:05	7:10	Pre-lift Tie-in Spool #2 at starboard main deck and adjust the lifting position and balancing.	
7:10	7:20	Lift-up Tie-in Spool #2 from main deck swing to stern port and lower down to sea surface.	
7:20	7:45	Continue lower down Spool #2 toward Riser bottom tie-in location assist guide by SAT Divers.	
7:45	7:55	SAT Divers, set lever block and start alignment of Tie-in Spool #2 and Spool #1 flanges.	
7:55	8:15	SAT Divers, insert studbolts, nut and gasket of Tie-in flange Spool #2 and Spool #1. (Measure flanges gap)	
8:15	8:34	SAT Divers, set-up the Hydratight Tools onto studbolts of Spool #2 and Spool #1 flanges.	
8:34	9:12	SAT Divers, commence hydratight the studbolts of Spool #2 and Spool #1 Tie-in flanges. (Measure flanges gap)	
9:12	9:34	SAT Divers, disconnect hydratight tools at Tie-in Spool #2 and Spool #1 flanges studbolts.	
9:34	9:58	SAT Divers, install the geotextile on Tie-in flanges Spool #2 and Spool #1. Inspection with CY inspector	
9:58	10:28	SAT Divers, disconnect lifting wire from Tie-in Spool #2 on seabed and recover to surface.	
10:28	10:34	Disconnect 30MT snatch block from Single hoist (Left & Right) then attached 30m extension wire.	
10:34	10:43	Lower down flange protector and set on Tie-in flanges of Spool #2 and #1 assist guide by SAT Divers.	
10:43	10:57	Disconnect lifting wire from Flange protector and connect to Diver tool box then recover to surface.	
10:45	11:07	SAT Divers, Install flange protector on Tie-in flanges Spool #2 and Spool #1. Inspection with CY inspector	
10:57	11:13	Lower down Lifting wire and attached to Spool #1 nylon sling then lift-up 1m off seabed.	
11:13	11:17	Holding up Spool by derrick crane then disconnect subsea frame chain hoist then lower down until seabed.	
11:17	11:34	SAT Divers, attached lifting wire onto Subsea frame #2 (Small) then recover to surface by crane.	
11:25	11:47	SAT Divers, back to bell and sealed. Bell left bottom and recover to surface.	
11:40	11:50	Transferred remote crews from WP47 PF upperdeck to K2 deck by derrick crane via personnel basket.	
11:47	12:40	SAT Divers interchange and preparation for next SAT diving operation.	
12:40	12:55	SAT Bell in the water, left surface and launch to bottom.	
12:55	13:00	SAT Divers, lock out then move to SL47 Pipeline and Spool #2 tie-in location	
13:00	13:15	Lower down Diver Tool box into the water by crane and set on seabed assist guide by SAT Divers.	
13:15	13:31	SAT Divers, set Spool #2 on subsea frame chain hoist assist by crane then preparation for tie-in.	
13:31	14:02	SAT Divers, connect chain pull and start alignment of Tie-in flanges Spool #2 and SL47 Pipeline	
14:02	14:25	SAT Divers, insert studbolts, nut and gasket of Tie-in flanges Spool #2 and Pipeline. (Measure flanges gap)	
14:25	15:00	SAT Divers, set-up the Hydratight Tools onto studbolts of Tie-in flanges Spool #2 and Pipeline.	
15:00	15:35	SAT Divers, commence hydratight the studbolts of Tie-in flanges Spool #2 and SL47 Pipeline.	
15:35	15:45	SAT Divers, disconnect hydratight tools at Tie-in Spool #2 and Pipeline flanges studbolts. (Measure flanges gap)	
15:45	16:00	SAT Divers, install the geotextile on Tie-in flanges Spool #2 and Pipeline. Inspection with CY inspector	
16:00	16:16	SAT Divers, disconnect lifting wire from Spool #2 and attached to Diver tool box and recover to surface.	
16:16	16:26	Lower down flange protector and set on Tie-in flanges of Spool #2 and Pipeline assist guide by SAT Divers.	
16:26	16:50	SAT Divers, Install flange protector on Tie-in flanges of Spool #2 and SL47 Pipeline. Inspection with CY inspector	
16:50	17:00	Holding up Spool by derrick crane then disconnect subsea frame chain hoist then lower down until seabed.	
17:00	17:15	SAT Divers, attached lifting wire onto Subsea frame #1 (Big) then recover to surface by crane.	
17:07	17:41	SAT Divers, carried out as-laid survey from SL47 Pipeline side to WP47 Riser bottom side.	
17:20	17:25	Shift K2 position toward 15m ahead close to WP47 Platform at KP=-0.033, OT=60m Hdg=270°	
17:25	17:34	Transferred remote crews from WP47 PF upperdeck to K2 deck by derrick crane via personnel basket.	
17:41	19:03	SAT Divers, cut-off the Temporary Clamp support at WP47 Riser bottom and recover to surface by derrick crane.	
19:03	19:19	SAT Divers, carried out Kamos Leak test at Tie-in flanges of Riser bottom and Spool #1.	
19:19	19:43	SAT Divers, attached lifting wire onto temporary working stage and recover to surface by crane.	
19:30	20:01	SAT Divers lock into the Bell and sealed, Bell left bottom and recover to surface.	
19:45	20:00	Shift K2 position clear from WP47 Platform toward anchor recovery location at KP=-0.033, OT=122m Hdg=270°	
20:00	21:37	CB TMS-8 alongside at port side drop-off 5paxs IN and pick-up 22paxs OUT with backload then cast proceed to ENA Wizard / SKL	
21:37	21:40	Shift K2 position clear from WP47 Platform toward standby location at KP=-0.033, OT=122m Hdg=270°	
21:40	24:00	DLBK2 unable to perform anchor handling due to adverse sea condition and standby wait on weather. Ongoing	2.33
		Meanwhile Activities	
8:15	12:00	Carried out blasting works at WP47 PF at Jacket Legs, Vertical Ladders, Riser top, Stairways, Handrails and Pipe support.	
14:30	17:40	Carried out painting works at WP47 PF 1st coat at Jacket Legs, Vertical Ladders, Riser top, Stairways, Handrails and Pipe support.	
12:45	14:45	Fabricate WP37 Tie-in Spool #2 - Fit-up and weld joint #6 at starboard side deck.	
15:29	15:50	Fabricate WP37 Tie-in Spool #2 - carried out x-ray joint #6 and #7 at starboard side deck. Result accepted.	
16:09	18:00	Fabricate WP37 Tie-in Spool #2 - Fit-up and weld joint #3 at starboard side deck.	
18:36	21:52	Fabricate WP37 Tie-in Spool #2 - Fit-up and weld joint #2 at starboard side deck.	

15:29	15:50	Fabricate WP37 Tie-in Spool #2 - carried out x-ray joint #3 and #2 at starboard side deck. Defects joint #8 (ISI-20mm)	
22:30	24:00	Fabricate WP37 Tie-in Spool #1 - Fit-up and weld joint #8 at starboard side deck.	
			Total DT (Hrs)
			2.33
			Total DT (Day)
			0.10

04. SUMMARY OF ADDITIONAL WORK / UNSCHEDULED WORK:

Description	Today (Hrs)	Previous (Hrs)	Total Acc
	0.00	0.00	0.00
	0.00	0.00	0.00
	0.00	0.00	0.00
	0.00	0.00	0.00
GRAND TOTAL in DAYS			0.00

05. PROGRESS STATUS:

Description	Actual Start Date	Actual End Date	Actual Dur. (Day)	Cumulative from Drop Anchor
Towing to Songkhla Thailand	20/5/2021 11:30	25/5/2021 14:30	5.13	
DLB K2 at Songkhla	25/5/2021 14:30	21/6/2021 11:15	26.86	
Towing to PTTEP Field	21/6/2021 11:15	23/6/2021 6:55	1.82	
GL26R Pipeline (16" x 10.8km)	23/6/2021 6:55	10/7/2021 9:15	17.10	
AWP42 Platform and GL26R Pre-flooding Survey	10/7/2021 9:15	20/7/2021 15:10	10.25	
GL39 Pipeline (26" x 5.8km) - Suspended	20/7/2021 15:10	30/7/2021 10:02	9.79	
Mode Change for GL39B Pipeline (12" x 4.0km)*	30/7/2021 10:02	2/8/2021 12:52	3.12	
Towing to GL39B Pipeline Location*	2/8/2021 12:52	4/8/2021 5:00	1.67	
GL39B Pipeline (12" x 4.0km)	4/8/2021 5:00	8/8/2021 9:15	4.18	
GL41 Pipeline (16" x 9.2km)	8/8/2021 9:15	15/8/2021 1:25	6.67	
Mode Change for GL39 Pipeline (26" x 5.8km)*	15/8/2021 1:25	16/8/2021 0:00	0.94	
GL41 Pipeline (16" x 9.2km)- Anchor Recovery	16/8/2021 0:00	16/8/2021 3:42	0.15	
GL39 Pipeline (26" x 5.8km) - Resume Works*	16/8/2021 3:42	16/8/2021 15:05	0.47	
GL39 Pipeline (26" x 5.8km)	16/8/2021 15:05	24/8/2021 4:00	7.54	
GL42 Pipeline (12" x 3.4km)	24/8/2021 4:00	28/8/2021 21:15	4.72	
GL42 Pipeline Pre-flooding Survey	28/8/2021 21:15	29/8/2021 16:30	0.80	
AWP42 Platform Tie-in	29/8/2021 16:30	1/9/2021 18:20	3.08	
GL42 Pipeline Pigging and Hydrotest	1/9/2021 18:20	6/9/2021 14:20	4.83	
AWP41 Platform & Tie-in	6/9/2021 14:20	21/9/2021 3:00	14.53	
Field Move to Bongkot North	21/9/2021 3:00	21/9/2021 21:16	0.76	
SL47 Pipeline (12" x 4.5km)	21/9/2021 21:16	25/9/2021 14:20	3.71	
SL47 Pipeline Pre-flooding Survey (WP47 end)	25/9/2021 14:20	26/9/2021 5:55	0.65	
SL47 Pipeline Pre-flooding Survey (WP37 end)	28/9/2021 4:57	28/9/2021 21:55	0.71	
WP47 Platform installation & Tie-in	26/9/2021 5:55			
Tie-in at WP37 Platform				
WP46 Platform Installation				
WP48 Platform Installation				
WPS17 Platform Installation				
Demobilization to Batam				
OVERALL PROJECT COMPLETION			129.47	

* The conclusion for the above either WOW or "Operation" to be finalized between CPY and CTR.

06. DOWN-TIME / BREAK-DOWN:

Item	Description	Today (hrs)	Prev (hrs)	Accumulative (hrs)	Todate (Days)
Barge Operation Down-time:					
1	Above Deck	0.00	0.00	0.00	0.00
2	Mechanical	0.00	197.48	197.48	8.23
3	Electrical	0.00	1.00	1.00	0.04
4	Welding, Internal Clamp & Bevel Machines (ST #	0.00	3.35	3.35	0.14
5	Weld Repair (Pipeline)	0.00	112.90	112.90	4.70
6	Weld Repair (Pile)	0.00	0.00	0.00	0.00
7	Weld Repair (Riser)	0.00	0.00	0.00	0.00
8	FJ Cut-Out (Pipeline) (Station # 1 & 2)	0.00	2.93	2.93	0.12
9	Field Joint Coating Repair	0.00	0.00	0.00	0.00
10	Hammer	0.00	3.68	3.68	0.15
11	Stinger	0.00	20.80	20.80	0.87
12	Weather	2.33	321.21*	323.54	13.48
13	Client	0.00	0.00	0.00	0.00
14	GMI	0.00	0.00	0.00	0.00
15	Others	0.00	0.00	0.00	0.00
Sub-Total:		2.33	663.35	665.68	27.74

Marine / Spread vessels Operation Down-time:

1	AHT No. 1 (ENA TREASURE)	0.00	0.00	0.00	0.00
2	AHT No. 2 (ENA GRIFFIN)	0.00	0.00	0.00	0.00
3	TMS-8 (CREW BOAT)	0.00	0.00	0.00	0.00
4	MARITIME RATU	0.00	0.00	0.00	0.00
5	TW OCEAN 18 (Pipe Barge No.1 Tug)	0.00	0.00	0.00	0.00
6	PW RELIANCE (Pipe Barge No.2 Tug)	0.00	0.00	0.00	0.00
7	POSH PANGLIMA (Pipe Barge No.3 Tug)	0.00	0.00	0.00	0.00
8	SCENA RAJA (Pipe Barge No.4 Tug)	0.00	0.00	0.00	0.00
9	ENA SOVEREIGN (Jacket Barge No.1 Tug)	0.00	0.00	0.00	0.00
10	ENA HERITAGE (Topside Barge No.1 Tug)	0.00	0.00	0.00	0.00
11	ENA LEGEND (Jacket Barge No.2 Tug)	0.00	0.00	0.00	0.00
12	TW OCEAN 18 (Topside Barge No.2 Tug)	0.00	0.00	0.00	0.00
Sub-Total:		0.00	0.00	0.00	0.00

Sub-Contractors Operation Down-time:

1	ROV (PAGEO)	0.00	3.58	3.58	0.15
2	SURVEY (FUGRO)	0.00	0.00	0.00	0.00
3	NDT (OTI)	0.00	1.12	1.12	0.05
4	DIVER (OWA)	0.00	0.00	0.00	0.00
5	Coating & Blasting Machine (RAE)	0.00	0.00	0.00	0.00
6	TNS	0.00	0.00	0.00	0.00
Sub-Total:		0.00	4.70	4.70	0.20

Grand Total:		2.33	668.05	670.38	27.93
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* Based on safety aspect, Barge Superintendent observed site condition and ceased work operation.(Refer to TH-ART-3C-AWP39-TNI-PDR-8071 Rev.C2, GL39 pipeline procedure). The conclusion for the above either WOW or MDT to be finalized between CPY and CTR.

07. FUEL & FRESH WATER REPORTS (Recorded @ 2400hrs):
Fuel Oil (Litres):

VESSEL	OPENING	REC'D	TRANSFERRED	CONS'D	R.O.B	Remarks
DLB KUROSHIO -2	650,100	-	-	7,500	642,600	
AHT ENA TREASURE	172,699	500,000	-	12,987	659,712	Received 500KL from Ena Wizard
AHT ENA GRIFFIN	199,948	-	-	7,985	191,963	
MARITIME RATU	159,340	-	-	6,190	153,150	
CB TMS-8	20,800	-	-	9,972	10,828	

Fresh Water (Metric Ton):

VESSEL	OPENING	PROD / RECD	TRANSFERRED	CONS'D	R.O.B	Remarks
DLB KUROSHIO -2	1,658.3	118.8	-	97.7	1,679.4	
AHT ENA TREASURE	217.0	-	-	3.0	214.0	
AHT ENA GRIFFIN	48.0	-	-	2.0	46.0	
MARITIME RATU	34.0	-	-	2.0	32.0	
CB TMS-8	11.0	-	-	2.0	9.0	

08. MARINE SPREAD / SUPPORT VESSELS MOVEMENT: (as of 24:00hrs):

Vessel / Cargo Barge	Location	Arrival @site	Departure	On Hire	Off Hire	Remarks
DLB KUROSHIO -2	GBN Field (WP47)	23-Jun-21		19-May-21		Construction Barge
AHT ENA TREASURE	GBN Field (WP47)	23-Jun-21		17-May-21		AHT No.1
AHT ENA GRIFFIN	GBN Field (WP47)	23-Jun-21		01-May-21		AHT No.2
MARITIME RATU	GBN Field (WP47)	30-Jun-21		03-May-21		Material Barge
TW OCEAN 18	Singapore	23-Jun-21	12-Sep-21	13-Apr-21		Pipe Barge No.1
PW RELIANCE	Songkhla Anchorage	19-Sep-21	24-Sep-21	22-Apr-21		Pipe Barge No.4 (SL47)
ENA SOVEREIGN	Bangpakong Anchorage	22-Aug-21	17-Sep-21	07-May-21		Jacket Barge No.2
ENA HERITAGE	En-route to TNS BPK	28-Sep-21	04-Oct-21	14-May-21		Topside Barge No.3 (WP47)
POSH PANGLIMA	En-route to Site (ETA 7th Oct)			22-Jun-21		Jacket Barge No.4 (WP46)
ENA UNICORN	Bangpakong Anchorage	06-Sep-21	18-Sep-21	02-Aug-21		Topside Barge No.2
SCENA RAJA	En-route to TNS BPK	23-Sep-21	03-Oct-21	22-Apr-21		Jacket Barge No.3 (WP47)
ENA LEGEND	Songkhla Anchorage	04-Aug-21	21-Aug-21	30-Jun-21		Jacket Barge No.1
CB TMS-8	Enroute to Songkhla	05-Oct-21	05-Oct-21	21-May-21		Crew Boat

09. PERSONNEL MOVEMENT:
Arrival: 5 Pax

Name	Classification	Company	Nationality	Purpose
1 Yamada Yuuki	Field Engineer	NSE	Japanese	Signed on @2012hrs by CB TMS-8 from SKL
2 Riku tachizaki	Field Engineer	NSE	Japanese	Signed on @2012hrs by CB TMS-8 from SKL
3 Nirut Boontham	Safety Officer	MPS	Thai	Signed on @2012hrs by CB TMS-8 from SKL
4 Wattana Khamthong	ALST	OWA	Thai	Signed on @2012hrs by CB TMS-8 from SKL
5 Warkim	Welder	OFS	Indonesian	Signed on @2012hrs by CB TMS-8 from SKL

Departure: 22 Pax

Name	Classification	Company	Nationality	Purpose
1 Shimomura Yoji	Barge Superintendent	NSOC	Japanese	Signed off @2140hrs by CB TMS-8 (To Batam by Ena Wizard)
2 Okazaki Kunihiro	Construction Manager	NSE	Japanese	Signed off @2140hrs by CB TMS-8 (To Batam by Ena Wizard)
3 Uematsu Kazuki	Asst Barge Foreman	NSOC	Japanese	Signed off @2140hrs by CB TMS-8 (To Batam by Ena Wizard)
4 Jonar Manik	Barge Operation Engineer	OFS	Indonesian	Signed off @2140hrs by CB TMS-8 (To Batam by Ena Wizard)
5 Akhmad Musolli	Asst. Fitter Foreman	OFS	Indonesian	Signed off @2140hrs by CB TMS-8 (To Batam by Ena Wizard)
6 Novi Agung Aryanto	Helper	OFS	Indonesian	Signed off @2140hrs by CB TMS-8 (To Batam by Ena Wizard)
7 Makhmud	Helper	OFS	Indonesian	Signed off @2140hrs by CB TMS-8 (To Batam by Ena Wizard)
8 Ahmad Sopandi	Helper	OFS	Indonesian	Signed off @2140hrs by CB TMS-8 (To Batam by Ena Wizard)
9 Anulloh	Helper	OFS	Indonesian	Signed off @2140hrs by CB TMS-8 (To Batam by Ena Wizard)
10 Mochamad Agus Widodo	Welding Supervisor	OFS	Indonesian	Signed off @2140hrs by CB TMS-8 (To Batam by Ena Wizard)
11 Hari Susilo Putra	Lead Welding Mechanic	OFS	Indonesian	Signed off @2140hrs by CB TMS-8 (To Batam by Ena Wizard)
12 Irwan Chaerudin	Lead Welding Mechanic	OFS	Indonesian	Signed off @2140hrs by CB TMS-8 (To Batam by Ena Wizard)
13 Ricky Samsudin	Welding Mechanic	OFS	Indonesian	Signed off @2140hrs by CB TMS-8 (To Batam by Ena Wizard)
14 Ade Lukmanto	Welding Mechanic	OFS	Indonesian	Signed off @2140hrs by CB TMS-8 (To Batam by Ena Wizard)
15 Ogi Apriyanto	Welding Mechanic	OFS	Indonesian	Signed off @2140hrs by CB TMS-8 (To Batam by Ena Wizard)
16 Windi Ari Yanto	Welding Mechanic	OFS	Indonesian	Signed off @2140hrs by CB TMS-8 (To Batam by Ena Wizard)
17 Sofyan Andika	Welding Mechanic	OFS	Indonesian	Signed off @2140hrs by CB TMS-8 (To Batam by Ena Wizard)
18 Mochamad Fadly	Welding Mechanic	OFS	Indonesian	Signed off @2140hrs by CB TMS-8 (To Batam by Ena Wizard)
19 Ahmad Suhardi	Welding Mechanic	OFS	Indonesian	Signed off @2140hrs by CB TMS-8 (To Batam by Ena Wizard)
20 Andy Antony	Radiographer	OTI	Indonesian	Signed off @2140hrs by CB TMS-8 (To Batam by Ena Wizard)
21 Yossaphat Arunsak	Safety Officer	MPS	Thai	Signed off @2140hrs by CB TMS-8 (To Songkhla)
22 Narongsak Panta	ALST	OWA	Thai	Signed off @2140hrs by CB TMS-8 (To Songkhla)

10. PERSONNEL BREAK-DOWN:

Description	Company	Thai	Japanese	Asian	Expat	Other	TOTAL
Overhead:							
Director	NSE						0
Construction Manager	NSE		1				1
Asst. Construction Manager	NSE						0
Sr.Barge Superintendent	NSOC						0
Barge Superintendent	NSOC		1				1
Asst. Barge Superintendent	NSOC		1				1
Project / Field Engineer	NSE		3	2			5
Barge Operation Engineer	OFS			1			1
Design Manager	NSE						0
Project HSE Manager / Safety Engineer	NSE						0
Deputy HSE Manager	NSE						0
Senior SSHE Officer	NSE			1			1
PTW Coordinator	NSE	1					1
QA/QC Supervisor / Assistant QC Supervisor	NSE			2			2
Sub-Total:		1	6	6	0	0	13
Above Deck:							
Barge Foreman / Anchor Foreman	NSOC / OFS			2			2
Assistant Barge Foreman	NSOC						0
Control Tower Operator	OFS / MPS			4			4
Derrick Crane Operator	OFS			2			2
Crawler Crane Operator	OFS			2			2
Proj. Safety Officer	NSE/MPS	5					5
Scaffolding Supervisor	MPS			2			2
Rigger Foreman	OFS			1			1
Assist Rigger Foreman	OFS						0
Rigger	OFS			31			31
Storekeeper	OFS			3			3
Assist Storekeeper	OFS						0
Welding Rep (AW)	NSE						0
Welding Engineer (AW)	NSE						0
Equipment Engineer (AW)	NSE						0
Maintenance Supv. (AW)	NSE						0
Welding Supv. (AW)	OFS						0
Asst Welding Supv. (AW)	OFS						0
Welding Mechanic / Electrician (AW)	OFS						0
Welder Foreman	OFS			1			1
Asst Welder Foreman	OFS			3			3
Welder	OFS			33			33
Junior Welder	OFS			5			5
Fitter Foreman	OFS / MPS			1			1
Asst Fitter Foreman	OFS						0
Fitter	OFS / MPS			15			15
Helper	OFS			18			18
Sub-Total:		5	0	123	0	0	128

Below Deck:							
Chief Barge Engineer	NSOC						0
Barge Engineer	NSOC		2				2
Mechanic Foreman	OFS			1			1
Asst. Mechanic Foreman	OFS			2			2
Mechanic / Mechanic Storekeeper	OFS			19			19
Machinist	OFS / CES			1			1
Electrician Foreman	OFS						0
Electrician	OFS						0
Barge Admin	OFS			3			3
Radio Operator	OFS / MPS	2					2
Barge Doctor	OFS / ISOS	1		1			2
Barge Medic	ISOS	1					1
Cadet	OFS-BOP			3			3
Sub-Total:		4	2	30	0	0	36
NSE Sub-Contractors:							
NDT Supervisor	OTI			1			1
NDT Radiography Interpreter (RI)	OTI			1			1
NDT Radiographer (RT)	OTI			1			1
NDT Multi Technician	OTI			4			4
NDT Crawler Technician	OTI			1			1
Welding Inspector	OTI			4			4
Coating Inspector	OTI / NSE			2			2
FJC Supervisor	RAE			1			1
FJC Technician	RAE			2			2
Party Chief	FUGRO			1			1
Survey System Engineer	FUGRO			1			1
Surveyor	FUGRO			2			2
Surveyor (SSS SurveyTeam)	FUGRO			3			3
Surveyor (As Built Survey Team)	FUGRO						0
ROV Supervisor	PAGEO			1		1	2
ROV Sub Engineer / ROV Pilot Technician	PAGEO			4			4
Project Engineer / Technician	SOMEHSA	1		2			3
Marine Warranty Surveyor	AQUALIS BRAEMAR	1					1
Quantity Surveyor	SK						0
Pest Control	HSET						0
Sub-Total:		2	0	31	0	1	34
NSE Sub-Contractors (Diver):							
Diving Superintendent	OWA		1				1
Diving Supervisor / DMT	OWA		2				2
SAT Diver / Air Diver/ DMT	OWA		2	11			13
Diving Operation Crew	OWA			1			1
LSS / System Tech	OWA		2	2			4
LST / ALST	OWA	1		1			2
Sub-Total:		1	7	15	0	0	23
NSE Sub-Contractors (Catering):							
Catering Supervisor (Campboss)	SPF Catering	2					2
Catering Crew	OFS			3			3
Catering Crew	SPF Catering	26					26
Sub-Total:		28	0	3	0	0	31
NSE Visitor:							
Director	NSE						
Installation Manager	NSE						
Senior HSE Manager	TNS						
Project SSHE Manager	NSE						
Sub-Total:		0	0	0	0	0	0
TNS Hook-up:							
TNS Project Engineer, QC & Supervisor	TNS	2					
TNS Painter & Blaster	TNS	3					
TNS Re-instatement team+Subcon	TNS						
Sub-Total:		5	0	0	0	0	5
Grand-Total POB NSE+TNS+Subcontractors DLB-K2		46	15	208	0	1	270

Client (PTTEP):							
Vice President (Visitor)	PTTEP						0
Construction Manager (Visitor)	PTTEP						0
CSR (CY Rep's)	PTTEP	1					1
SSHE Rep's	PTTEP	1					1
Brown Field CSR	PTTEP						0
Brown Field QA/QC Inspector	PTTEP						0
Marine Rep's	PTTEP	1					1
Project Manager (Visitor)	PTTEP						0
Structural / Mechanical / Pipeline / Subsea Eng	PTTEP						0
Planning / Process / I/E Engineer	PTTEP						0
Project Engineer / QC Engineer	PTTEP						0
Platform Operator / PBN-FC	PTTEP						0
Senior Welding Inspector	PTTEP	1					1
Welding Inspector	PTTEP	2					2
QA/QC Inspector	PTTEP						0
Sub-Total:		6	0	0	0	0	6
Grand-Total POB for DLB-K2:		52	15	208	0	1	276
Vessel Spread Manning:							
AHT ENA TREASURE	EASTERN NAVIGATION			15			15
AHT ENA GRIFFIN	EASTERN NAVIGATION			13			13
MARITIME RATU	POSH			11			11
TW OCEAN 18	TIONG WOON MARINE						0
PW RELIANCE	POSH						0
POSH PANGLIMA	POSH						0
SCENA RAJA	SCENA OFFSHORE						0
ENA UNICORN	EASTERN NAVIGATION						0
ENA SOVEREIGN	EASTERN NAVIGATION						0
ENA HERITAGE	EASTERN NAVIGATION						0
ENA LEGEND	EASTERN NAVIGATION						0
CB TMS-8	Top Maritime	7					7
Sub-Total:		7	0	39	0	0	46
Grand Total POB for DLB-K2 + Vessel Spreads:		59	15	247	0	1	322

11. ANY OTHER CONCERN:

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SASAKI SHIGETA
CONSTRUCTION MANAGER

WUTTIPONG POUNGTHIP
COMPANY SITE REPRESENTATIVE

เอกสารแนบที่ 77

PTTEP Wellhead General Specifications



PTTEP Wellhead General Specifications

Specification Master List

Date : 14-Jul-10

PWGS	Discipline	No.	Description	Revision	Revision Date	Book
Volume 1						
General						
	PWGS-GEN-001		Definition of General Specification	0	12-Jul-10	1
	PWGS-GEN-002		Minimum Requirements for Contractor's Final Documentation	0	21-May-10	1
	PWGS-GEN-003		Site Conditions and Climate	0	12-May-10	1
	PWGS-GEN-004		Material Traceability	0	28-Apr-10	1
	PWGS-GEN-005		Specification for Packing	0	19-Apr-10	1
	PWGS-GEN-006		QA/QC Inspection and Testing	0	12-May-10	1
	PWGS-GEN-007		AutoCAD Standard and Procedures	0	26-Mar-10	1
	PWGS-GEN-008		PTTEP Standard Numbering Procedure	0	8-Jun-10	1
	PWGS-GEN-009		Minimum Requirements for Vendor's Documentation	0	28-Apr-10	1
	PWGS-GEN-010		QA/QC Requirements for Vendor	0	28-Apr-10	1
	PWGS-GEN-011		PDMS Standards and Procedures	0	12-Jul-10	1
Volume 2						
Surveys						
	PWGS-GEO-001		Offshore Geotechnical Soil Survey	0	6-May-10	1
	PWGS-GEO-002		Offshore Geophysical Surveys	0	19-Apr-10	1
	PWGS-GEO-003		Geophysical Survey for Offshore Pipeline Installation	0	4-May-10	1
Volume 3						
Process						
	PWGS-PRO-001		Process Documents to be Prepared during Engineering Phase	0	19-Apr-10	1
	PWGS-PRO-101		Process Sizing Criteria	0	19-Apr-10	1
Volume 4						
Safety						
	PWGS-SAF-101		Layout	0	29-Jun-10	1
	PWGS-SAF-103		Liquid Drainage	0	1-Jul-10	1
	PWGS-SAF-104		Emergency Shut-Down and Emergency De-Pressurisation (ESD & EDP)	0	26-May-10	1
	PWGS-SAF-105		Pressure Protection Relief and Hydrocarbon Disposal Systems	0	29-Jun-10	1
	PWGS-SAF-107		Escape, Evacuation and Rescue from Fixed Installations	0	29-Jun-10	1
Volume 5						
Mechanical						
	PWGS-MEC-101		Unfired Pressure Vessels	0	15-Jun-10	1
	PWGS-MEC-111		Air Cooled Heat Exchangers	0	7-Jul-10	1
	PWGS-MEC-121		Cranes for Fixed Offshore Installations	0	5-Jul-10	1
	PWGS-MEC-201		Centrifugal Pumps	0	6-May-10	1
	PWGS-MEC-202		Positive Displacement Reciprocating and Metering Pumps	0	14-May-10	1
	PWGS-MEC-211		Packaged Reciprocating Compressors	0	31-May-10	1
	PWGS-MEC-212		Fuel Gas Treatment Units	0	14-Jul-10	1
	PWGS-MEC-213		Rotating Machinery Packages	0	6-Jul-10	1
	PWGS-MEC-401		Installation of Offshore Mechanical Equipment	0	15-Jun-10	1
	PWGS-MEC-501		Equipment Vibration	0	25-May-10	1
	PWGS-MEC-502		Equipment Noise Limits	0	7-Jul-10	1



PTTEP Wellhead General Specifications

Specification Master List

Date : 14-Jul-10

PWGS	Discipline	No.	Description	Revision	Revision Date	Book
Volume 6						
<u>Piping and Valves</u>						
	PWGS-PIP-101		Piping Design, Fabrication and Installation	0	7-Jul-10	1
	PWGS-PIP-102		Piping Stress Analysis	0	12-May-10	1
	PWGS-PIP-191		Model Review Check List	0	14-May-10	1
	PWGS-PIP-201		Piping and Valve Materials	0	7-Jul-10	2
	PWGS-PIP-501		Pressure Testing of Platform Piping Systems	0	26-May-10	1
	PWGS-PIP-601		Insulation	0	21-May-10	1
Volume 7						
<u>Structural</u>						
	PWGS-STR-001		Reference Levels for Offshore Platforms	0	9-Mar-10	1
	PWGS-STR-002		Weight Control	0	9-Mar-10	1
	PWGS-STR-101		Miscellaneous Minor Steel Structures	0	17-May-10	1
	PWGS-STR-102		Skid Mounted Assemblies	0	6-May-10	1
	PWGS-STR-201		Offshore Structural Materials	0	6-May-10	1
	PWGS-STR-301		Structural Steel Fabrication	0	19-Apr-10	1
	PWGS-STR-302		Offshore Structural Welding and Inspection	0	4-May-10	1
	PWGS-STR-401		Load-out, Transportation and Installation of Offshore Structures	0	26-May-10	1
Volume 8						
<u>Electrical</u>						
	PWGS-ELE-101		Electrical Engineering Guidelines	0	1-Jul-10	1
	PWGS-ELE-102		Electrical Requirements for Mechanical Packaged Equipment	0	5-Jul-10	1
	PWGS-ELE-203		Distribution Board	0	1-Jul-10	1
	PWGS-ELE-205		Solar Power System	0	5-Jul-10	1
	PWGS-ELE-206		Navigation Aids System	0	5-Jul-10	1
	PWGS-ELE-207		Hybrid Power System	0	5-Jul-10	1
	PWGS-ELE-401		Electrical Bulk Materials	0	5-Jul-10	1
	PWGS-ELE-402		Electrical Installation Specification	0	1-Jul-10	1
Volume 9						
<u>Instrument</u>						
	PWGS-INS-101		Instrumentation Engineering, Supply and Construction General Requirement	0	23-Jun-10	1
	PWGS-INS-102		Instrumentation Symbols and Identification	0	5-Jul-10	1
	PWGS-INS-103		Design and Installation of Instrument Links	0	23-Jun-10	1
	PWGS-INS-104		Fire and Gas System	0	23-Jun-10	1
	PWGS-INS-105		On/Off Valves and Control Valves sizing, Selection and Specification	0	23-Jun-10	1
	PWGS-INS-106		Design and Supply of Integrated Control and Safety System	0	5-Jul-10	1
	PWGS-INS-201		Electrical and Instrument Cables	0	5-Jul-10	1
	PWGS-INS-203		Instrument for Package Units	0	23-Jun-10	1
Volume 10						
<u>Telecommunication</u>						
	PWGS-TEL-101		Design, Supply and Installation of Telecommunication Systems	0	7-Jul-10	1



PTTEP Wellhead General Specifications

Specification Master List

Date : 14-Jul-10

PWGS	Discipline	No.	Description	Revision	Revision Date	Book
Volume 11						
<u>Pipelines and Risers</u>						
PWGS-PLR-101			Submarine Pipeline Systems	C	5-May-10	1
PWGS-PLR-102			Design of Submarine Pipelines as per API RP 1111 and ANSI B 31.4/31.8	0	14-Jul-10	1
PWGS-PLR-111			Pipeline Span Rectification	0	14-Jul-10	1
PWGS-PLR-211			Fabrication of Seamless Pipes for Pipelines (Mild, Intermediate and Severe Sour Service)	C	31-May-10	1
PWGS-PLR-212			Fabrication of Longitudinally Submerged Arc Welded Pipes for Pipelines (Mild , Intermediate and Severe Sour Service)	C	18-Jun-10	1
PWGS-PLR-213			Fabrication of ERW Line Pipe for Pipelines (Mild, Intermediate and Severe Sour Service)	C	5-Jul-10	1
PWGS-PLR-231			Carbon Steel Flanges and Branch Outlet Fittings for Pipelines (Mild, Intermediate and Severe Sour Service)	0	6-Jul-10	1
PWGS-PLR-232			Carbon Steel Tees for Pipelines (Mild, Intermediate and Severe Sour Service)	0	14-Jul-10	1
PWGS-PLR-233			Design, Materials and Fabrication of Pig Launchers and Receivers (Mild, Intermediate and Severe Sour Service)	0	14-Jul-10	1
PWGS-PLR-311			Induction Bends for Pipelines (Mild, Intermediate and Severe Sour Service)	0	14-Jul-10	1
PWGS-PLR-321			Concrete Coating for Submarine Pipelines	0	14-Jul-10	1
PWGS-PLR-331			Packaging and Transportation of Line Pipes	0	13-Jul-10	1
PWGS-PLR-351			Riser Fabrication and Installation	0	5-Jul-10	1
PWGS-PLR-401			Installation of Submarine Pipelines	B	4-May-10	1
PWGS-PLR-412			Site Welding of Carbon Steel Pipelines to API 1104 (Mild, Intermediate and Severe Sour Service)	B	21-May-10	1
PWGS-PLR-413			Automated Ultrasonic Testing (AUT) of Pipeline Girth Welds	B	2-Apr-10	1
PWGS-PLR-421			Spoolpiece Fabrication and Installation	0	6-Jul-10	1
PWGS-PLR-501			Hydrostatic Testing of Pipelines	C	7-May-10	1
PWGS-PLR-502			Precommissioning of Submarine Gas Pipelines	0	6-Jul-10	1
Volume 12						
<u>Corrosion</u>						
PWGS-COR-001			Protection of Oil and Gas Production Facilities Against Corrosion for Development Projects	0	2-Jul-10	1
PWGS-COR-002			Protection of Oil and Gas Production Facilities Against Corrosion for Operations	0	14-May-10	1
PWGS-COR-101			Design of Cathodic Protection of Offshore Structures by Sacrificial Anodes	0	7-Jul-10	1
PWGS-COR-102			Corrosion Spec on Design, Installation and Inspection of Cathodic Protection of Sealines by Sacrificial Anodes	0	2-Jul-10	1
PWGS-COR-105			Design of Internal Cathodic Protection of Equipment and Storage Tanks	0	6-May-10	1
PWGS-COR-111			Internal Corrosion and Erosion Control and Monitoring	0	5-Apr-10	1
PWGS-COR-201			Materials for Sour Service	0	5-Apr-10	1
PWGS-COR-202			Supply of Anodes and Monitoring Equipment for Cathodic Protection by Sacrificial Anodes	0	11-May-10	1
PWGS-COR-203			Insulating Joints	0	25-May-10	1
PWGS-COR-301			Painting of Offshore and Coastal Structures and Facilities	0	7-Jul-10	1
PWGS-COR-303			External Anticorrosion Coating for Pipelines	0	24-May-10	1
PWGS-COR-304			External Field Joint Coating for Pipelines	0	5-Apr-10	1
PWGS-COR-305			Coating of Bends and Fittings for Pipelines	0	5-Apr-10	1
PWGS-COR-306			Corrosion Coating of Pipeline Risers	0	7-Jul-10	1
PWGS-COR-307			Corrosion Internal Coating of Pressure Vessels and Tanks	0	19-Apr-10	1
PWGS-COR-308			Internal Coating of Water Injection Tubing and Lines	0	19-Apr-10	1
PWGS-COR-501			Water Treatment for Hydrostatic Pressure Testing	0	19-Apr-10	1
Volume 13						
<u>Precommissioning and Commissioning</u>						
PWGS-PCC-101			Precommissioning and Commissioning Specification	0	17-May-10	1
PWGS-PCC-102			Precommissioning and Commissioning Technical Preparation	0	17-May-10	1
PWGS-PCC-103			Precommissioning Execution	0	14-Jun-10	2
PWGS-PCC-104			Commissioning Execution	0	7-Jun-10	1

เอกสารแนบที่ 78

Load-out, transportation and installation of offshore structures (PWGS-STR-401)



PTTEP General Specification

Load-out, Transportation and Installation of Offshore Structures

PWGS-STR-401

Date: May 10 / Rev. 0

Page 1 of 86

PTTEP GENERAL SPECIFICATION

(FOR BONGKOT & ARTHIT WELLHEAD PLATFORM DEVELOPMENT)

STRUCTURAL

Load-out, Transportation and Installation of Offshore Structures

Approved

Date

DOA:

24/06/2010

EOS:

23/6/10

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22/06/10

EWP:

22 JUN 2010

Reviewed

Date

Technical Authority:

21 JUN 2010

Originator:

16 JUN 2010



PTTEP General Specification

Load-out, Transportation and Installation of Offshore Structures

PWGS-STR-401

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Page 2 of 86

...		
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TABLE OF CONTENTS

1	SCOPE	7
1.1	Load-out	7
1.2	Marine Transportation	7
1.3	Jacket Launch, Upend and Set-down	7
1.4	Offshore Lifting	8
1.5	Offshore Piling	8
1.6	Offshore Grouting	9
1.7	Related Documents	9
2	REFERENCES	10
2.1	Industry Codes and Standards	11
2.2	PTTEP Wellhead General Specifications	12
3	GENERAL	12
3.1	Definitions	12
3.2	Abbreviations	14
3.3	Safety and Health	15
4	PROJECT EXECUTION PLAN	16
4.1	General	16
4.2	Planning and Engineering	16
4.3	Coordination Meeting	17
4.4	Involved parties and responsibilities	17
4.5	Installation Procedures	20
4.6	Installation Correspondence/Reports	21
4.7	Completion Report	22



PTTEP General Specification

Load-out, Transportation and Installation of Offshore Structures

PWGS-STR-401

Date: May 10 / Rev. 0

Page 4 of 86

5	LAND BASED AND MARINE SPREAD OPERATIONS	24
5.1	Barge and Anchor Positioning	24
5.2	Rigging Testing and Placement	24
5.3	Vessels	24
5.4	Preparation	24
6	LOADOUT	27
6.1	Pre-service consideration	27
6.2	Loadout Parameters	27
6.3	Structure, Quay and Soil	28
6.4	Loadout Procedures	31
6.5	Post Loadout Cargo Inspection	32
7	MARINE TRANSPORTATION	32
7.1	General Requirements	32
7.2	Design Environmental Criteria	33
7.3	Barge Motions, Analysis and Strength	34
7.4	Design Tow Resistance	38
7.5	Stability of Transportation vessel/barge	39
7.6	Tow Arrangements	40
7.7	Transportation Barge Requirements	45
7.8	Tow vessel Requirements	47
7.9	Sailaway Approval	51
7.10	Tow Reporting and Weather Forecasting	52
8	JACKET LAUNCH, UPEND AND SET-DOWN	53
8.1	Pre-Installation Activities	53
8.2	Jacket Installation	54
8.3	General Activities	58



PTTEP General Specification

Load-out, Transportation and Installation of Offshore Structures

PWGS-STR-401

Date: May 10 / Rev. 0

Page 5 of 86

8.4	Diving and Remotely Operated Vehicles (ROV)	58
9	OFFSHORE LIFTING AND FLOATOVER	58
9.1	General Requirements	58
9.2	Installation of Jackets	59
9.3	Installation of Topside Components	60
9.4	General Activities	67
10	OFFSHORE PILING	68
10.1	Pile Installation	68
10.2	Driving using followers	74
10.3	Jacket to Pile Connection	74
10.4	Limiting Conditions	75
10.5	General Activities	76
11	GROUTING	77
11.1	Contractor's Responsibility	77
11.2	Grout Mix Design	77
11.3	Grout Materials Specifications	78
11.4	Laboratory Test Requirements	78
11.5	Quality Control	79
11.6	Grout Curing	80
11.7	Grout Sampling and Testing	80
12	DOCUMENTATION	81
12.1	General Requirement for documentation	81
12.2	Documentation for loadout	81
12.3	Documentation for Marine Operation	82
12.4	Documentation for Jacket Launch, Upend and Set-down	84



PTTEP General Specification

Load-out, Transportation and Installation of Offshore Structures

PWGS-STR-401

Date: May 10 / Rev. 0

Page 6 of 86

12.5 Documentation for Offshore Lifting	84
12.6 Documentation for Offshore Piling	85
12.7 Documentation for Grouting	86

เอกสารแนบที่ 79

Design of Submarine Pipeline



PTTEP General Specification

Design of Submarine Pipelines as per
API RP 1111 and ASME B 31.4/31.8

PWGS-PLR-102

Date: Jul 10 / Rev. 0

Page 1 of 7

PTTEP GENERAL SPECIFICATION

(FOR BONGKOT & ARTHIT WELLHEAD PLATFORM DEVELOPMENT)

PIPELINES AND RISERS

Design of Submarine Pipelines as per API RP 1111 and ASME B 31.4/31.8

Approved

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PTTEP General Specification

Design of Submarine Pipelines as per
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Page 2 of 7

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PTTEP General Specification

Design of Submarine Pipelines as per
API RP 1111 and ASME B 31.4/31.8

PWGS-PLR-102

Date: Jul 10 / Rev. 0

Page 3 of 7

TABLE OF CONTENTS

1	SCOPE	4
2	REFERENCES	4
2.1	Industry Codes and Standards	5
2.2	PTTEP Wellhead General Specifications	5
3	GENERAL	5
3.1	Definitions	5
4	AMENDMENTS TO ASME B31.4 AND B31.8	6
4.1	General	6
4.2	Yielding	6
4.3	Local Buckling	6
4.4	Propagation Buckling	6
4.5	Bar Buckling	6
4.6	Cyclic Loads and Fatigue	6
5	AMENDMENTS TO API RP 1111	7
5.1	General	7



PTTEP General Specification

Design of Submarine Pipelines as per
API RP 1111 and ASME B 31.4/31.8

PWGS-PLR-102

Date: Jul 10 / Rev. 0

Page 4 of 7

1 SCOPE

This General Specification is supplementing the PWGS-PLR-101 when the applicable Prime Reference for a specific project is either ASME B 31.4, ASME B 31.8, or API RP 1111.

2 REFERENCES

The reference documents listed below, including Industry Codes and Standards and COMPANY specifications, form an integral part of this General Specification. Unless otherwise stipulated, the applicable version of these documents, including relevant appendices and supplements, is the latest revision published on the effective date of the contract.

The overall order of precedence of the applicable documents shall be:

- 1) Government Laws, Rules and Regulations
- 2) Purchase Order/ Service Order/ Contract Documents
- 3) Project Particular Specification (PPS)
- 4) Present General Specification
- 5) Codes and Standards in reference

Any conflict between any of the Contract Documents, or between this specification and any other Contract Document, shall be reported to the COMPANY for decision. In such a case, and unless otherwise agreed or decided by the COMPANY, it is understood that the more stringent requirement shall apply.

Exceptions to, or deviations from this specification are not permitted unless previously accepted in writing by the COMPANY. For this purpose, requests for substitutions or changes of any kind shall be complete with all pertinent information required for COMPANY assessment. COMPANY's approval, nevertheless, will not, in any way, relieve the responsibility of the Contractor to meet the requirements of the industry Codes and Standards referred to and amended herein, in the event of conflict.

Prime References

The Prime References (PR) are those of the reference documents which are addressing the entire scope of the design.

All Prime References ASME B31.4, ASME B31.8, API RP 1111, are identified with a (PR) mark-up in the following lists of the reference documents:



PTTEP General Specification

Design of Submarine Pipelines as per
API RP 1111 and ASME B 31.4/31.8

PWGS-PLR-102

Date: Jul 10 / Rev. 0

Page 5 of 7

2.1 Industry Codes and Standards

Reference	Title
ASME B 31.4	(PR) Pipeline Transportation Systems for Liquid Hydrocarbons and Other Liquids
ASME B 31.8	(PR) Gas Transmission and Distribution Piping System
API RP 1111	(PR) Design, Construction, Operation and Maintenance of Offshore Hydrocarbon Pipelines
DNV OS F101	Submarine Pipeline Systems
DNV RP F105	Free Spanning Pipelines

2.2 PTTEP Wellhead General Specifications

Reference	Title
PWGS-PLR-101	Submarine Pipeline Systems

3 GENERAL

3.1 Definitions

Throughout this specification, the following definitions shall apply:

Reference	Description
Approval	The authorisation in writing given by the COMPANY to the 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 construed accordingly
COMPANY	PTT Exploration and Production Public Company Limited
Contract Documents	The material requisitions, material specifications, etc. issued by the COMPANY and attached to the Contract or the Purchase Order
Contractor	Any company PTTEP has signed a contract with for the Engineering, Procurement, Construction and Installation of a part of a project
PPS	Designates Project Particular Specification detailing the additional tests and requirements or the possible modifications to the present specification, based on the particular design conditions or the local legislation of the project
Shall	Used to indicate that a provision is mandatory



PTTEP General Specification

Design of Submarine Pipelines as per
API RP 1111 and ASME B 31.4/31.8

PWGS-PLR-102

Date: Jul 10 / Rev. 0

Page 6 of 7

Reference	Description
Should	Used to indicate that a provision is not mandatory but is recommended as good practice
May	Used to indicate that a provision is optional

4 AMENDMENTS TO ASME B31.4 AND B31.8

4.1 General

In addition to the following amendments, the DNV OS F101 shall be used whenever the Prime Reference documents are silent.

4.2 Yielding

The maximum allowable stress levels shall be determined for each section of the Pipeline System, according to the API RP 1111 and the recorded stress levels shall be compared to the relevant maximum allowable values.

The extent of the offshore pipeline riser shall be as defined within ASME B31.4 or ASME B31.8 and shall not be arbitrarily modified by the definition contained within API RP1111.

4.3 Local Buckling

If results indicate any possibility of buckling, further analysis shall be made in accordance with API RP 1111 method and allowing for constraints during installation.

4.4 Propagation Buckling

The propagation buckling shall be analysed as per API RP 1111.

4.5 Bar Buckling

Buckling of pipelines under longitudinal compression shall be analysed in accordance with API RP 1111. If the compression thrust load is significant, then elastic limits shall be reanalysed taking into account lateral deformation using large deformation analysis.

4.6 Cyclic Loads and Fatigue

Calculation of vibrations due to turbulence shall be made in accordance with API RP 1111 and DNV RP F105.



PTTEP General Specification

Design of Submarine Pipelines as per
API RP 1111 and ASME B 31.4/31.8

PWGS-PLR-102

Date: Jul 10 / Rev. 0

Page 7 of 7

5 AMENDMENTS TO API RP 1111

5.1 General

The DNV OS F101 shall be referred to whenever the Prime Reference document is silent.

เอกสารแนบที่ 80

Specification for Installation of Submarine Pipelines (PWGS-PLR-401)



PTTEP GENERAL SPECIFICATION

(FOR BONGKOT & ARTHIT WELLHEAD PLATFORM DEVELOPMENT)

PIPELINES AND RISERS

Installation of Submarine Pipelines

Approved

Date

DOA:

EOS:

ENC:

EWP:

Reviewed

Date

Technical Authority:

Originator:



PTTEP General Specification
Installation of Submarine Pipelines

PWGS-PLR-401 (WC)

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Page 2 of 44

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TABLE OF CONTENTS

1	SCOPE	5
2	REFERENCES	5
2.1	Industry Codes and Standards	6
2.2	PTTEP Wellhead General Specifications	6
3	GENERAL	7
3.1	Definitions	7
3.2	Abbreviations	7
4	SAFETY AND ENVIRONMENT	8
4.1	Safety	8
4.2	Environment	8
4.3	Site Reinstatement	9
5	REGULATIONS	9
5.1	International Maritime Regulations	9
5.2	Local Authorities	9
6	CONSTRUCTION ENGINEERING	9
6.1	General	9
6.2	Calculation Notes	9
6.3	Procedures	10
6.4	Pipeline Characteristics Monitoring System	11
6.5	General Laying Procedure	12
6.6	Particular Laying Procedures	13
6.7	Contingency Procedures	14
6.8	Anchoring Procedures	14
6.9	Dynamic Positioning Procedures	16
6.10	Construction Manual	16
6.11	Mobilisation Manual	16
7	INSTALLATION SPREAD AND FACILITIES	16
7.1	General	16
7.2	Diving Spread	17
7.3	ROV Spread	18
7.4	Station Keeping and Positioning System	18
7.5	Weather Forecast and Metocean Condition	19
8	MATERIAL	19
8.1	Care of Material	19
8.2	Marking of Materials	19
9	LAYING ROUTE PREPARATION	19
9.1	Laying Corridors	19
9.2	Pre-survey	20
9.3	Freespan Assessment	20
9.4	Seabed Preparation	21



PTTEP General Specification
Installation of Submarine Pipelines

PWGS-PLR-401 (WC)

Date: Aug 10 / Rev. 0

Page 4 of 44

9.5	Existing Facilities	21
9.6	Shore Approaches	22
10	INSTALLATION WORKS	22
10.1	General	22
10.2	Laying Direction	22
10.3	Pipeline Standard Assembly and Laying	22
10.4	Connections	25
10.5	Freespan Reduction	26
10.6	Corrosion Protection	26
10.7	Offshore Terminations	27
10.8	Onshore Terminations	27
10.9	Crossings	29
10.10	Mechanical Protection	29
10.11	Pipeline Pre-commissioning	31
10.12	Scheduled Stand-by and Abandonment	31
10.13	Contingency	31
10.14	Final and Contingency Surveys	32
11	ADDITIONAL REQUIREMENTS FOR FLEXIBLE PIPE, CABLE AND UMBILICAL INSTALLATION	32
11.1	General	32
11.2	Engineering	32
11.3	Pipe Characteristics Monitoring System	33
11.4	Laying Equipment	33
11.5	Laying Operation	34
11.6	Remedial Works	34
11.7	Testing and Pre-commissioning	35
12	ADDITIONAL REQUIREMENTS FOR RIGID PIPE REELING INSTALLATION	36
12.1	General	36
12.2	Laybarge Requirements	36
12.3	Pipeline Material Requirements	37
13	SCHEDULING	38
14	COMPLETION FILE	39
	APPENDIX 1 SHORE APPROACHES	40
	APPENDIX 2 MOORING SYSTEM	43



PTTEP General Specification
Installation of Submarine Pipelines

PWGS-PLR-401 (WC)

Date: Aug 10 / Rev. 0

Page 5 of 44

1 SCOPE

This specification - which shall be read in conjunction with the PWGS-PLR-101 - defines the minimum technical requirements with respect to the installation of submarine pipelines (S-Lay and J-Lay), flexible pipes, umbilicals, reeled pipes.

Pipeline installation in swamp areas, and towing out of bundles are not covered by the present General Specification

2 REFERENCES

The reference documents listed below, including Industry Codes and Standards and COMPANY specifications, form an integral part of this General Specification. Unless otherwise stipulated, the applicable version of these documents, including relevant appendices and supplements, is the latest revision published on the effective date of the contract.

The overall order of precedence of the applicable documents shall be:

- 1) Government Laws, Rules and Regulations
- 2) Purchase Order/ Service Order/ Contract Documents
- 3) Project Particular Specification (PPS)
- 4) Present General Specification
- 5) Codes and Standards in reference

Any conflict between any of the Contract Documents, or between this specification and any other Contract Document, shall be reported to the COMPANY for decision. In such a case, and unless otherwise agreed or decided by the COMPANY, it is understood that the more stringent requirement shall apply.

Exceptions to, or deviations from this specification are not permitted unless previously accepted in writing by the COMPANY. For this purpose, requests for substitutions or changes of any kind shall be complete with all pertinent information required for COMPANY assessment. COMPANY's approval, nevertheless, will not, in any way, relieve the responsibility of the Contractor/Supplier to meet the requirements of the industry Codes and Standards referred to and amended herein, in the event of conflict.



PTTEP General Specification
Installation of Submarine Pipelines

PWGS-PLR-401 (WC)

Date: Aug 10 / Rev. 0

Page 6 of 44

2.1 Industry Codes and Standards

Reference	Title
API RP 1111	Design, Construction, Operation and Maintenance of Offshore Hydrocarbon Pipelines (Limit State Design), Third Edition July 1999
API RP 5L1	Railroad Transportation of Line Pipe, July 2002
API RP 5LW	Transportation of Line Pipe on Barges and Marine Vessels, December 1996
API SPEC 17J	Specification for unbonded flexible pipe
ASME B31.4	Pipeline Transportation Systems for Liquid Hydrocarbons and Other Liquids
ASME B31.8	Gas Transmission and Distribution Piping Systems, 2003
DNV OS F101	Offshore standard - Submarine Pipeline System
ISO 13628	Petroleum and Natural gas industries - Design and operation of Subsea Production Systems
OGP	Diving Recommended Practice
IMCA	Current Guidance collection and information notes from Diving (including AODC and DMAC), Marine, ROV and Survey divisions International Code of Practice for Offshore Diving
IMO	COLREG, SOLAS, MARPOL Code of Safety for Diving Systems

2.2 PTTEP Wellhead General Specifications

Reference	Title
PWGS-COR-102	Corrosion Spec on Design, Installation and Inspection of Cathodic Protection of Sealines by Sacrificial Anodes
PWGS-COR-202	Supply of Anodes and Monitoring Equipment for Cathodic Protection by Sacrificial Anodes
PWGS-COR-304	External Field Joint Coating of Pipelines
PWGS-GEO-002	Offshore Geophysical Surveys
PWGS-GEO-003	Geophysical Survey for Offshore Pipeline Installation
PWGS-PLR-101	Submarine Pipeline Systems
PWGS-PLR-321	Concrete Coating for Submarine Pipelines
PWGS-PLR-331	Packaging and Transportation of Line Pipes
PWGS-PLR-412	Site Welding of Carbon Steel Pipelines to API 1104 (mild, intermediate and severe sour service)
PWGS-PLR-501	Hydrostatic Testing of Pipelines
PWGS-PLR-502	Precommissioning of Submarine Gas Pipelines



3 GENERAL

3.1 Definitions

Reference	Description
Approval	Authorization in writing given by the COMPANY to the Contractor/Supplier on a procedure or to proceed with the performance of a specific part of the work without releasing in any way the Contractor/Supplier from any of his obligations to conform with the technical specifications, requisitions etc. The words “Approve”, “Approved” and “Approval” shall be construed accordingly
Contract Documents	The material requisitions, material specifications, etc. issued by the COMPANY and attached to the Contract or the Purchase Order
Contractor	Any company PTTEP has signed a contract with for the Engineering, Procurement, Construction and Installation of a part of a project
PPS	Designates Project Particular Specification detailing the additional tests and requirements or the possible modifications to the present specification, based on the particular design conditions of the pipeline project
Shall	Used to indicate that a provision is mandatory
Should	Used to indicate that a provision is not mandatory but is recommended as good practice
May	Used to indicate that a provision is optional
the WORKS	Means the surveys, site preparation works, installation works, and reinstatement works, as a whole.

3.2 Abbreviations

Reference	Description
API	American Petroleum Institute
COLREG	International Regulations for Preventing Collisions at Sea
DNV	Det Norske Veritas
DP	Dynamic Positioning
DRP	Diving Recommended Practice
FMEA	Failure Modes and Effects Analysis
HSE	Health Safety and Environment
IMCA	International maritime Contractors Association
IMO	International Maritime Organization
ITA	Inline Tee Assembly
ITP	Inspection and Test Plan
OBSROV	Observation ROV
OGP	International Association of Oil & Gas Producers
OTDR	Optical Time Domain Reflectometry
PLET	Pipeline End Termination
ROT	Remote Operated Tool
ROV	Remote Operated Vehicle
SDRL	Supplier Data Requirements List
SI	International System of Units

เอกสารแนบที่ 81

Offshore Pipeline Installation Procedure

EPCI FOR ARTHIT PHASE 3D. G1/61 PHASE 1A & G2/61 PHASE 1A




OFFSHORE PIPELINE INSTALLATION PROCEDURES

Wellhead Platform Construction Project
<input checked="" type="checkbox"/> 1. APPROVED <input type="checkbox"/> 2. APPROVED (Proceed to AFC) <input type="checkbox"/> 3. APPROVED with comments <input type="checkbox"/> 4. APPROVED with comments (Proceed to AFC) <input type="checkbox"/> 5. Not APPROVED
<small>COMPANY'S APPROVAL shall not relieve CONTRACTOR from his obligation under the CONTRACT. COMPANY'S failure not to comment or only partially comment any CONTRACT DOCUMENT shall not be construed as an acceptance of the content of the documents.</small>
Signed: Thanasak Sotananan Pipeline Engineer

C2	9-Mar-21		Approved for Construction	Kishimoto	Toyonaga		
C1	5-Feb-21	Teranishi	Approved for Construction	Kishimoto	Toyonaga		
A1	07-Jul-20	Teranishi	Issued for Review	Kishimoto	Toyonaga		
REV	DATE	BY	DESCRIPTION	CHECK	APPR.	CHECK	APPR.
				CONTRACTOR APPROVAL		COMPANY APPROVAL	

REVISION CODE: A = Issued for Review, B = Issued for Approval, C = Approved for Construction, 00 = As-built

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	PTT EXPLORATION AND PRODUCTION PUBLIC COMPANY LIMITED AND PTTEP INTERNATIONAL LIMITED PTTEP ENERGY DEVELOPMENT COMPANY LIMITED		 
	EPCI FOR ARTHIT PHASE 3D, G1/61 PHASE 1A & G2/61 PHASE 1A		
	TH-ART-3D-GEN-TNI-PDR-8070	REVISION C2	
	TH-G1-61-1A-GEN-TNI-PDR-8070	C2	
	TH-G2-61-1A-GEN-TNI-PDR-8070	C2	

TABULATION OF REVISED PAGES

PAGE	REVISIONS							REMARKS	PAGE	REVISIONS							REMARKS
	A1	C1	C2							A1	C1	C2					
1	X	X	X					Cover page	51	X							
2	X	X	X						52	X							
3	X	X							53	X		X					
4	X	X	X						54	X		X					
5	X	X							55	X							
6	X	X	X						56	X							
7	X	X							57	X							
8	X								58	X							
9	X								59	X							
10	X								60	X							
11	X								61	X	X						
12	X	X	X						62	X	X						
13	X								63	X	X						
14	X								64	X	X						
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26	X	X							76	X							
27	X	X							77	X							
28	X								78	X							
29	X								79	X							
30	X								80	X	X						
31	X								81	X	X						
32	X								82	X	X						
33	X								83	X							
34	X								84	X							
35	X								85	X							
36	X	X							86	X							
37	X								87	X							
38	X								88	X							
39	X								89	X							
40	X	X							90	X							
41	X	X							91	X							
42	X	X							92	X							
43	X	X							93	X	X						
44	X	X							94								
45	X								95								
46	X								96								
47	X								97								
48	X		X						98								
49	X								99								
50	X								100								

TABULATION OF REVISED PAGES

PAGE	REVISIONS								REMARKS	PAGE	REVISIONS								REMARKS
	A1	C1	C2								A1	C1	C2						
101		X								App-1	X								
102										App-2	X								
103										App-3	X								
104										App-4	X	X							
105										App-5	X	X							
106										App-6	X								
107										App-7	X								
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REVISION STATUS / SUMMARY OF CHANGES

REV	REVISED PAGES/SECTIONS	REVISION DESCRIPTION	REASON FOR REVISION
A1	-	Issued for Review	-
C1	As per Tabulation Revised Page	Approved for Construction	- Revised as per CPY comments
C2	As per Tabulation Revised Page	Approved for Construction	- Due to the change of roller No.11 elevation

TABLE OF CONTENTS

1.	GENERAL	7
1.1	Introduction.....	7
1.2	Scope of Work	7
1.3	COMPANY Reference Documents	8
1.4	CONTRACTOR Reference Documents	8
1.5	Code and Standard	9
1.6	Abbreviations.....	10
1.7	Installation Vessel	11
1.8	Weather Limitation	11
1.9	Responsible personal and scope	11
2.	PIPELINE INSTALLATION PROCEDURE	12
2.1	General	12
2.2	Work Flow for Pipeline Laying.....	14
2.3	Preparatory Work.....	15
2.4	Start-up Procedure	16
2.5	Normal Laying Procedure	45
2.6	Lay Termination Procedure.....	59
2.7	Crossing Sleeper Installation Procedure	67
2.8	In-line Flange Installation Procedure	76
2.9	Emergency Abandonment / Recovery Procedures	81
2.10	Pipeline Relocation Procedures	91
2.11	Pipeline Buckling.....	97
2.12	Pre-flooding Surveys.....	99
2.13	Pipeline Free Span Rectification Work.....	99
2.14	As-Built Survey.....	101

APPENDIX – 1 Weather and Sea State Limitation for Kuroshio-2

APPENDIX – 2 Drawing of Suspension Type Stinger

APPENDIX – 3 Kuroshio-2 Derrick Crane & Crawler Crane Lifting Capacity

APPENDIX – 4 Installation Record Form

APPENDIX – 5 Shrink Sleeve Application Procedure

APPENDIX – 6 MSDS for Acetone

APPENDIX – 7 Acceptance Criteria for Pipeline Welding

1. GENERAL

1.1 Introduction

PTT Exploration and Production Public Company Limited (PTTEP) intends to further develop and produce gas and condensate from an offshore concession, identified as the Arthit, Bongkot and Erawan Field located in Gulf of Thailand.

EPCI FOR ARTHIT PHASE 3D, G1/61 PHASE 1A & G2/61 PHASE 1A EPCI of Wellhead Platforms, Pipelines and Tie-ins forms part of Arthit, Bongkot and Erawan Field located in the Gulf of Thailand, approximately 625 kilometres from Rayong province and 250 kilometres northeast of town of Songkhla. Water depth is approximately ranging from 60-80 meters.

The Project scope is to perform Design, Engineering, Procurement, Fabrication, Construction, Transportation and Installation of wellhead platforms, associated pipelines, tie-in work and Brownfield modification work.

1.2 Scope of Work

This document is intended to describe the procedure for pipeline installation. Detail information and procedure for each pipeline is described in Pipeline procedure issued for particular phase.

Activities involved in the pipeline installation are summarized as below:

- (1) Pre-installation survey of proposed pipeline corridor. (The detailed survey procedure can be found in "Offshore Works - Pre-Installation, Post-Installation Procedure and As-Built Survey Procedure".
- (2) Start-up / normal laying / termination of pipeline. (The detailed procedure is shown in this report)
- (3) Pre-flooding survey of laid pipeline. (The detailed survey procedure can be found in "Offshore Works - Pre-Installation, Post-Installation Procedure and As-Built Survey Procedure".

All activities in this procedure shall be monitored / supervised by Construction Manager and Barge Superintendent.

1.3 COMPANY Reference Documents

The following COMPANY documents shall be referenced for CONTRACTOR's installation of pipelines:

No.	Document number	Title
1	PWGS-COR-304, Rev.0	Specification for External Field Joint Coating for Pipelines
2	PWGS-COR-102, Rev.0	Specification for Design, Installation and Inspection of Cathodic Protection of Pipelines by Sacrificial Anodes
3	PWGS-PLR-401, Rev.0	Specification for Installation of Submarine Pipelines:
4	PWGS-PLR-412, Rev.0	Site Welding of Carbon Steel Pipelines to API 1104
5	PWGS-STR-401, Rev.0	Specification for Load-out, Transportation and Installation of Offshore Structures
6	10009-OLG-WIS-4101, Rev.0	General Marine Instructions for Great Navamindra Field, 31 st Aug 2015
7	Chevron Marine Standard, January 2019	-

1.4 CONTRACTOR Reference Documents

Apart from this Pipeline Installation Procedure, other documents related to this procedure submitted separately to COMPANY are as follows:

No	Title	Reference No.
AA. ENGINEERING REPORT		
1	Laying Analysis Report	TH-ART-3D-GEN-TNI-CAL-8051 TH-G1-61-1A-GEN-TNI-CAL-8051 TH-G2-61-1A-GEN-TNI-CAL-8051
2	Engineering Criteria for Pipeline Installation Engineering	TH-ART-3D-GEN-TNI-PDR-8052 TH-G1-61-1A-GEN-TNI-PDR-8052 TH-G2-61-1A-GEN-TNI-PDR-8052
3	Pipeline Design Basis and Procedure	TH-ART-3D-GEN-PLR-BOD-0001 TH-G1-61-1A-GEN-PLR-BOD-0001 TH-G2-61-1A-GEN-PLR-BOD-0001
BB. QA/QC PROCEDURE		
1	Inspection and Test Plan	TH-ART-3D-GEN-INT-PDR-8304 TH-G1-61-1A-GEN-INT-PDR-8304 TH-G2-61-1A-GEN-INT-PDR-8304
2	Offshore NDE Operators and Certification (Structural and Pipeline)	TH-G1-61-1A-GEN-QAC-PDR-8111 TH-G2-61-1A-GEN-QAC-PDR-8111 TH-ART-3D-GEN-QAC-PDR-8111
CC. OPERATION GENERAL PROCEDURE		

1	Offshore Works - Pre-Installation, Post-Installation Procedure and As-Built Survey Procedure	TH-ART-3D-GEN-TNI-PDR-8105 TH-G1-61-1A-GEN-TNI-PDR-8105 TH-G2-61-1A-GEN-TNI-PDR-8105
2	Offshore Works - Diving Manual	TH-ART-3D-GEN-TNI-PDR-8106 TH-G1-61-1A-GEN-TNI-PDR-8106 TH-G2-61-1A-GEN-TNI-PDR-8106
3	Offshore Works - Anchor Handling Procedure	TH-ART-3D-GEN-TNI-PDR-8107 TH-G1-61-1A-GEN-TNI-PDR-8107 TH-G2-61-1A-GEN-TNI-PDR-8107
4	Towing Plan for Pipe Barges & Platform Barges	TH-ART-3D-GEN-TNI-PDR-8108 TH-G1-61-1A-GEN-TNI-PDR-8108 TH-G2-61-1A-GEN-TNI-PDR-8108
5	Offshore Works – ROV Procedure	TH-ART-3D-GEN-TNI-PDR-8113 TH-G1-61-1A-GEN-TNI-PDR-8113 TH-G2-61-1A-GEN-TNI-PDR-8113
6	Offshore Riser and Tie-in spool Installation Procedures	TH-ART-3D-GEN-TNI-PRC-8080 TH-G1-61-1A-GEN-TNI-PDR-8080 TH-G2-61-1A-GEN-TNI-PDR-8080
7	Pipeline Pigging and Hydrotest Procedures	TH-ART-3D-GEN-TNI-PRC-8090 TH-G1-61-1A-GEN-TNI-PDR-8090 TH-G2-61-1A-GEN-TNI-PDR-8090
8	Offshore Works - Survey & Positioning Procedure	TH-ART-3D-GEN-TNI-PDR-8109 TH-G1-61-1A-GEN-TNI-PDR-8109 TH-G2-61-1A-GEN-TNI-PDR-8109
DD. PROJECT MANAGEMENT PROCEDURE		
1	Offshore Installation Works - QC Plan	TH-G1-61-1A-GEN-TNI-PDR-8101 TH-G2-61-1A-GEN-TNI-PDR-8101 TH-ARD-3D-GEN-TNI-PDR-8101

1.5 Code and Standard

No.	Document number	Title
1	DNV 1981	Rules for Submarine Pipeline Systems
2	API RP 1111	Design, Construction, Operation and Maintenance of Offshore Hydrocarbon Pipelines (Limit State Design), July 2015.
3	API 1104	Welding of Pipelines and Related Facilities, 2013

1.6 Abbreviations

CPY	COMPANY
CSR	COMPANY Site Representative
AHT	Anchor Handling Tug
B/S	Barge Superintendent
B/E	Barge Engineer
B/F	Barge Foreman
CA	Certifying Authority
CM	Construction Manager
CD	Chart Datum
CTR	Contractor
DGPS	Differential Global Positioning System
DK	Deck
DMA	Dead Man Anchor
DLB	Derrick Lay Barge
D/SV	Diving Supervisor
FJC	Field Joint Coating
FJC/SV	FJC Supervisor
F/E	Field Engineer
F/F	Fitter Foreman
JKT	Jacket
JSA	Job Safety Analysis
K1	KUROSHIO
K2	KUROSHIO-2
LAT	Lowest Astronomical Tide
MSL	Mean Sea Level
MWS	Marine Warranty Surveyor
NDT	Non Destructive Test
NDT/SV	NDT Supervisor
PF	Platform
PL	Pipeline
QA	Quality Assurance
QC	Quality Control
Q/SV	QC Supervisor
R/F	Rigger Foreman
ROV	Remotely Operated Vehicle
S/O	Safety Officer
Surv	Surveyor
S/SV	Scaffolding Supervisor
TBA	To Be Advised

T/O	Tower Operator
USBL	Ultra Short Base Line (Acoustic Positioning System)
W/F	Welder Foreman

1.7 Installation Vessel

KUROSHIO-2 will be utilized for pipeline installation operation.

1.8 Weather Limitation

Weather limitation for pipe laying has been described in APPENDIX – 1 “Weather and Sea State Limitations for KUROSHIO-2”.

1.9 Responsible personal and scope

Barge Superintendent	Responsibility for barge operation.
Construction Manager	Responsibility for construction at site
Field Engineer	Make daily schedule plan, Engineering management at site
Barge Foreman	Responsibility for barge activity (scaffolding, welding, lifting etc) at site.
Tower Operator	Anchoring operation, Communication with AHT, Record activity progress
Tensioner Operator	Tension control of tensioners

2. PIPELINE INSTALLATION PROCEDURE

2.1 General

2.1.1. Laying Summary

The laying parameters such as the laying vessel, the laying tension variation range and the stinger angle variation range are extracted from “Laying Analysis Report, Doc. No. TH-ART-3D-GEN-TNI-CAL-8051, TH-G1-61-1A-GEN-TNI-CAL-8051 and TH-G2-61-1A-GEN-TNI-CAL-8051” and summarized in Table 2.1 below.

Table 2.1 Laying Parameters

Pipe Size & WT & CWC	Material Grade	Laying Tension Variation Range	Set Tension	Tensioner Pad Hole No.	Stinger Angle Variation Range	Type of Stinger
12"x14.3mm	X52	10 ton – 20ton	15 ton	No.10	10.0deg ~18.5deg	Suspension Type
16"x14.3mm with CWC 25mm	X60	30 ton – 40ton	35 ton	No.10	8.4 deg – 17.9 deg	Suspension Type
16"x12.7mm with CWC 40mm	X60	30 ton – 40ton	35 ton	No.10	11.7 deg – 17.8 deg	Suspension Type Stinger

C2

Note.1: The tensioner pad is adjusted as shown in 2.4.4, Figures

Note.2: The drawings of stingers are shown in APPENDIX-2

2.1.2 Positioning of DLB

The position of the DLB during the pipe laying will be controlled with the positioning system equipped on board the DLB as below:

- (1) During the pipe laying, the DLB position will be controlled with reference to the specified pipeline corridor (+/- 15m for standalone pipeline, +/- 5m for congested area).
- (2) The anchor pattern shall be approved by CPY prior to pipe laying. The anchor patterns during the pipe laying will be approved by CSR and CPY marine engineer onboard the DLB prior to deployment of anchors. Anchor deployment over the existing facility or within 500m radius of an existing facility requires CPY approval.

Detailed anchor handling and positioning procedure can be found in "Offshore Works - Anchor Handling Procedure and "Offshore Works – Survey & Positioning Procedure.

- (3) Heading of the DLB will be monitored with the gyrocompass equipped on the DLB.
- (4) Theoretical pipeline touchdown point will be displayed on the survey monitor to check if the pipeline is being laid within the specified corridor. Off track of the DLB from the nominal pipeline centerline will also be displayed on the monitor so that tower operator can adjust the DLB position accordingly.

2.1.3 Minimum Curvature during Pipe Laying

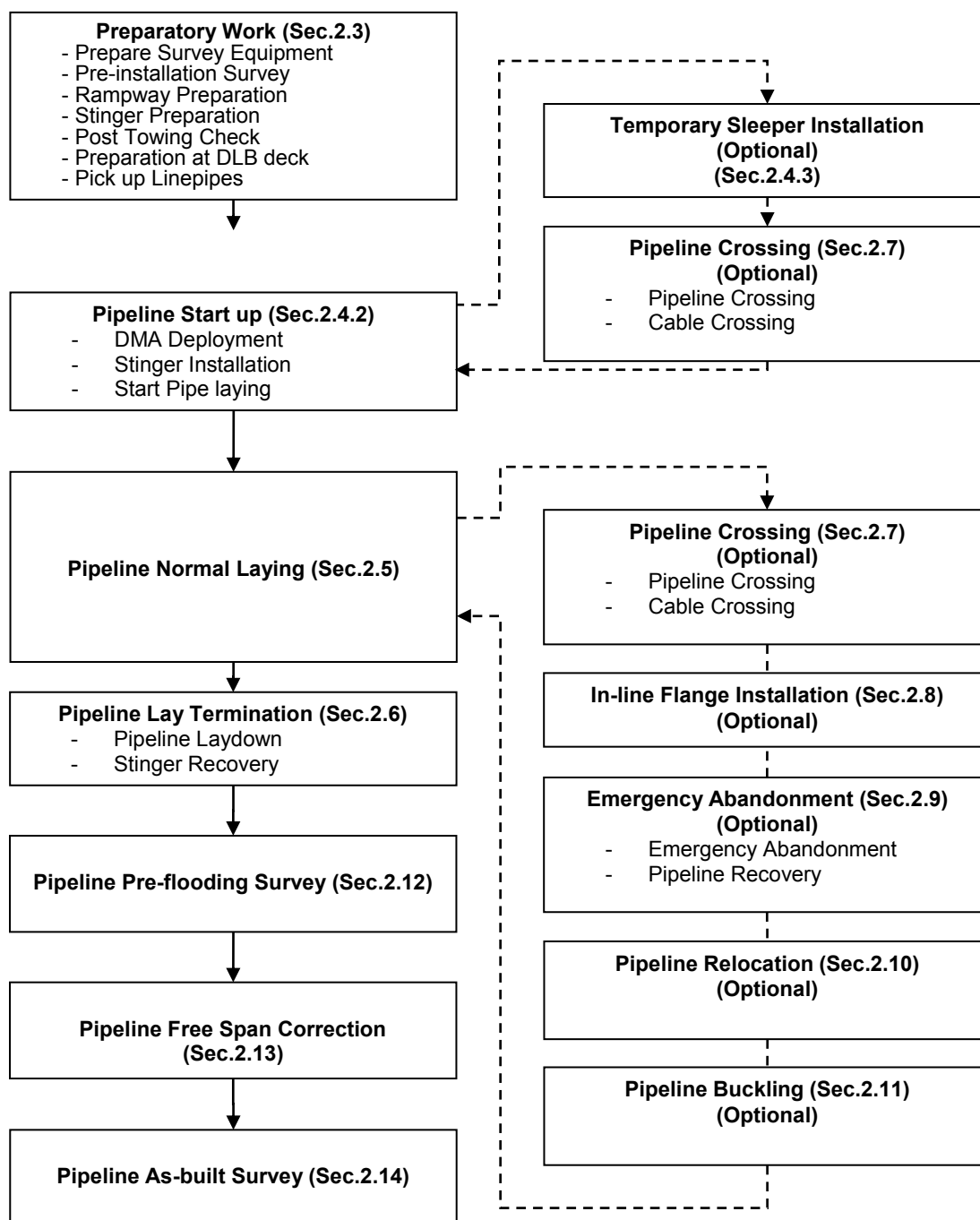
Minimum curvature during pipe laying calculated in the Pipeline design report "12" & 16" PIPELINE WALL THICKNESS VERIFICATION REPORT".

12" Pipeline : 1650m

16" Pipeline (Hot end) : 1600m

16" Pipeline (Cold end) : 1600m

2.2 Work Flow for Pipeline Laying



2.3 Preparatory Work

Preparatory work detail is shown in below table.

Item	Description	Action by	Checked by
1	<u>Prepare Survey Equipment</u> Survey equipment (i.e., DGPS system, gyrocompass, USBL, etc.) shall be calibrated prior to installation work. All necessary subsea information such as existing pipeline, WYE, PLEM, wellhead, cable, debris and jacket structure shall be displayed on the survey monitor.	Surv	F/E
2	<u>Pre-installation Survey</u> Pre-installation survey at the proposed pipeline routes including platforms shall be conducted to detect debris and anomaly of the seabed within corridor. Pre-installation survey report shall be reviewed by CPY. Any new information derived from pre-installation survey will be displayed on the survey monitor.	Surv	F/E CM
3	<u>Rampway preparation (Hold Point by F/E)</u> Adjust barge roller elevation and adjust tensioner pad. Set up auto welding equipment.	ALL	F/E
4	<u>Stinger preparation (Hold Point by F/E)</u> Adjust stinger roller elevation. Install camera at stinger tip Install emergency hawser	R/F, D/SV	F/E, B/F
5	<u>Post-towing Check (Hold Point by F/E)</u> General cargo check/inspection will be performed when pipe barge is brought alongside at DLB.	Q/SV B/F	F/E
6	<u>Preparation at DLB Deck</u> Erect pipe rack and transfer roller	R/F	B/F
7	<u>Pick up Linepipe</u> Alongside pipe barge and pick up linepipes <u>(Hold Point by B/S)</u> Review weather and sea condition whether barge can be brought alongside to DLB.	R/F	B/S,B/F

2.4 Start-up Procedure

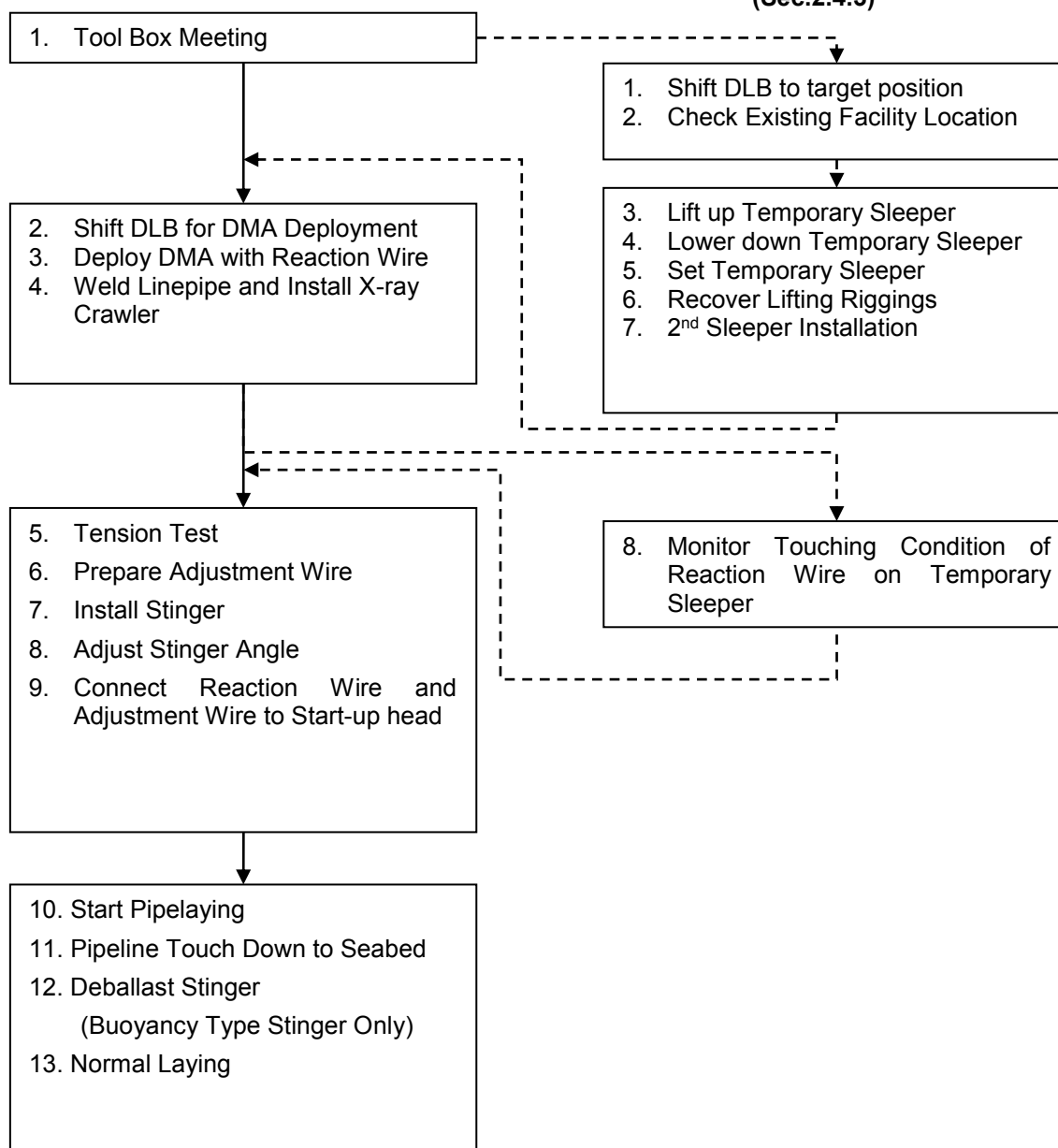
This section describes procedure for pipeline start-up operations.

The installation procedure for pipeline start-up is shown in Section 2.4.2 and procedure for temporary sleeper is described in Section 2.4.3.

2.4.1 Work Flow

Pipeline Start up (Sec.2.4.2)

Temporary Sleeper Installation (Optional) (Sec.2.4.3)



เอกสารแนบที่ 82

ตัวอย่างเอกสารแสดงรายละเอียดการออกแบบ

Design of Cathodic Protection for Offshore Structures by Sacrificial Anodes



PTTEP General Specification

Protection of Oil and Gas Production Facilities
Against Corrosion for Development Projects

PWGS-COR-001

Date: Jul 10 / Rev.0

Page 1 of 30

PTTEP GENERAL SPECIFICATION

(FOR BONGKOT & ARTHIT WELLHEAD PLATFORM DEVELOPMENT)

CORROSION

Protection of Oil and Gas Production Facilities Against Corrosion for Development Projects

Approved

Date

DOA:

14/7/10

EOS:

13/7/10

ENC:/EOP

04/07/10

EWP:

07 JUL 2010

Reviewed

Date

Technical Authority:

6 Jul 10

Originator:

5 Jul 10



PTTEP General Specification

Protection of Oil and Gas Production Facilities
Against Corrosion for Development Projects

PWGS-COR-001

Date: Jul 10 / Rev.0

Page 2 of 30

...		
0	2 Jul 10	First Issue
C	5 Mar 10	Issued For Approval
B	29 Jan 10	Issued For Review
A	15 Jan 10	Issued For IDC
Revision	Date	Description



TABLE OF CONTENTS

1	SCOPE	5
2	REFERENCE	5
2.1	Industry Codes and Standards	6
2.2	PTTEP Wellhead General Specifications	6
3	DEFINITIONS	7
3.1	Definitions	7
3.2	Abbreviations	7
4	BASIC OPTIONS FOR CORROSION CONTROL AND CRITICAL ITEMS	8
4.1	Models to be Used for the Corrosion Studies and Material Selection	8
4.2	Basic Option for Material Selection	8
4.3	Selection of Corrosion Control Systems for Critical Items	8
5	IMPLEMENTATION OF THE COMPANY REQUIREMENTS	9
5.1	Conceptual and Pre-Project Phases	9
5.2	Basic Engineering	10
5.3	General Specifications and Project Specifications	10
5.4	Feed Back at the End of Basic Engineering	10
5.5	Detailed Engineering Phase	10
5.6	Tie – In Projects	10
6	VALIDATED DATA	11
7	PROTECTION OF PRODUCTION FACILITIES AGAINST EXTERNAL CORROSION	11
7.1	External Protection of Offshore Structures and Topsides Facilities	11



PTTEP General Specification

Protection of Oil and Gas Production Facilities
Against Corrosion for Development Projects

PWGS-COR-001

Date: Jul 10 / Rev.0

Page 4 of 30

7.2	External Protection of Onshore Facilities	12
7.3	Protection of Bolting	13
7.4	External Protection of Pipelines / Risers	13
8	PROTECTION OF PRODUCTION FACILITIES AGAINST INTERNAL CORROSION	16
8.1	Material Selection	16
8.2	Chemical Treatment	22
8.3	Heat Insulation for TLC Prevention	26
8.4	Water Treatment for Hydrotesting of Equipment and Lines	26
8.5	Critical Velocity for Corrosion Erosion	28
8.6	Corrosion Monitoring	29



PTTEP General Specification

Protection of Oil and Gas Production Facilities
Against Corrosion for Development Projects

PWGS-COR-001

Date: Jul 10 / Rev.0

Page 5 of 30

1 SCOPE

This document defines the COMPANY policy and requirements to be adopted during the design for the protection of oil and gas production and treatment facilities against internal and external corrosion. It shall be used as basis for the conceptual, pre-project and basic engineering phases of new developments. All COMPANY general specifications (new ones and also existing ones) shall be in full compliance with this document. This document contains the COMPANY's general requirements but also some important technical details considered as critical and necessary for the design of the new facilities and for the modification of the existing facilities. This document shall be applied to all new development projects starting with conceptual phase after the date of its approved publication by PTTEP management. It shall not be applied to ongoing projects at the date of its application.

2 REFERENCE

The reference documents listed below, including Industry Codes and Standards and COMPANY specifications, form an integral part of this General Specification. Unless otherwise stipulated, the applicable version of these documents, including relevant appendices and supplements, is the latest revision published on the effective date of the contract.

The overall order of precedence of the applicable documents shall be:

- 1) Government Laws, Rules and Regulations
- 2) Purchase Order/ Service Order/ Contract Documents
- 3) Project Particular Specification (PPS)
- 4) Present General Specification
- 5) Codes and Standards in reference

Any conflict between any of the Contract Documents, or between this specification and any other Contract Document, shall be reported to the COMPANY for decision. In such a case, and unless otherwise agreed or decided by the COMPANY, it is understood that the more stringent requirement shall apply.

Exceptions to, or deviations from this specification are not permitted unless previously accepted in writing by the COMPANY. For this purpose, requests for substitutions or changes of any kind shall be complete with all pertinent information required for COMPANY assessment. COMPANY's approval, nevertheless, will not, in any way, relieve the responsibility of the Contractor to meet the requirements of the industry Codes and Standards referred to and amended herein, in the event of conflict.



PTTEP General Specification

Protection of Oil and Gas Production Facilities
Against Corrosion for Development Projects

PWGS-COR-001

Date: Jul 10 / Rev.0

Page 6 of 30

2.1 Industry Codes and Standards

Reference	Title
NACE MR 0175 / ISO 15156	Petroleum and Natural Gas Industry – Materials for Use in H ₂ S Containing Environments in Oil and Gas Production.

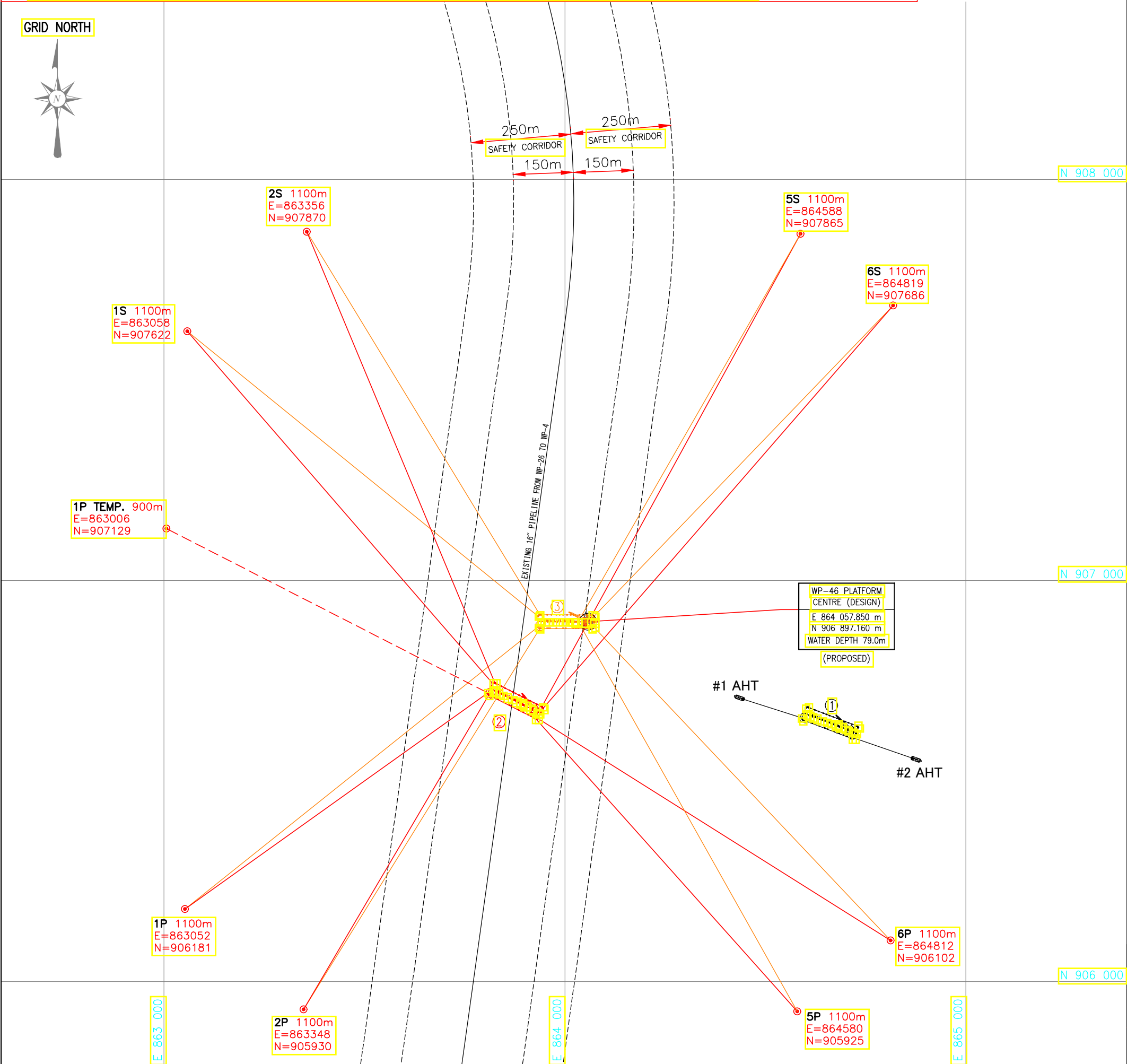
2.2 PTTEP Wellhead General Specifications

Reference	Title
PWGS-COR-101	Design of Cathodic Protection of Offshore Structures by Sacrificial Anodes
PWGS-COR-102	Corrosion Spec.on Design Installation and Inspection of Cathodic Protection of Sealines by Sacrificial Anodes
PWGS-COR-105	Design of Internal Cathodic Protection of Equipment and Storage Tanks
PWGS-COR-111	Internal Corrosion and Erosion Control Monitoring
PWGS-COR-201	Materials for Sour Service
PWGS-COR-202	Supply of Anodes and Monitoring Equipment for Cathodic Protection by Sacrificial Anodes
PWGS-COR-203	Insulating Joints
PWGS-COR-301	Painting of Offshore and Coastal Structurals and Facilities
PWGS-COR-303	External Anticorrosion Coating for Pipelines
PWGS-COR-304	External Field Joint Coating for Pipelines
PWGS-COR-305	Coating for Bends and Fittings for Pipelines
PWGS-COR-306	Corrosion Coating of Pipelines Risers
PWGS-COR-307	Corrosion Internal Coating of Pressure Vessels and Tanks
PWGS-COR-308	Internal Coating of Water Injection Tubing and Lines
PWGS-COR-501	Water Treatment for Hydrostatic Pressure Testing

เอกสารแนบที่ 83

ตัวอย่าง Anchor Pattern

ANCHOR PATTERN FOR APPROACH AT WP46PF (WEST HEADING)



ANCHOR PATTERN FOR APPROACH AT WP46PF (WEST HEADING)

NOTE:—

POSITION(1)

APPROACH TO WP46 PF LOCATION

POSITION(2)

DEPLOY ANCHORS

- 1P TEMP., 6P
- 1S, 5P
- 2S, 2P
- 5S, 6S

RELOCATE ANCHOR 1P TEMP. TO 1P

POSITION(3)

JKT LIFTING AND UPENDING POSITION

LEGEND:—

- ⊙ : ANCHOR POINT.
- : PARACHUTE BUOY (0 PCS REQ'D).

K2 POSITION	REQUIRED PARACHUTE BUOY								QTY
	1P	2P	5P	6P	1S	2S	5S	6S	
(1)	—	—	—	—	—	—	—	—	—
(2)	—	—	—	—	—	—	—	—	—
(3)	—	—	—	—	—	—	—	—	—

NOTE:—

THESE ANCHOR PATTERN WILL BE ADJUSTED AS PER ACTUAL SITUATION

EPCI OF WELLHEAD PLATFORMS , PIPELINES & TIE-INS FOR G2/61 PHASE 1A

ANCHOR PATTERN FOR APPROACH AT WP46PF (WEST HEADING)



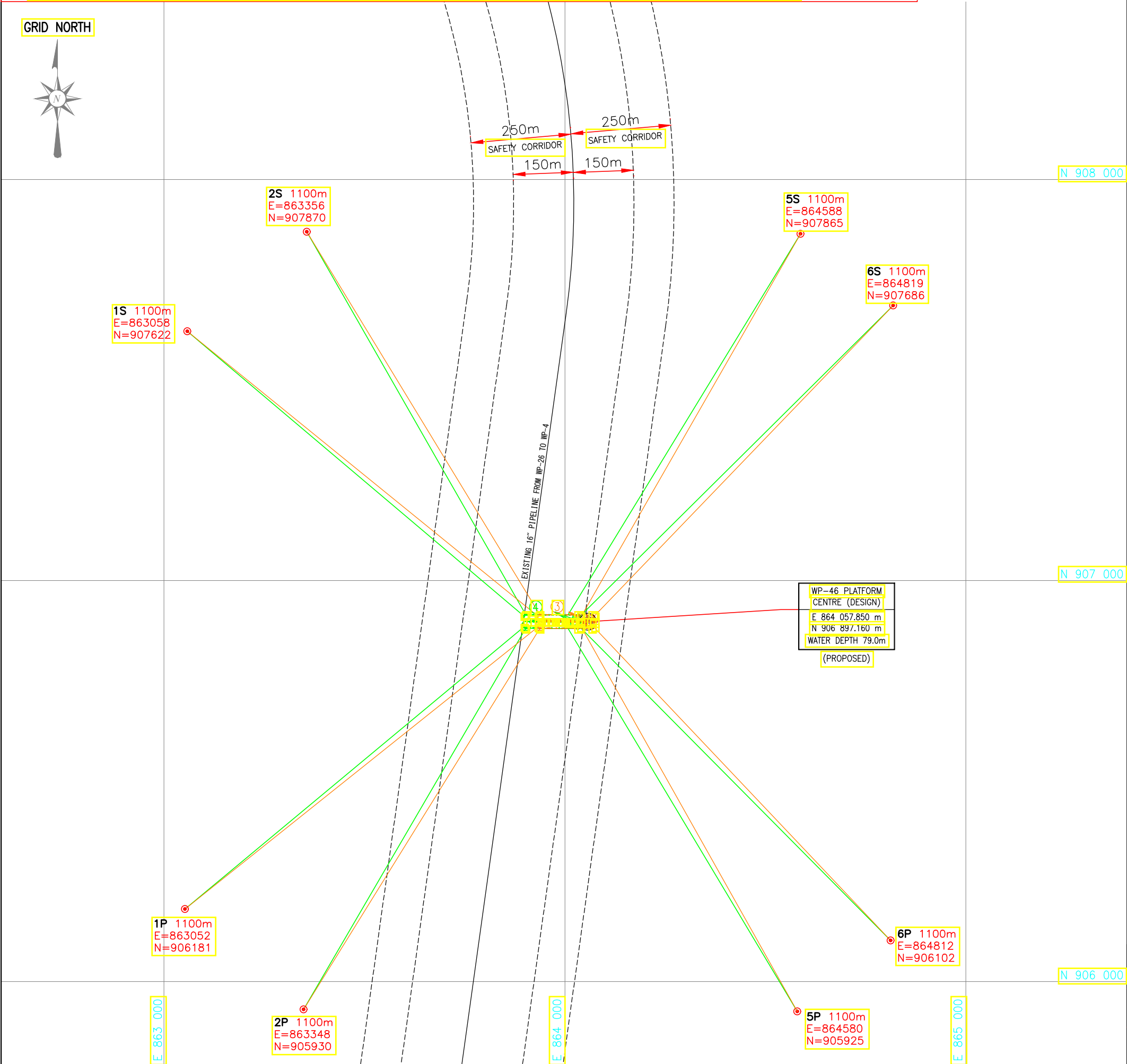
NIPPON STEEL ENGINEERING

DWG.NO: G2-61-1A-ANCP-WP46-001

DATE: 9 OCT '21

REV.NO: 2

ANCHOR PATTERN FOR WP46PF JKT INSTALLATION (WEST HEADING)



ANCHOR PATTERN FOR WP46PF JKT INSTALLATION (WEST HEADING)

NOTE:—

POSITION(3)

ANCHOR LINE 5S AND 5P REQUIRED
SNATCH BACK OF 30M APPROX.

ALONGSIDE JKT BARGE AT K2 STERN.
*IF REQUIRED, 6S AND 6P WILL BE SLACKED.

JACKET LIFTING AND RELEASE JKT BARGE

COMMENCE JKT UPENDING

SHIFT TO POSITION 4

LEGEND:—

- ⊙ : ANCHOR POINT.
- : PARACHUTE BUOY (0 PCS REQ'D).

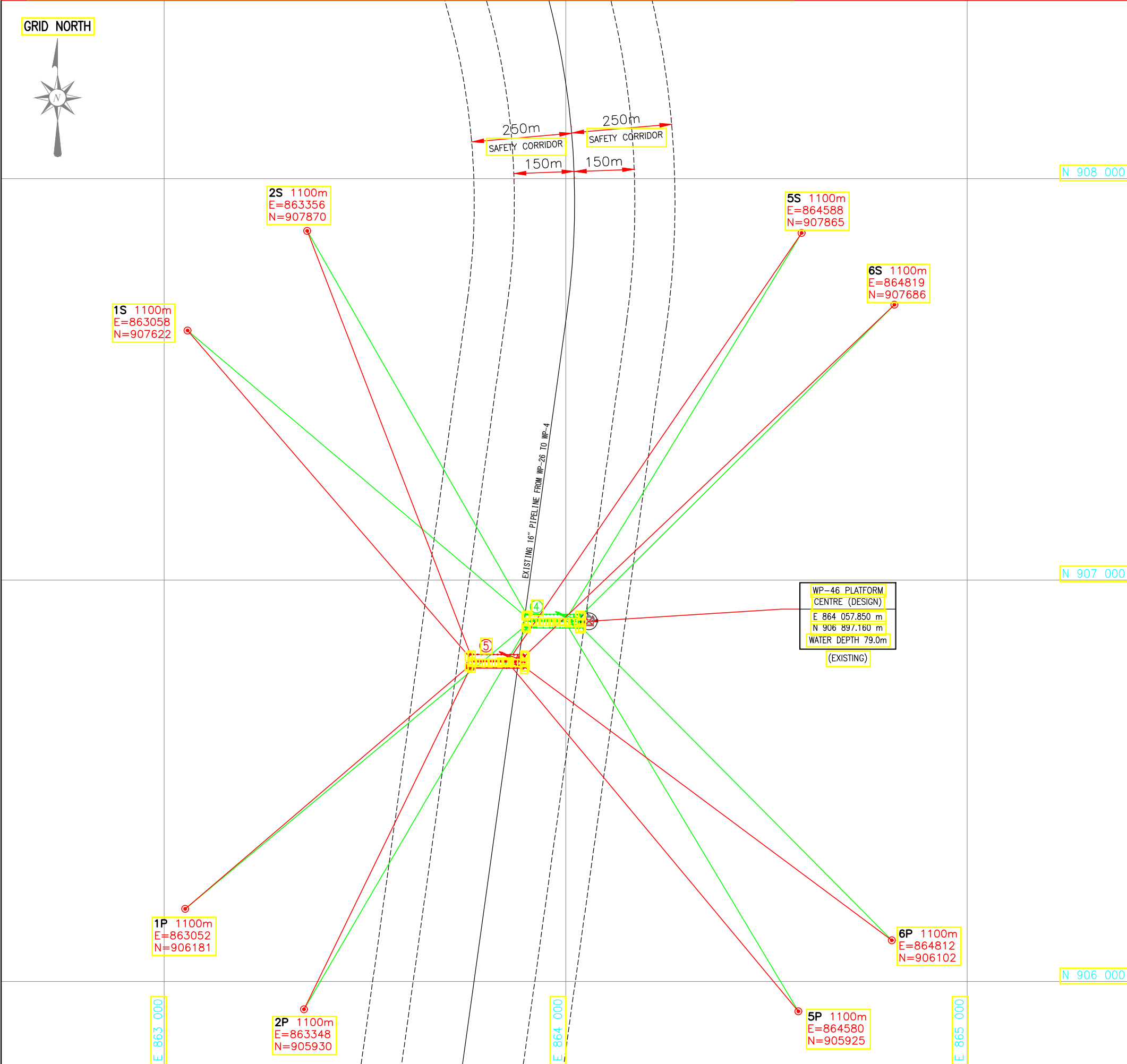
K2 POSITION	REQUIRED PARACHUTE BUOY								QTY
	1P	2P	5P	6P	1S	2S	5S	6S	
(3)	—	—	—	—	—	—	—	—	—
(4)	—	—	—	—	—	—	—	—	—

NOTE:—

THESE ANCHOR PATTERN WILL BE ADJUSTED
AS PER ACTUAL SITUATION

EPCI OF WELLHEAD PLATFORMS , PIPELINES & TIE-INS FOR G2/61 PHASE 1A		DWN ENDRI	DWG.NO: G2-61-1A-ANCP-WP46-002
ANCHOR PATTERN FOR WP46PF JKT INSTALLATION (WEST HEADING)		ENGR S.K	DATE: 9 OCT '21
NIPPON STEEL ENGINEERING			REV.NO: 2

ANCHOR PATTERN FOR WP46PF DK INSTALLATION (WEST HEADING)



ANCHOR PATTERN FOR WP46PF DK INSTALLATION (WEST HEADING)

NOTE:—

POSITION(4)

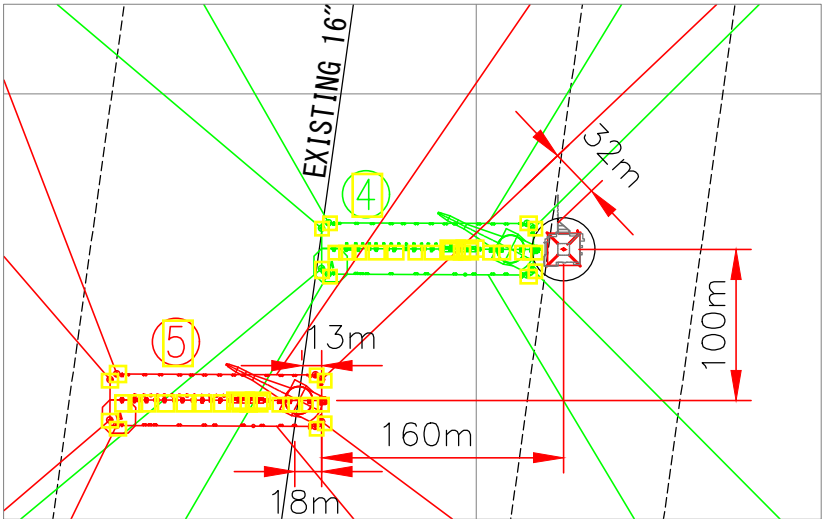
SHIFT K2 TO POSITION 5

POSITION(5)

ANCHOR LINE 5S AND 5P REQUIRED SNATCH BACK OF 30M APPROX.

ALONGSIDE DK BARGE AT K2 STERN.
*IF REQUIRED, 6S AND 6P WILL BE SLACKED.

DK LIFTING AND RELEASE DK BARGE



LEGEND:—

- ⊙ : ANCHOR POINT.
- : PARACHUTE BUOY (0 PCS REQ'D).

K2 POSITION	REQUIRED PARACHUTE BUOY								QTY
	1P	2P	5P	6P	1S	2S	5S	6S	
(4)	—	—	—	—	—	—	—	—	—
(5)	—	—	—	—	—	—	—	—	—

NOTE:—

THESE ANCHOR PATTERN WILL BE ADJUSTED AS PER ACTUAL SITUATION

EPCI OF WELLHEAD PLATFORMS , PIPELINES & TIE-INS FOR G2/61 PHASE 1A

ANCHOR PATTERN FOR WP46PF DK INSTALLATION (WEST HEADING)

DWN
ENDRI

ENGR
S.K

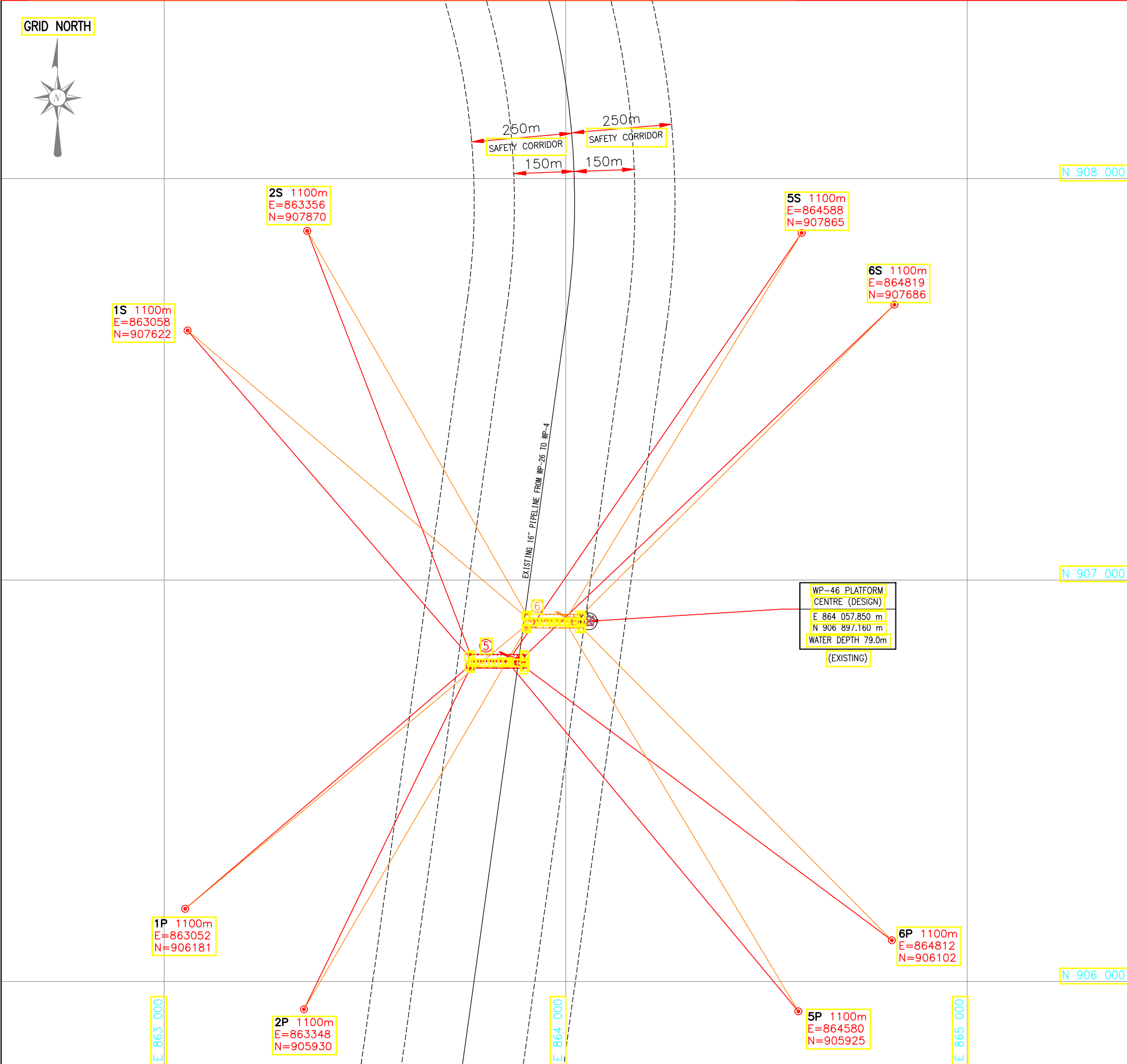
DWG.NO:
G2-61-1A-ANCP-WP46-003

DATE: 11 OCT '21

REV.NO.
4

NIPPON STEEL ENGINEERING

ANCHOR PATTERN FOR WP46PF DK INSTALLATION (WEST HEADING)



ANCHOR PATTERN FOR WP46PF DK INSTALLATION (WEST HEADING)

NOTE:—

POSITION(5)

ANCHOR LINE 5S AND 5P REQUIRED SNATCH BACK OF 30M APPROX.

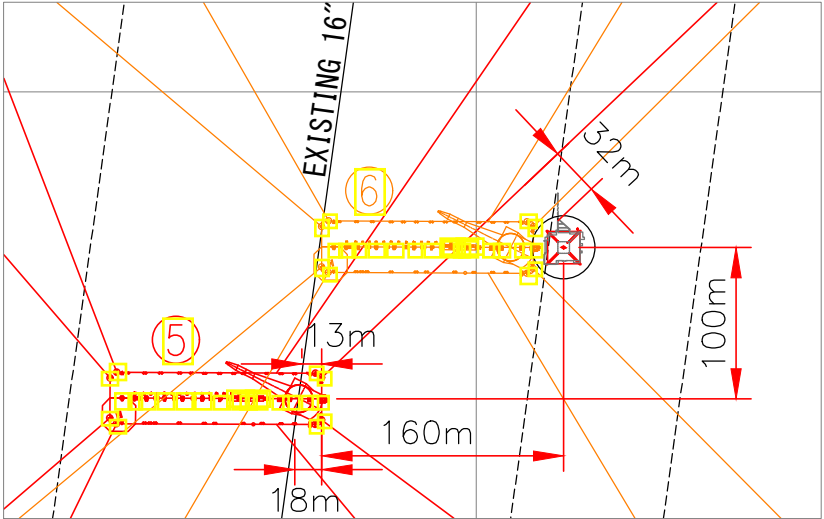
ALONGSIDE DK BARGE AT K2 STERN.
*IF REQUIRED, 6S AND 6P WILL BE SLACKED.

DK LIFTING AND RELEASE DK BARGE

SHIFT BACK TO POSITION 6 WITH LIFTED DK

POSITION(6)

WP46 DK INSTALLATION



LEGEND:—

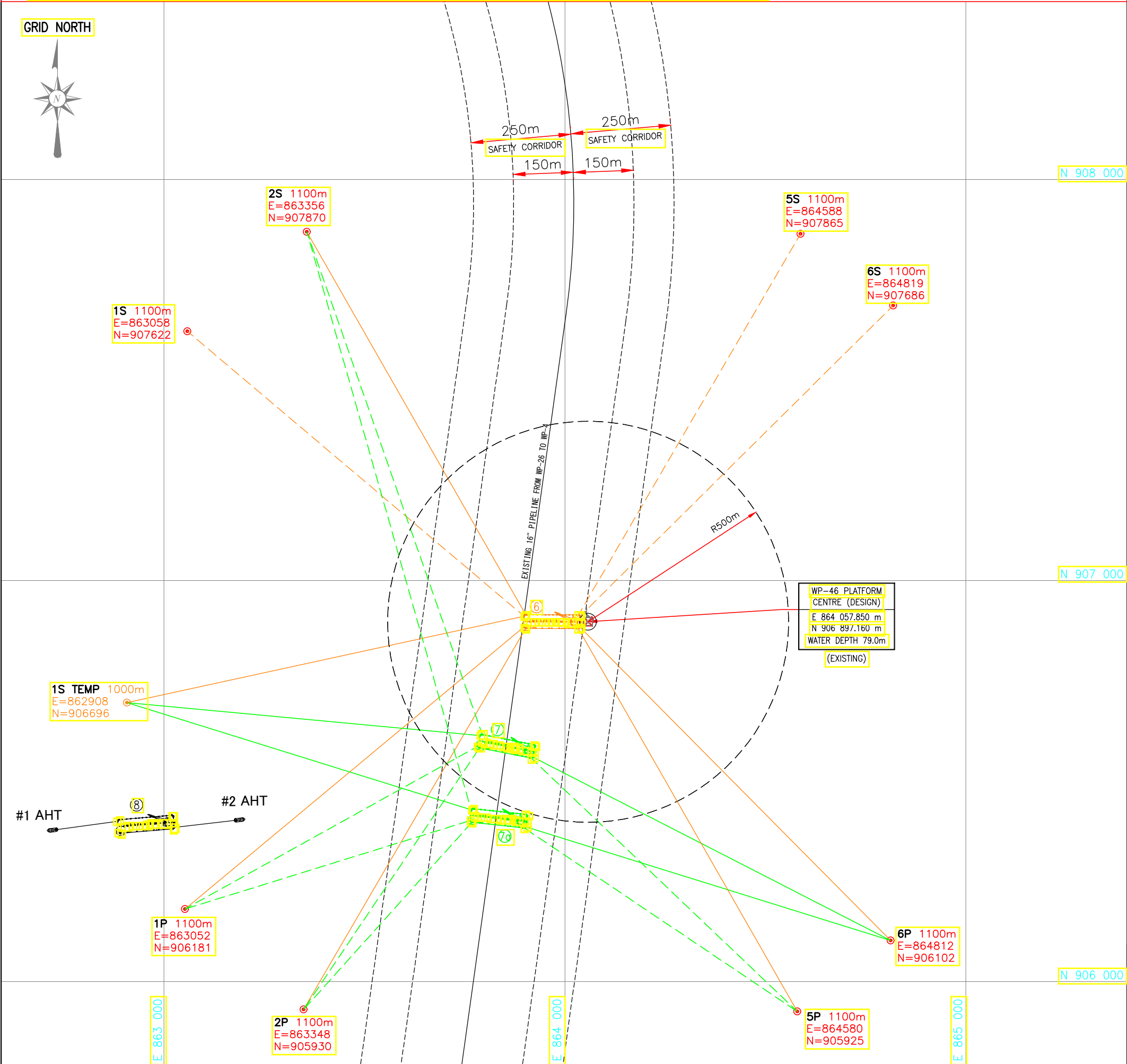
- ⊙ : ANCHOR POINT.
- : PARACHUTE BUOY (0 PCS REQ'D).

K2 POSITION	REQUIRED PARACHUTE BUOY								QTY
	1P	2P	5P	6P	1S	2S	5S	6S	
(5)	—	—	—	—	—	—	—	—	—
(6)	—	—	—	—	—	—	—	—	—

NOTE:—

THESE ANCHOR PATTERN WILL BE ADJUSTED AS PER ACTUAL SITUATION

ANCHOR PATTERN FOR DEPARTURE AT WP46PF (WEST HEADING)



ANCHOR PATTERN FOR DEPARTURE AT WP46PF (WEST HEADING)

NOTE:—

POSITION(6)

- WP46 DK INSTALLATION
- RELOCATE 1S TO 1S TEMP.
- RECOVER 5S & 6S

POSITION(7)

- RECOVER 1P, 2S, 2P & 5P
- PICK UP 1S TEMP & 6P

NOTE : K2 POSITION SHALL ALWAYS BE ABOVE PIPELINE !

POSITION(8)

TOWING TO NEXT LOCATION

LEGEND:—

- ⊙ : ANCHOR POINT.
- : PARACHUTE BUOY (0 PCS REQ'D).

K2 POSITION	REQUIRED PARACHUTE BUOY								QTY
	1P	2P	5P	6P	1S	2S	5S	6S	
(6)	—	—	—	—	—	—	—	—	—
(7)	—	—	—	—	—	—	—	—	—
(8)	—	—	—	—	—	—	—	—	—

NOTE:—

THESE ANCHOR PATTERN WILL BE ADJUSTED AS PER ACTUAL SITUATION

EPCI OF WELLHEAD PLATFORMS , PIPELINES & TIE-INS FOR G2/61 PHASE 1A

DWN
ENDRI
DWG.NO:
G2-61-1A-ANCP-WP46-005

ANCHOR PATTERN FOR DEPARTURE AT WP46PF (WEST HEADING)

ENGR
S.K
DATE: 9 OCT '21




NIPPON STEEL ENGINEERING

REV.NO.
2

เอกสารแนบที่ 84

ตัวอย่างเอกสาร SSHE Vessel Suitability Inspection

EWP SSHE Vessel Inspection Rev. 0		EWP SSHE SSI 8 App - 6: SSHE Vessel Suitability Inspection Checklist Health, Safety/Environment Assessment Program		
Note: Intensity of the Inspection is dependent upon the vessel size, operation (work scope) - if vessel is Accommodation Work Barge Health & Hygiene Inspection Should be carried out SSHE SSI				
The scoring for each question can range 0 to 5, using 0.5 decimal points where applicable. Individual score guidelines are : 0.5 to 1.0= Very Poor; 1.5 to 2=Poor; 2.5 to 3=Below Average; 3.5 to 4= Average; 4.5 to 5= Acceptable Items not checked will be marked N/A Distribution: Snr SSHE Engineer, CSR, OIM, T&I Manager, Vessel Operator, CTR Representatives, others as necessary				
General HSE Management details:		Tick ✓	Comment	
Records of Incident Investigation and Reporting System, statistics produced		✓		
Risk Assessment System (JSA, HazID, Assessment of Hazardous Chemicals & Wastes)		✓		
Hot Work Procedure		✓		
Radioactive Sources Management Procedure		✓		
Permit to Work and LOTO System		✓		
System for Management & Handling of Industrial Gases		✓		
Procedures for Lifting and Equipment Management (including Marine Standards)		✓		
Waste Management Procedure available		✓		
Electrical Management Standard / Procedure available (considering marine environment and conditions, competency)		✓		
Involvement of Barge Crew in Safety Management (i.e. Safety Committee, TBSM)		✓		
Vessel Security Plan (witness only may be deemed confidential, Project may require SVA covering execution of works)		✓		
Emergency Response Plan (Vessel Specific, Project Bridging to be established)		✓		
Fire / Safety Plans & Emergency Equipment Lay-out Plans		✓		
Diving Safety Procedures		✓	Diving Procedure TH-ART-3D-GEN-TNI-PDR-8106	
Anchor Handling Safety Procedures		✓		
Safety Induction & Training Records, Vessel Rules available		✓		
Audit Leader Name: Ross Husain Date: 12 May 2021		Score	Points Awarded	693
Barge/Vessel: DLB KUROSHIO II Contractor SSHE Rep/ Project Rep : OGURA HIROSHI		98.93%		
A	General HSE Requirement	Target (DO NO EDIT THESE CELLS BELOW)	Actual Score awarded or N/A	700
1	SSHE Handbooks/ Information dealing with General Offshore Emergency & General Rules, Are safety rules prominently displayed	5	5	
2	Are personnel Inducted which includes Emergency Procedure	5	5	
3	Personnel including subcontractors receive training in PTW System and Risk Assessment	5	5	
4	Crew Offshore Training Certificates records/updated (SWTC / OPITO or similar) -	5	5	
5	Crew Medical Fit to Work (FTW) certificates records/updated (Medic & Dr, Catering 6 months other validity <60 years 2 year, >60 1 year)	5	5	
6	On-board training program/program, available	5	5	
7	Safety Signs in place (English & other crew languages)	5	5	
8	Safety Officer or Organisation Appointed	5	3	Balance 6 Safety Officers mob from Songkhla
9	Is there a system in place for reporting accidents, near misses are Actions tracking systems in place to record learnings & corrective actions	5	5	
10	Are the number of near misses being recorded greater than the actual number of accidents occurring	5	5	

11	Is there a defined Incident Investigation Procedure which defines who is responsible for leading such meetings and generating reports	5	5	
12	Have incident investigators received training	5	5	
13	Are environmental incidents included in the incident statistics & incident Reports generated for all incidents	5	5	
14	All loose Equipment / Materials below deck to be secured	5	5	
15	Key Personnel Understand the Safety Management System	5	5	
16	Personnel consulted on Safety Issues & method in place to track close out (i.e. ATR/ Minutes of Meetings)Records of Meetings Maintained	5	4.5	Updates on weekly basis during project
17	Personnel involved in TBSM,	5	5	
18	Notice Boards indicate details of Safety Officer and Personnel Representatives, Notice Boards are well maintained	5	5	
19	SSHE Committee established	5	3	After all crews onboard at Songkhla
20	Is SSHE given a high visibility	5	5	
21	System available for Risk Management including recording and ensuring adequate controls	5	5	
22	Are risk assessments generated for e.g. Radiation, Noise, manual handling, hot work work, personnel welfare, working at heights, lifting etc	5	5	
23	Other:			
POSSIBLE POINTS AWARDED		110	105.5	95.91%
B	Fall Protection			
1	Deck Perimeter Guarding	5	5	
2	Fall protection maintained and has current inspection, personnel trained in use	5	5	
3	Fall protection equipment is used only for fall protection	5	5	
4	If scaffold erected, it is erected to an acceptable standard, tagged etc	5	5	
5	Scaffolding for Project meets with Company Standards i.e. B-SAFE-I 811 page 7 EN & BS	5	5	
6	Scaffold & Working at Heights Procedure (if not available will be required for Project)	5	5	
7	Scaffolders & Scaffold Supervisor certificates available and current (B-SAFE-I811 & SSHE.010.1)	5	5	
8	Harnesses & Lanyards Available, personnel trained on safe use & anchoring points / 100% Hook on policy	5	5	Harness replaced newly purchased
9	Access Gantries & bridges in good condition and Certified (6 monthly)	5	5	
10	Ladders in good condition and well maintained	5	5	Certified by 3rd party
11	Transfer of Personnel Procedure available / Personnel trained (to be approved by Company)	5	5	
12	No Lone working on Deck at Night/ High Visibility Clothing	5	5	Daily discussed in tool box meeting
13	Adequate Fall Protection Barriers in place on deck, or where barriers not available Life Vests ensured	5	5	
14	Work near or over water fall protection requirement, WOW procedure / instruction available	5	5	
15	Other:			
POSSIBLE POINTS AWARDED		70	70	100.00%
C	Fire Protection, Equipment Detection & Emergency Preparedness			
1	Flammables Stored Properly - MSDS (English & Other Languages), Fire Fighting Equipment available	5	5	
2	Fire Prevention: Hot Work Procedures available and applied including Welding, Cutting, Grinding, Acetylene Cutting, Smoking controls etc	5	5	
3	Fire mains, pumps, hoses nozzles to be in good condition and ready to use. Operating instruction displayed	5	5	
4	Fire / Smoke Detection & Alarm System Operational, available & Regularly Tested (records)	5	5	Tested by third party with certificate
5	Alarm call points available and well positioned/ accessible	5	5	
6	Fixed fire detection and alarm system fully operational	5	5	
7	Measures in place to effectively isolate HVAC system (i.e.. Engine room, accommodation, galley, store rooms)	5	5	
8	Vessel personnel familiar with the operations of fire fighting, life saving and other emergency equipment,	5	5	
9	Firemen's Suit including SCBA in good condition and ready to use	5	5	Inspected, function tested and newly supplied on 15 April 2021
10	Certification & training available for SCBA equipment, log board used for personnel donning SCBA	5	5	ERT
11	Fire & Muster Station Plans well displayed, accessible. Routes are well light and directional systems/ back up battery lighting, Muster station identified in cabins	5	5	
12	Fire ERT available and trained	5	5	
13	Emergency Routes, Doors clear & free from Trip hazards	5	5	
14	Fire Tender/ Pumps available and tested weekly (records)	5	5	Monthly Inspection
15	Tropical Rotating Storm Response & Avoidance Procedure Available (to be established)	5	5	Thyphoon Evacuation Procedure

16	Emergency Communications available - handheld, VHF, Satellite phones etc	5	5	
17	Emergency procedures cover collision, explosion, gas / vapour release, vessel grounding	5	5	
18	Medical Emergency Equipment, First Aid, Infirmary established, Medical Response Procedure in place (refer to SSHE SSI Health & Hygiene Inspection)	5	5	
19	Doctor/ Medic minimum ALCS (PSH008), 2 per Work / Accommodation Barge to cover MEDEVAC. Vessels STWC II minimum - certificates available	5	5	
20	Drills Carried and Records Available	5	5	Conducted 7 May 2021
21	Crew shall have received onboard training in MOB Response / SOLAS requirements special arrangements in place/ FRC crew (Coxswain)	5	4	After all crews onboard at Songkhla
22	MOB ERT are provided with PPE including Head Protection	5	5	
23	FRC function tested, spare fuel, coxswain trained, radio comms adequate, launching system in good condition & safe, drills carried out regularly	5	5	Serviced, drill to be carried out prior sail out from Batam
24	Robust POB Management system in place (procedure required for PTTEPI review)	5	5	
25	Other			
POSSIBLE POINTS AWARDED		120	119	99.17%
D	Permits/JSA (PTW Procedure will be approved fully for project execution)			
1	Is a defined PTW procedure available	5	5	
2	Is there a defined Organisation detailed in the procedure and put into practice	5	5	
3	PTW Issuer in place, approval system being applied and well defined	5	5	
4	Pre-talk safety reviews/TBSM/ Applicable Permits Posted	5	5	
5	Is a LOTO system available and applied (to be approved if Pre-Project Audit)	5	5	
6	Are audits carried out of the PTW/ LOTO System (to be approved if Pre-Project Audit)	5	5	
7	Is there a defined list of onboard activities to be covered by the PTW system or exempted from the PTW system	5	5	
8	Is there a procedure for assessing confined spaces and flammable or oxygen deficient atmospheres, forced ventilation system available	5	5	
9	Procedure being followed. i.e. JSA, Confined space, equipment / machinery shutdown and intervention etc.	5	5	
10	Other:			
POSSIBLE POINTS AWARDED		45	45	100.00%
E	Rigging & Lifting Equipment (system to align with PTTEPI LOG-00DP4 during Project Execution)			
1	Cranes maintenance records & current inspection certificate (6 monthly)	5	5	ABS certified on 4 Jan 2021
2	Man basket / Billy Pugh System and equipment certified (6 monthly third party)	5	5	ABS Certified on 20 Apr 2021
3	Lifting gear certification and color coded	5	5	ABS certified - Shackles 3 May '21, Nylon Slings 5 Apr '21, Level Block 31 Mar 2021
4	Proper handling storage of lifting appliance	5	5	
5	Proper rigging technique used/ Training System in place	5	5	
6	Crane's operators license & competency training.	5	5	
7	Containers & Lifting Racks Test certificates available	5	5	ABS Certified
8	Certified Pad Eyes and designated lifting arrangement (slings, shackles) utilised for Marine Logistics Equipment, Baskets, Containers, Racks	5	5	ABS certified on 15 Mar 2021
9	Other: Crane 4 yearly load test in line with PTTEPI SSHE instructions for Contractors	5	5	ABS certified on 25 Feb 2021
POSSIBLE POINTS AWARDED		45	45	100.00%

F			
Life Saving Appliance & Emergency Systems			
1	Lifeboats in good conditions/certified and operating instruction displayed nominated personnel trained to activate and launch		N/A
2	Life Boats lower test in last 3 months, davits in good working order & condition.		N/A
3	Life rafts in good condition/certified and operating instruction displayed, nominated personnel trained to activate and launch	5	Certificate of Re-inspection on 23 Feb 2021
4	Life raft shall have a valid inspection certificate & Casings shall be in good condition, Davit launch life rafts to have been exercised every 6 months.	5	Certificate of Re-inspection on 23 Feb 2021
5	Boarding ladders to be in good condition (check for missing steps, rope deterioration and lashings).	5	Use Boatlanding
6	Life rafts shall be stowed in such a position that they can be easily and successfully launched.	5	
7	Painter length shall be appropriate for the height of stowage & boarding ladders to be in good condition (check for missing steps, rope deterioration and lashings).	5	
8	Hydrostatic releases, if fitted, shall be correctly attached, in good condition and in date.	5	Certificate of Re-inspection on 23 Feb 2021
9	Radar transponders to be fitted one to each side of the vessel and stowed to permit rapid use in survival craft. Check they are in date.	5	
10	EPIRB shall be stowed such that it will float free on release. Battery shall be in date.	5	Certified on 23 Apr 2021
11	Lifebuoys, life buoys lights, self activating smoke floats in good order. Life Jackets in Cabins	5	
12	First Aid packs / Boxes ready for use and contents in good condition	5	Medicine Chest certified 9 May 2021 (6 mths validity)
13	SOLAS Life jackets / Number 200% (SOLAS/ As per vessel Certificate) are in good conditions - donning instruction posted on the deck, sufficient available	5	
14	Safety Plan & emergency equipment lay-out plan updated/ displayed / available	5	
15	Fast Rescue Craft in good condition records of function tests available	5	Serviced
	Man Over Board Procedure/ Response Available & tested - personnel trained in response	5	
17	Life buoys positioned on deck, Flares, Night Lighting available	5	
18	Oxygen Resuscitation Equipment Available and Personnel Trained (medical)	5	Serviced with certificate on 15 Apr 2021
19	Isolating valves in fire/foam system lines to be clearly marked and operational.	5	
20	Firemen's outfits including breathing apparatus in good condition and ready for immediate use.	5	Breathing apparatus serviced and certified 15 Apr 2021
21	International ship/shore fire connection is readily available and it's location clearly marked.	5	
22	Suitable stretcher for marine use is available.	5	
23	SCBA Available, Spare bottles fully charged, training given on doing and use	5	Serviced with certificate on 15 Apr 2021
24	Emergency fire pump to be fully operational. Starting instructions shall be clearly displayed.	5	
25	Fire mains, pumps, hoses and nozzles to be in good order and available for immediate use	5	
26	Establish operational condition of fire detection and alarm systems throughout vessel.	5	
27	Are measures in place to effectively isolate ventilation to enclosed spaces, i.e. engine room, accommodation, galley, storerooms, Vent fan stops shall be operational (spot check) and clearly marked. Closing devices to have a maintenance and testing program in place.	5	
28	Emergency generator & fuel tank to be fully charged, Emergency lighting batteries to be in satisfactory condition. * Instructions to be available to maintain/restore main plant in the event of emergency	5	
29	Emergency escape routes to be clearly marked, unobstructed and illuminated on deck and in the Engine Rooms, Corridors etc	5	
30	Other:		
POSSIBLE POINTS AWARDED		135	135 100.00%

G	Waste Management & Pollution Prevention		
1	Trash receptacles are provided at work areas	5	5
2	Waste Management Procedure/ Place in place and well communicated	5	5
3	No wastes to be dumped overboard (Company rules)	5	5
4	Work areas/facilities are clean and free of excess trash & debris	5	5
5	Adequate arrangement to prevent any oil spills entering the water	5	5
6	Oil water separator control system in place & good working order	5	5
7	Segregation of waste and maintained waste disposal record/book in place	5	5
8	Information & training regarding waste management rules in place	5	5
9	Drip trays / containment etc used under plant, such as generators, compressors, hydraulic lines	5	5
10	Shipboard Oil Pollution Emergency Plan in place & Drills carried out every 4 months	5	5
11	Anti-pollution warning notices posted	5	5
12	Unused bunker pipeline manifolds, drains and vents and unused gauge stems to be suitably blanked or capped	5	5
13	Bilge overboard valves to be suitably marked – specific warning notices / LOTO to be applied, Bilge Alarms working	5	5
14	During fuel transfer operations, scuppers are to be plugged or dammed	5	5
15	List of spill incidents maintained	5	5
16	Bunkering Procedure in place and used	5	5
17	System for Managing Waste Oils, Fuels, Chemicals including Kitchen Oils - segregated to reduce fire risk	5	5
18	Spill and Emergency Response Kits available - absorbent, booms etc	5	5
19	Personnel Trained on Emergency Spill response on board and over board	5	5
20	Hazardous Waste Records Maintained	5	5
21	Other:		
POSSIBLE POINTS AWARDED		100	100
			100.00%
H	Heli-Pad & Helicopter Transfer (for Project Works detailed inspection & Aviation Certificate required)		
1	Helicopters Safety Manual & Operation Procedure On-board	5	5
2	Helicopter Deck certification (to be approved by Company Separate Inspection if to be used in field)	5	5
3	Fire Fighting Equipment in place - Foam Tender, FFE, Fire Suits, SCBA, other Equipment in ERT Cupboard	5	5
4	Deck Crew trained -HLO and ERT trained - certificates available	5	5
5	Safety briefing/procedure to passenger, video available and records maintained	5	3
6	Landing Net, Nav Lights, Heli-deck markings, perimeter netting	5	5
7	All Routes clear and free from obstruction, access stairs in good condition	5	5
8	Fueling Capabilities Available, Operating Procedure in place, Fire Fighting Equipment, (to be approved by Company)	5	5
9	Other	5	
POSSIBLE POINTS AWARDED		45	43
			95.56%
I	Hazardous Substances Control		
1	Procedure for stowage/handling of chemicals (copy of MSDS, Signs/Notices/PPE/segregation/ Risk and health Assessments etc)	5	5
2	Radioactive Sources Storage (max 20Ci) Security, Marine Handling Acceptable - IMDG Compliant Procedure (for Project later to align with Company Standards)	5	5
3	Industrial Gases Handling, Secured to prevent fall over & used/ storage upright, Flash Back Arrestors, Leak test, Certification available, Safely stored and transported around the vessel, storage areas well ventilated (for Project later to align with Company Standards)	5	5
4	List of on board hazardous substances maintained, appropriate containers and storage used, warning labels in use, Spill kits	5	5
5	Chemical Spill Drills Carried out regularly and all personnel involved	5	5
8	Other:	5	5
POSSIBLE POINTS AWARDED		30	30
			100.00%
TOTAL POSSIBLE POINTS AWARDED		700	
ACTUAL POINTS AWARDED			692.5
			99%
Signatures Required Ross Husain - NSE			
Audit Leader : Ross Husain			

	SSHE Rep : Contractor Representatives:			
	Other Attendees : Ogura Hiroshi (CM), Ujang SSHE Lead), Adrian Alcoy (ISM Marine Officer)			
	COMMENTS & ACTION ITEMS (Use Photographic Evidence as far as possible)	RESP Person	REF Report Item	CORRECTED
1				
2				
3				
4				
5				
<p>The responsible individual for observations requiring corrective action shall sign off as corrected and return this report within 24 hours of receipt. A status report shall be attached for observations that are not corrected..</p>				

Assessment Summary



Total Score Assessment Ratings:
 95 % - 100 % - Excellent ; 90 % - 94 % - Good
 85 % - 89 % - Fair ; 70 % - 84 % - Lacking
 50 %- 70% - Poor ; 0 % - 50% - Very Poor

Audit Leader Name: Ross Husain **Date:** 12 May 2021

Score

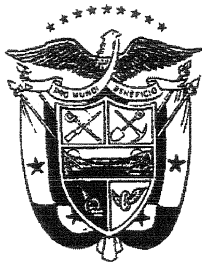
Barge/Vessel: DLB KUROSHIO II **Contractor SSHE Rep/ Project Rep :** OGURA HIROSHI

98.9%

A	General HSE Requirement	110	105.5	95.9%
B	Fall Protection	70	70	100.0%
C	Fire Protection, Equipment Detection & Emergency Preparedness	120	119	99.2%
D	Permits/JSA (PTW Procedure will be approved fully for project execution)	45	45	100.0%
E	Rigging & Lifting Equipment (system to align with PTTEPI LOG-0ODP4 during Project Execution)	45	45	100.0%
F	Life Saving Appliance & Emergency Systems	135	135	100.0%
G	Waste Management & Pollution Prevention	100	100	100.0%
H	Heli-Pad & Helicopter Transfer (for Project Works detailed inspection & Aviation Certificate required)	45	45	100.0%
I	Hazardous Substances Control	30	30	100.0%
TOTAL		700	694.5	99.2%

เอกสารแนบที่ 85

ตัวอย่างเอกสารรับรองการติดตั้งระบบจัดการสิ่งปฏิกูลของเรือที่ใช้ในการปฏิบัติงานของโครงการฯ



Certificate No.: 7603758-4464773-049

REPUBLIC OF PANAMA

**INTERNATIONAL SEWAGE POLLUTION
PREVENTION CERTIFICATE**

Issued under the provisions of
the International Convention for the Prevention of Pollution from Ships, 1973
as modified by the Protocol of 1978 relating thereto,
and as amended by resolution MEPC.115(51), (hereinafter referred to as "the Convention")
under the authority of the Government of:

Republic of Panama

(name of state)

by **American Bureau of Shipping**

Particulars of Ship:

Name of ship	Distinctive number or letters	Port of Registry
KUROSHIO II	3EOH7	Panama
Gross tonnage	Number of persons which the ship is certified to carry	IMO Number ¹
15859	316	8757336

~~New Ship~~ / Existing Ship *

Type of ship for the application of regulation 11.3.*

~~New / Existing Passenger ship~~ *

Ship other than a passenger ship

Date on which keel was laid or ship was at a similar stage of construction or where applicable, date on which work for a
conversion or an alteration or modification of a major character was commenced 04 February 1975

THIS IS TO CERTIFY:

- (1) That the ship is equipped with a Sewage Treatment Plant / ~~Comminuter~~ / Holding Tank * and a discharge pipeline in
compliance with regulations 9 and 10 of Annex IV of the Convention as follows:

***(1.1) Description of the sewage treatment plant :**Type of sewage treatment plant SBT-150 (TWO) SET & SBH-15 (TWO) SETName of manufacturer TAIKO KIKAI INDUSTRIES CO., LTD.

The sewage treatment plant is certified by the Administration to meet the effluent standards as provided for in
resolution MEPC.159 (55).

~~*(1.2) Description of comminuter :~~Type of comminuter N/AName of manufacturer N/AStandard of sewage after disinfection N/A***(1.3) Description of holding tank :**Total capacity of the holding tank 16.8 m³Location Fr.14 - 15 (S) and Fr.15 - 16 (P)

- (1.4) A pipeline for the discharge of sewage to a reception facility, fitted with a standard shore connection.

* Delete as appropriate

¹ In accordance with resolution A.600(15) - IMO Ship Identification Number Scheme, this information may be included voluntarily

- (2) The ship has been surveyed in accordance with regulation 4 of Annex IV of the Convention.
- (3) That the survey shows that the structure, equipment, systems, fittings, arrangements and material of the ship and the condition thereof are in all respects satisfactory and the ship complies with the applicable requirements of Annex IV of the Convention.

N/A

This certificate is valid until 31 January 2025² subject to surveys in accordance with regulation 4 of Annex IV of the Convention.

Completion date of the survey on which this certificate is based: 10 December 2020

Issued at Singapore on 10 December 2020



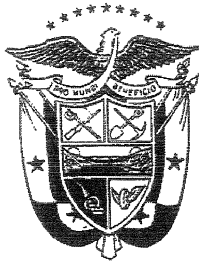
Y
(Surveyor, American Bureau of Shipping)



² Insert the date of expiry as specified by the Administration in accordance with regulation 8.1 of Annex IV of the Convention. The day and the month of this date correspond to the anniversary date as defined in regulation 1.8 of Annex IV of the Convention.

เอกสารแนบที่ 86

ตัวอย่างเอกสารรับรองการติดตั้งอุปกรณ์กรองน้ำมันของเรือที่ใช้ในการปฏิบัติงานของโครงการฯ



Certificate No.: 7603758-4464773-043

INTERNATIONAL OIL POLLUTION PREVENTION CERTIFICATE

REPUBLIC OF PANAMA

(This Certificate shall be supplemented by a Record of Construction and Equipment)

Issued under the Provisions of the
International Convention for the Prevention of Pollution from Ships, 1973,
as modified by the Protocol of 1978 relating thereto and as amended,
(hereinafter referred to as "the Convention")
under the authority of the Government of

Republic of Panama

(name of state)

by American Bureau of Shipping

Particulars of Ship

Name of Ship	Distinctive Number or Letters	Port of Registry
KUROSHIO II	3EOH7	Panama
Gross Tonnage ¹ a) According to footnote ² b) According to footnote ³	Maximum Deadweight of Ship (metric tons) ⁴	IMO Number
15859	-	8757336

Type of Ship¹:

Oil Tanker

~~Ship other than an oil tanker with cargo tanks coming under Regulation 2(2) of Annex I of the Convention~~

Ship other than any of the above

THIS IS TO CERTIFY:

1. That the ship has been surveyed in accordance with Regulation 6 of Annex I of the Convention;
2. That the survey shows that the structure, equipment, systems, fittings, arrangement and material of the ship and the condition thereof are in all respects satisfactory and that the ship complies with the applicable requirements of Annex I of the Convention.

This Certificate is valid only when Supplement A issued at Singapore
on 10 December 2020 is attached.

This certificate is valid until 31 January 2025 ⁵ subject to surveys in accordance with Regulation 6 of Annex I of the Convention.

Completion date of the survey on which this certificate is based: 10 December 2020
Issued at Singapore on 10 December 2020
(Place of Issue of Certificate) (Date of Issue)



Yanawin, Nakorn, Singapore Port
Surveyor, American Bureau of Shipping



- ¹ Delete as appropriate
² The above gross tonnage has been determined in accordance with the International Convention on Tonnage Measurement of Ships, 1969.
³ The above gross tonnage has been determined by the authorities of the Administration in accordance with the national tonnage rules which were in force prior to the coming into force for existing ships of the International Convention on Tonnage Measurement of Ships, 1969.
⁴ For oil tankers.
⁵ Insert the date of expiry as specified by the Administration in accordance with regulation 10.1 of Annex I of the Convention. The day and the month of date corresponds to the anniversary date as defined in regulation 1.27 of Annex I of the Convention, unless amended in accordance with regulation 10.8 of Annex I of the Convention.

ENDORSEMENT FOR ANNUAL AND INTERMEDIATE SURVEYS

THIS IS TO CERTIFY that, at a survey required by Regulation 6 of Annex I of the Convention, the ship was found to comply with the relevant requirements of the Convention.

Annual Survey:

Signed:

Place:

Date:

REQUIRED SURVEY CARRIED OUT PREVIOUSLY

Annual / Intermediate¹ Survey:

Signed:

(Surveyor, American Bureau of Shipping)

Place:

Date:

Annual / Intermediate¹ Survey:

Signed:

(Surveyor, American Bureau of Shipping)

Place:

Date:

Annual Survey:

Signed:

(Surveyor, American Bureau of Shipping)

Place:

Date:



¹ Delete as appropriate

เอกสารแนบที่ 87

เอกสารรับรอง IOPP



Certificate No. **6-58-124**

**MARINE DEPARTMENT
THAILAND**

INTERNATIONAL OIL POLLUTION PREVENTION CERTIFICATE

(Note: This certificate shall be supplemented by a Record of Construction and Equipment)

Issued under the provisions of the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto, as amended, (hereinafter referred to as "the Convention") under the authority of the Government of the KINGDOM OF THAILAND by the MARINE DEPARTMENT

Particulars of ship*

Name of ship	TMS 9
Distinctive number or letters	HSB 4962
Port of registry	BANGKOK
Gross tonnage	229
Deadweight of ship (tonnes)†	-
IMO Number‡	9715608

Type of ship.§

~~Oil tanker~~

~~Ship other than an oil tanker with cargo tanks coming under regulation 2.2 of Annex I of the Convention~~

Ship other than any of the above

THIS IS TO CERTIFY:

1. That the ship has been surveyed in accordance with regulation 6 of Annex I of the Convention; and
2. That the survey shows that the structure, equipment systems, fittings, arrangement and material of the ship and the condition thereof are in all respects satisfactory and that the ship complies with the applicable requirements of Annex I of the Convention.

This certificate is valid until **24/06/2020**
subject to surveys in accordance with regulation 6 of Annex I of the Convention.

Completion date of the survey on which this certificate is based **25/06/2015**
Issued at **BANGKOK, THAILAND**

25/06/2015
Date of issue

**(THONGCHAI PONGVICHAI)
GOVERNMENT SHIP SURVEYOR**



* Alternatively, the particulars of the ship may be placed horizontally in boxes.
† For oil tankers
‡ Refer to the IMO Ship Identification Number Scheme adopted by the Organization by resolution A.600(15).
§ Delete as appropriate

ENDORSEMENT FOR ANNUAL AND INTERMEDIATE SURVEYS

THIS IS TO CERTIFY that at a survey required by regulation 6 of Annex I of the Convention the ship was found to comply with the relevant provisions of the Convention:

Annual survey:

Signed

Government Ship Surveyor

Place

Date

Annual*/Intermediate survey*:

Signed

Government Ship Surveyor

Place

Date

Annual*/Intermediate survey*:

Signed

Government Ship Surveyor

Place

Date

Annual survey:

Signed

Government Ship Surveyor

Place

Date

ANNUAL/INTERMEDIATE SURVEY IN ACCORDANCE WITH REGULATION 10.8.3

THIS IS TO CERTIFY that, at an annual/intermediate[†] survey in accordance with regulation 10.8.3 of Annex I of the Convention, the ship was found to comply with the relevant provisions of the Convention:

Signed

Government Ship Surveyor

Place

Date

ENDORSEMENT TO EXTEND THE CERTIFICATE IF VALID FOR LESS THAN 5 YEARS WHERE REGULATION 10.3 APPLIES

The ship complies with the relevant provisions of the Convention, and this Certificate shall, in accordance with regulation 10.3 of Annex I of the Convention, be accepted as valid until.....

Signed

Government Ship Surveyor

Place

Date

* Delete as appropriate
† Delete as appropriate

**ENDORSEMENT WHERE THE RENEWAL SURVEY HAS BEEN
COMPLETED AND REGULATION 10.4 APPLIES**

The ship complies with the relevant provisions of the Convention and this Certificate shall, in accordance with regulation 10.4 of Annex I of the Convention, be accepted as valid until

Signed

.....
Government Ship Surveyor

Place

Date

**ENDORSEMENT TO EXTEND THE VALIDITY OF THE CERTIFICATE UNTIL
REACHING THE PORT OF SURVEY OR FOR A PERIOD OF GRACE
WHERE REGULATION 10.5 OR 10.6 APPLIES**

This Certificate shall, in accordance with regulation 10.5 or 10.6* of Annex I of the Convention, be accepted as valid until

Signed

.....
Government Ship Surveyor

Place

Date

**ENDORSEMENT FOR ADVANCEMENT OF ANNIVERSARY DATE
WHERE REGULATION 10.8 APPLIES**

In accordance with regulation 10.8 of Annex I of the Convention the new anniversary date is

Signed

.....
Government Ship Surveyor

Place

Date

In accordance with regulation 10.8 of Annex I of the Convention the new anniversary date is

Signed

.....
Government Ship Surveyor

Place

Date

* Delete as appropriate



FORM A

**MARINE DEPARTMENT
THAILAND**

**SUPPLEMENT TO THE INTERNATIONAL OIL POLLUTION PREVENTION CERTIFICATE
(IOPP CERTIFICATE)**

**RECORD OF CONSTRUCTION AND EQUIPMENT FOR SHIPS
OTHER THAN OIL TANKERS**

in respect of the provisions of Annex I of the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto (hereinafter referred to as "the Convention").

Notes:

1. This form is to be used for the third type of ships as categorized in the IOPP Certificate, i.e. "ships other than any of the above" For oil tankers and ships other than oil tankers with cargo Tanks coming under Regulation 2.2 of Annex I of the Convention, Form B shall be used.
2. This Record shall be permanently attached to the IOPP Certificate. The IOPP Certificate shall be available on board the ship at all times.
3. If the language of the original Record shall be at least in English, French or Spanish. If an official language of the issuing country is also used, this shall prevail in case of a dispute or discrepancy.
4. Entries in boxes shall be made by inserting either a cross (x) for the answers "yes" and "applicable" or a dash (-) for the answers "no" and "not applicable as appropriate".
5. Regulations mentioned in this record refer to regulations of Annex I of the Convention and Resolutions refer to those adopted by the International Maritime Organization.

1. PARTICULARS OF SHIP

- 1.1 Name of ship **TMS. 9**
- 1.2 Distinctive number or letters **HSB 4962**
- 1.3 Port of registry **BANGKOK**
- 1.4 Gross tonnage **229**
- 1.5 Date of build:
- 1.5.1 Date of building contract **7**
- 1.5.2 Date on which keel was laid or ship was at a similar stage of construction
..... **1st OCTOBER 2013**
- 1.5.3 Date of delivery..... **3rd AUGUST 2014**

1.6 Major conversion (if applicable):

1.6.1 Date of conversion contract

1.6.2 Date on which conversion was commenced

1.6.3 Date of completion of conversion

1.7 The ship has been accepted by the Administration as a "ship delivered on or before 31 December 1979" under regulation 1.28.1 due to unseen delay in delivery



**2. EQUIPMENT FOR THE CONTROL OF OIL DISCHARGE FROM MACHINERY SPACE
BILGES AND OIL FUEL TANKS (Regulations 16 and 14)**

2.1 Carriage of ballast water in oil fuel tanks:

2.1.1 The ship may under normal conditions carry ballast water in oil fuel tanks



2.2 Type of oil filtering equipment fitted:

2.2.1 Oil filtering (15 ppm) equipment (Regulation 14.6)



2.2.2 Oil filtering (15 ppm) equipment with alarm and automatic
stopping device (Regulation 14.7)



2.3 Approval standards:

2.3.1 The separating/filtering equipment:

.1 has been approved in accordance with resolution A.393 (X);



.2 has been approved in accordance with resolution MEPC.60(33);



.3 has been approved in accordance with resolution MEPC.107(49)



.4 has been approved in accordance with resolution A.233(VII)



.5 has been approved in accordance with national standards not based upon resolution
A.393(X) or A.233(VII)



.6 has not been approved



2.3.2 The process unit has been approved in accordance with resolution A.444(XI)



2.3.3 The oil content meter

.1 has been approved in accordance with resolution A.393 (X)



.2 has been approved in accordance with resolution MEPC.60(33)



.3 has been approved in accordance with resolution MEPC.107(49)



2.4 Maximum throughput of the system is0.50..... cubic meter/h

2.5 Waiver of Regulation 14:

2.5.1 The requirements of Regulation 14.1 or 14.2 are waived in respect of the ship in accordance
with Regulation 14.5.



2.5.1.1 The ship is engaged exclusively on voyages within special area(s):



.....

2.5.1.2 The ship is certified under the International Code of Safety for High-Speed Craft and
engaged on a scheduled service with a turn-around time not exceeding 24 hours



2.5.2 The ship is fitted with holding tank(s) for the total retention on board of all oily bilge water as follows:



Tank Identification	Tank location		Volume (m ³)
	Frames (from) – (to)	Lateral position	
-	-	-	-
Total volume.....-..... (m ³)			

2A.1 The ship is required to be constructed according to regulation 12A and compliance with the requirements of:

Paragraphs 6 and either 7 or 8 (double hull construction)



paragraph 11 (accidental oil outflow performance)



2A.2 The ship is not required to comply with the requirements of regulation 12A.



3. MEANS FOR RETENTION AND DISPOSAL OF OIL RESIDUES (SLUDGE) (Regulation 12) AND BILGE WATER HOLDING TANK(S)

3.1 The ship is provided with oil residue (sludge) tanks for retention of oil residues (sludge) on board as follows:

Tank Identification	Tank location		Volume (m ³)
	Frames (from) - (to)	Lateral position	
SLUDGE TANK	1 – 2	PORT	0.20
Total volume.....0.20...(m ³)			

3.2 Means for the disposal of residues (sludge) retained in oil residue (sludge) tanks :

3.2.1 Incinerator for oil residues (sludge), maximum capacity.....-..... KW or kcal/h
(delete as Appropriate)



3.2.2 Auxiliary boiler suitable for burning oil residues (sludge)



3.2.3 Other acceptable means:



3.3 The ship is provided with holding tank(s) for the retention on board of oily bilge water as follows:

Tank Identification	Tank location		Volume (m ³)
	Frames (from) - (to)	Lateral position	
-	-	-	-
Total volume(m ³)			

4. STANDARD DISCHARGE CONNECTION (Regulation 13)

4.1 The ship is provided with a pipeline for the discharge residues from machinery bilges and sludges to reception facilities, fitted with a standard discharge connection in accordance with regulation 13



5. SHIPBOARD OIL/MARINE POLLUTION EMERGENCY PLAN (Regulation 37)

5.1 The ship is provided with a shipboard oil pollution emergency plan in compliance with regulation 37



5.2 The ship is provided with a shipboard marine pollution emergency plan in compliance with regulation 37.3



6. EXEMPTION

6.1 Exemptions have been granted by the Administration from the requirements of Chapter 3 of Annex I of the Convention in accordance with Regulation 3.1 on those items listed under paragraph(s)

.....
.....of this record



7. EQUIVALENTS (Regulation 5)

7.1 Equivalents have been approved by the Administration for certain requirements of Annex I on those items listed under paragraph(s)

..... of this record



THIS IS TO CERTIFY that this Record is correct in all respects.

Issued at**BANGKOK**..... on the ...**25th**..... day of**JUNE** 2015.....

(THONGCHAI PONGVICHAI)
GOVERNMENT SHIP SURVEYOR



เอกสารแนบที่ 88

ตัวอย่างบันทึก Waste Indicator รายเดือน



Waste Indicator

Project : BONGKOT SOUTH

Activity : Production

Year : 2021

Month : November

No.	Code	Name	Unit	Waste Quantity			Contractor Detail			Treatment and Disposal Method			Waste Manifest no.
				Generated	Disposed of	Stored	Transporter	Storage	Disposer	1st Treatment or Pre - Disposal	2nd Treatment or Pre - Disposal	Final Disposal	
1	1902	General non-hazardous waste	kg	5920	5920	0	DIW-T-115600025 -	N/A	DIW-D-115600017 -	N/A	N/A	042 - Alternative fuel blending	64-11-393
2	1902	General non-hazardous waste	kg	4650	4650	0	DIW-T-115600025 -	N/A	DIW-D-115600017 -	N/A	N/A	042 - Alternative fuel blending	64-11-394
3	1902	General non-hazardous waste	kg	3390	3390	0	DIW-T-115600025 -	N/A	DIW-D-115600017 -	N/A	N/A	042 - Alternative fuel blending	64-11-396
4	1902	General non-hazardous waste	kg	3110	3110	0	DIW-T-115600025 -	N/A	DIW-D-115600017 -	N/A	N/A	042 - Alternative fuel blending	64-11-399
5	1902	General non-hazardous waste	kg	7680	7680	0	DIW-T-115600025 -	N/A	DIW-D-115600017 -	N/A	N/A	042 - Alternative fuel blending	64-11-403
6	1902	General non-hazardous waste	kg	4090	4090	0	DIW-T-115600025 -	N/A	DIW-D-115600017 -	N/A	N/A	042 - Alternative fuel blending	64-11-408
7	1901	Other hazardous wastes otherwise specified in the list, specify the name	kg	450	450	0	DIW-T-115600025 -	N/A	DIW-D-115600017 -	N/A	N/A	042 - Alternative fuel blending	64-11-394
8	1901	Other hazardous wastes otherwise specified in the list, specify the name	kg	150	150	0	DIW-T-115600025 -	N/A	DIW-D-115600017 -	N/A	N/A	042 - Alternative fuel blending	64-11-403
9	1901	Other hazardous wastes otherwise specified in the list, specify the name	kg	150	150	0	DIW-T-115600025 -	N/A	DIW-D-115600017 -	N/A	N/A	042 - Alternative fuel blending	64-11-408

เอกสารแนบที่ 89

ตัวอย่างเอกสารการตรวจสอบรายการอุปกรณ์ตอบสนองต่อการหกรั่วไหล

**NIPPON STEEL ENGINEERING CO.,LTD**

IMO No. 8757336

DLB KUROSHIO-2

OIL SPILL KIT INSPECTION

Inspected On: Nov 09, 2021

ENGINE ROOM

No.	CONTENTS	QUANTITY	CONDITION
1	Oil Sorbent Sock net Boom	6 pcs	Good
2	Oil Sorbent Pillow	10 pcs	Good
3	Oil Sorbent Pads	50 pcs	Good
4	Disposable Chemical Coverall (Tyvek)	6 pcs	Good
5	Nitrile Gloves	6 pcs	Good
6	Anti fog Goggle	6 pcs	Good
7	Mask	20 pcs	Good
8	Hazmat disposal bag with cable tie	2 pcs	Good

Crane Tub

No.	CONTENTS	QUANTITY	CONDITION
1	Oil Sorbent Sock net Boom	6 pcs	Good
2	Oil Sorbent Pillow	10 pcs	Good
3	Oil Sorbent Pads	50 pcs	Good
4	Disposable Chemical Coverall (Tyvek)	6 pcs	Good
5	Nitrile Gloves	6 pcs	Good
6	Anti fog Goggle	6 pcs	Good
7	Mask	20 pcs	Good
8	Hazmat disposal bag with cable tie	2 pcs	Good

Below Helideck

No.	CONTENTS	QUANTITY	CONDITION
1	Oil Sorbent Sock net Boom	6 pcs	Good
2	Oil Sorbent Pillow	10 pcs	Good
3	Oil Sorbent Pads	50 pcs	Good
4	Disposable Chemical Coverall (Tyvek)	6 pcs	Good
5	Nitrile Gloves	6 pcs	Good
6	Anti fog Goggle	6 pcs	Good
7	Mask	20 pcs	Good
8	Hazmat disposal bag with cable tie	2 pcs	Good

Checked by: Adrian Alcoy
ISM/ISPS OFFICER

SSHE Dept

Photos:



Engine Room



Below Helideck



Crane Tub

เอกสารแนบที่ 90

เอกสารขั้นตอนการทดสอบท่อ Pipeline Pigging & Hydrotest Procedures

Item	Pipe Diameter	Pipeline		Tie-in Spool / Riser		Gauge Plate Diameter	Gauge Plate *2 Thickness
		Pipe Wall Thickness	95% of Nominal ID	Pipe Wall Thickness	95% of Nominal ID		
1	12.75"	14.3mm	280.5mm	15.9mm	277.5mm	277.5mm	6mm
2	16"	14.3mm/ 12.7mm	358.9mm/ 362.0mm	17.5mm	352.9mm	352.9mm	12mm

Note*1: Diameter of gauge plate is calculated in accordance with PWGS-PLR-501.

Note*2: Plate thickness of gauge plate is in accordance with PWGS-PLR-501

2.3. Chemicals

The pipeline will be filled with chemically treated sea water.

Type of chemicals and concentration are as follows.

<Pipeline System >

- 1) Inhibitor : Oxygen scavenger and Biocide
 - O-3670R : 1000 ppm
- 2) Dye
 - Fluorescein Liquid Dye : 50 ppm

<Future Riser >

- 1) Inhibitor : Oxygen scavenger and Biocide
 - O-3670R : 2000 ppm

MSDS (Material Safety Data Sheet) of above chemicals are presented in Appendix-3.

APPENDIX – 3

CHEMICALS TECHNICAL DATA SHEET & MATERIAL SAFETY DATA SHEET

SPECIALITY CHEMICAL TECHNICAL DATA SHEET O-3670 R

Product Description

O-3670R is a water soluble combination product designed to protect pipelines for corrosion during hydrostatic testing. This product incorporates filmforming amine corrosion inhibitor, biocide and oxygen scavenger components to give a one-step chemical treatment for hydrotest operations.

Product Application

O-3670R is a completely soluble product in fresh water, seawater and in high brine solutions and is therefore suitable for use in water injection systems (which have no mechanical deaeration), hydrotest operations and as a packer fluid.

O-3670R is increasingly being chosen over the traditional chemical package and has been used in a number of major projects in the North Sea, Latin America and South East Asia.

Physical Properties

FORM	LIQUID
COLOUR	CLEAR
pH (20 deg C)	5.0-6.0
RELATIVE DENSITY (20 degC)	1.00 – 1.11
SOLUBILITY	COMPLETELY SOLUBLE IN FRESH, SEA WATER AND HIGH BRINE SOLUTIONS

Dosage

O-3670R dosage levels typically range between 350-500ppm for hydrotest operations and 1000-4000ppm when used as a packer fluid inhibitor.

For further technical or application information please contact CTI Chemicals Asia Pacific Pte. Ltd.

Champion Technologies believes the information presented in this data sheet to be correct but disclaims any liability with respect to any recommendations or applications made in connection therewith. No warranties whatsoever are made with respect to the information or the product to which it refers.



SAFETY DATA SHEET
Hydrosure O-3670R

1 IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

PRODUCT NO. O3670R
 APPLICATION HYDROTEST CHEMICAL
 SUPPLIER CTI Chemicals Asia Pacific Pte Ltd
 61 Science Park Road
 #05-22/24 The Galen
 Singapore 117525
 Tel No. +65 6733 9482
 Fax No. +65 6733 8247
 EMERGENCY TELEPHONE +65 6733 9482

2 HAZARDS IDENTIFICATION

Contact with acids liberates toxic gas. Causes burns. Very toxic to aquatic organisms.

CLASSIFICATION (1999/45) C;R34. N;R50. R31.

3 COMPOSITION/INFORMATION ON INGREDIENTS

Name	EC No.	CAS-No.	Content %	Classification (67/548/EEC)
Quaternary ammonium chloride	270-325-2	68424-85-1	10-30%	Xn;R22. C;R34. N;R50.
AMMONIUM BISULPHITE	233-469-7	10192-30-0	10-30%	Xi;R36. R31.
DIPROPYLENE GLYCOL MONOMETHYL ETHER (DPM)	252-104-2	34590-94-8	1-10%	-
ETHANEDIOL	203-473-3	107-21-1	< 1%	Xn;R22

The Full Text for all R-Phrases is Displayed in Section 16

4 FIRST-AID MEASURES

INHALATION

Move the exposed person to fresh air at once. If respiratory problems, artificial respiration/oxygen. Get medical attention.

INGESTION

NEVER MAKE AN UNCONSCIOUS PERSON VOMIT OR DRINK FLUIDS! Immediately rinse mouth and drink plenty of water (200-300 ml). DO NOT induce vomiting. Get medical attention immediately. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs. Generates toxic gas in contact with acid.

SKIN CONTACT

Rinse the skin immediately with lots of water. Continue to rinse for at least 15 minutes. Remove contaminated clothes and rinse skin thoroughly with water. Get medical attention immediately. Chemical burns must be treated by a physician.

EYE CONTACT

Remove victim immediately from source of exposure. Make sure to remove any contact lenses from the eyes before rinsing. Promptly wash eyes with plenty of water while lifting the eye lids. Continue to rinse for at least 15 minutes and get medical attention. To hospital or eye specialist.

5 FIRE-FIGHTING MEASURES

EXTINGUISHING MEDIA

Water spray. Carbon dioxide (CO2). Dry chemicals, sand, dolomite etc.

SPECIAL FIRE FIGHTING PROCEDURES

Avoid water in straight hose stream; will scatter and spread fire. Cool containers exposed to flames with water until well after the fire is out. Avoid breathing fire vapours. Keep run-off water out of sewers and water sources. Dike for water control.

UNUSUAL FIRE & EXPLOSION HAZARDS

May develop highly toxic or corrosive fumes if heated.

REVISION DATE 30/11/2010

Hydrosure O-3670R

SPECIFIC HAZARDS

Fire or high temperatures create: Oxides of: Carbon. Nitrogen. Sulphur.

PROTECTIVE MEASURES IN FIRE

Wear full protective clothing. Use air-supplied respirator during fire fighting.

6 ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS

Wear protective clothing as described in Section 8 of this safety data sheet. Avoid inhalation of vapours and contact with skin and eyes.

ENVIRONMENTAL PRECAUTIONS

Do not discharge into drains, water courses or onto the ground.

SPILL CLEAN UP METHODS

Stop leak if possible without risk. DO NOT touch spilled material! Absorb in vermiculite, dry sand or earth and place into containers. Flush area with plenty of water. Do not let washing down water contaminate ponds or waterways. Containers with collected spillage must be properly labelled with correct contents and hazard symbol.

7 HANDLING AND STORAGE

USAGE PRECAUTIONS

Avoid spilling, skin and eye contact. Ventilate well, avoid breathing vapours. Use approved respirator if air contamination is above accepted level. Observe good chemical hygiene practices. Keep away from heat, sparks and open flame. Eye wash facilities and emergency shower must be available when handling this product.

STORAGE PRECAUTIONS

Store in tightly closed original container in a dry, cool and well-ventilated place. Store separated from: Acids. Alkalis. Oxidising material.

8 EXPOSURE CONTROLS/PERSONAL PROTECTION

Name	STD	TWA - 8 Hrs		STEL - 15 Min		Notes
AMMONIUM BISULPHITE						
DIPROPYLENE GLYCOL MONOMETHYL ETHER (DPM)	WEL	50 ppm	308 mg/m3			Sk
ETHANEDIOL	WEL		10 mg/m3		104 mg/m3	Sk

WEL = Workplace Exposure Limit.

Sk = Can be absorbed through skin.

PROTECTIVE EQUIPMENT



PROCESS CONDITIONS

Provide eyewash, quick drench.

ENGINEERING MEASURES

Provide adequate general and local exhaust ventilation.

RESPIRATORY EQUIPMENT

In case of inadequate ventilation use suitable respirator.

HAND PROTECTION

Use protective gloves made of: Rubber, neoprene or PVC. The most suitable glove must be chosen in consultation with the gloves supplier, who can inform about the breakthrough time of the glove material. Be aware that the liquid may penetrate the gloves. Frequent change is advisable.

EYE PROTECTION

Use approved safety goggles or face shield.

OTHER PROTECTION

Wear appropriate clothing to prevent any possibility of skin contact.

HYGIENE MEASURES

DO NOT SMOKE IN WORK AREA! Wash at the end of each work shift and before eating, smoking and using the toilet. Wash promptly if skin becomes wet or contaminated. Promptly remove any clothing that becomes contaminated. When using do not eat, drink or smoke.

9 PHYSICAL AND CHEMICAL PROPERTIES

REVISION DATE 30/11/2010

Hydrosure O-3670R

APPEARANCE	Liquid
COLOUR	Light (or pale) Coloured
ODOUR	Pungent Sulphur.
SOLUBILITY	Miscible with water
RELATIVE DENSITY	1.045 - 1.075 @ 20 °c
pH-VALUE, CONC. SOLUTION	4.0-6.0
REFRACTIVE INDEX	39-41

10 STABILITY AND REACTIVITY

STABILITY

Stable under normal temperature conditions.

CONDITIONS TO AVOID

Avoid heat, flames and other sources of ignition.

HAZARDOUS POLYMERISATION

Will not polymerise.

MATERIALS TO AVOID

Strong acids. Strong oxidising substances.

HAZARDOUS DECOMPOSITION PRODUCTS

Oxides of: Carbon. Nitrogen. Sulphur.

11 TOXICOLOGICAL INFORMATION

INHALATION

Gas or vapour may irritate respiratory system.

INGESTION

Causes burns. May cause chemical burns in mouth and throat. Generates toxic gas in contact with acid.

SKIN CONTACT

Causes burns.

EYE CONTACT

Causes burns. Risk of serious damage to eyes.

12 ECOLOGICAL INFORMATION

ECOTOXICITY

The product contains a substance which is very toxic to aquatic organisms.

MOBILITY

The product is soluble in water.

BIOACCUMULATION

No data available on bioaccumulation.

13 DISPOSAL CONSIDERATIONS

GENERAL INFORMATION

Empty containers should be taken for local recycling, recovery or waste disposal

DISPOSAL METHODS

Recover and reclaim or recycle, if practical. Dispose of waste and residues in accordance with local authority requirements.

WASTE CLASS

For this product, in accordance with the European Waste Catalogue (EWC), a catalogue number cannot be given because the customer has to lay down the purpose first. The catalogue number has to be given according to the local waste removal processes.

14 TRANSPORT INFORMATION



PROPER SHIPPING NAME

CORROSIVE LIQUID, ACIDIC, ORGANIC, n.o.s. (contains quaternary ammonium chloride)

REVISION DATE 30/11/2010

Hydrosure O-3670R

UN NO. ROAD	3265
ADR CLASS NO.	8
ADR CLASS	Class 8: Corrosive substances.
ADR PACK GROUP	III
HAZARD NO. (ADR)	80 Corrosive or slightly corrosive substance.
HAZARD No. (ADR)	80
HAZCHEM CODE	2X
UN NO. SEA	3265
IMDG CLASS	8
IMDG PACK GR.	III
EMS	F-A S-B
UN NO. AIR	3265
ICAO CLASS	8
AIR PACK GR.	III

15 REGULATORY INFORMATION

LABELLING



Corrosive



Dangerous for the environment

CONTAINS Quaternary ammonium chloride

RISK PHRASES

R31	Contact with acids liberates toxic gas.
R34	Causes burns.
R50	Very toxic to aquatic organisms.

SAFETY PHRASES

S24/25	Avoid contact with skin and eyes.
S26	In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S36/37/39	Wear suitable protective clothing, gloves and eye/face protection.
S45	In case of accident or if you feel unwell, seek medical advice immediately (show label where possible).
S57	Use appropriate containment to avoid environmental contamination.
S60	This material and its container must be disposed of as hazardous waste.
S61	Avoid release to the environment. Refer to special instructions/safety data sheets.

UK REGULATORY REFERENCES

Approved Supply List.

STATUTORY INSTRUMENTS

The Chemicals (Hazard Information and Packaging for Supply) Regulations 2009 (S.I 2009 No. 716).

APPROVED CODE OF PRACTICE

Classification and Labelling of Substances and Preparations Dangerous for Supply.

GUIDANCE NOTES

Workplace Exposure Limits EH40. Approved guide to the classification and labelling of substances and preparations dangerous for supply.

16 OTHER INFORMATION

REVISION COMMENTS

NOTE: Lines within the margin indicate significant changes from the previous revision.

ISSUED BY

GC

REVISION DATE 30/11/2010

REV. NO./REPL. SDS
GENERATED 4

REVISION DATE 30/11/2010

Hydrosure O-3670R

RISK PHRASES IN FULL

R34	Causes burns.
R31	Contact with acids liberates toxic gas.
R22	Harmful if swallowed.
R36	Irritating to eyes.
R50	Very toxic to aquatic organisms.

DISCLAIMER

The information provided in this SDS is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal, and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process unless specified in the text.

FLUORESCEIN DYE

61 Science Park Road,

#05-22/24 The Galen

Singapore 117525

(65) 67339482

- **SODIUM SALT OF HYDROXY-O-CARBONYL PHENYL FLUORINE IN SOLID OR LIQUID FORM**
- **COMPLETELY SOLUBLE PRODUCT IN FRESH WATER , SEA WATER AND IN HIGH BRINE SOLUTION**
- **SUITABLE FOR USE IN HYDROTEST OPERATIONS AND CEMENTING OPERATIONS**
- **THIS PRODUCT EXHIBITS A DARK GREENISH YELLOW COLOUR AND IS GENERALLY DETECTED BY UV LIGHT AT 491 nm**
- **AN EXCELLENT TRACER DYE FOR USE IN LEAK DETECTION**

Typical Applications

- Fluorescein dye dosage levels typically range between 25-100 ppm for hydrotest operations and 1000-4000 ppm when used for cementing application.

TYPICAL PROPERTIES	
Specific Gravity @ 20°C	1.20 ± 0.10
Appearance	Dark Greenish Yellow Liquid
Solubility	Miscible with water
Boiling Point	~100-102 °C
pH	9 - 10

* Data might not be correct. See latest MSD sheet.

Handling & Storage

- Handle with care. Protect eyes and skin with goggles, face shield and protective clothing
- Spills and splashes on skin or clothing should be washed immediately with soap and water
- If eyes are affected, wash with water and get medical attention
- For more information, see Material Safety Data Sheet.

For further information and specific recommendations, please contact your local CHAMPION representative. 05/01

Champion Technologies believes the information presented in this data sheet to be correct but disclaims any liability with respect to any recommendations or applications made in connection therewith. No warranties whatsoever are made with respect to the information or the product to which it refers.



SAFETY DATA SHEET

Fluorescein Liq Dye

1 IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

PRODUCT NAME Fluorescein Liq Dye
PRODUCT NO. FLUOR LIQ
APPLICATION INDUSTRIAL DYE
SUPPLIER CTI Chemicals Asia Pacific Pte Ltd
 61 Science Park Road
 #05-22/24 The Galen
 Singapore 117525
 Tel No. +65 6733 9482
 Fax No. +65 6733 8247
EMERGENCY TELEPHONE +65 6733 9482

2 HAZARDS IDENTIFICATION

Not regarded as a health or environmental hazard under current legislation.

3 COMPOSITION/INFORMATION ON INGREDIENTS

Name	EC No.	CAS-No.	Content	Classification
Sodium Carbonate	207-838-8	497-19-8	10-30%	Xi;R36

The Full Text for all R-Phrases are Displayed in Section 16

4 FIRST-AID MEASURES

INHALATION

Provide rest, warmth and fresh air. Get medical attention if any discomfort continues.

INGESTION

Rinse nose, mouth and throat with water. Drink plenty of water. Get medical attention.

SKIN CONTACT

Wash skin thoroughly with soap and water. Immediately remove contaminated clothing. Get medical attention if irritation persists after washing.

EYE CONTACT

Make sure to remove any contact lenses from the eyes before rinsing. Promptly wash eyes with plenty of water while lifting the eye lids. To hospital or eye specialist.

5 FIRE-FIGHTING MEASURES

EXTINGUISHING MEDIA

Carbon dioxide (CO₂). Foam. Water spray.

SPECIAL FIRE FIGHTING PROCEDURES

No specific fire fighting procedure given.

UNUSUAL FIRE & EXPLOSION HAZARDS

No unusual fire or explosion hazards noted.

SPECIFIC HAZARDS

Oxides of: Sulphur. Nitrogen. Carbon.

PROTECTIVE MEASURES IN FIRE

Use air-supplied respirator during fire fighting.

6 ACCIDENTAL RELEASE MEASURES

Fluorescein Liq Dye**PERSONAL PRECAUTIONS**

Wear protective clothing as described in Section 8 of this safety data sheet. Avoid contact with skin and eyes.

ENVIRONMENTAL PRECAUTIONS

Do not discharge into drains, water courses or onto the ground.

SPILL CLEAN UP METHODS

Stop leak if possible without risk. Provide ventilation and confine spill. Do not allow runoff to sewer. Absorb in vermiculite, dry sand or earth and place into containers.

7 HANDLING AND STORAGE**USAGE PRECAUTIONS**

Avoid spilling, skin and eye contact.

STORAGE PRECAUTIONS

Store in tightly closed original container in a dry, cool and well-ventilated place. Use container made of: Suitable plastic material. Stainless steel.

8 EXPOSURE CONTROLS/PERSONAL PROTECTION

Name	Std	TWA - 8 hrs		STEL - 15 min		Notes
Sodium Carbonate		No std.		No std.		

PROTECTIVE EQUIPMENT**RESPIRATORY EQUIPMENT**

Respiratory protection not required.

HAND PROTECTION

Rubber or plastic. The most suitable glove must be chosen in consultation with the gloves supplier, who can inform about the breakthrough time of the glove material. Be aware that the liquid may penetrate the gloves. Frequent change is advisable.

EYE PROTECTION

Use approved safety goggles or face shield.

OTHER PROTECTION

Wear appropriate clothing to prevent any possibility of skin contact.

HYGIENE MEASURES

When using do not eat, drink or smoke. DO NOT SMOKE IN WORK AREA! Wash at the end of each work shift and before eating, smoking and using the toilet.

9 PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE	Liquid				
COLOUR	Brown				
SOLUBILITY	Soluble in water				
MELTING POINT (°C)	0 (pour point)	RELATIVE DENSITY	1.0-1.07 @ 20c		
pH-VALUE, CONC. SOLUTION	9-10	VISCOSITY	<5 cps @ 20DegC		

10 STABILITY AND REACTIVITY**STABILITY**

Stable under normal temperature conditions and recommended use.

MATERIALS TO AVOID

Strong acids.

HAZARDOUS DECOMPOSITION PRODUCTS

Oxides of: Sulphur. Nitrogen. Carbon.

Fluorescein Liq Dye**11 TOXICOLOGICAL INFORMATION****INHALATION**

No specific health warnings noted.

INGESTION

May cause stomach pain or vomiting.

SKIN CONTACT

Liquid may irritate skin.

EYE CONTACT

May cause temporary eye irritation.

12 ECOLOGICAL INFORMATION**ECOTOXICITY**

The product is not expected to be hazardous to the environment.

MOBILITY

The product is soluble in water.

BIOACCUMULATION

The product does not contain any substances expected to be bioaccumulating.

DEGRADABILITY

The product is not biodegradable.

13 DISPOSAL CONSIDERATIONS**GENERAL INFORMATION**

Recover and reclaim or recycle, if practical.

DISPOSAL METHODS

Absorb in vermiculite or dry sand, dispose in licensed hazardous waste. Dispose of waste and residues in accordance with local authority requirements.

WASTE CLASS

For this product, in accordance with the European Waste Catalogue (EWC), a catalogue number cannot be given because the customer has to lay down the purpose first. The catalogue number has to be given according to the local waste removal processes.

14 TRANSPORT INFORMATION**GENERAL**

The product is not covered by international regulation on the transport of dangerous goods (IMDG, IATA, ADR/RID).

15 REGULATORY INFORMATION**RISK PHRASES**

NC Not classified.

SAFETY PHRASES

P13 Safety data sheet available for professional user on request.

UK REGULATORY REFERENCES

Approved Supply List.

STATUTORY INSTRUMENTS

Chemicals (Hazard Information and Packaging) Regulations.

APPROVED CODE OF PRACTICE

Safety Data Sheets for Substances and Preparations.

GUIDANCE NOTES

Classification and Labelling of Substances and Preparations Dangerous for Supply.

16 OTHER INFORMATION

REVISION DATE: 15/07/2009

R

Fluorescein Liq Dye

REVISION COMMENTS

General revision.

ISSUED BY

KH

REVISION DATE 15/07/2009

REV. NO./REPL. SDS GENERATED 3

RISK PHRASES IN FULL

R36 Irritating to eyes.

DISCLAIMER

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เอกสารแนบที่ 91

เอกสารขั้นตอนการทดสอบ Precommissioning of Gas Pipelines

7.3.2 DEWATERING AND SWABBING PRINCIPLES

Dewatering will be performed with two trains using high sealing pigs (BIDI type) propelled by super dry compressed air (dew point -40°C at atmospheric pressure).

The PPS may require having a methanol or glycol slug in the dewatering train preceded and/or followed by a nitrogen batch.

Methanol should be used only after verifying that it is not detrimental to flow coating (if any), valves internal, etc. Its purpose is to improve the dewatering and prepare the line for drying operations. In view of its toxicity and operating restrictions at sea, this methanol slug will only be passed through once.

This method must not be used alone to achieve the requested dryness of the pipe, unless explicitly requested in the PPS. It is also noted that methanol/glycol swabbing may be kept as backup in case of problems during the dewatering train run.

The speed will be controlled by back pressure so as to achieve a speed range above 1 m/s, with no stoppage nor speed reduction. In case of stoppage, the corresponding train will have to be rerun.

In the case when a combined swabbing/dewatering operation is performed with production gas, the volume of glycol is to be sufficient to achieve max. 2% water contamination at reception of the last batch of glycol.

7.3.3 DEWATERING

Dewatering will be performed by means of two separate pig trains, made up of BIDI pigs.

Fresh water batches will be run in the first dewatering train, to remove salt residues. The volume of fresh water shall represent 2 to 4% of the pipe volume, and be split in several batches. The fresh water used must be filtered to 50 microns and treated as per 10008-STD-6-COR-031, PEGS-12059-COR-031 requirements.

7.3.3.1 TRAIN A

The purpose of this train is to remove most of the water from the pipeline. It will include one or two batch of fresh water propelled by super dry air (minimum dew point of -40°C, measured at entrance of pipeline) and possibly a methanol/glycol batch, between bi-directional pigs. The salt content in the last batch of fresh water shall be less than 0.2 g/l. If this value is not achieved, additional batch of fresh water is to be run until the value is met.

7.4.3.1 PIGGING WHILE DRYING

The pipeline should be pigged with high sealing disks or with foam pigs, or combination of both, during the drying operation, to spread the water uniformly on the pipe walls. Foam pigs may be preferred for shorter pipelines and/or if there is a flow coating. The pigs shall be propelled with super dry air (or nitrogen) **at a speed not exceeding 1 m/s for foam pigs and 2 m/s for BIDI**. The pigging shall be continued until the specified dew point has been achieved.

7.4.3.2 PURGING

The pipeline volume shall be replaced twice, with the dry air/nitrogen, and the dew point shall remain consistently below the specified dew point.

7.4.3.3 SOAK TEST

The pipeline shall be isolated for 24 h and, then, the pipeline volume replaced: the drying operation will be considered acceptable if the dew point remains below the specified dew point.

7.4.3.4 FILLING WITH AIR/NITROGEN

The filling shall be performed as per 7.4.2.1.7 above, leaving generally a positive pressure.

7.4.4 DRYING BY CIRCULATION OF NATURAL GAS

The method is identical to the above, but air is replaced by natural gas. The gas must be dry and free from contaminants which are corrosive in the presence of free water (H₂S, CO₂, etc.).

It requires an access to a dry gas source and that all surface installations have been already commissioned. Its main advantage lies in the simplicity of the equipment to be installed and to its very low cost.

Its disadvantage is the disposal of gas charged with water vapour: it is unfit for commercial sale unless it can be retreated and dried. Otherwise, it has to be flared.

The other disadvantage is the long duration of this operation: the capacity of pressurised natural gas to pick up water is limited, as shown in Appendix 9: Dew point of Natural Gas. The efficiency will increase with lower gas pressure.

Pigging is possible during the operation, helping in water removal, and the drying is achieved when the dew point at the exit is meeting the specified value.

PTTEP G2/61 Phase 1A Project
PIGGING OPERATION SEQUENCE OF 12" SL46 (WP26-WP46) PIPELINE.

		Pipe OD. (mm)	Thickness (mm)	Length (m)	Volume (m ³)
WP26	Topside piping	406.40	17.5	36.1	3.9
	Riser	406.40	17.5	82.7	9.0
	Spool	323.85	15.9	96.2	6.4
WP46	Topside piping	323.85	15.9	17.8	1.2
	Riser	323.85	15.9	83.7	5.6
	Spool	323.85	15.9	87.2	5.8
Pipeline		323.85	14.3	4,666.0	319.5
Total		-	-	5069.6	351.4

1) Pump The Equivalent of 250m of Pipeline With Treated Sea Water (Inhibitor).

Volume (m ³)	Accum. Volume (m ³)	F. Rate (m ³ /min) ^(*)	Speed (m/min)	Time (min)	Accum. Time (min)
17.329	17.329	4.16	60	4.2	4.2

2) Launch Cleaning Pig.

3) Pump 500m with Treated Sea Water (Inhibitor).

Volume (m ³)	Accum. Volume (m ³)	F. Rate (m ³ /min) ^(*)	Speed (m/min)	Time (min)	Accum. Time (min)
34.658	51.987	4.16	60	8.3	12.5

4) Launch Batching Pig.

5) Pump 500m with Treated Sea Water (Inhibitor).

Volume (m ³)	Accum. Volume (m ³)	F. Rate (m ³ /min) ^(*)	Speed (m/min)	Time (min)	Accum. Time (min)
34.658	86.645	4.16	60	8.3	20.8

6) Launch Gauging Pig (with Gauge Plate and Pinger).

7) Pump Treated Sea Water (Inhibitor & Dye).

Volume (m ³)	Accum. Volume (m ³)	F. Rate (m ³ /min) ^(*)	Speed (m/min)	Time (min)	Accum. Time (min)
282.089	368.734	4.16	60	67.8	88.7

8) Recover Cleaning Pig.

9) Pump 500m with Treated Sea Water (Inhibitor & Dye).

Volume (m ³)	Accum. Volume (m ³)	F. Rate (m ³ /min) ^(*)	Speed (m/min)	Time (min)	Accum. Time (min)
34.658	403.392	4.16	60	8.3	97.0

10) Recover Batching Pig.

11) Pump 500m with Treated Sea Water (Inhibitor & Dye).

Volume (m ³)	Accum. Volume (m ³)	F. Rate (m ³ /min) ^(*)	Speed (m/min)	Time (min)	Accum. Time (min)
34.658	438.050	4.16	60	8.3	105.3

12) Recover Gauging Pig.

13) Flushing With Treated Sea Water (Inhibitor & Dye).

Volume (m ³)	Accum. Volume (m ³)	F. Rate (m ³ /min) ^(*)	Speed (m/min)	Time (min)	Accum. Time (min)
31.042	469.092	1.00	-	30.0	135.3

14) Stop Pumping.

Estimated Req'd Water Volume :	469.1 m3
Estimated Pumping Time :	2.3 hours

Chemical Type	Concentration	Req'd Volume for Pigging	Req'd Volume for Test	Total Req'd Volume	Injection Rate (liter/min)
Inhibitor ^(*)	1000 ppm	469.1 litre.	20.0 litre.	489.1 litre.	4.16
Dye ^(*)	50 ppm	19.1 litre.	-	19.1 litre.	0.21

Note 1 ; Flow Rate will be adjusted at site according to the actual pressure of injection line during pigging operation.

Note 2 ; Dye will be injected only after gauging pig is launched.

Note 3 ; Additional **20 litres** of inhibitor will be injected during flushing to maintain 1000ppm concentration at the timing of hydrotest completion. During hydrotest, there is no inhibitor injection.

Note 4 ; Time duration for flushing are assumed based on flow rate = 1 (m³/min). The time can be changed depend on actual site condition.

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4. FINAL DOCUMENTATION

On completion of the hydrotest the following documents will be submitted for each pipeline:

- 1) Instrument certificates
- 2) Completed Pigging and Hydrostatic Test Form (Appendix-5)

Form -1: Pigging Test Record / Pig Time and Condition with Pipeline gauging acceptance (with CY signature)

Form -2: Hydrostatic Test Record / Drain Test Result (with CY signature)

Form -3: Hydrostatic Test Record / including following records as minimum requirement,

- Temperature data
- Dead weight tester log
- Evaluation (with CY signature)

- 3) Pressure Recording Chart
- 4) Theoretical and hand plot pressure volume curve
- 5) Records of failure (if any)
- 6) Pipeline and P&ID Diagram
- 7) Calculation memo for Hydrostatic Test

All applicable documents will be submitted to CPY for co-signature before compiling final deliverables.

5. HSE

As a minimum, HSE requirement specified in “PWGS-PLR-501 for Hydrostatic Testing of Pipelines” and “PWGS-PLR-502 for Pre-commissioning of Submarine Gas Pipelines” will be followed.

- 1) During the hydrotest operations, no other work will be done within the immediate area of the pipeline or risers which are subjected to the hydrotest pressure.
- 2) Treated sea water disposed into the sea will be minimized as much as possible.