CARIGALI – PTTEPI OPERATING COMPANY SDN BHD

JDA BLOCK B-17

PHASE 5 DEVELOPMENT PROJECT

EXHIBIT 1

SCOPE OF WORK

TABLE OF CONTENTS

ATTACHMENTS

1.0 GENERAL WORKSCOPE

1.1 OVERVIEW

This document provides Scope of Work for Engineering, Procurement, Construction, Onshore Pre-Commissioning, Load-out & Sea fastening, Offshore Transportation & Installation, Offshore Hook-up and Commissioning (EPCIC) of two (2) Wellhead Platforms, namely TAPI B (TPB) and Muda G (MDG), associated Subsea Pipelines and Host Tie-ins Works on TAPI A (TPA), Muda F (MDF) and Muda CPP (MDPP) for JDA Block B17 Field Development Project (Phase 5).

1.1.1 INTRODUCTION

Carigali-PTTEP Operating Company Sdn Bhd (CPOC) (COMPANY) is a joint venture between Petronas Carigali Sdn Bhd of Malaysia (50%) and PTTEPI of Thailand (50%) for the field development in Joint Development Area (JDA). The COMPANY Blocks B-17 and B-17-01 Field Development Area are situated offshore in the Gulf of Thailand at the northern tip of the Malay Basin. The offshore location is 268 km east of Songkhla in southern Thailand and 171 km north-east from Kota Bharu in northern Malaysia. (Refer Figure 1.0)

Blocks B-17 and B-17-01 at an average water depth of 60 meter has gas and condensate reserves.

CPOC has successfully developed and is currently producing from Phase-1, Phase-2, Phase-3 and Phase-4 installations. Offshore facilities installations comprises of Muda Processing Platform (MDPP) receiving multiphase well from bridge linked wellhead platform (MDA) and satellite wellhead platforms (namely MDB, MDC, MDD, MDE, JKA, JKB, TPA, MDF, MTA, AMA, ADA, ADB and TJA) via subsea pipelines. Other facilities includes bridge linked Living Quarters and a bridge linked flare tripod. Condensate from the production is stabilized at MDPP and transferred by subsea pipeline to FSO. Wet gas from the combined bulk separation is conditioned and sweetened to remove trace contaminants such as mercury and bulk CO2 before compression and export. Treated gas is exported to the Buyer via subsea pipeline connecting to 42” PTT third trunk line.

In order to continue meeting Sales Gas commitment to the Buyers, CPOC has initiated Phase-5 development that is planned to commence production from end of Q2’ 2022. Phase-5 development comprises of two (2) satellite Wellhead Platforms, namely TAPI B (TPB) and Muda G (MDG), in Block B-17 gas fields. (Refer Figure 2.0)

FIGURE-1.0: Joint Development Area (JDA) in Gulf of Thailand

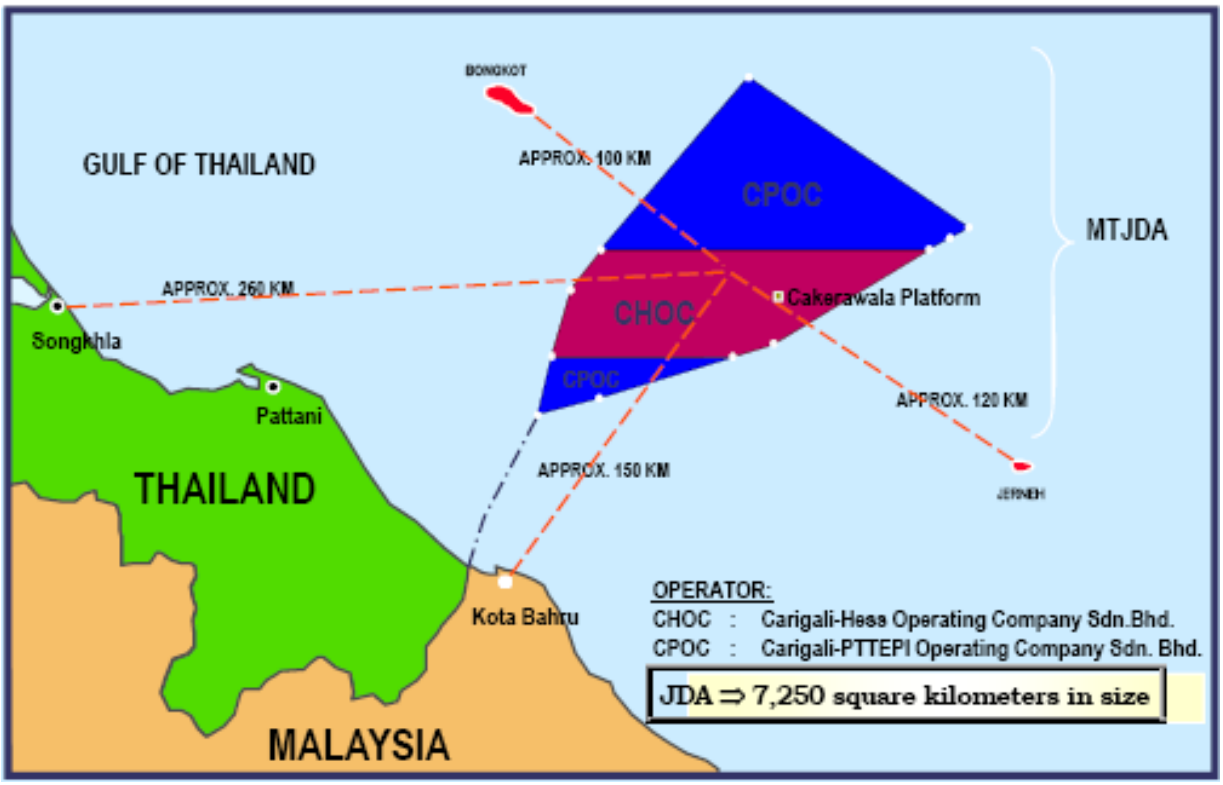
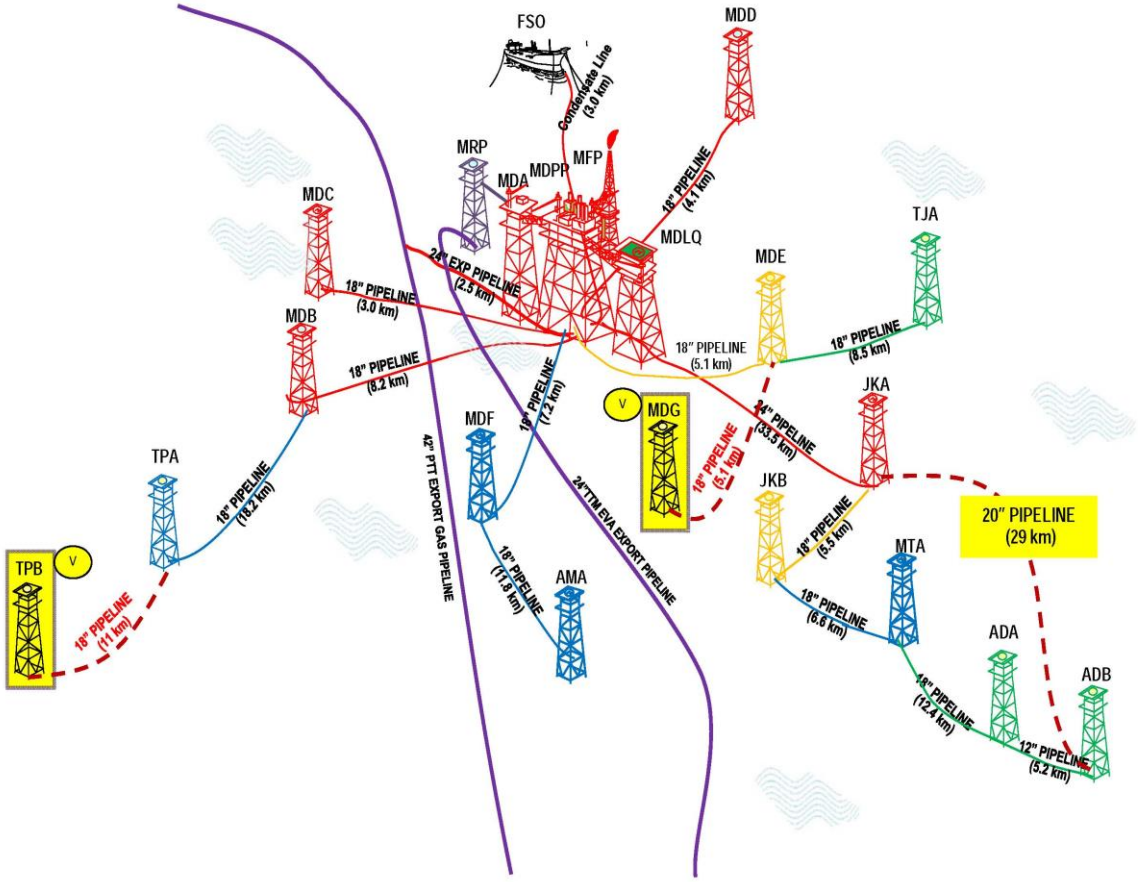


FIGURE-2.0: CPOC Phase-5 Field Development



(Note: Pipeline lengths referred above are approximate)

1.1.2 ABBREVIATIONS

The following abbreviations are widely used in the Exhibit-1 Scope of Work and other documents.

ADA	Andalas Wellhead Platform
ADB	Andalas East or Andalas-A Wellhead Platform
AFC	Approved for Construction
AI	Analogue Input
AO	Analogue Output
AMA	Amarit-A Wellhead Platform
C&E	Cause and Effects
CCR	Central Control Room
CFME	COMPANY Furnished Material and Equipment
CGS	CPOC General Specifications
COMPANY	Carigalli-PTTEPI Operating Company Sdn Bhd or CPOC
CPP	Central Processing Platform
CRA	Corrosion Resistant Alloy
CSV	Construction Support Vessel
DI	Digital Input
DO	Digital Output
EPC	Engineering, Procurement and Construction
EPCC	Engineering, Procurement, Construction and Commissioning
EPCIC	Engineering, Procurement, Construction, Installation and Commissioning
ESD	Emergency Shutdown
ERW	Electric Resistance Weld
F&G	Fire and Gas
FAT	Factory Acceptance Test
FEED	Front End Engineering Design
FSO	Floating Storage and Offloading
FWS	Full Well Stream
GMI	General Marine Instructions
H&MB	Heat and Material Balance
HP	High Pressure
HSE	Health, Safety and Environment
HUC	Hook-up & Commissioning
IMCA	International Marine Contractors Association
IR	Insulation Resistance
JSA	Job Safety Analysis
JKA	JENGKA-A Wellhead Platform
JKB	JENGKA-B Wellhead Platform
LP	Low Pressure
LQ	Living Quarters
LV	Low Voltage

MDA	Muda-A Wellhead Platform
MDB	Muda-B Wellhead Platform
MDC	Muda-C Wellhead Platform
MDD	Muda-D Wellhead Platform
MDE	Muda-E Wellhead Platform
MDF	Muda-F Wellhead Platform
MDG	Muda-G Wellhead Platform
MDLQ	Muda Living Quarter Platform
MDPP	Muda Central Processing Platform
MCC	Motor Control Centre
MCD	Mechanical Completion Date
MFB	Muda Flare Bridge
MFP	Muda Flare Platform
MPI	Magnetic Particle Inspection
MRP	Muda Receiving Platform
MTA	Melati-A Wellhead Platform
MV	Medium Voltage
MWS	Marine Warranty Surveyor
NC	Non Compliance
NCR	Non Compliance Report
NCN	Non Compliance Notification
NDT	Non Destructive Test
O&M	Operations and Maintenance
OIC	Offshore Installation Contractor
P&ID	Process and Instrumentation Diagram
PAGA	Platform Alarm / General Alarm
PCS	Process Control System
PE	Professional Engineer
PQP	Project Quality Plan
PEP	Project Execution Plan
PFD	Process Flow Diagram
QA/QC	Quality Assurance / Quality Control
QC	Quality Control
QRA	Quantitative Risk Assessment
RFQ	Request for Quotation
RT	Radiographic Test
SAW	Submerged Arc Welding
SCADA	Supervisory Control And Data Acquisition
SDV	Shut Down Valve
SIMOP	Simultaneous Operating (Production and drilling/construction)
SIS	Safety Instrument System
SLD	Single Line Diagram
SWL	Safe Working Load

T&I	Transportation and Installation
TPA	Tapi-A Wellhead Platform
TPB	Tapi-B Wellhead Platform
TJA	Tanjung Wellhead Platform
UFD	Utility Flow Diagram
UPS	Uninterruptible Power Supply
UT	Ultrasonic Test
WHP	Wellhead Platform (Topside and Jacket)
WCS	Wellhead Control System
WHCP	Wellhead Control Panel

1.1.3 LANGUAGE AND UNITS OF MEASUREMENT

All documentation, communication and instructions between COMPANY and CONTRACTOR shall be in the English language.

All software systems provided by CONTRACTOR for use by COMPANY or CONTRACTOR shall be in English language version of that software.

CONTRACTOR shall ensure that all CONTRACTOR's Key Personnel are fluent in written and spoken English.

System International (SI) Units of Measurement shall be used throughout project development. Alternative imperial unit may be provided in bracket () next to SI unit, whenever required.

1.1.4 PROJECT DESCRIPTION

The scope of work under this project consists of two wellhead platforms (namely TPB and MDG wellhead platforms); two associated subsea pipelines (18" TPB pipeline, and 18" MDG pipeline); Receiving Facilities and respective tie-ins at existing TPA and MDE and relevant tie-ins/modification on MDPP. (Refer Figure-2.0).

[A] Phase-5 Wellhead Platforms

TPB Wellhead Platform

TPB is 16 slots wellhead platform to be installed approximately 10.150 kilometers in south-west direction of TPA and approximately 35 kilometers in south-west direction of MDPP.

MDG Wellhead Platform

MDG is 16 slots wellhead platform to be installed approximately 5.124 kilometers in south-east direction of MDE and approximately 8.06 kilometers in south-east direction of MDPP.

All of the Phase-5 wellhead platforms will be designed as un-manned, self-reliant and self-contained platforms operated with minimal operational intervention. Phase-5 wellhead platforms will have high pressure (HP) wells, and normal pressure (NP) wells as noted in Table 1.0.

Table 1.0 Type and Number of wells

Type of wells	Number of wells	
	TPB	MDG
High Pressure (HP) wells	0	2
Normal Pressure (NP/IP) wells	12	12
Number of wells slots	16	16

The design capacity of Phase-5 wellhead platforms is as noted in Table 2.0.

Table 2.0 Platforms Design Capacity

Phase-5 Platforms	TPB	MDG
Max. Gas Rate (MMscfd)	120	100
Max. Condensate Rate (SBPD)	2800	2000
Max. Produced Water Rate (SBPD)	3600	2400

Each of the Phase - 5 wellhead platforms (TPB and MDG) will be provided with the following minimum facilities and features with three deck levels namely Main Deck, Cellar Deck and Sump Deck, unless and otherwise stated:

Below are the typical equipment and systems designated for each deck level of the wellhead platform. The same shall be read in conjunction with this Exhibit, Exhibit – 4 and Exhibit – 5 of the CONTRACT.

Main Deck

- Diesel storage and transfer system
- Wash water system
- Space provision for Corrosion Inhibitor and Diesel Tote tanks
- Pedestal Crane
- Diesel engine generator (AC power supply) (portable unit)
- Navigational aids [Lantern and Automatic Information system (AIS)]

Cellar Deck

- Wellhead area with wellhead control panel (WHCP)
- 3-Phase Test Separator for local and remote well testing (with all phases testing)
- Flow lines (completed with choke valve, check valve; diverter compact valves for production and test manifold with provisions for future booster compressor manifold and related tie-ins; instruments, both onshore and offshore installed spools; a complete seamless connection from X-mas tree to all manifold headers in manifold area)
- Manifold Area with Production Header and Test Header with provision for future Booster Compressor Header.
- Safety features at all manifolds (PSVs, IPS)
- Sand monitoring by intrusive probe and non-intrusive clamp on at test header
- Pig Launcher for intelligent pigging.
- Pig Receiver for intelligent pigging (provision for future only)
- Methanol injection facility (provision with injection quills and tubing manifold)
- Corrosion inhibitor injection system
- Demulsifier injection facility (provision with injection quill)
- E&I equipment room
- Vent and Drain Systems
- Instrument and Utility Gas system
- Fuel gas conditioning system
- Hybrid DC power generation using Thermo-electric generator (TEG) and solar power generation with battery charger, DC distribution board, charge controller

- PLC based automated wellhead control system (ESD, PCS and SIS) linked to MDPP SCADA via Remote Telemetry Unit (RTU)
- Fire and Gas Detection system (integrated in SIS, fusible plugs and infrared detectors)
- Booster Compressor (space and tie-in provisions for future only)

Sump Deck

- Open drain system (hazardous and non-hazardous)
- Vent and drain systems
- Operator's Temporary weather shelter

WHP Other Features

- Material handling equipment (monorails, pad eyes, pedestal crane, etc)
- Platform lighting system
- Two level boat landing
- Pre-installed risers and provision for future post installed risers
- Telecommunication equipment (License band SCADA radio and Trunk Radio)
- Safety Equipment (Fire extinguishers, Eye wash and Safety showers, Safety Signage, Life Jacket, Life Buoys, Life Raft, etc)
- Corrosion monitoring system (coupons, probes, sample connections)
- Four leg jacket
- Wellhead Platform suitable for both Jack up rigs and Tender assisted rigs
- Vent Boom (meeting radiation and dispersion criteria)
- Open drain system (hazardous and non-hazardous)
- Vent and Closed drain system
- Others as required under the CONTRACT

[B] Phase-5 Subsea Pipelines

Phase-5 development includes installation of subsea pipelines to gather production from aforementioned two satellite wellhead platforms.

TPB Pipeline

A subsea pipeline of 18" (TPB pipeline) is selected to carry production from TPB to TPA wellhead platform. The TPB pipeline will be connected to the existing 18" riser at TPA wellhead platform. The production from TPB wellhead platform will flow through the existing subsea pipeline network for delivery to MDPP.

TPB pipeline will be of carbon steel material of different thickness in hot and cold section of pipeline.

MDG Pipeline

A subsea pipeline of 18" (MDG pipeline) is selected to carry production from MDG to MDE wellhead platform. The MDG pipeline will be connected to the existing 18" riser at MDE wellhead platform. The production from MDG wellhead platform will flow through the existing subsea pipeline network for delivery to MDPP.

MDG pipeline will be of carbon steel material of different thickness in hot and cold section of pipeline

[C] Phase-5 Host Tie-in Wellhead Platforms

The production from TPB and MDG will be transported to MDPP through the existing subsea pipeline network. The incoming production from TPB and MDG will be received at existing Host Tie-in platforms, TPA and MDE respectively for subsequent transportation to MDPP. In order to receive TPB and MDG production, Receiving facilities at TPA and MDE are required.

Receiving Facilities at TPB

In order to receive TPB production on Host Tie-in platform TPA, Receiving facilities at TPA are required. The Receiving Facilities at TPA will comprise of Pig Receiver, piping, instrumentation, electrical and necessary tie-ins to existing wellhead platform facilities by utilizing available space on these wellhead platforms. The Receiving Facilities at TPA will tie-in to the existing 18" riser on platform. The production from TPB will be received at TPA and for further delivery to MDPP via existing network of subsea pipelines.

Receiving Facilities at MDE

In order to receive MDG production on Host Tie-in platform MDE, Receiving facilities at MDE are required. The Receiving Facilities at MDE will comprise of Pig Receiver, piping, instrumentation, electrical and necessary tie-ins to existing wellhead platform facilities by utilizing available space on these wellhead platforms. The Receiving Facilities at MDE will tie-in to the existing 18" riser on platform. The production from MDG will be received at MDE and for further delivery to MDPP via existing network of subsea pipelines.

Host tie-in at MDPP

MDPP is an existing Central Processing Platform where production from TPB and MDG wellhead platform will be received. All telecommunication, control and shutdown systems will tie-in to MDPP. Accordingly MDPP telecommunication, instrumentation, control and shutdown system (DCS, SIS and SCADA), UPS System including batteries, all associated wiring, interconnection cable, interface with existing system and others as necessary will be modified, upgraded and added to accommodate requirements for new wellheads and host tie-in platforms, developed under Phase-5.

1.1.5 CONTRACT PLAN

The planned CONTRACT EFFECTIVE DATE is 1st July 2020.

CONTRACTOR's scope is to provide completed and functional Phase - 5 wellhead platforms. CONTRACTOR shall ensure full onshore (both topsides and jackets) completions progressively to allow sail away of TPB platform and MDG platform by their respective MILESTONE DATES. Each of these facilities onshore completion date will be the Onshore Mechanical Completion Date (MCD) and termed as MILESTONE. Refer to Exhibit – 3 for designated MILESTONES and corresponding MILESTONE DATES.

Offshore transportation and installation of TPB platform and TPB pipeline shall be completed in all manners on or before specified MILESTOME DATE. This is one of the most critical activities considering subsequent execution plan for TPB Pre-Drill HUC work, rig arrival and drilling activities on TPB platform. This shall follow with subsequent offshore transportation and installation of MDG platform and MDG pipeline completed in all manners on or before specified MILESTOME DATE. Similar to TPB, completion dates for MDG platform and pipelines also are highly critical considering subsequent execution plan for MDG Pre-Drill HUC work, rig arrival and drilling activities on TPB platform. Offshore transportation and installation of Phase - 5 wellhead platforms and pipelines are designated as MILESTONES.

CONTRACTOR shall ensure and make all endeavor under all circumstances, to complete all WORKs under the respective WORK PHASE and enable 1st gas production from the respective facilities in accordance with the planned schedule.

CONTRACTOR shall complete the installation of receiving facilities and host tie-in works on COMPANY's existing offshore facilities, namely, TPA, MDE and MDPP within the offshore schedule designated as a specific MILESTONES under Exhibit – 3 of the CONTRACT. All necessary works shall be executed and completed in order to seamlessly meet respective MILESTONE DATES and enable subsequent Pre-Drill HUC and Drilling activities on Phase - 5 wellhead platforms to be executed according to the plan. The host tie-in and receiving facilities completion on existing platforms shall be on or before completion of MILESTONE for Pre-Drill HUC of the associated WHPs. CONTRACTOR shall refer to Exhibit – 3 of the CONTRACT for the sequence of MILESTONES for both BASE and OPTION scenarios, as applicable.

The Offshore Pre-Drill HUC WORK on Phase-5 wellhead platforms shall commence progressively upon completion of offshore Transportation and Installation of respective wellhead platform and associate subsea pipeline. Offshore Pre-Drill HUC works shall be completed in all respects without any balance of work / punch list prior to the planned drilling activity on respective facilities. Immediately upon completion of offshore Pre-Drill HUC work and demobilization of marine and construction spread, CONTRACTOR shall undertake Seabed Survey at and around the location of Phase - 5 wellhead platforms.

It is planned that HUC of TPB platform is to carryout hook up in separate campaigns and batches. Subsequent to completion of offshore transportation and installation of TPB

wellhead platform and associated subsea pipeline, Pre-Drill HUC on TPB wellhead platform and TPA Host Tie-in WORK shall be performed. A seabed survey shall be undertaken at TPB wellhead location immediately upon demobilization of CONTRACTOR's construction spread. Refer Exhibit – 3 CONTRACT Schedule MILESTONES and MILESTONE DATES for the sequence and time line of execution. All WORK as defined and required for completion of HUC of TPA wellhead and MDE Host Tie-in platform shall be executed as per the APPROVED MASTER SCHEDULE. The balance of HUC scope shall be exclusively for Flow line tie-in and RFSU which is planned under various batches.

The 1st batch of flow line hook-up on TPB platform shall be for partial wells to allow early platform production and shall be completed on or before specified MILESTONE DATE. A total of four (4) batches of flow line hook-up on TPB platform are planned. Similarly the 1st batch of flow line hook-up on MDG platform shall be for partial wells to allow early platform production and shall be completed on or before specified MILESTONE DATE. A total of three (3) batches of flow line hook-up on MDG platform are planned. Refer to Exhibit – 3 CONTRACT SCHEDULE for respective MILESTONES and MILESTONE DATES. Each of the offshore HUC campaigns and batches will be separate offshore mobilizations and completions to allow progressive startup of each facility and all of them are designated as specific MILESTONES.

The final and the last batch of flow line hook-up scope shall include balance of the reinstatement and commissioning WORK as explicitly specified in the subsequent sections of Exhibit - 1 of CONTRACT.

Offshore commissioning of receiving facility and host tie-in on TPA shall also be completed along with Pre-Drill HUC of TPB platform on or before corresponding MILESTONE DATE. Similarly, commissioning of receiving facility and host tie-in on MDE shall be completed on or before the MILESTONE DATE for Pre-Drill HUC of MDG platform.

For OPTION Case, offshore HUC on MDG shall commence upon demobilization of drilling rig. Full MDG HUC will be executed under single campaign with simultaneous completion of associated Host Tie-in WORK in MDE. Offshore HUC mobilization on MDG shall be planned and agreed with COMPANY sufficiently in advance during the execution phase.

COMPANY reserves the right to alter activities sequence of offshore campaigns to suit COMPANY's other priorities. Such alternation shall be permissible within given offshore work duration as per Exhibit - 3 COMPANY SCHEDULE within Lump Sum Price and as long not requiring additional mobilization / demobilization.

1.1.6 SCHEDULE

CONTRACTOR shall submit ninety (90) days Look Ahead Schedule for all initial activities including detailed engineering and procurement along with overall EPCIC project schedule to meet CONTRACT plan in their bid proposal. Refer GC-33 and Exhibit - 7 of the CONTRACT in this respect. The 90 days look-ahead schedule will be used to monitor initial

activities from the EFFECTIVE DATE until the APPROVED CONTRACT SCHEDULE is established. CONTRACTOR shall develop CONTRACT SCHEDULE that shall include detailed EPCIC project activities schedule for each Work Phases (onshore EPC activities until sail away, offshore transportation and installation of wellhead platforms, offshore transportation and installation of subsea pipelines and risers, offshore HUC and host tie-in activities) meeting CONTRACT MILESTONES requirements and submit for COMPANY review and APPROVAL within sixty (60) days from the EFFECTIVE DATE.

CONTRACTOR shall develop, update and maintain the APPROVED CONTRACT SCHEDULE for periodic monitoring and reporting in accordance with Exhibit - 3 CONTRACT SCHEDULE and Exhibit-7 Project Coordination and Administration Requirement.

In accordance with the General Conditions (GC) and Special Conditions (SC) of the CONTRACT, CONTRACTOR shall take all measures to mitigate delays to the WORK that may be caused due to any reason including but not limited to delayed material deliveries, non-availability of resources and like and shall take all measures to recover any delays that may occur to the WORK.

The construction activities shall be planned to meet the onshore Mechanical Completion Date. The onshore fabrication must be completed; all facilities shall be pre-commissioned and preserved before the load-out date. The offshore execution including offshore Transportation and Installation, HUC and Host Tie-in activities shall be planned in detail including vessel mobilization, day to day activities, demobilization and close out, etc.

A Level - 2 & 3 schedule shall be developed in detail for onshore EPC activities, all T&I activities and HUC activities. All requirements stated under Exhibit - 1 Scope OF WORK shall be referred for activities and schedule development under each WORK Phase.

1.1.7 WORK REQUIREMENT

CONTRACTOR shall engineer, specify, procure, fabricate, transport, offshore install, perform offshore hook-up and commissioning; mechanically complete and warrant the WORK in conformance with CONTRACT, related Drawings and Specifications, etc. and in accordance with the terms and conditions of the CONTRACT.

The facilities and equipment covered by this CONTRACT shall be designed and fabricated for an offshore environment considering severe weather and corrosive conditions.

Any WORK or materials not indicated on the Drawings, or not specifically called out in the Specifications or elsewhere, which are necessary for performance of the WORK in accordance with the CONTRACT, shall be provided and incorporated into the WORK at the expense of the CONTRACTOR to the same extent as if both indicated and specified. Any WORK indicated on the Drawings or elsewhere in the CONTRACT but not specified, or vice versa, shall be furnished as though fully set forth in both. It shall be the CONTRACTOR's responsibility to bring any discrepancies or questions regarding the intent

of any scope definition, specifications or drawings to COMPANY's attention for clarification and approval.

Anything contained herein or omitted here shall not be construed to relieve the CONTRACTOR of any obligation for providing a complete, safe and fully operational facility, that will perform according to the requirement of the CONTRACT including but not limited to all Drawings, Design Basis, and Specifications, etc under the CONTRACT provided to CONTRACTOR.

The complete responsibility for the Engineering, Procurement, Construction, Testing and Pre-commissioning, Preservation, Load out and Sea fastening, offshore Transportation and Installation, Hook-up and Commissioning (EPCIC) of the specified facilities rests entirely with the CONTRACTOR.

CONTRACTOR shall account and consider all interfaces with COMPANY and OTHERS CONTRACTORs for performance of WORK. Meeting and managing all and any specific requirements, in order to safely, on schedule and cost effectively execute the concurrent WORK, shall be sole responsibility of the CONTRACTOR under the CONTRACT.

1.1.8 CONFLICT OF DOCUMENTS

CONTRACTOR shall review all the COMPANY documents, drawings, data, information, guidelines and procedures, within thirty (30) days prior to planning or initiation WORK and/or any portion of WORK. CONTRACTOR shall identify any conflicts or errors and immediately notify COMPANY for necessary clarification/advise/decision by COMPANY. Failure to acquaint with COMPANY Guidelines and Procedures shall not relieve CONTRACTOR of discharge of its obligations under the CONTRACT and within CONTRACT PRICE and Schedule.

Notwithstanding provision in any part of the Technical Specifications, in the event of any conflict between the Technical Specifications, CGS, General Conditions (GC), Special Conditions (SC) and all associated Exhibits, the most stringent requirement shall be applied unless and otherwise required by COMPANY.

1.2 COMPANY RESPONSIBILITY

1.2.1 GENERAL

COMPANY has furnished requirements, information and data to CONTRACTOR under Exhibit - 4 Technical Requirements (GoBy Design Package, Gap Register and Statement of Requirement (SOR)), Exhibit - 5 CPOC General Specifications (CGS) and Exhibit – 12 Site Survey and Soil Boring Reports. The design requirements, information and data provided by COMPANY along with the Exhibit - 1 and other Exhibits shall be used for development Phase 5 CPOC AFC Design Package, construction of FACIITIES, onshore testing and pre-commissioning, offshore installation, commissioning and Start-up. COMPANY furnished design information and data shall not be construed as basic engineering package. The provision of this information shall not obviate CONTRACTOR's responsibility for all WORK necessary for the completion of the design and delivery of Phase 5 Facilities. However any changes or deviations to Exhibit – 4 and Exhibit – 5 planned by CONTRACTOR shall be referred to COMPANY with sufficient advance notice. CONTRACTOR shall solicit COMPANY APPROVAL prior to proceeding with WORK. COMPANY's decision shall be final and binding to CONTRACTOR with no impact to COMPANY, APPROVED CONTRACT SCHEDULE and CONTRACT PRICE. In all cases the CONTRACTOR remains solely responsible and shall provide design guarantee and warranties of the completed facility in compliance with CONTRACT.

CONTRACTOR shall use COMPANY furnished information, GoBy Design Package, in the development of its engineering and design and its usage shall in line with GC-19 of CONTRACT. In the event that CONTRACTOR identifies errors or inconsistencies in such documents, and others as furnished under Exhibit – 4 and Exhibit – 5, CONTRACTOR shall immediately approach COMPANY for resolution providing minimum notification of two (2) weeks. Under the circumstances, final resolutions shall be exclusively based on COMPANY decision and discretion within CONTRACT PRICE. CONTRACTOR shall review all such Information at the upfront for subsequent utilization without any impact to COMPANY.

1.2.2 DESIGN

Exhibit - 4 Technical Requirements of the CONTRACT defines technical requirements and constitute "GoBy" Design Package, Statement of Requirement (SOR) and Gap Register. All the documents provided under Exhibit – 4 shall be read together with other Exhibits of the CONTRACT and a part of the documentation required for completing the WORK. These documents shall not be inferred or construed as comprising detailed design or construction reports or drawings and shall not be used as such. CONTRACTOR shall be fully responsible for developing technical solutions, detailed engineering and design of the Facilities in accordance with the Exhibit -1, technical requirements as referred under other Exhibits, CPOC General Specifications (CGS), International Design Codes/Standards and Recommendations and good international practices. CONTRACTOR shall identify and

correct all errors or omissions between technical requirements and general specifications in consultation with COMPANY.

COMPANY's intention is to standardize Phase 5 facilities, TPA and MDG, and CONTRACTOR shall consider the same in design. CONTRACTOR shall solicit COMPANY's agreement prior to proceeding with any deviation/alternatives to GoBy package and provide necessary qualification to this respect. COMPANY shall have the sole discretion to accept/waive or require CONTRACTOR to follow/comply to the "GoBy" Design and provide obligatory design warranties as required under the CONTRACT without impacting CONTRACT PRICE and SCHEDULE.

(Also refer to section 2.1 Detailed Engineering of Exhibit -1)

COMPANY has provided Site Survey and Soil Boring (Geophysical and Geotechnical Reports) reports for Phase 5 Development under Exhibit - 12. CONTRACTOR shall design and develop CPOC AFC Design Package based on the Site Survey and Soil Boring Reports for Phase 5 – TPB and MDG Wellheads platform locations.

1.2.3 COMPANY FURNISHED MATERIALS AND EQUIPMENT (CFME) – NOT APPLICABLE

There shall be "**NO" COMPANY purchased and supplied material and equipment (CFME) to the CONTRACTOR** for performance of WORK under the CONTRACT. All equipment, materials, structural steel, bulks, consumables, services supply necessary for the successful completion of the WORK shall be CONTRACTOR's responsibility.

Accordingly, Exhibit – 6 COMPANY FURNISHED MATERIALS AND EQUIPMENT (CFME) is NOT APPLICABLE under the CONTRACT.

1.2.4 LONG LEAD ITEMS

Long Lead items or **critical items** in general are defined as that material and equipment where deliveries are potentially longer and are likely to impact critical path of the project, such as material and equipment, namely, Primary Structural steel, line pipe(for risers) and bends, Safety relief valves, Choke Valves, Actuated Ball Valves, Pedestal Cranes, etc. CONTRACTOR shall establish a Long Lead Items List as part of Project Procurement Plan, defining the various stages of engineering, procurement, logistics and relevant tax exemption/customs approval against the Project timeline. CONTRACTOR shall ensure development of mature design and technical specifications, placement of respective Purchase orders in expeditious manner in order not to impact the critical path of the project. CONTRACTOR may require negotiating / exploring early deliveries with relevant suppliers/VENDORS. *Special consideration shall be made to the imported structural steel material into Malaysia/Thailand where relevant Authorities material testing and clearances procedures may require additional time before final delivery to the WORKSITE*.

1.2.5 SERVICES

COMPANY shall supply the following services. All other services not explicitly noted as COMPANY supplied shall be CONTRACTOR's responsibility. Any services and provisions requested by or rendered to the CONTRACTOR, other than those stated herein and exceeding the agreed plan duration, shall be reimbursed at cost to the COMPANY as per General Conditions (GC) - 39 BACKCHARGES of the CONTRACT:

1. COMPANY will review, comment and accept/reject/approve CONTRACTOR's deliverables. CONTRACTOR shall be responsible for producing "Approved for Construction (AFC)" deliverables. COMPANY acceptance of CONTRACTOR deliverables shall not relieve CONTRACTOR of his responsibilities under the CONTRACT to provide complete and functional Phase-5 facilities meeting all technical and design requirements. CONTRACTOR shall be solely responsible and shall correct any engineering and construction documentation at every level of project execution whenever mistakes, errors and design conflicts are identified for whatever reason. Accordingly any shortage and/or defect of materials, constructed item, and/or assembled/installed package/skid and completed system shall be reworked and corrected to meet technical compliance within the CONTRACT PRICE.
2. COMPANY will appoint a COMPANY Site Representative (CSR) and supporting quality and safety personnel at CONTRACTOR's onshore fabrication/construction yard (WORKSITE/S), on Marine vessel(s) during offshore (SITE) T&I and Survey operations, offshore HUC and Host Tie-in WORK to monitor compliance, progress and work schedule. CONTRACTOR shall comply with CSR instructions related to performance of WORK at WORKSITE/SITE. On the matters of CONTRACT and commercial, CONTRACTOR shall refer to COMPANY Representative – Project Manager for necessary direction and resolution.
3. COMPANY will provide transport for CONTRACTOR personnel, material and equipment between COMPANY Songkla Base and SITE for execution of WORK directly related to Flow line hook-up and RFSU planned under respective batches. Maximum number of CONTRACTOR personal is limited to fifteen (15) pax only. CONTRACTOR shall make due considerations within its schedule and planning regarding the COPANY Logistics/Offshore vessel schedule. Cost impact due to the failure of CONTRACTOR to allow such considerations into its execution schedule shall not be compensated.
4. COMPANY will provide lodging and food for CONTRACTOR personnel at SITE, on MDLQ and/or COMPANY vessel during the execution of WORK directly related to Flow line hook-up and RFSU at Phase 5 wellhead platforms planned under respective batches. Maximum number of CONTRACTOR personal is limited to fifteen (15) pax only.
5. COMPANY will provide offshore transport; lodging and food for CONTRACTOR personnel at SITE during COMPANY performed Performance Test on Phase 5 wellhead platforms.
6. COMPANY will provide Offshore Safety Passports for all CONTRACTOR personnel required to be at SITE for the WORK. This is subject to correct and acceptable application

and relevant documentation furnished by CONTRACTOR. Refer to Exhibit – 8 HSE for specific requirements for obtaining Offshore Safety Passport (OSP). CONTRACTOR may require interfacing with COMPANY on a hard copy application submission and/or online application submission as may be advised after the EFFECTIVE DATE within CONTRCT PRICE.

CONTRACTOR shall plan in advance and manage utilization of COMPANY services for offshore execution in a most optimal manner without undue cost impact to COMPANY, and considering various limitations including availability constraints and safety risk at offshore operations. The cost of extended utilization of the above provisions due to reasons exclusive to CONTRACTOR shall be managed as per GC-39 BACKCHARGES of the CONTRACT. Any request or requirement for extension of services by COMPANY related to offshore execution shall be reviewed and Approved by COMPANY as part of offshore execution plan. CONTRACTOR shall revise and improve its plan based on COMPANY review. COMPANY's decision shall be binding to the CONTRACTOR. CONTRACTOR shall undertake necessary measures within the CONTRACT PRICE.

1.2.6 CERTIFICATION

1. The structures shall be certified to "+A1 Offshore Installation". CONTRACTOR shall certify the primary steel design, fabrication/construction, load out, sea fastening, sail away, and transportation and installation activities of CONTRACTOR.
2. COMPANY shall contract for the purpose of Marine Warranty Surveyor (MWS) in accordance with Special Conditions (SC) - 23 MARINE WARRANTY SURVEYOR of the Special Conditions of the CONTRACT.
3. COMPANY shall retain the services of MWS, in accordance with the requirements of the COMPANY's insurer to inter alia, review design and construction procedures related to marine operations (including load out, sea fastening, transportation and offshore installation operations) and inspect the related RESULT OF WORK and CONSTRUCTION EQUIPMENT in order to issue the certificates of compliance with the relevant regulations and insurance policies. CONTRACTOR shall make available to the MWS all necessary design documents, drawings, procedures, information and allow the full inspection by such MWS of CONTRACTOR's and SUB-CONTRACTOR's relevant RESULT OF WORK and CONSTRUCTION EQUIPMENT.
4. CONTRACTOR shall comply with the MWS requirements. However, approval, recommendations and clearances given by the MWS shall not relieve CONTRACTOR of his ultimate responsibility for properly complying with all of his obligations under the CONTRACT. CONTRACTOR shall bear all cost associated with interface, coordination, providing all necessary support services to the MWS and complying with MWS requirements.

5. CONTRACTOR shall make available to COMPANY all information requested and shall comply with all recommendations and requirements of COMPANY and shall incorporate in the WORK, without extension to the CONTRACT SCHEDULE and/or changes to the CONTRACT PRICE.
6. CONTRACTOR shall liaise with MWS as authorized and directed by COMPANY. Accordingly CONTRACTOR shall resolve MWS comments, furnish information (documents, data, drawings, etc) requested and necessary for the purpose of review by MWS/COMPANY, follow-up and expedite review with MWS. CONTRACTOR shall follow and COMPANY shall render advice/direction to CONTRACTOR from time to time during execution of WORK for proper management of interface with MWS.
7. CONTRACTOR shall keep the COMPANY in loop for all communications and discussions with the MWS. COMPANY reserves the right to attend all meeting conducted between CONTRACTOR and MWS. CONTRACTOR shall maintain a record of all liaison activities, including meetings, teleconference, reviews and electronic communications undertaken with COMPANY appointed MWS.

1.2.7 OFFSHORE START-UP

CONTRACTOR shall assist and COMPANY shall perform startup of Phase - 5 facilities by introduction of well-fluids into the process systems of WHPs, subsea pipelines and receiving facilities. CONTRACTOR shall prepare START-UP Procedure and shall assist trouble shoot, correct the system and design and perform all necessary work for successful and uninterrupted startup and plant operation. CONTRACTOR shall also be responsible for provision of all required technical assistance and vendor support during start up under the CONTRACT PRICE.

CONTRACTOR shall make the platform facilities READY FOR START-UP (RFSU) duly accepted by COMPANY before wellhead platform START-UP could commence. Delay in wellhead platform RFSU from the approved schedule will cause invocation of relevant provisions of the CONTRACT.

CONTRACTOR shall as part of Offshore HUC WORK Package, prepare the detailed START-UP procedure/s, check sheets, acceptance sheets, punch list and close action status, etc for managing wellhead platform RFSU.

1.3 CONTRACTOR RESPONSIBILITY

1.3.1 GENERAL

CONTRACTOR shall perform WORK in accordance with this Exhibit 1 - Scope of Work, all Attachments and Exhibits of the CONTRACT. CONTRACTOR shall be responsible for everything stated, or that can reasonably be inferred herein for completing the detailed engineering, procurement, fabrication/construction, onshore testing, pre-commissioning

and commissioning, preservation, load-out and sea fastening, offshore transportation and installation, offshore Host Tie-in works and offshore Hook-up and commissioning, unless and otherwise noted explicitly.

a) The WORK specified in this CONTRACT include; detail Engineering, Procurement, Fabrication, onshore Testing and Pre-commissioning, Preservation, Load out and Sea fastening, offshore Transportation and Installation requirements, offshore Host Tie-in works, offshore Hook-Up and Commissioning requirements of two (2) wellhead platforms (TPB and MDG), two (2) subsea pipelines (TPB and MDG) and two (2) Receiving Facilities (TPA and MDE) along with host tie-ins (TPA, MDE and MDPP).

b) CONTRACTOR shall mobilize Engineering services (in-house/subcontract) within ten (10) working days from the EFFECTIVE DATE and shall complete necessary **"early engineering"** within eight (8) weeks from the EFFECTIVE DATE. This shall enable CONTRACTOR to initiate procurement of critical/Long Lead material and equipment, namely, Primary Structural steel, line pipe(for risers) and bends, Safety relief valves, Choke Valves, Actuated Ball Valves, Pedestal Cranes and other Long Lead/Critical Items as identified by CONTRACTOR under Long Lead/Critical Item list.

c) CONTRACTOR shall mobilize, furnish and demobilize on completion of the WORK, all necessary offices, project management, engineering, supervision, services, materials, equipment, labor, transportation, all logistic, duties/customs clearances, marine spreads, consumables, insurance and others as required to Design, Procure, Construct, test, Inspect, preserve/protect, Load-out, Transport and Install, Tie-in, Hook-Up and Commission (up to RFSU) as well as all other items necessary to complete the intended functional requirements as detailed in the drawings, specifications, reports, exhibits of the CONTRACT and the like which can reasonably be inferred as being necessary.

d) CONTRACTOR shall set up a project office at WORKSITES and provide project management and engineering services to enable compliance of the CONTRACT requirements. Engineering and Project Management services carried out and shall be located in the country of CONTRACTOR's construction yard (WORKSITE).

e) CONTRACTOR shall provide a dedicated, experienced and specialist Detailed Engineering Design Team responsible for all engineering activities and integrated with the Project Management Team. Engineering must be carried out at location in the country of CONTRACTOR's Fabrication Yard and as approved by COMPANY.

f) CONTRACTOR shall produce all and any necessary deliverables for the WORK including those for Project management, Engineering, fabrication, commissioning, transportation, installation and hookup and commissioning. Deliverable List as included under GoBy design package may be referred to as a minimum requirement and additional project deliverables shall be produced under CONTRACT PRICE.

g) CONTRACTOR shall be responsible for all interface engineering among various WORK Phases and with Vendors/Suppliers/Forwarding agents, agencies, government authorities, OTHER CONTRACTORS, MWS and COMPANY, all other material

procurement, material take-offs, fabrication/construction, temporary aids, equipment installation, piping, risers, wiring, tubing, outfitting, testing, onshore pre-commissioning, onshore commissioning, preservation work, weighing, load out, sea fastening, offshore survey, transportation and installation, host tie-in, offshore hook up and commissioning and handover of the completed WORK.

h) CONTRACTOR shall supply all commissioning spares, manuals and first fills required for all the equipment and systems within CONTRACT PRICE. CONTRACTOR shall solicit COMPANY endorsement on the List of Commissioning Spares and First Fills. All necessary information and details as required by COMPANY shall be provided under this list for each spare and first fill items.

i) CONTRACTOR is responsible for trial fit/test install and removal of equipment and material that is required to be ship loose for transportation and in consideration of drilling activities. Such items shall be identified in advance during detailed engineering phase.

j) All ship loose material for T&I requirements, Drilling requirement, HUC requirements and commissioning material and spares shall be properly bagged and tagged and delivered to SITE with wellhead platform and/or with CONTRACTOR Pre-Drill HUC/HUC Construction vessel, as applicable. The ship loose material for installation and commissioning works planned under flow line hook-up batches shall be delivered at COMPANY supply base in Songkhla, Thailand, in coordination with and as instructed by COMPANY. CONTRACTOR shall plan and prepare in advance the List (with necessary details) for all bagged and tagged items/equipment and material. CONTRACTOR shall solicit COMPANY approval on the same in advance.

k) Should CONTRACTOR identify any discrepancies, anomalies or errors within the Exhibits, CONTRACTOR shall bring this to the immediate attention of COMPANY for resolution. However, stringent requirement shall prevail.

l) CONTRACTOR shall make all necessary applications and submissions, on behalf of COMPANY if required by respective government agency/authority or Law, for the performance of WORK. The COMPANY will provide details and other supporting documents for completing the application/s. CONTRACTOR shall be responsible for follow-up and expediting the relevant PARTIES as necessary. Any delay in grant of approval by government agency/authority shall be managed by CONTRACTOR under the CONTRACT PRICE.

CONTRACTOR work scope includes the following activities but not limited to:

1. Undertaking Project Management of the Engineering, Procurement, Construction, onshore Testing and Pre-Commissioning, Offshore Transportation and Installation (T&I), Offshore Hook-Up and Commissioning until HANDOVER of the WORK, and the management and supervision of all SUBCONTRACTORS, VENDORS, and ancillary or temporary services which are necessary for the expeditious completion of the WORK.

2. Preparation, submission and provision of organization charts with description of Engineering, Procurement, Construction, onshore Testing and Pre-commissioning, Preservation, Offshore Transportation and Installation (T&I), Offshore Hook-Up and Commissioning (HUC) and Host Tie-in; separately for each WORK Phase and location of the WORK. CONTRACTOR shall also submit sub-contractor's details with their organization chart proposed under each WORK phase.
3. Deployment of dedicated project management team to manage the implementation of the WORK including deployment of all Key CONTRACTOR/major Sub-CONTRACTOR Personnel (as referred in other sections of Exhibit -1).
4. Coordination and control of the WORK, e.g., Engineering, Procurement, Project Controls, Contracting, Construction, Pre-Commissioning, Transportation and Installation, Hook-Up and Commissioning until HANDOVER to ensure the WORK is completed on schedule and according to the specifications, drawings and requirements given in various Exhibits.
5. Management, coordination and follow-up with COMPANY for review/acceptance/approval of documents, drawings, notices and deliverables by listing the priorities in sync with the execution schedule. COMPANY will endeavor however shall not be exclusively be governed by the specified review period. CONTRACTOR shall be fully responsible to manage COMPANY review under CONTRACT SCHEDULE and PRICE.
6. Implementation of a safety program throughout the execution of the WORK.
7. Implementation of a quality assurance program throughout the execution of the WORK and submission of periodic reports to COMPANY.
8. Carrying out periodic quality, safety, technical and schedule audits and advising COMPANY of the results of such audits together with the appropriate action taken and any recommendations. COMPANY should be informed sufficiently in advance to the implementation of such audits in order to arrange COMPANY's participation.
9. Establish and implement the procedure for recording and correcting any "Non Compliance" to quality and delivery requirements (including delivery timeline) as set forth in the CONTRACT. CONTRACTOR shall register and take necessary remedial measures for "Non Compliances" as identified/notified by COMPANY. In the event for CONTRACTOR's failure to remedy or correct the recorded/identified "Non Compliance", relevant provisions of the CONTRACT shall be invoked.
10. Management and coordination of all external and internal interfaces associated with the WORK. The interfaces shall cover complete scope or WORK, including but not limited to, Engineering, Procurement, Construction, Pre-commissioning, Load out and Sea fastening, Offshore T&I, Offshore HUC and Host Tie-in.
11. Attending all meetings with COMPANY on the project, onshore and offshore, such as progress, HSE, interface, quality, etc.
12. Reporting to COMPANY in accordance with approved procedures. CONTRACTOR to provide weekly progress reports, monthly progress reports in general throughout the

performance of WORK. CONTRACTOR shall provide daily reports for all activities during offshore execution including Transportation & Installation, Seabed Survey, Pre-Drill HUC/HUC, Flow line Hook-up and commissioning, etc. CONTRACTOR shall provide daily reports for activities/portion of WORK identified as CHANGE (GC-36 CHANGES) for onshore and offshore activities and also as and when instructed by COMPANY.

13. Manage logistics, customs and declaration to government authorities
14. Interface with COMPANY for arranging necessary applications and documentation for submission to Authorities for declaration, solicitation or approval, etc. CONTRACTOR shall plan its activities well in advance accounting for the long approval time by respective Authorities.
15. Construction Management and Supervision.
16. Construction engineering and control.
17. Material control and warehousing of CONTRACTOR supplied materials.
18. CONTRACTOR shall ensure and perform all necessary and required interfaces with VENDOR(S) and SUBCONTRACTOR(S). CONTRACTOR shall also ensure VENDORS and SUBCONTRACTORS compliance with COMPANY HSE and QA/QC requirements.
19. Ensure and submit relevant requests or notices to COMPANY sufficiently in advance for soliciting information, drawing, data, offshore safety passports, meetings, etc. CONTRACTOR shall regularly coordinate with COMPANY for management of such requests within CONTRACT SCHEDULE and under CONTRACT PRICE.
20. Welding, NDT qualification and others as required under QAQC requirements.
21. Preparation of pre-commissioning and commissioning procedures, start-up procedures, performance test procedures for all wellhead platform systems and facilities, operating and maintenance manuals, etc.
22. Re-conciliation, disposal by sale or removal of construction scrap, surplus and excess materials as advised and required by COMPANY.
23. Dismantling and disposal of fabrication/construction aids and temporary facilities except as otherwise directed by COMPANY.
24. Disposal of Sea fastening packaging, debris and rubbish during T&I and HUC activities.
25. Timely supply of Engineering documents, AFC drawings and information to Subcontractors, vendors, COMPANY and COMPANY OTHER CONTRACTORS.
26. Certification of all structures and equipment in accordance with the Project Specifications, General Specification and all relevant exhibits of the CONTRACT.
27. Expediting of VENDOR(S) drawings / data / information for review and incorporation in detailed engineering and timely return of engineering comments and approvals of VENDOR(S) drawings/data.

28. Expediting and inspection of Vendor's equipment and materials.
29. Timely supply of Pre-Commissioning, Commissioning and start-up Spare Parts to the WORKSITES/SITE.
30. Expediting VENDOR(S) and timely supply of completed two (2) years "Spare Parts and Interchangeability Record (SPIR)" or the operational spare parts list, within two (2) months after placement of each purchase order (PO). SPIR shall include parts and services unit prices as per the corresponding purchase order(s) (PO).
31. Necessary provision of VENDOR(S) assistance for respective equipment/package during Fabrication/construction, Pre-Commissioning, Offshore HUC, Start-up until HANDOVER.
32. CONTRACTOR shall ensure that VENDOR(S) agreements provide all necessary provisions to mobilize Vendor representatives to assist COMPANY start-up phase.
33. Timely supply of equipment and materials for fabrication and installation.
34. Co-ordination with COMPANY's marine warranty surveyor (MWS) for timely issuance of documents for approvals. CONTRACTOR shall be responsible for resolving and rectifying deficiencies identified by the MWS and incorporate in WORK.
35. Testing / Retesting, calibration and re-certification of safety equipment, PSVs and all other critical items during offshore HUC, where validity of initial certification has expired or is scheduled to expire within six (6) months after offshore commissioning
36. Recording, reporting, classifying, attending and resolving all punch list arising from onshore and offshore activities until MECHANICAL ACCEPTANCE.
37. Perform Lessons Learnt Workshop for each WORK PHASE and for Overall WORK at the completion of WORK. All CONTRACTOR Key personnel including those directly responsible for respective WORK PHASE and execution shall be participate.
38. Handover of facilities at offshore, system and sub-system wise to the acceptance of COMPANY.
39. Final Documentation and Project Close out report as per Exhibit – 5 CPOC General Specification and CONTRACT Exhibits.

1.3.2 MOBILIZATION AND DEMOBILIZATION

1. CONTRACTOR shall prepare all yard, office and associated offsite support facilities ready to execute the WORK. All requirements for commencement, Implementation and completion of the WORK and its HANDOVER shall be met by CONTRACTOR in a timely manner and in accordance with CONTRACT SCHEDULE and with any and all other CONTRACT requirements.
2. CONTRACTOR shall designate a Project Manager and Key Personnel who shall be assigned for the full term of this CONTRACT. The Project Manager shall be fluent in spoken and written English and experienced in managing oil and gas offshore

construction and installation projects. The Project Manager and other key personnel shall dedicate 100% of their working time to execute responsibilities and shall be available for all meetings between COMPANY and CONTRACTOR. The Project Manager shall have all powers requisite for the performance of WORK. The Project Manager shall liaise with COMPANY and MWS for the proper coordination and timely completion of WORK and on any other matters pertaining to WORK.

3. All Key Personnel proposed by the CONTRACTOR to carry out the WORK on this CONTRACT shall be suitably qualified and experienced and subject to COMPANY written APPROVAL prior to the commencement of WORK.
4. CONTRACTOR shall provide a full time dedicated planner/scheduler. CONTRACTOR shall prepare and maintain a resource loaded 'CONTRACT SCHEDULE' of project activities through all the phases of the WORK through to completion and handover to COMPANY.
5. CONTRACTOR shall engage dedicated and specialist detail engineering resources/sub-contractor for engineering activities. Moreover, CONTRACTOR's in house engineering team with necessary capability shall supervise SUB-CONTRACTOR and overall WORKS throughout all WORK Phases.
6. CONTRACTOR shall engage 3rd party specialist for undertaking specialist studies as required under the CONTRACT.
7. CONTRACTOR shall engage specialist HUC resources for HUC and Host Tie-in activities. Moreover, CONTRACTOR's in house HUC team shall supervise sub-contractor and overall WORKS.
8. CONTRACTOR shall engage specialist seabed survey SUBCONTRACTOR to undertake survey activities under the CONTRACT.

1.3.3 PROJECT MANAGEMENT AND ADMINISTRATION

A. CONTRACTOR shall provide the project management expertise for initiating, planning, executing, controlling and closing out the CONTRACT. CONTRACTOR shall ensure that all parties involved in the WORK are properly coordinated and that all interfaces are dealt with in a prompt manner. Accordingly, CONTRACTOR shall initiate and implement appropriate project management, interface management, project control and administration procedures.

B. CONTRACTOR shall prepare specific project management procedures that meet COMPANY's minimum requirements and are suitable for the specific requirements of the CONTRACT. CONTRACTOR is cautioned not to assume a direct reproduction of its existing procedures to be sufficient or acceptable for COMPANY review. CONTRACTOR shall prepare as required by the Invitation to Bid and the CONTRACT, the following PROJECT specific procedures or equivalent but not limited to, for COMPANY review within the indicated times from CONTRACT award as per

requirements of Exhibit - 7 Project Coordination and Administration Requirements. Some of the general procedures are stated hereunder;

a) Project Execution Plan
b) CONTRACTOR Project Team Organization Chart
c) Health, Environmental and Safety Plan
d) Quality Management System, Quality Assurance and Quality Control Programme
e) Project Coordination Procedure, Interface Procedure, etc
f) Procurement Procedure
g) Materials Handling Procedure, Scrap/Surplus/Excess Procedure, etc
h) Document Control
i) Fabrication/Construction Procedures
j) Subcontract Control
k) Project Planning and Progress Control and measurement procedures
l) Preservation Procedure
m) Sea fastening (WHP equipment)
n) Others, as referred in various CONTRACT Exhibits and necessary for execution.
o) Others

All and any procedures necessary to provide detailed guidelines, work flow control and planning, etc shall be prepared and submitted to COMPANY for review/acceptance sufficiently in advance and prior to planned activities. As may deem necessary, COMPANY may instruct CONTRACTOR to submit relevant procedures or detailed method statement for the WORK or any portion of WORK for review/acceptance.

CONTRACTOR shall follow the established procedures for performance of WORK, except where deviations are approved by COMPANY. Any review/acceptance/approval shall not obviate CONTRACTOR responsibility under the CONTRACT. COMPANY shall not be responsible for any errors or incorrect method statement/s prepared by CONTRACTOR for the WORK. CONTRACTOR shall provide all remedies to the incorrect performance of WORK or portion of WORK within CONTRACT SCHEDULE and PRICE.

C. CONTRACTOR shall produce and submit, within fourteen (14) working days from the EFFECTVE DATE, a definitive Project Execution Plan (PEP), to COMPANY for review and approval. This shall set out the entire work plan for the Project covering all topics for onshore and offshore activities including but not limited to:

- Organization
- Management (both onshore and offshore)
- Contracting Plan
- Schedule (onshore EPC activities, T&I activities, offshore HUC and host tie-in activities)

- Interface Management and Control and set up of interface register for various WORK Phases
- HSE Management Plan, ERP, etc
- Risk Management
- Quality Assurance
- Certification
- Offshore WORK Pack Completion
- Final Documentation
- Interface Management and Control with Sub-contractors, Vendors and other Contractors.
- Material Management
- Vendor Mobilization at WORKSITE/S and SITE
- Payment schedule and payment progress report

The PEP shall include all major Subcontractors and their organizations as part of the plan.

D. CONTRACTOR shall provide and complete all project management and support activities that are deemed necessary to complete the Scope of Work in a safe, efficient and timely manner.

CONTRACTOR shall provide an effective project management organization inclusive of CONTRACTOR Representative, to provide overall project direction and control. This shall be the central point of contact for the COMPANY Authorized Representative and other delegated COMPANY Representatives. CONTRACTOR shall establish and maintain all necessary systems, controls, and reporting procedures, in accordance with the requirements of the Contract and supporting documentation, throughout the duration of CONTRACT. CONTRACTOR shall ensure that supporting services are in place so that correspondence, reports and documentation produced by CONTRACTOR are processed and presented in a satisfactory manner and all correspondence files are established and maintained.

CONTRACTOR shall provide COMPANY personnel with high-quality office services and facilities at WORKSITE. These services shall be arranged to allow COMPANY personnel easy access into the overall CONTRACTOR's project organization. CONTRACTOR shall provide to COMPANY personnel, a clean and safe accommodation, and office and services onboard marine vessel during the offshore WORK Phase.

E. Planning Meetings

Kick-off Meetings

COMPANY requires that a Project Kick-Off meeting (KOM) be held with CONTRACTOR within five (5) working days from the EFFECTIVE DATE and prior to commencement of WORK. The meeting shall be used to familiarize the COMPANY and CONTRACTOR

teams with each other, to confirm the organizational arrangements and lines of communication and interfaces, determine the priorities for the short and medium term CONTRACTOR activities and to initiate the detailed scheduling of the WORK.

Weekly Meetings

COMPANY requires that a weekly planning/progress meeting be held and that COMPANY Representatives and CONTRACTOR Project Team shall attend. The purpose of the meetings shall be to review CONTRACTOR safety performance, the previous week's progress and project goals and milestones for the following week, highlighting any areas of concern including milestones that were not met during the previous week and identifying remedies, interface issues. The minutes will be recorded by CONTRACTOR with onscreen projection for right wording and essence of deliberation. Refer Exhibit - 7 for specific requirements.

Weekly Construction Progress meeting, HSE, QA/QC and Procurement expediting meeting shall be conducted at office of COMPANY Site Representative (CSR) at onshore construction /fabrication facility/WORKSITE.

Monthly Meetings

COMPANY requires that a Monthly planning/progress meeting be held and that COMPANY Representatives and CONTRACTOR Project Team attend. The purpose of the meetings shall be to review CONTRACTOR's HSE performance, the previous months progress and project goals and milestones for the following Month, highlighting any areas of concern including milestones that were not met during the previous Month and identify remedies, review of interface and risk register. The minutes will be recorded by CONTRACTOR with onscreen projection for right wording and essence of deliberation. Refer Exhibit-7 for specific requirements.

Daily Meetings

CONTRACTOR Foremen and Supervisors for each discipline/trade shall hold a daily "Tool Box Meeting" to review the previous day progress, planned progress, any safety incidents and to resolve coordination between disciplines/trades during onshore execution/WORK Phase and offshore WORK Phase including offshore transportation and installation; offshore hook-up and commissioning. A daily work progress meeting and SIMOP Coordination Meeting shall be conducted with Company Representative (CSR), Muda OIM and Drilling COMPANY Man respectively for related offshore activities including T&I, Host Tie-in and HUC and other marine operations.

Minutes of Meeting

Minutes shall be recorded by CONTRACTOR scribe during the respective meetings. CONTRACTOR shall submit the Minutes within two (2) working days from the date of meeting. COMPANY may review and make necessary comments for incorrect incomplete recordings and return the same to CONTRACTOR for information/action.

F. Project Schedule

CONTRACTOR shall be responsible for the development, implementation, control, status update, and recovery and reporting of an overall integrated Project Schedule - CONTRACT SCHEDULE, as well as separate and logically linked detailed sub-schedules for each of the following phases of the WORK for COMPANY APPROVAL:

- Detailed Engineering Design,
- Procurement,
- Construction
- Onshore Testing and Pre-commissioning
- Preservation and Protection
- Load-out and sea-fastening,
- Offshore T&I
- Offshore HUC and host tie-in works

CONTRACTOR shall be responsible to meet all the requirements of project coordination and administration as per Exhibit-7 for schedule preparation, monitoring and control.

CONTRACTOR shall schedule the WORK and its resource requirements in an efficient and timely manner consistent with the requirements of CONTRACT General Condition (GC) - 33 CONTRAT SCHEDULE and Special Condition (SC) – 4 SCHEDULES. CONTRACTOR shall use, maintain and progress its detailed work plan as the basis of planning, scheduling, control and reporting of the Work.

CONTRACTOR shall develop a detailed work plan comprising a control network detailing all activities to be completed in a logical sequence. It shall be in sufficient detail to identify all activities and restraints, interdependencies and interrelationships required to control the Work on a day to day basis.

CONTRACTOR shall promptly submit for COMPANY approval any proposed change in the above described Work Schedule and shall not affect any such changes without APPROVAL. The effects of the changes shall be highlighted. CONTRACTOR shall issue a revised copy of any changed Work Schedule and narrative within ten (10) days of APPROVAL of such changes, in accordance with GC -33 CONTRACT SCHEDLUE.

G. Information Provided During Execution

CONTRACTOR shall provide the following information as a minimum and all other requirements as per Exhibit-7 during the execution of the WORK;

- One (1) page summary bar chart, Level 1 (Summary) of approximately thirty (30) activities indicating the planned, actual and forecast dates of significant activities.
- Time analysis report, Level 2 (Work Package), for all activities within each Work Package, detailing the activities, planned duration, remaining duration, scheduled dates and percentage completion.

- Detailed bar chart presentation of the Level 2 (Work Package) time analysis, indicating planned, actual and forecast dates, highlighting the critical path and key dates.
- Prior to the commencement of construction, CONTRACTOR shall prepare a detailed Level 3 fabrication/construction procedure for review and approval by COMPANY, which corresponds to the detail as defined in Exhibit 3 CONTRACT SCHEDULE. This procedure shall outline the methods employed and the sequence of fabrication for each of the components within the WORK.
- Manpower histograms to reflect the direct manpower planned, actual and forecast
- 'S' curves to reflect construction progress, and overall progress control.
- CONTRACTOR shall also develop and perform a Project Risk Based Schedule Assessment that reflects the material deliverable schedule. The Risk Register and said schedule shall be updated at the end of each month for the duration of the CONTRACT. Schedule Risk shall be assessed on monthly basis and presented to COMPANY. First Schedule Risk Assessment shall be completed and submitted to COMPANY approval within sixty (60) days from the EFFECTIVE DATE. A brief procedure detailing the methodology for Schedule Risk Assessment shall be submitted to COMPANY within thirty (30) days after CONTRACT award.

H. Risk Management

1. CONTRACTOR shall have a Project Risk Management Plan for quantitative assessment, probability, impact and uncertainty allowances.

2. CONTRACTOR shall develop and maintain a 'Risk Register' throughout project life to identify all the risks posed during project execution, which shall be submitted to COMPANY on a monthly basis. The 'Risk Register' shall be used to address all direct and indirect issues and to provide mitigating measures during Monthly Meeting.

3. CONTRACTOR shall submit for COMPANY APPROVAL a written Recovery Plan in the event the actual percentage of the WORK completed deviates more than 5% from the planned percentage of WORK completed. This recovery plan shall detail the remedial measures CONTRACTOR shall take all necessary measures to accelerate WORK so that actual progress exceeds the planned schedule. Agreed remedial measures shall be explicitly stated and performance shall be measured to ensure continuous reduction in negative progress variance.

1.3.4 QUALITY ASSURANCE AND QUALITY CONTROL

The general requirements for Quality Assurance (QA) and Quality Control (QC) are elaborated in Exhibit - 9 QA and QC Requirements. However, CONTRACTOR shall also comply with the supplementary requirements below;

1. CONTRACTOR shall operate a Quality System in line with the requirements of ISO 9000:2015 as minimum, API SPEC Q1 and ISO 29000. CONTRACTOR shall maintain this Quality System to control the supply and distribution of material throughout the job. Full material traceability is required for structural steel and hydrocarbon piping and fittings. All steelwork shall be supplied with mill certificates.
2. CONTRACTOR shall maintain an up-to-date set of all quality records for materials, fittings, inspection, testing, etc., throughout the CONTRACT. Copies of all records shall be provided to COMPANY at conclusion of the CONTRACT. CONTRACTOR shall keep all records for a minimum of five (5) years after HANDOVER (Date of HANDOVER CERTIFICATE).
3. CONTRACTOR shall prepare the Quality Assurance Record Books, which shall consist of a compilation of quality assurance/quality control documentation representative of the material, manufacturer, fabrication/construction, erection and test history of the equipment, materials and structures provided.
4. The purpose of the Quality Assurance Record Book is to ensure that quality assurance and quality control documents originating at the engineering, procurement, fabrication, installation and commissioning stages from multiple sources (CONTRACTOR, SUBCONTRACTORS, and VENDORS) will be easily retrievable. This will provide evidence that equipment, materials and structures provided comply with the Contract requirements at each step of the WORK.
5. In view of the requirement for full traceability of materials and dimensional control, CONTRACTOR shall include drawings for structures and piping marked up with welding identification and material certificate numbers.
6. The documents for the quality assurance dossier shall be kept in specific quality assurance files as soon as they are issued and shall remain easily retrievable and available for consultation at all times during the course of the WORK.
7. CONTRACTOR shall organize the Quality Assurance Record Books by facility and equipment category as required in CPOC-GS-GEN-0001 (Minimum Requirements for CONTRACTOR's Final Documentation).

The Quality Assurance Record Book shall include, as a minimum, the following:

- Approved dossier index.
- Signed off copy of quality plan.
- Inspection and Testing Plans(ITPs)
- Technical certificates of compliance as well as non-conformance reports for the record, if any.
- Typical material certificates.
- Fully traceable material mill certificates.
- Weld procedures and qualifications.
- Weld repair procedures.

- Welder qualifications.
- NDE procedures.
- NDE reports for examination of welds including X-ray films.
- UT test sheets.
- NDE operator qualifications.
- Visual examination certificates.
- Dimensional control reports.
- Heat treatment procedures.
- Heat treatment charts.
- As-built drawings.
- Vessel MDRs.
- Final Weight Report.
- Hydrostatic test certificates.
- Pneumatic test certificates.
- Coating inspection reports.
- Functional tests, either mechanical, electrical, instrument or others as required by COMPANY specifications, whether witnessed or not (as applicable).
- Crane SWL certificates.
- Electrical continuity/ insulation resistance tests.
- Instrument calibration certificates.
- General electrical/instrument/controls/telecommunication testing.
- Fabrication and installation Audits for all WORK Phases.

All phases of WORK shall be included in Quality Assurance Record Book. Refer CPOC-GC-GEN-0001 for further details/guidance.

CONTRACTOR QAQC KPI

Project Quality Assurance Plan shall set forth CONTRACTOR QAQC KPI that it shall achieve for successful completion of the Project. All costs, effort and time necessary for QAQC compliance and achievement of QAQC KPIs shall be under CONTRACT PRICE. CONTRACT QAQC KPIs are tabulated below;

S. No.	Metric	KPI	Remarks
1	Project QAQC Audit compliance	100%	
2	No. of VENDOR / SUBCONTRACTOR Audits	5	
3	Complete QAQC Book for each WHP for onshore WORK PHASE (Fabrication/ Construction)	Within 3 months after Sail away	

4	QAQC Improvement Campaign	3	
5	Inspection attendance for VENDOR packages a per Approved ITPs (Witness & HOLD point)	80%	
6	Close-out NCR with COMPANY acceptance	Within 2 months	
7	QAQC Weekly surveillances with recorded findings	100%	
8	QAQC Team participate all HSE walkabouts at WORKSITE(s) and SITE	100%	
9	Submit all Project and Execution Procedures (prior to the planned WORK and/or as explicitly specified in the CONTRACT.	100%	
10	No. of rejected deviations/ waiver/ concession requests (Note-1 below)	10 max	Covers the requirement of the CONTRACT

NOTE – 1: *Deviations/ waiver/ concession requests shall be submitted under a separate Form of Concession. STQ or ETQ shall not be acceptable for such requests.*

The Project Quality Assurance Plan shall present specific monitoring and reporting plan for CONTRACT QAQC KPIs. Detailed reporting of QAQC KPIs shall be submitted to COMPANY. COMPANY reserves the right to scrutinize, audit or reject CONTRACTOR's submission in case of incorrect reporting.

NON CONFORMANCE REPORT (NCR) AND SYSTEM

CONTRACTOR shall develop a detailed NCR System on the Project. This shall cover all WORK Phases and FULL SCOPE of CONTRACT. NCR System shall be applied to both Contractual and Technical deliveries and compliances under the CONTRACT. In this respect CONTRACTOR shall establish a NCR systems addressing procedure for recording, registering, monitoring, resolution and closeout on the Project. The procedure shall be submitted for COMPANY review and approval within thirty (30) days after EFFECTIVE DATE.

- NCR issued by COMPANY

  COMPANY shall exercise is right to issue / notify an NCR whenever CONTRACTOR is observed or deemed to have failed to comply with CONTRACT requirements. A Form of NCR is included under the CONTRACT for implementation on Project.

  CONTRACTOR shall close each NCR with agreement from COMPANY and within the specified duration. CONTRACTOR's failure to propose and perform acceptable

resolution/rectification shall require COMPANY to invoke other available provisions of the CONTRACT.

- NCR issued by CONTRACTOR

  CONTRACTOR as part of QA/QC Standard procedures and CONTRACT requirements shall perform continuous surveillance of the WORK. This includes compliance with contractual and technical execution requirements. All noncompliance during performance of WORK shall be registered and an acceptable resolution is put in place within specified duration.

  CONTRACTOR shall establish a Form of NCR with agreement from COMPANY as part of development of NCR Procedure.

CONTRACTOR shall refer to Exhibit 9 QA/QC Requirements for relevant guidelines. In case of any conflict between Exhibit 1 and Exhibit 9, CONTRACTOR shall request COMPANY for direction. CONTRACTOR shall comply with COMPAN directions related to procedures and guidelines within CONTRACT PRICE.

1.3.5 HEALTH, SAFETY AND ENVIRONMENT (HSE)

COMPANY is committed to ensuring that the health and safety of its employees, contractors, partners, and the public are protected at all times. COMPANY's order of safety priority is listed as below:

- The safety of human life;
- Prevent / minimize damage to COMPANY plant and property;
- Reputation of COMPANY.

The objective of the Project Safety Management Plan is to provide guidance to achieve the project safety goal of zero incidents. The intent of "Zero Incident" thinking is to eliminate all on-the-job accidents by changing the behavior and thinking (mindset) of Management, Supervisors, and Employees so they will live every day by the Project's Safety Tenets:

1. Says do it safely or not at all.
2. Always stop unsafe conditions and behaviors.
3. Always follow safe WORK practices.
4. Always operate equipment within design and environmental.
5. Limits and with safety devices armed.
6. Doing it safely is always more important than schedule or cost.
7. Management actions will always proactively support the safety tenets.

Leadership and accountability at all levels of the Project Management Team, as well as CONTRACTOR Management will be required to foster a "Zero Incident" mentality. Visible Management Engagement will also be critical to the success of the project safety goals and objectives.

CONTRACTOR shall manage Health, Safety and Environmental compliance in accordance with the requirements in Exhibit - 8 Health, Safety and Environmental Requirements and all instructions and guidelines imposed by COMPANY and authorities during execution of WORKS.

Safe Working Assurance

CONTRACTOR shall ensure that its equipment such as cranes, pressure vessels, lifting appliances, slings, chains and the like, brought onto the worksite for the purpose of the WORK have satisfactorily passed inspection by a body authorized to inspect and certify in accordance with statutory requirements and that all such equipment is the subject of a current, valid certificate of safe working from such Authority. CONTRACTOR shall maintain valid up-to-date certificates and preventive maintenance record for all construction equipment, safety equipment, and marine vessels during all time at WORKSITES. Scaffolding at all Work Sites shall be inspected and certified by authorized and qualified inspector. Any major incident or accident or loss time injury to any personnel at work sites due to lack of specifying safety requirements, awareness recommendations enforcement and compliance will attract appropriate action by COMPANY as allowed under the relevant CONTRACT provisions.

Personal Safety Equipment (PPE)

CONTRACTOR shall provide all protection and safety services required for performance of the WORK. CONTRACTOR shall ensure that its work force is fully equipped with personal safety equipment, as a minimum, hard-hats, safety glasses, hearing protection and protective clothing for CONTRACTOR, SUBCONTRACTORS and COMPANY personnel, including any visitors, which shall be worn at all times. Windshields, spray guards, scaffolding safety harnesses etc, shall be provided as required. All safety Equipment and scaffolding have to be complied with international safety standard and shall be in accord with the requirements of Exhibit - 8 for Personnel Protective Equipment.

All work areas including fabrication/construction areas shall have a minimum of two separate escape routes, which shall to the extent possible be in opposite directions.

CONTRACTOR shall provide SCBA (Self Contained breathing Apparatus) sets for all its construction crew executing Flow line Hook-up on wellhead platforms under SIMOP with concurrent drilling activities.

Zone 2 Equipment

For and during the performance of WORK at offshore COMPANY facilities (SITE), including execution of Host Tie-in at existing WHPs (TPA, MDE and MDPP) and Hook-up and Commissioning under SIMOP, etc., CONTRACTOR shall utilize equipment suitably rated

and certified for use in the respective hazardous area (e.g. Zone 0, 1 and 2). However, CONTRACTOR shall maintain Zone 2 as a minimum requirement for all equipment. This applies to the temporary Instrument Air Package (Air Compressor and Air Dryer unit)

Emergency Response Plan (ERP)

CONTRACTOR shall maintain at all times an adequate emergency response plan (ERP) and capability for execution. This shall include provision of appropriately trained personnel, equipment, materials and procedures to deal with any emergency associated with its operations. The ERP shall address all phases of WORK including specific plans for offshore T&I and HUC activities. A specific Project ERP shall be prepared which shall include requirements as set forth in COMPANY ERP.

Work Competency

CONTRACTOR shall provide suitably qualified and experienced personnel to work at WORKSITE and SITE as per Exhibit - 8. Further to those requirements:

- Rigger Foremen designated on WORK shall have a minimum of five (5) years relevant rigging experience.
- Scaffolding inspector(s) shall be provided by CONTRACTOR and dedicated to WORK. CVs of scaffolding inspector(s) shall be submitted for COMPANY approval.
- Senior HSE officers designated on WORK shall have a minimum of ten (10) years relevant experience with safety officer qualifications from a recognized international body.
- HSE officers designated on WORK shall have a minimum of five (5) years relevant experience with safety officer qualifications from a recognized international body.

COMPANY shall have right to review/interview CONTRACTOR personnel during the execution of WORK and reject/seek replacement of personnel found not suitable/qualified for the assigned activity.

Manpower assigned and approved by COMPANY for execution of WORK shall not be removed or reassigned without approval of COMPANY.

Health

CONTRACTOR shall ensure that there is adequate provision of first aid facilities and arrangements for secondary care should they be required for personnel working on their sites and any personnel visiting the WORKSITE.

CONTRACTOR shall ensure sufficient rest areas at WORKSITE per number of workers to be located in close proximity to work areas. Resting on and below the platform structure is strictly prohibited.

Hazardous Substances & Dangerous Goods

CONTRACTOR shall incorporate and follow the requirements in Exhibit - 8 Health, Safety and Environmental Requirements for:

- Safety And Loss Control
- Hazardous Goods
- Safe Practice Standards, Rules and Work Permits

The abovementioned requirements shall also be incorporated and adhered to by CONTRACTOR's SUBCONTRACTOR(S), Suppliers, and VENDORS in the supply of equipment and materials for the WORK.

CONTRACTOR shall provide COMPANY with Material Safety Data Sheets for all hazardous goods provided as part of the WORK.

CONTRACTOR shall ensure that personnel are not exposed to harmful atmospheric contaminants that exceed local legislative limits or guidelines e.g. welding fumes. Monitoring shall be conducted by qualified personnel to ensure compliance.

Hygiene

CONTRACTOR shall ensure that its personnel maintain high standards of hygiene in connection with the performance of the WORK.

CONTRACTOR shall provide clean toilet facilities and clean drinking water facilities sufficient to accommodate construction personnel as required at all WORKSITES and shall enforce the use of same. In no case will human waste products be discharged onto the decks, into piping, into equipment or onto the ground adjacent to the fabrication/construction area during the fabrication/construction, load-out, and transportation, offshore sites during installation and HUC activities of the facilities. Any damage to equipment, deck steel, pipe, or paint that is caused from human waste products will be repaired at CONTRACTOR expense.

Health and Fitness

CONTRACTOR shall ensure that all CONTRACTOR personnel are fully qualified, healthy and medically (mentally and physically) fit for their respective assignments and shall certify the same to COMPANY if so requested. CONTRACTOR shall perform Drugs & Alcohol test for all crews working offshore at the point of mobilization under the CONTRACT PRICE.

Medical Welfare

CONTRACTOR shall be responsible for the medical welfare of its personnel.

General Marine Instructions (GMI)

COMPANY shall adhere and be responsible of all offshore activities and campaigns, pursuant to Exhibit 5 – CPOC General Specifications (CGS) and General Marine Instructions (GMI).

NOTE: Irrespective of the requirements/guidelines related to Offshore Marine Stand by under specified weather conditions, compensation for “weather standby” shall be strictly in accordance to SPECIAL CONDITIONS (SC) – 24 of the CONTRACT.

COMPANY Procedures & Guidelines

COMPANY HSE Procedures and guidelines are included under Exhibit 8 for adherence by CONTRACTOR. These are;

- Emergency Response and Crisis Management Plan
- Tropical Revolving Strom Response Plan
- Hazard Identification and Risk Assessment Guidelines
- Permit to Work Procedure
- Fit to Work Procedure
- Simultaneous Operations (SIMOPS) Guidelines
- Offshore Safety Passport Guideline
- Manual of Permitted Operation (MOPO)
- Health, Safety and Environment Management System
- HSE Instruction for Contractors
- Etc.

These among others referred in various Exhibits and as may be prescribed by COMPANY, shall be utilized and implemented by the CONTRACTOR for management of HSE on the Project.

CONTRACTOR shall review all the COMPANY Guidelines and Procedures prior to planning or initiation WORK and/or any portion of WORK, immediately bring to COMPANY’s notice any conflicts or errors for clarification/advise/decision by COMPANY. Failure to acquaint with COMPANY Guidelines and Procedures shall not relieve CONTRACTOR of discharge of its obligations under the CONTRACT and within CONTRACT PRICE and Schedule.

COMPANY may, from time to time, during the execution of WORK, update COMPANY Procedures and Guidelines as included under Exhibit - 8. CONTRACTOR shall comply with such revised or additional requirements. CONTRACTOR shall, upon receiving such revisions/updates to COMPANY Procedures and Guidelines, immediately review and report (within four (4) working days) to COMPANY for any concern/clarification/advise/decision prior to implementation on WORK.

Project HSE Plan

CONTRACTOR shall develop and implement a Project specific HSE Plan for implementation, monitoring and control of all pertinence to HSE. . The minimum contents required in the HSE Plan are outlined in Exhibit 8 – Health, Safety and Environmental Requirements. The Project HSE Plan shall be reviewed and approved by COMPANY. Comments as noted by COMPANY shall be addressed and included in the approved Plan. The Plan shall be implemented in its full intention however shall not be construed as limiting in any manner. The Plan shall include comprehensive method or procedure to monitor the actual implementation of Project HSE Plan and report the progress on weekly basis. CONTRACTOR shall undertake all action necessary to ensure Safety in performance of WORK.

A Project HSE Plan shall be developed for the Project with separate HSE plans for the following phases:

1. Engineering
2. Construction
3. Transportation & Installation
4. Hook-Up & Commissioning
5. Host-Tie in works

During development of each HSE plan, gaps shall be identified between COMPANY and CONTRACTOR HSE requirements and the final interfacing arrangements that are agreed between the two parties shall be documented under respective phase HSE plan. CONTRACT shall implement agreed HSE Plan on WORK under the CONTRACT PRICE.

Monitoring of implementation of planned HSE activities (e.g. audits, drills, HSE campaigns, etc.) shall be reported in project weekly progress reports.

HSE Reporting

CONTRACTOR shall submit monthly HSE reports (separate from monthly progress report however at the same time) with the following information:

- HSE statistics (man-hours, incidents, KPIs, etc.)

- HSE highlights
- HSE Plan progress (actual vs. planned)
- Incidents
- Audits
- UAUC Analysis
- Photos

CONTRACTOR HSE KPI

Project HSE Plan shall set forth CONTRACTOR HSE KPI that it shall achieve for successful completion of the Project. All costs, effort and time necessary for HSE compliance and achievement of HSE KPIs shall be under CONTRACT PRICE. CONTRACT HSE KPIs are tabulated below;

S. No.	Metric	KPI	Remarks
1	Fatalities	Zero	
2	Total Recordable Case Frequency (TRCF) based on number of LTIs, MTCs and RWDC per 1,000,000 man-hours	1.08	
3	No. of Major Fire Incidents	0	"Major" defined as causing damage more than USD 25,000
4	No. of UA/UC submissions per 1000 man-hours	5	
5	No. of "Near Misses"	5 for every recordable case	
6	No. of senior management visits to onshore yard, during T&I and HUC phase	1 visit every 3 months	
7	Compliance with HSE program	100% compliance with HSE program throughout Phase 5	
8	No. of violations or no. of waivers requested against those stipulated under CONTRACT	0	Compliance to be verified against CONTRACT GC, SC, Exhibit 1, Exhibit 8 and approved HSE program

9	% of audits with significant non-conformities (high-risk)	20%	

The Plan shall present specific monitoring and reporting plan for Contract HSE KPIs. Detailed reporting of HSE KPIs shall be submitted to COMPANY. COMPANY reserves the right to scrutinize, audit or reject CONTRACTOR's submission in case of incorrect reporting.

Disciplinary Action Plan

In supplement to various HSE awards and appreciations, a necessary disciplinary action will be initiated by COMPANY in the event of default. Disciplinary Actions to be implemented by CONTRACTOR for its personnel and subcontractors are prescribed in document - HSE Instructions to CONTRACTORS under Exhibit - 8 Health, Safety and Environmental Requirements. Following disciplinary actions may be invoked by COMPANY in case of failure on part of CONTRACTOR's Project and HSE Management personnel;

HSE Disciplinary Action

HSE KPI / Default	Designation	Action
Risk Matric S. No : 1, 2 & 3 (Note-1)	HSE Manager	- Issuance of Warning Letter - Removal and Replacement
Risk Matric S. No : 1, 2 & 3 (Note-1)	CONTRACTOR REPRESENTATIVE e.g. Project Director, Project Manager	- Issuance of Warning Letter - Removal and Replacement
Risk Matric S. No : 4 to 9 (Note-1)	CONTRACTOR REPRESENTATIVE e.g. Project Director, Project Manager	- Issuance of Warning Letter
	HSE Manager	- Issuance of Warning Letter - Removal and Replacement
Note-1 : Risk Matric items shall be referred as noted in the Table above titled **"Contractor HSE KPI"**		

Leadership and accountability at all levels of the Project Management Team, as well as Contractor Management will be required to foster a "Zero Incident" mentality. Visible Management Engagement will also be critical to the success of the project safety goals and objectives.

CONTRACTOR shall update a risk management process to be included within SSHE plan. This process shall review all activities involved with scope of hook-up and commissioning WORK, identify the hazards associated with these activities and provide appropriate control measures to ensure that risk to personnel, the environment and assets are reduced to ALARP level. CONTRACTOR shall monitor and implement the control measures effectively.

CONTRACTOR shall transport, store, handle and use radiographic sources in accordance with prevailing standards, codes and practices and laws governing at the WORKSITE and SITE.

CONTRACTOR shall submit for APPROVAL the detailed procedure for the control of fire, safety, first aid and security applicable to the WORKSITE and SITE.

CONTRACTOR shall check periodically and provide sufficient firefighting equipment, safety equipment, lifesaving equipment, personal protective equipment (PPE), safety habitats and ensure proper functioning.

CONTRACTOR shall ensure safe and adequate scaffolding and access to the WORK.

CONTRACTOR shall implement prompt reporting, investigation and closure of all safety violations, incidents, accidents and near misses including cases of environmental damages.

CONTRACTOR shall be responsible to conduct Hazard Identification (HAZID), Job Safety Analysis (JSA), daily tool box talks for critical activities. COMPANY will participate for all HAZID and JSA sessions.

CONTRACTOR shall fully comply with COMPANY's Health, Safety and Environmental requirement as contained in Exhibit-8.

CONTRACTOR shall strictly follow general marine instructions (GMI) as given in Exhibit-5 during all offshore T&I, HUC and Host Tie-in, Seabed Survey campaigns under its CONTRACT SCOPE and PRICE.

Training

CONTRACTOR shall ensure that both direct and indirect manpower are trained and well aware of COMPANY's HSE requirement prior to offshore mobilization. CONTRACTOR shall conduct both classroom lessons and practical training to qualify all offshore personnel. A formal classroom training of minimum one (1) day (8 hours) duration shall be conducted for each personnel. The training program and material shall be reviewed and approved by COMPANY and shall include but not limited to Project HSE Induction, PTW, Construction Safety (grinding/welding), Work at Heights, Work over Water, Electrical Safety, Swing rope transfer, etc. CONTRACTOR shall provide the training pack, training matrix and plan thirty (30) days before planned training and prior to mobilization for offshore operations.

1.3.6 PROJECT INTERFACES

CONTRACTOR shall provide, manage and coordinate all project interfaces on the project and throughout the WORK and WORK Phases. An interface procedure and Interface matrix shall be developed by CONTRACTOR including the following but not limited to:

- Control, allocation and scheduling of all resources required to successfully execute the WORK.
- Procurement, QA/QC, scheduling, expediting, transportation, customs clearance, handling and storage of all project materials and equipment.
- Engineering management among various disciplines, VENDORS and SUBCONTRACTOR.
- Performance of the entire work in accordance with established Quality, Environmental, Health & Safety procedures such as ISO 9001 and ISO 14001 and the requirements of Exhibit - 8 Health, Safety and Environmental Requirements.
- Coordination of all interfaces among CONTRACTOR and COMPANY's OTHER CONTRACTOR, VENDORS and MWS.

1.3.7 MANUFACTURER AND VENDORS

1. COMPANY has a strong interest to standardize equipment and spare parts inventories so as to enhance efficiency of equipment/plant maintenance and operations. Some project specifications may also stipulate specific manufacturers' products.
2. A CPOC Recommended Equipment Manufacturer List (CPOC RML) included under Exhibit - 1, provides reference to equipment and material with their makes/models that are installed and operating on COMPANY existing facilities.
3. In addition, MTJA Recommended Material and Equipment Manufactures List (MTJA REML) is also included under Exhibit – 1 and refers to specific manufacturers of Equipment and Material. While considering the two lists, CPOC RML shall supersede MTJA REML.
4. A list of CPOC Approved Manufacturers for Subsea pipeline and Bends material, CPOC AML, is also included under Exhibit - 1. CONTRACTOR shall follow this list for sourcing of Subsea pipeline and Bends material.
5. Equipment and Material Specifications produced by CONTRACTOR shall include and make reference to Recommended/Approved manufacturers. CONTRACTOR shall make endeavor to source Equipment and Material same as those recommended in the above lists. CONTRACTOR shall only use the manufactures as referred under this list for purchase of line pipe material and shall request quotations (RFQ).
6. Except for CPOC AML and equipment/items specified in item 11 below, such stipulations should not be understood to imply rejection of any other Manufacturer's

standard design(s) or equipment but rather to identify preference or a minimum quality level that must be ensured along with standardization of equipment and spare parts inventories for operating and maintenance efficiencies.

7. Equipment and material proposed to be purchased from other manufacturers shall be of equal or better specification and quality and upon solicitation of COMPANY prior written approval. Due consideration shall be given to evaluate the services, support and cost effectiveness for supplied equipment and material by respective vendor/manufacturer during Plant operation. With other considerations being satisfied, sourcing from Thai or Malaysian suppliers is encouraged.
8. All equipment shall be of proven design. Incorporation of prototypes, new designs, or extensive modifications of standard designs into the Design Solution requires COMPANY prior written approval. All vessels shall require as ASME code stamp.
9. CONTRACTOR shall use vendors and manufactures exhaustively (as referred under the three (3) lists noted above before recommending any additional manufacturer due to constrains of specialty and proprietary product, superior technical alternatives and other unprecedented.
10. CONTRACTOR shall be fully responsible for coordination and managing interface information with Vendors and incorporation of such information in its detail design to produce integrated and technically functional solution.
11. CONTRACTOR shall use the following manufacturer (brand) equipment on Phase - 5 wellhead platforms to meet uniformity of existing systems from ease of operation and maintenance requirement. Alternative shall not be acceptable to these equipment.

Equipment Description	Manufacturer (Brand)	Remarks
Wellhead control system (PLC)	Alan Bradley	
Corrosion Probe	Cosasco	
Choke Valves	Master Flo	
Manifold diverter valves (all)	Piper	Actuated ball valves on flow lines (compact type) connecting to production header, test header and booster header
Corrosion Inhibitor Pump	Williams Pumps	
Navigational Aids	ORGA	

1.3.8 LOGISTICS

Transportation of Material and Equipment

CONTRACTOR shall be responsible for the transportation of all CONTRACTOR supplied materials, equipment, tools, labor, etc to and from all WORKSITES by providing its own personnel or appointing logistic agent during the execution of WORKS.

CONTRACTOR shall also be responsible for onshore transportation of materials, equipment and tools between CONTRACTOR's warehouse / yard and onshore supply base including all material handling facilities during offshore WORK Phases.

CONTRACTOR shall be responsible for transportation of materials, equipment and tools between onshore and offshore SITE for execution under offshore WORK PHASE.

Transportation of Personnel

CONTRACTOR shall be responsible for the onshore and offshore transportation and accommodation of all CONTRACTOR's personnel, VENDOR representatives/technicians and SUB-CONTRACTORs for the execution of the WORKS.

Initial mobilization of personnel to offshore shall be via construction vessel.

CONTRACTOR shall also be responsible for the transportation of COMPANY and CONTRACTOR personnel between onshore and SITE/to work boat/ construction vessel.

CONTRACTOR shall also be responsible for planning and preparation for mobilization of its personnel to offshore for execution of offshore WORK PHASE. CONTRACTOR shall provide to COMPANY minimum thirty (30) days in advance /or as required by COMPANY, of its personnel mobilization schedule and details.

CONTRACTOR may request and COMPANY may render services for personal transportation by helicopter between COMPANY's Onshore Helibase and MUDA Living Quarters. Such COMPANY services shall only be available during emergency and at "cost and availability" during normal times. COMPANY reserves its rights to decline rendering such services and shall be as no impact to CONTRACT PRICE and CONTRACT SCHEDULE. CONTRACTOR, in the event requires utilizing COMPANY Helicopter services, shall provide the schedule and complete and correct personnel details including offshore safety passport (OSP) application at least ten (10) working days in advance. COMPANY will arrange CONTRACTOR's personnel travel after confirming the availability of passenger seat onboard helicopter on the requested date of travel. Personnel are allowed to carry personal effects only. Any delay in submitting the schedule and Personnel details or last minute change, including 'no show' at onshore base is not acceptable. Last minute changes and 'no show' of CONTRACTOR personnel at the helibase shall be subject to cost recovery / back-charges to CONTRACTOR under GC – 39 BACKCHARGES of the CONTRACT.

1.3.9 MARINE VESSELS

CONTRACTOR shall be responsible for supply, MWS approval, port clearance, Entry permits, mobilization and demobilization of all marine vessels and barges including the numbers and type required for execution of offshore WORK PHASE.

Transportation and Installation Marine spread

The Transportation and Installation Marine spread includes offshore transportation of completed structures, line pipes and equipment skids from onshore WORKSITE to offshore SITE. CONTRACTOR shall also be responsible for supply, mobilization and demobilization of all marine spreads for offshore installation including heavy lift crane vessel, pipe lay barge, dive support vessel, survey vessel, AHT, crew boat, supply boat and any other vessel required to complete the WORKS at SITE. CONTRACTOR shall be solely responsible for the capability and adequacy of marine spread for transportation and installation requirements under the WORK. Installation vessel shall be capable of performing the WORK uninterrupted under minimum offshore conditions as stated in Special Conditions (SC) – 25 WEATHER DOWNTIME. The reimbursement of claim for stand-by due to weather shall be strictly in accordance to Special Conditions (SC) – 25 WEATHER DOWNTIME.

Offshore HUC and Host Tie-in works marine spread

CONTRACTOR shall be responsible for supply, mobilization and demobilization of marine vessels required for all offshore hook-up and commissioning (HUC) campaigns (Pre-Drill HUC and/or Post Drill campaign) comprising of Construction support vessel (CSV) of at least 120 pax, anchor handling tug, supply vessel and crew vessel.

Similarly, CONTRACTOR shall be responsible for supply, mobilization and demobilization of marine vessels required for host tie-in work campaign including Construction support vessel (CSV) of at least 120 pax, anchor handling tug, supply vessel and crew vessel.

Offshore Construction (HUC) vessel shall be capable of performing the WORK uninterrupted under minimum offshore conditions as stated in Special Conditions (SC) – 25 WEATHER DOWNTIME. The reimbursement of claim for stand-by due to weather shall be strictly in accordance to Special Conditions (SC) – 25 WEATHER DOWNTIME.

Offshore Seabed Survey marine spread

CONTRACTOR shall be responsible for supply, mobilization and demobilization of offshore survey vessel required for seabed survey activities. All specialist equipment and personal shall be inclusive of this vessel. The marine spread shall be fully equipped and independent to perform the designated activities at offshore location.

1.3.10 MECHANICAL COMPLETION

1.0 CONTRACTOR shall utilize an industry recognized Mechanical Completion System (MCS) and produce detailed procedures covering the pre-commissioning, commissioning and hook-up of all items at the onshore and offshore location. The MCS shall employ a Job Card System that will be used to measure progress for hook-up and commissioning and also serve to support System Completion and Check Sheets for the handover to COMPANY. *MCS shall be as referred under COMPANY General Specifications (CPOC-GS-PR-0004/0005).*

2.0 *CONTRACTOR shall propose the module, system and sub-system configuration to be followed for mechanical completion, for COMPANY review and APPROVAL.*

3.0 CONTRACTOR shall complete the WORK and shall bring the WORK to MECHANICAL COMPLETION and MECHANICAL ACCEPTANCE that is ready for receiving well fluid (RFSU) in all respect without any punch list. While execution of the hook-up and commissioning at offshore there shall be a progressive acceptance and handover to COMPANY of the sub-systems and systems of the WORK. Subsequently, COMPANY shall assume its right to operate the plant/facility, perform necessary and planned activities and produce hydrocarbon. Systems and equipment shall be completed in accordance with a *system and sub-system configuration* to be developed by CONTRACTOR and approved by COMPANY. *COMPANY shall not accept the WORK until CONTRACTOR achieves full MECHANICAL ACCEPTANCE*.

4.0 CONTRACTOR shall operate and maintain all systems up to mechanical completion of the system or sub-system. CONTRACTOR shall prepare and submit a maintenance schedule for all routine maintenance required on all equipment, packages and systems prior to mechanical completion of the System or Sub-system, for COMPANY review. This schedule shall be issued sixty (60) Days prior to Load-out and shall be maintained throughout the Offshore Installation and HUC activities. All equipment shall be maintained in accordance with Manufacturers Recommendations.

5.0 MECHANICAL ACCEPTANCE by COMPANY means that the PROJECT is:

- Complete - the PROJECT has been fully constructed and installed in accordance with the specifications and design as presented in the CPOC AFC Design Package.
- Tight – there is no leakage from equipment, valves, piping, joints, etc.
- Fully Tested – both in shop and field all systems and equipment have been tested for completeness and correctness of installation and for functional performance to the maximum extent possible without the introduction of well fluids. They have been witnessed as required by COMPANY, including loop checks, instrument calibrations, electrical controls checks, alignment and operability checks, sequence checks, nitrogen leak tests, etc.
- Safe – all systems, equipment and signage for the protection of personnel, property and process have been properly installed and tested.

- Clean – the WORK have been cleaned, flushed and are in readiness for habitation and start-up.
- First filled – the First Fill of all lubricants, fuels, chemicals, water, gases, etc., has been charged.
- Startup and operational spares – All startup and commissioning spares properly listed, tagged and supplied as ship loose items for offshore HUC and startup.
- Documented – documentation as required under the AGREEMENT has been prepared, compiled, is complete and handed over to COMPANY. This shall include the "As-built" documentation both hard copy and electronic soft copy in native format.

6.0 The above completions shall enable reaching "Ready for Start-up (RFSU)" stage and subsequent ACCEPTANCE.

7.0 Formal handover of the completed WORK (on a system by system basis) upon achieving MECHANICAL ACCEPTANCE is required. Formal handover shall be managed by soliciting endorsement by COMPANY SITE Representative and COMPANY Operations Representative.

8.0 Notwithstanding the above, introduction of well fluids to the wellhead platform process system by COMPANY shall be deemed as MECHANICAL ACCEPTANCE of the **corresponding portion of WORK** by COMPANY. MECHANICAL ACCEPTANCE by COMPANY renders full control of the custody and operation of wellhead facility.

9.0 MECHANICAL ACCEPTANCE as deemed upon introduction of well fluids shall not be construed as HANDOVER and commencement of corresponding obligations including twenty four (24) month WARRANTY period.

1.3.11 CONFORMANCE OF THE WORK / PERFORMANCE OF THE FACILITIES

The structure(s) and equipment covered by this CONTRACT shall be designed and fabricated for an offshore environment where severe weather and corrosive conditions are anticipated.

CONTRACTOR shall perform and warrant the WORK to conform to the CONTRACT and related Drawings and Specifications in accordance with the CONTRACT terms and conditions.

The drawings, reports and other technical information provided in EXHIBIT – 4 and Exhibit - 5 constitutes technical requirements under Phase - 5 Development and CONTRACTOR shall further develop and perform detail engineering to provide total technical solution and seamless system integrity. The provision of "GoBy Design Package" doesn't constitute as a comprehensive Phase - 5 development requirements nor shall be used as copy and paste of its drawings and documents for development of Phase 5 FACILITIES development and delivery. However this shall not be construed as blanket APPROVAL by COMPANY to deviate from the requirements, information, design, data, etc furnished under "GoBy Design Package". CONTRACTOR shall notify of any change/deviation from "GoBy Design

Package" while producing COMPANY AFC Design Package and seek prior APPROVAL. COMPANY shall reserve the right to reject CONTRACTOR request for deviation/change and CONTRACTOR shall fully comply under the CONTRACT PRICE. A complete EPCIC WORKS in similar manner is required meeting technical requirement of Phase - 5 Development. Any other reference drawings, documents, data sheets and like provided here in Exhibit - 4 shall in no way relieve the CONTRACTOR of its full responsibility for quality and fitness for purpose of the completed WORK under Phase - 5 EPCIC.

1.3.12 COMPLETE FACILITY

1. Any WORK or materials not indicated on the Drawings, or not specifically called out in Specifications, Exhibit - 4 and Exhibit - 5, which are necessary for performance of the WORK in accordance with the CONTRACT, shall be provided and incorporated into the WORK at the expense of the CONTRACTOR to the same extent as if both indicated and specified. Any WORK indicated on the Drawings but not specified, or vice versa, shall be furnished as though fully set forth in both. It shall be the CONTRACTOR's responsibility to bring any discrepancies or questions regarding the intent of any specifications or drawings to COMPANY's attention for clarification and approval.
2. Anything contained herein or omitted here shall not be construed to relieve the CONTRACTOR of any obligation for providing a complete, safe and fully operational facility, that will perform according to the requirement of the CONTRACT including but not limited to all Drawings, Design Basis, and Specifications provided to CONTRACTOR.
3. The complete responsibility for the Hook-up and Commissioning of wellhead platforms, subsea pipelines, Host tie-ins of Receiving Facilities, entire telecommunication system and all necessary integral systems of Phase - 5 development rests entirely with the CONTRACTOR.

1.3.13 PROJECT DOCUMENTATION

CONTRACTOR shall maintain accurate stick files or controlled Master stack/folder of all Drawings. All changes must be recorded (clouded) on the appropriate drawing along with the following information:

- Date the change was recorded.
- Initials of individual making the change.
- Reference to the reason for the change, i.e., site instruction number, etc.

1. The As-Built drawings must be issued in two (2) stages,
   a. First issuance: after the completion of onshore fabrication works upon onshore MECHANICAL COMPLETION, and
   b. Second issuance: after the completion of offshore installation, hook-up and commissioning (Pre-Drill HUC/HUC) phase upon MECHANICAL ACCEPTANCE.

2. CONTRACTOR will be required to revise the drawings, from time to time, to include changes resulting from incorporation of VENDOR Data, changes in design, addition of installation aids and sea-fastening details and additional fabrication details, As-installed Jacket, Deck and pipeline at offshore, fabrication/installation and modification details under HUC completions, etc.
3. PROJECT DOCUMENTATON shall be submitted in phases and the manner as noted below;
   a. CPOC AFC Design Package: Prior to start of onshore fabrication/construction phase

      CONTRACTOR shall compile all detail engineering design documents, drawings, data, reports, etc., upon completion of detail design prior to start of onshore fabrication and construction phase.

   b. Operations DOCUMENTATION: Ninety (90) days before sail away

      CONTRACTOR must obtain all VENDOR and equipment manufacturer data and compile as initial 'VENDOR Documentation' to support onshore pre-commissioning and commissioning requirements. A compilation of detail engineering documents, vendor documents, commissioning and operation procedures / manuals, etc, called "Operations DOCUMENTAION" shall be submitted to COMPANY at least ninety (90) days before sail away from fabrication yard for COMPANY operation personnel familiarization and involvement during onshore pre-commissioning and commissioning and subsequently offshore commissioning, RFSU and plant operation after 1st Gas. The specific documents to be included under "Operations DOCUMENTAION" shall be prepared by CONTRACTOR in agreement with COMPANY during the onshore fabrication stage.

   c. Preliminary DOCUMENTATION

      i. 1st Submission: Upon ten (10) days after sailaway of wellhead platform topsides

         CONTRACTOR shall compile updated AFC Design Package upon incorporating of any missing VENDOR data, details and information, as-built drawings, Red line Markups(as applicable), Offshore commissioning Procedures, Start-up Procedures, Operating and Maintenance Manuals, complete VENDOR Documentation, SPIR and Spare Part List, Punchlist and Carryover List, Platform Facilities, Preservation and Protection report, completion / acceptance certificates, FAT and SAT reports, Warranty Certifications/documentation, PASR Documents, etc.

      ii. 2nd Submission: Upon fifteen (15) days after completion of offshore HUC

         CONTRACTOR shall compile updated AFC Design Package upon incorporating as installed wellhead platforms and pipelines, details and information, as-built drawings, Red line Markups (as applicable), HUC Punchlist, Commissioning and RFSU acceptance certificates and related documentation, etc.

The list of documents and drawings required to be prepared and delivered to COMPANY under Preliminary FINAL DOCUMENTAION prior to sail away shall be prepared in agreement with COMPANY. CONTRACTOR shall prepare list/table of content for Preliminary FINAL DOCUMENTATION for COMPANY review minimum sixty (60) days prior to the planned sail away.

d. PASR DOCUMENTATION: Prior to offshore commissioning and RFSU

CONTRACTOR shall prepare and compile the PASR Package for COMPANY for performance of Pre-Activity Safety Review prior to Start-up. Refer Appendix VI for the list of documents required. CONTRACTOR shall consult with COMPANY and prepare a PASR Document Content List during the detailed engineering phase for subsequent compilation of PASR Package.

e. QAQC Book

CONTRACTOR shall compile first draft of the QAQC Data book in the manner as required for FINAL DOCUMENTATION however shall cover the onshore fabrication/construction WORK Phase. The QAQC Data Book shall be completed and submitted for COMPANY acceptance within three (3) months after sail away. CONTRACTOR shall prepare the Table of content for the QAQC Data Book and submit to COMPANY thirty (30) days prior to Sail away for acceptance.

f. FINAL DOCUMENTATION: Two (2) months upon completion and commissioning of last the wellhead platform.

CONTRACTOR FINAL DOCUMENTAION shall be produced and delivered to COMPANY in accordance with CPOC-GS-GEN-0001 (Minimum Requirement for Contractor's Final Documentation) and CPOC-GS-GEN-0004 (Minimum Requirement for Vendor's Documentation.

4. CONTRACTOR shall also be responsible for Project Close-out Report as per CPOC-GS-GEN-001.

5. CONTRACTOR shall produce as Final Documentation Procedure establishing the FINAL DOCUMENTATON content and structure. This procedure shall be subject to COMPANY review and Approval. The first submission of this procedure shall be submitted for COMPANY review within five (5) months upon EFFECTIVE DATE.

1.3.14 PERSONNEL AND WORKMANSHIP

CONTRACTOR shall have fully experienced supervisory personnel in charge of all aspects of the WORK and shall only employ fully experienced engineers, craftsmen and fully qualified inspectors to carry out the WORK. All key personnel working on this project shall be prior approved by COMPANY. CONTRACTOR shall maintain list of all such approved personnel during entire contract period and no unauthorized personnel shall work during all WORK PHASES. *All and any personnel mobilized on the WORK throughout the duration of CONTRACT, shall not be demobilized without prior written approval from COMPANY. CONTRACTOR shall seek prior approval for removal/replacement of personnel mobilized on critical activities such as HSE, QAQC, Supervisory and skilled tradesmen. COMPANY reserves the right to review/assess competency of SUBCONTRACTOR and VENDOR personnel on work and/or reject or seek replacement of all and any personnel assigned to WORK.*

CONTRACTOR shall not replace COMPANY Approved key personnel during CONTRACT period including Project Manager, Engineering Manager, Project Engineer/Interface Coordinator, T&I Manager / Superintendent, HUC Manager / Superintendent, Lead Engineers, HSE Manager, QA/QC Manager. All key personnel must be assigned full time on COMPANY project work and not to be diverted for CONTRACTOR's other project/s and/or work any time during course of WORKS.

CONTRACTOR shall also assign Project Sponsor from its senior management office such as the rank/designation of Dy. General Manager / General Manager / Director to oversee direct and resolve major / critical bottlenecks with CONTRACTOR's project management team and also liaise with COMPANY periodically at critical stages and monthly meetings as a minimum.

CONTRACTOR shall ensure that all workmanship and inspection conform to the requirements of the Technical Specifications, General Specifications, Data Sheets and all Codes and Standards referenced, herein and shall supply all labor, tools, equipment, facilities and services necessary to accomplish this task.

The WORK performed hereunder shall be performed in a thorough and diligent manner and in accordance with the Contract and all applicable industry Codes and Standards, including but not limited to relevant Codes, Standards and Regulations of Thailand and Malaysia

All industry Codes and Standards referred to in these specifications shall be the latest revisions.

All Managers including Project Manager and Engineering Manager, Supervisors and Lead Engineers and others shall have requisite years of experience in offshore oil and gas oil and gas offshore engineering, construction and installation projects and relevant works. All key positions assigned on the project are subject to COMPANY's written approval prior to commencement of WORK.

Below are stipulated minimum qualification and experience requirements for Key Personal for assignment on Project;

i. Project Manager

The candidate shall be responsible in managing the overall WORK and shall be the CONTRACTOR Authorized Representative for CONTRACT. The candidate shall possess a Bachelors' Degree in engineering as a minimum, and shall have at least twenty (20) years of experience in the oil and gas industry, specializing in offshore engineering, construction, and transportation and installation activities with minimum five (5) years in EPCC/EPCIC Project Manager role.

ii. Project Engineer

The candidate shall be responsible for assisting Project Manager, interface and coordination for the overall WORK. The candidate shall possess a Bachelors' Degree in engineering with minimum ten (10) years working experience in oil and gas industry having at least three (3) project engineering and coordination role on similar project scope.

iii. Planning and Cost Control Manager

The candidate shall assist Project Manager and be responsible in monitoring WORK progress, analyzing and controlling the overall WORK schedule and cost. The candidate shall possess a Bachelors' Degree as a minimum with at least fifteen (15) years of experience in the oil and gas industry and shall be knowledgeable and familiar with the offshore EPCI and/or EPCIC project work sequences. The candidate shall be familiar with Primavera 6.

iv. Project Engineering Manager

The candidate shall be responsible in managing Engineering activities and deliverables for the overall WORK and be the CONTRACTOR Authorized Representative for CONTRACT. The candidate shall possess a Bachelors' Degree in engineering as a minimum, and shall have at least twenty (20) years of experience in the oil and gas industry, specializing in offshore engineering, construction, and transportation and installation activities with minimum with 5 years in EPCC/EPCIC Engineering Manager role.

v. Engineering Discipline Lead

The candidate shall be responsible in managing Engineering activities and deliverables for the respective engineering discipline throughout the performance of WORK and be the CONTRACTOR Engineering Discipline Representative for managing detailed engineering design work by Subcontractor(s) .The candidate shall possess a Bachelors' Degree in engineering with minimum fifteen (15) years working experience in oil and gas industry offshore facilities design with five (5) years in Engineering Discipline Lead role. Requirements are applicable to each engineering discipline namely, Process, Mechanical, Piping, Instrumentation and Electrical, Telecommunication, Structure, Pipeline, Technical

Safety, Material and Corrosion in similar project scope. This shall apply to Engineering Leads for various disciplines under SUBCONTRACTOR(S) or 3rd Party Consultant.

vi. Procurement Manager

The candidate shall be responsible in managing, monitoring and controlling the souring and procurement activities for the WORK. The candidate shall possess a bachelors' degree as a minimum and shall have at least ten (10) years of experience in managing the procurement of materials, equipment, line pipes and bends, and other relevant items specific to the WORK.

vii. Onshore Construction Manager and Superintendent(s)

The candidate shall be responsible in managing, monitoring and controlling execution of hook-up and commissioning of topsides facilities at offshore. The candidate shall be interface focal person with COMPANY during offshore operations. The candidate shall possess Bachelors' Degree in engineering with minimum twenty (20) years working experience in oil and gas industry with 5 years in Offshore HUC Team Leader / Manager in similar project scope in fabrication, construction of oil and gas production and processing facilities.

The Superintendents shall possess a minimum of fifteen (15) years' of experience in fabrication, construction of oil and gas production and processing facilities.

viii. HUC and Host Tie-in Manager and Superintendent(s)

The candidate shall be responsible in managing, monitoring and controlling execution of hook-up and commissioning of topsides facilities at offshore. The candidate shall be interface focal person with COMPANY during offshore operations. The candidate shall possess bachelors' degree in engineering with minimum twenty (20) years working experience in oil and gas industry with 5 years in Offshore HUC Team Leader / Manager in similar project scope.

The Superintendents shall possess a minimum of fifteen (15) years' of experience in the hook-up and commissioning of topsides facilities.

ix. Transportation and Installation Manager and Superintendent(s)

The candidate shall be responsible in managing offshore operations for transportation and installation of offshore facilities and pipeline systems. The candidate shall possess a Bachelors' Degree in engineering with twenty (20) years working experience in oil and gas industry with five (5) years in Offshore Installation Team Leader / Manager role in similar project scope.

The Superintendents shall possess a minimum of fifteen (15) years' of experience in the transportation and installation of offshore facilities and offshore pipeline systems.

x. QA/QC Manager

The candidate shall be responsible in managing, monitoring and controlling all Quality Assurance and control activities on WORK. The candidate shall possess a Bachelors' Degree as a minimum twenty (20) years of experience in the oil and gas industry with five (5) years in QAQC Manager role in similar project scope. The candidate shall be knowledgeable and familiar with the relevant codes, standards, and procedures such as NDT, AWS/ASME/ANSI.

xi. HSE Manager

The candidate shall be responsible in managing, compliance, procedures, monitoring and controlling Health, safety and environment hazards throughout the performance of WORK. The candidate shall possess a bachelors' degree as a minimum twenty (20) years working experience in oil and gas industry with five (5) years in HSE Manager Role in similar project scope. The candidate shall also be a holder of a valid DOSH certification (or equivalent) and have sufficient trainings in industrial health and occupational safety.

xii. Document Control Manager

The candidate shall be responsible in managing (transmission & receipt, compilation, distribution, etc.), monitoring and controlling of all Project documents and deliverables throughout all WORK PHASES starting from Project management, Engineering, procurement, vendor, Subcontract or 3rd Party deliverables to Final Documentation.

The candidate shall possess a Bachelors' Degree as a minimum with at least ten (10) years of working experience in the construction of offshore / onshore oil and gas facilities and/or petrochemical plants. The candidate shall have experience in document management for EPCI and/or EPCIC projects.

1.3.15 PROVISIONS FOR COMPANY

CONTRACTOR shall provide services to COMPANY as required in this section under Lump Sum CONTRACT PRICE. Any additional services or deletion/reduction of the same, requested by COMPANY or early demobilization of service/s or provision of deficient services by CONTRACTOR shall be incorporated into the CONTRACT PRICE in accordance with GC-35 CHANGES and shall be calculated based on the Unit rates in Exhibit-2 – Payment Terms and Commercial Arrangement. CONTRACTOR shall not demobilize any such services without prior approval from COMPANY.

1.0 Network and Video Conferencing Requirement Provided by CONTRACTOR

CONTRACTOR shall provide one network file server for COMPANY use at WORKSITE/S. Said file server will support COMPANY WORKSITE personnel and it will be used as VIRTUAL Private Network (VPN) within CONTRACTOR's network. CONTRACTOR shall also provide fully functional Personal Computers (PCs) of recent specifications complete with latest software applications, Ethernet Unshielded Twisted Pair, RJ-45 network cards, external storage devices (USB port, DVD port, etc) compatibility (refer below detailed requirements for each WORK phase) for COMPANY SITE staff under CONTRACT PRICE.

CONTRACTOR shall provide video conferencing facility at COMPANY WORKSITE office in fabrication/construction yard to perform video conferencing with COMPANY's head office in Kuala Lumpur, Malaysia. The video conferencing equipment and communication channel shall be of superior quality to provide un-interrupted video and audio quality.

CONTRACTOR shall provide internet (via LAN cable and wifi) with Download and Upload speed exceeding 10 Mbps for COMPANY and shall not be shared with other parties at COMPANY WORKSITE office at CONTRACTOR's fabrication/construction yard, detail engineering office and all other onshore work locations.

2.0 Facilities Provided by CONTRACTOR for COMPANY

CONTRACTOR shall provide facilities and services during the Detailed Engineering, Construction and offshore T&I and HUC WORK Phases as detailed below. All facilities provided for COMPANY use by CONTRACTOR shall remain under CONTRACTOR's ownership and within CONTRACT PRICE

Should any additional or reduction of services is instructed by COMPANY, the Unit Rates for Provision of Additional Services stated under Exhibit 2 – Payment Terms and Commercial Arrangement shall apply.

A) During Entire WORK

CONTRACTOR shall provide the following common facilities and services which shall be applicable and available throughout completion of the WORK.

a) Ten (10) numbers of smart phone handsets (new model and superior brand) suitable for making calls, running smart phone applications, network connection, taking photos and video recordings and use by COMPANY personnel with following minimum features:
   - 64 GB storage memory.
   - Compatible with 2G, 3G and 4G networks.
   - Minimum duel-camera system with zoom function.
   - Wireless Network 802.11a//b/g/n/ac, 2.4HHz and 5GHz Bluetooth.
   - Rear Camera with at least 16MP resolution.
   - Splash, water and dust resistant IP68.
   - Antivirus

     All smart phones shall be returned to CONTRACTOR upon issuance of HANDOVER CERTIFICATE by COMPANY.

b) CONTRACTOR shall provide Visa and travel support per following:
   - Complete support for assisting COMPANY personnel (including family members) obtaining and maintaining necessary visas/ work permits
   - Cost for obtaining and maintaining visas / work permits for COMPANY personnel.
   - Customs clearance services and support for COMPANY personnel's personal equipment imported to CONTRACTOR country for the duration of the job and re-exported to COMPANY personnel's personal equipment country of origin.
   - Transportation services to the nearest western style grocery shopping area and medical facilities.
   - Provision of Visa and related Customs clearance support and services shall be per one time for movement for maximum fifteen (15) COMPANY personal. Such services if not utilized fully or partially shall be subject to CONTRACT PRICE adjustment In accordance with Exhibit 2 – Payment Terms and Commercial Arrangement.

c) CONTRACTOR shall provide video records, photographs, interviews and presentations for each PHASE of the WORK and for overall WORK scope to record project activities and achievements. This shall include the following, but not limited to:
   - Full HD video record with zoom function and MPEG-4 file format or better
   - Digital Cameras with zoom lens and at least 20 megapixels or better
   - Photographers/ Videographers
   - Drone with 4K @30 fps video record or better c/w qualified pilot for bird's-eye view records (including Onshore WORKSITE and offshore SITE).

B) <u>Detail Engineering PHASE</u>

CONTRACTOR shall provide for COMPANY personnel exclusively the following services throughout the Detailed Engineering WORK PHASE use at CONTRACTOR's engineering/detailed design the following facilities and services.

a) Three (3) single room office with, hard-walled, lockable offices each sized at least 120 sq. ft. and complete with:

- Desk (6 feet long, with drawers)
- Layout table
- Large adjustable bookshelf
- Four drawer, lockable filing cabinet
- Hands-free, conference call type telephone with international direct dialing for each desk, as well as voicemail capability (flashing light for messages)
- Wall mounted whiteboard, complete with multiple pens and an eraser
- Office chair (ergonomic, adjustable, roller type) for each table plus 2 visitors chairs
- Three (3) computer/telephone outlets
- Email and internet access (SDSL) and Wi-Fi

b) Fifteen (15) open cubical style workstations, desktop computers with internet access, communication system such as SDSL/Wi-Fi and telephone. One round table with six (6) chairs is required to be located in the same area as the workstations.

c) CONTRACTOR shall provide a dedicated conference room within the Engineering Site Office to serve at least fifteen (15) personnel, complete with:

- Conference table
- Fifteen (15) chairs min.
- Wall mounted whiteboards (c/w marker pens and erasures)
- Overhead projector
- Infocus data projector or equal
- Group audio-teleconferencing facilities – “Coherent Conference Master” or equal
- Access to and right to use CONTRACTOR’s video-conferencing facilities at Engineering Office, as “on request basis” under the CONTRACT PRICE.

d) One (1) COMPANY Secretary and one (1) single occupancy secretarial workstation complete with personal computer c/w general office software and network card to attach to COMPANY network cabling and typist chair and including secretarial service. The workstation area shall be at least 75 sq. ft and will be located alongside COMPANY offices.

e) Office equipment and facilities for use by COMPANY:

- CONTRACTOR shall provide a suitable document control area for these facilities in the general vicinity of COMPANY offices.
- One (1) Canon image runner advance C3520i or equivalent, color photocopier/scanner with A3/A4 reduction, A4/A3 enlargement and enlargement, complete with sheet feeder and collating capability.
- All consumables (cartridges, paper etc.) for office equipment.

- Pantry with kitchen facilities. CONTRACTOR shall provide for COMPANY personnel a coffee making machine and tea making facilities as well as cups, coffee beans and powder, tea, fresh milk, sugar and filtered drinking water consumables, snacks, chocolates, biscuits, aerated drinks, bottled water and dispenser, etc. The kitchen facilities shall have a refrigerator, microwave, sink, etc.
- Access to western standard male and female toilet / washroom facilities as well as provision of toilet / washroom consumables. These facilities to be cleaned and maintained on a daily basis.
- General maintenance and service contracts for all CONTRACTORS supplied services and equipment.

f) Provision of servicing of COMPANY facilities including:

- All office utilities including electricity, lighting, heating and air conditioning. This shall include office heating and air-conditioning outside of normal working hours if specifically requested by COMPANY.
- Daily cleaning of COMPANY occupied office, work stations, kitchen facilities and toilet / washroom facilities
- Regular maintenance and supply of consumables for all facilities used by COMPANY.

g) All stationery requirements as requested by COMPANY personnel

h) Seven (7) seat vehicle, ONE NUMBER (1) (HONDA, Toyota or equivalent) along with English speaking full time driver and three (3) parking bays for use by COMPANY's Engineering team during entire project period. Vehicle refueling, periodic maintenance, necessary insurances, driver services, etc shall be under CONTRACT PRICE throughout services.

The vehicle shall:

- Have an engine size of at least 2000cc
- Have seating for at least 7 passengers.
- Have heating and air-conditioning
- Have dual air safety bags in the front
- Have seat belts in front and back
- Be safe and new condition
- Be less than 2 years old or equivalent condition
- Have Anti-lock Breaking system

C) Onshore Construction PHASE

CONTRACTOR shall provide WORKSITE Office for COMPANY use at CONTRACTOR's fabrication/construction yard together with the following facilities and services:

a) WORKSITE Office should have four (4) single occupancy, lockable office each complete with:

- Desk (6 feet long, with drawers)
- Large adjustable bookshelf
- Four drawer, lockable filling cabinet
- Hands-free, conference call type telephone with international direct dialing for each desk, as well as voicemail capability (flashing light for messages)
- Wall mounted whiteboard, complete with multiple pens and eraser
- Office chair (ergonomic, adjustable, roller type) for each table plus 2 visitor chairs
- Three computer/telephone outlets
- Email and internet access (SDSL/Wi-Fi)

b) Two (2) of these offices above shall be at least 150 sq. ft. in area; the other remaining two (2) offices shall be at least 120 sq. ft. in area. Two 150 sq. ft. offices shall include a small round table with four additional chairs.

c) An open area specious enough to accommodate at least ten (16) station/cubicles with additional spare and desk and chair provisions. Each station shall consist of one (1) table complete with workstation, computer, chair, book shelf and cabinet. Size of each station shall be about 75 sq. ft or more. Open area plan shall also have sufficient space for ease of personnel movement and transportation of materials.

d) WORKSITE Office for at least sixteen (20) COMPANY personnel, located adjacent to CONTRACTOR's own fabrication/construction yard. The WORKSITE Office shall be equipped with heating, air-conditioning, telephones, network connections, furniture, etc similar to the facilities provided for CONTRACTOR's offices.

e) A dedicated conference room within the WORKSITE Office to seat at least twenty (20) personnel, complete with:

- Conference table
- Chairs
- Wall mounted whiteboard (c/w markers and erasures)
- Overhead projector
- Infocus data project or equal
- Group audio-teleconferencing facilities – "Coherent Conference Master" or equal.

f) One (1) COMPANY secretary and one (1) Document Controller along with their workstations shall be supplied by CONTRACTOR. The workstation area should be complete with:

- Personal Computer, as specified in item h) below, with network card to attach to COMPANY's network cabling
- General office software – Microsoft Windows, Microsoft Office, including Outlook, internet connection (all latest versions)
- One wireless Canon or equivalent A4 laser printers
- Desk
- Desk Return

- Large Bookshelf
- Four drawer, lockable filling cabinet
- Telephone with international dialing
- Typist's chair

g) Office equipment and facilities within the WORKSITE Office for exclusive use by COMPANY:

- One single sheet A4 paper facsimile machines with memory capability and international dialing.
- One A3 and A4 laser printer connected via high capacity link to COMPANY Network
- Paper shredder.
- (20) off 4-drawer filing cabinets, (6) off 2-door large metal frame stationary cabinets, 20 off drawing hanger racks (including 120 off stick hangers) and (2) large drawing layout tables. CONTRACTOR shall provide a suitable document control area for these facilities in the general vicinity of COMPANY offices.
- One Canon image runner advance C3520i or equivalent, color photocopier/scanner with A3/A4 reduction, A4/A3 enlargement and enlargement, complete with sheet feeder and collating capability.
- All consumables (cartridges, paper etc.) for office equipment.
- Dedicated kitchen facilities. CONTRACTOR shall provide for COMPANY personnel a coffee making machine and tea making facilities as well as cups, coffee beans and powder, tea, fresh milk, sugar and filtered drinking water consumables, snacks, chocolates, biscuits, aerated drinks, bottled water and dispenser, etc. The kitchen facilities shall have a refrigerator, microwave, sink, etc.
- Access to western standard male and female toilet / washroom facilities as well as provision of toilet / washroom consumables. These facilities to be cleaned and maintained on a daily basis.
- General maintenance and service contracts for all CONTRACTOR's supplied services and equipment.

h) IT Equipment and Network access as part of CONTRACTOR's network set-up:

- CONTRACTOR shall provide one network file server (USB Connection – 1000 Gigabyte) for COMPANY use at the WORKSITE, said file server will support COMPANY site personnel only and it shall be used as a VIRTUAL Private Network (VPN) within CONTRACTOR's network.
- CONTRACTOR shall provide video conferencing facility at COMPANY WORKSITE office in fabrication/construction yard to perform video conference with COMPANY's head office in Kuala Lumpur, Malaysia. The video conferencing equipment and communication channel shall be of superior quality to provide un-interrupted video and audio quality. This facility shall be maintained until sail away of last wellhead platform.

- One valid Internet Provider address and not a private IP address, COMPANY's VPN must have a routable IP address to enable it to function correctly.
- All network connections, cabling, hubs, routers, hardware, network cards of COMPANY provided network cards are not compatible with CONTRACTOR's network, software and labor to establish and maintain COMPANY network system to all COMPANY personnel.
- Two (2) each 21" LED color monitors for use with COMPANY laptop computers.
- Sixteen (16) desktop Personal Computers (PC's) for use by COMPANY. The hardware shall be a minimum of latest Intel Core i7, 16 GB RAM, 1TB hard disk, 21" widescreen LED color monitor, Graphics card with display port/HDMI/DVI support with minimum 512 MB RAM, USB 2.0 ports, network and unlimited internet access, DVDROM, mouse and keyboard. The PC's shall be complete with all required software. The software shall be a minimum of Microsoft Windows, Microsoft Office including Outlook, Microsoft Internet Explorer, Adobe Acrobat Professional, AutoCAD, Navisworks and Trend Micro or Symantec or equivalent virus scanning software (all latest software). They shall be connected to CONTRACTOR Network and be available for the use of COMPANY's inspection and operations personnel in the WORKSITE office. All of the PC's shall have unlimited Internet access.
- A link between COMPANY's network file server and CONTRACTOR's network for file transfer, print services, email and internet access. Minimum 10 Mbps for both upload and download speed (equipment to ISDN speed), continuous Internet access for all COMPANY personnel complete with CONTRACTOR supplied firewall and virus protection for external communication.
- Information Technology (IT) call off support to maintain COMPANY's network file server and PC's (hardware and software)
- An un-interruptible Power Supply (UPS) that provides 30 minutes of power for COMPANY's network including file server, router, hubs and selected computers and printers. CONTRACTOR shall guarantee power, should power be lost during non-work periods CONTRACTOR shall shutdown COMPANY's server in an orderly manner.

i) IT and Telecommunication services including:

- Dedicated external IDD telephone lines for the fax machines.
- IT support to COMPANY personnel in relation to COMPANY network file server and PC's and other telecommunication devices.
- All telecommunications (phone and fax) charges for local, between WORKSITE / SITE to COMPANY's Head office and to VENDORs made by COMPANY personnel.

j) Servicing of COMPANY facilities including:

- All office utilities including electricity, lighting, heating and air conditioning. This shall include office heating and air-conditioning outside of normal working hours if specifically requested by COMPANY.

- Daily cleaning of COMPANY occupied office, work stations, kitchen facilities and toilet / washroom facilities
- Maintenance and supply of consumables for all facilities used by COMPANY.

k) All Stationary requirements as requested by COMPANY personnel

l) The following vehicles and associated facilities shall be provided and maintained inclusive of running cost and comprehensive insurance during project contract schedule under CONTRACT PRICE. The 12-seater van shall come along with English speaking driver for service to COMPANY personnel. Vehicle refueling, periodic maintenance, necessary insurances, driver services, etc shall be under CONTRACT PRICE throughout the service.

At COMPANY WORKSITE Office:

- Two (2) units of reliable 12-seater van for COMPANY personnel's use.
- One (1) unit of reliable 7-seater sedan/MPV car (Honda, Toyota or equivalent) for COMPANY personnel's use.
- Eight (8) dedicated parking bays adjacent to the respective COMPANY offices.

Each car/van at site shall:

- Have an engine size of at least 2000cc
- Have heating and air-conditioning
- Have dual air safety bags in the front
- Have seat belts for all the seats in front and back
- Be in safe and new condition
- Be less than 2 years old or equivalent condition
- Have Anti-lock Breaking system
- Have seating for at least 7 passengers.

m) If additional vehicles along with drivers as and when requested by COMPANY, CONTRACTOR shall provide at the applicable rate in Exhibit 2 Payment Terms and Commercial Arrangements.

n) Provide daily lunches for all COMPANY personnel at WORKSITE. Lunches shall be healthy, balanced in dietary contribute and prepared and presented with a high standard of hygiene. The lunch provided shall also meet the religious dietary requirements, i.e. Halal meals for Muslim and non-Halal meals for non-Muslim. Alternatively, CONTRACTOR shall allow COMPANY personal to order or take lunch at nearest food outlet/restaurant and pay directly to for respective food to the food outlet/restaurant The lunches provided shall be varied daily as requested by Company Site Representative (CSR) and shall be of sufficient variety to maintain interest of personnel. The standard, quality, variety and quantity of lunch per person shall not be less than USD Sixteen (16) for both if served by CONTRACTOR or consumed outside by COMPANY personnel. This includes regular drinks served at the food outlet/restaurant.

CONTRACTOR shall make provision for lunch for visitors (from COMPANY Headquarters) during their stay / visit to WORKSITE. The lunch shall be of similar quality and price range as specified for COMPANY WORKSITE personnel, as minimum.

o) CONTRACTOR shall provide complete Personal Protective Equipment (PPE) to all COMPANY personal and visitors at WORKSITE(S) and on CONTRACTOR vessel. The PPE shall include, as a minimum, coverall, hard helmet, safety goggle, ear plugs, hard gloves, safety shoes, harness, rain gear, etc.

p) CONTRACTOR shall provide four (4) numbers walkie-talkie for exclusive COMPANY personnel usage and shall able to communicate with WORKSITE Construction manager, Superintendent and other CONTRACTOR's key personnel.

q) CONTRACTOR shall provide twelve (12) bicycles with 24-28" wheel with gear for travelling/riding inside the fabrication/construction yard. Bicycles shall be in new condition with regular service/upkeep. CONTRACTOR shall immediately replace defective bicycle, upon request by COMPANY.

D) <u>During Offshore WORK PHASE; Transportation & Installation and HUC</u>

CONTRACTOR shall provide the following for COMPANY personnel exclusive use at all CONTRACTOR's vessels during all offshore activities including Transportation & Installation (T&I) and Hook-up and commissioning (HUC). All such services shall be included in CONTRACT PRICE.

a) For COMPANY Site Representative (CSR) and/or COMPANY Authorized delegates, offshore living and boarding accommodation in two (2) x one-man cabin and two (2) number private office space.

b) In addition, two-men cabins for COMPANY other personnel shall be provided as per following minimum number of personnel required on various vessels:

- Heavy Lift crane vessel – 10 personnel
- Pipelay vessel – 10 personnel
- Dive support – 8 personnel
- Survey vessel – 4 personnel
- HUC/CSV – 10 personnel
- Any other vessel – 4 personnel

For the avoidance of doubt, COMPANY shall be entitled to occupy unutilized accommodation cabin(s) for any additional personnel, the cost of which shall be deemed to be included in CONTRACT PRICE.

c) Facilities on all the vessels shall include email, telephone, Wi-Fi, internet, facsimile, catering, laundry, medical facility, hygienic ablution, etc.

d) CONTRACTOR shall provide sufficient and good quality gym and sports equipment (i.e., table tennis, etc) on the main work vessels (i.e., Heavy Lift / Pipelay vessel/barge, Dive support vessel, HUC/CSV, etc) for recreation.

e) CONTRACTOR shall provide dedicated refrigerator(s) in COMPANY's room and/or office on the main work vessels (i.e., Heavy Lift / Pipelay vessel/barge, Dive support vessel, HUC/CSV, etc). CONTRACTOR shall also provide sufficient snacks and drinks (i.e., ice cream, chocolates, biscuits, fruits, soft drinks, water, etc.) throughout all offshore campaigns.

f) CONTRACTOR shall provide complete Personal Protective Equipment (PPE) to all COMPANY personal and visitors at SITE and on CONTRACTOR vessel. The PPE shall include, as a minimum, coverall, hard helmet, safety goggle, ear plugs, hard gloves, safety shoes, harness, rain gear, life vests, etc.

g) CONTRACTOR shall provide three (3) numbers walkie-talkie on each vessel for use by COMPANY personnel and one VHF radio (marine channels) in each private office space, on all vessel and barges (i.e., Heavy Lift / Pipelay vessel/barge, Dive support vessel, HUC/CSV, etc), which shall be able to communicate within SITE.

h) Offshore accommodation and mess services shall be equal to that provided to CONTRACTOR's senior staff personnel. Mess services shall include provision of Halal food. CONTRACTOR shall also ensure that sufficient number of Thai and Malay chef/cooks be available onboard each vessel to prepare Thai/Malay meals. Boat transportation shall also be provided by CONTRACTOR as and when required by COMPANY and COMPANY's representatives to adequately follow and inspect the project facilities as WORK proceeds.

i) CONTRACTOR shall provide internet (via LAN cable and Wi-Fi) with dedicated Upload and download speed exceeding 10 Mbps for COMPANY usage exclusively.

j) CONTRACTOR shall provide dedicated internet network to COMPANY to ensure that emails and mobile applications such as LINE and Whatsapp can be used for sending text, voice, photos, and videos efficiently and exclusively. There shall be **NO** internet usage or access limitations to COMPANY's personnel at Marine vessel/s.

E) General Requirement Provided By CONTRACTOR

CONTRACTOR shall provide the following general services during entire project under the CONTRACT PRICE.

a) CONTRACTOR shall arrange team building among COMPANY's project management team (circa 25 headcount) and CONTRACTOR's personnel with similar or higher numbers to include as a minimum, all relevant key personnel assigned to specific WORK PHASE. At least three (3) Team Building sessions of minimum full one (1) day per occasion in CONTRACTOR's country shall be arranged. Team Building sessions shall not be arranged / conducted in CONTRACTOR or SUBCONTRACTOR office/

WORKSITE premise. All related logistics/travel (air/land) costs and overnight accommodation (min. 4 star rated) costs for COMPANY personnel shall be under CONTRACT PRICE.

The Team Building sessions shall be planned at regular intervals in order to align with each WORK Phase and shall include respective groups/team from CONTRACTOR's Engineering, Construction, T&I and HUC for respective sessions. The first Team building session shall be arranged (2nd month from EFFECTIVE DATE) during Detail Engineering WORK Phase involving CONTRACTOR's (including its Subcontractor's) key personnel in PMT and Detail Engineering team. The second Team building shall be arranged soon after mobilization of WORKSITE/construction and pre Commissioning team (5nd or 6rd month from EFFECTIVE DATE) and shall include CONTRACTOR's (including its Subcontractor's) key personnel in PMT and fabrication/construction yard. The final and the last Team building shall be arranged last but 3rd month prior to the planned Sail away of 1st WHP. This session shall include CONTRACTOR's (including its Subcontractor's) key personnel in PMT, T&I and offshore HUC.

b) CONTRACTOR shall arrange "Sail away Ceremony" for platform structure sail away event, either for first platform or the last platform structure, as instructed by COMPANY. CONTRACTOR shall invite COMPANY senior management, COMPANY PMT, COMPANY's shareholders (PCJDA and PTTEPI) and MTJA. CONTRACTOR shall account overall COMPANY's circa 30 headcount for ceremony. CONTRACTOR shall provide token of appreciation (in a price range of USD 150 per person and type to be agreed with COMPANY) to both COMPANY (circa 40 numbers) and CONTRACTOR personnel during both ceremonies.

c) CONTRACTOR shall arrange "Safety Record celebration" to achieve injury free working hours (1 million man-hours; 2 million man-hours, and so on) and shall arrange "achievement certificates", 'token of appreciations' to deserving workers at WORKSITE. CONTRACTOR shall invite COMPANY's senior management to such occasions. CONTRACTOR shall arrange at least two such safety record celebration during entire project works. Token of appreciation shall be to a total of USD fifty thousand (50,000), with the details of type and price to be agreed with COMPANY during execution.

d) CONTRACTOR shall provide safety token/give-away items for personnel working offshore (T&I and HUC) as part of safety promotion/campaigns at least once a week during all offshore T&I and HUC campaigns. The overall safety promotions/campaigns shall be to a total of USD thirty thousand (30,000). The details of type and price to be agreed with COMPANY during execution.

2.0 ONSHORE WORKSCOPE

2.1 DETAILED ENGINEERING

The CONTRACT document includes Exhibit – 4 Technical Requirements that comprise of GoBy Design Package, Statement of Requirement (SOR) and Gap Register; Exhibit – 5 CPOC General Specifications; Exhibit – 12 Site survey and soil boring reports that shall be used as the basis for preparation of design solutions complete detail engineering and design development.

CONTRACTOR is required to utilize the Statement of Requirement (SOR), GoBy Design Package, Gap Register and CPOC General Specifications (CGS) to produce its design solutions in the form of the CPOC AFC Design Package for Phase - 5 Wellhead platforms and host tie-in works. (Also refer to Section 1.2.2 Design of Exhibit – 1.)

The drawings, reports and other technical information provided in Exhibit **–** 4 and Exhibit - 5 constitutes technical requirements under Phase - 5 Development and CONTRACTOR shall further develop and perform detail engineering to provide total technical solution and seamless system integrity.

GoBy Design Package;

The GoBy Design Package intends to provide a **reference, guidance and minimum requirements** for development of design for Phase 5 FACILITIES. The provision of GoBy Design Package doesn't constitute as a comprehensive Phase - 5 development requirements nor shall be used as copy and paste of its data, drawings and documents for development of Phase 5 FACILITIES development and delivery. The GoBy Design Package considered a mature design that shall be leveraged to the maximum by the CONTRACTOR under CONTRACT PRICE. CONTRACTOR shall use the GoBy Design Package in conjunction with requirements as set forth in Statement of Requirement (SOR), Gap Register, CPOC General Specifications (CGS) and other Exhibits of CONTRACT. CONTRACTOR shall carefully read the Exhibit 1 scope of WORK specific directions, if any. CONTRACTAR must seek agreement from COMPANY for any differences/alternatives proposed under Phase 5 Design compared with GoBy Design Package and COMPANY shall have the right to Reject/Accept with conditions. CONTRACTOR shall implement accordingly on Phase 5 development within CONTRACT PRICE providing corresponding design and system warranties. CONTRACTOR to note that CHANGE Claim shall be inadmissible for such differences/alternatives however any major cost saving due to the proposed alternatives shall be share equally among the PARTIES.

Gap Register

The Gap Register intends to capture the specific requirements over and above GoBy Design Package and shall form the requirements for Phase 5 Development. CONTRACTOR shall incorporate the same in the design and delivery. In addition to that Gap register may also identify alternatives/deviations to COMPANY Specifications, procedures, etc. for incorporation under Phase 5 Development. CONTRACTOR shall implement accordingly on Phase - 5 development within CONTRACT PRICE.

It shall however be noted that Gap Register is not comprehensive document. Differences/alternatives" to GoBy Design Package, project specifications, etc established as part of Phase 5 design development shall not be construed as gap.

Statement of Requirement (SOR)

SOR is a 'must comply' document. It establishes the minimum requirements for the facilities and delivery under Phase - 5 development. CONTRACTOR shall ensure that the requirements stated therein are fully understood for consideration in design and delivery of Phase – 5 project. CONTRACTOR shall be responsible for seeking necessary clarification for its understanding of the requirements from COMPANY and for subsequent implementation as directed by COMPANY within CONTRACT PRICE and SCHEDULE. Deviation to SOR is not acceptable.

A complete EPCIC WORKS in similar manner is required meeting technical requirement of Phase - 5 Development. Any other reference drawings, documents, data sheets and like provided here in Exhibit - 4 shall in no way relieve the CONTRACTOR of its full responsibility for quality, completeness and compliance for purpose of the completed WORK under Phase - 5 EPCIC.

Early Engineering

Early engineering is the detail engineering effort performed at the initial phase immediately upon EFFECTIVE DATE in order to establish key design parameters and requirements to enable early placement of Purchase Order from long lead/critical material and equipment. Primary Structural steel, pedestal crane, relief valves, choke valves, control valves, etc., are some of the critical items, where CONTRACTOR may require expeditious engineering effort and prepare corresponding specification, MTO, data sheets, RFQ etc to proceed with Procurement activities.

Any WORK or materials not indicated on the Drawings, or not specifically called out in Specifications, Exhibit - 4 and Exhibit - 5, which are necessary for performance of the WORK in accordance with the CONTRACT, shall be provided and incorporated into the WORK at the expense of the CONTRACTOR to the same extent as if both indicated and specified. Any WORK indicated on the Drawings but not specified, or vice versa, shall be furnished as though fully set forth in both. It shall be the CONTRACTOR's responsibility to bring any discrepancies or questions regarding the intent of any specifications or drawings to COMPANY's attention for clarification and approval.

The general work-scope for engineering includes the following but not limited to; in order to provide complete and functional design solutions for Phase - 5 facilities.

1. CONTRACTOR shall review Exhibit – 4 Technical Requirements and Exhibit – 5 CPOC General Specifications to further develop and produce 'Approved for Construction (AFC)' deliverables.
2. Should CONTRACTOR identify any discrepancies, anomalies or errors within Technical requirements, CGS and other exhibits, CONTRACTOR shall bring this to immediate attention of COMPANY, for resolution and the same shall be binding to CONTRACTOR. Nevertheless, the most stringent requirement shall prevail.
3. CONTRACTOR shall standardize the Phase - 5 facilities. CONTRACTOR is required to follow the GoBy Design package to maximum extent and shall solicit COMPANY's agreement prior to proceeding with any deviation to GoBy design package and provide necessary qualification to this respect. COMPANY shall have the sole discretion to accept or require CONTRACTOR to strictly follow the "GoBy" Design and provide obligatory design warranties as required under the CONTRACT without impacting CONTRACT PRICE and SCHEDULE.
4. The technical information provided in Exhibit - 4 by no means dictate quality or guarantee similar pipe sizes, skid dimensions, equipment capacity, flow rates, material selection etc in 'CPOC AFD Design Package to be developed during detail engineering by CONTRACTOR. Any such differences between data and drawings in any exhibits and the "CPOC AFC Design Package' shall be under CONTRACT PRICE and Scope of WORK for CONTRACTOR and will not be qualified as CHANGES under CONTRACT General Conditions.
5. CONTRACTOR shall perform all necessary design and engineering that is required for Phase - 5 development and not available in Exhibit - 4. Subsequent detailing shall be developed for accepted design solutions by COMPANY.
6. CONTRACTOR to fully define a design solutions for Phase - 5 facilities including remote Wellhead Platforms (TPB and MDG); Subsea Pipelines (TPB and MDG) and receiving facilities (on TPA, MDE) to develop 'CPOC AFC Design Package.
7. CONTRACTOR shall update and revise (and/or develop new drawings/detail as necessary and directed by COMPANY) the AFC drawings and documents for the existing Host Tie-in facilities (TPA, MDE and MDPP). This includes updating the As-built information of topside facilities not directly related to Phase – 5 Development detail engineering design scope to develop 'CPOC AFC Design Package'. The necessary information shall be provided by COMPANY for incorporation by CONTRACTOR.
8. CONTRACTOR shall produce all and any necessary engineering and design deliverables for the WORK and shall become CPOC AFC Detail Design Package. Deliverable List as included under GoBy design package shall be referred to as a minimum requirement and additional design deliverables shall be produced under CONTRACT PRICE.

9. The detail engineering and procurement work shall consist of all process guarantees pertinent to ultimate design solutions for equipment and system packages in supply and scope.
10. CONTRACTOR shall prepare design solutions including coordination and oversight of designs and specifications; consultation and inputs of general contractors, specialists and vendors. CONTRACTOR to conduct all work necessary to deliver fully integrated and functional CPOC facilities in accordance with drawings and specifications. All hardware and software deliverables during engineering phase shall be capable of meeting all performance criteria to be developed by CONTRACTOR and approved by COMPANY. CONTRACTOR shall ensure that the hardware and software deliverables provided by others comply with the requirement of the Design solution.
11. Development and enhancement of the Design solution throughout stages from preliminary to Approved for Construction (AFC) for all designs and continuous coordination to enable others (equipment vendors) to fabricate the process systems, utilities, controls and all other requirements integration. Designs and specifications shall cover, but are not limited to, the disciplines of Structural, Process, Piping, Mechanical, Electrical, Instrumentation and Control, Health/Safety/Environmental (HSE), Telecommunications, Pipelines, Quality Assurance and Quality Control (QA/QC), etc.
12. CONTRACTOR under CPOC AFC Design Package shall include the design for the provisions for future equipment such as Booster Compressor and Pig Receivers. Develop design to include but not limited to necessary space provisions, required tie-ins to existing systems, utility consumption, instrument and control systems, electrical loads, offshore installation and construction considerations, etc.
13. CONTRACTOR shall use latest version of design standards and codes including API, ASME, ANSI, BS, PTS, etc as applicable for Phase - 5 development.
14. CONTRACTOR shall use latest version of all required software including HYSIS, PIPESIM, OLGA, FLARESIM, FLARENET, PHAST, SACS, ERLWEAP, PDMS, CAESAR, PV Elite, AUTO PIPE, DNV STABLINES, ABAQUS, ANSYS, INSTRUCALC, OFFPIPE/PLUSONE, AGA L2 STAB, PRIMAVERA, MS-Project, OFFPIPE, etc.
15. CONTRACTOR shall, upon request, allow COMPANY personnel the access to computer/desktops for all engineering software/application files being generated/prepared as part of detail design activity for necessary review.
16. CONTRACTOR shall provide all documentation, drawings and software generated models in both electronic and paper copy format as specified and whenever requested by COMPANY. The as-built documentation shall be in both readable electronic format (PDF version) and in native files. CONTRACTOR shall also provide as-built software models used in project work including PDMS Model, SACS Model, etc.
17. CONTRACTOR shall fully consider and incorporate COMPANY and MWS comments into its detailed engineering design deliverables. CONTRACTOR shall revise and re-submit the respective document with a “Comments Response Sheet (CRS)” included

within the document and stating the closeout (clarification, incorporation, etc) on each of the COMPANY comments.

18. Update and revise existing (As-built) design drawings and documents for TPA, MDE and MDPP as provided by COMPANY and incorporate all Host tie design & details for phase 5. Prepare demolition and installation drawings and details for Host tie-in platforms. Prepare additional design drawings and documents as necessary in order to provide other relevant details.
19. CONTRACTOR shall fully consider and incorporate all the interfaces with OTHER CONTRACTORS, SUB-CONTRACTORS, VENDORs/Manufactures/Suppliers and COMPANY into the design to ensure that all aspects are fully functioning including the following but not limited to:
    - Review and incorporate vendor/ Manufactures/Suppliers data into the detail design, including As-Built documents, and ensure supply meeting project design requirements
    - Provision of Bulk-material MTOs.
    - Provision of Calculated Weights and center of gravity to T&I party in order to enable development of the offshore lifting procedures, lifting lugs/sling design, procurement and fabrication.
    - Design data transfer for Primary Structural design verification; comments resolution and agreed changes incorporation into design.
    - Develop review and updates as required for the risk analysis of cost, schedule and constructability for the Project. Update the risk assessment report and risk register following each assessment to maintain updated project status.
    - Provision of sea fastening design and interface with T&I party to enable design, procurement and fabrication.
    - Preparation of pre-commissioning, commissioning, startup/operations and maintenance manuals.
    - Preparation of Seabed survey execution pack/plan.
    - Preparation of Host Tie-in work packs.
    - Preparation of offshore HUC work packs.
20. Liaise with equipment/ package VENDOR. Perform VENDER Data/ calculations/drawings/documentation review and ensure incorporation of material handling requirements and Human Factor Engineering (HFE) considerations. Incorporate VENDOR data/information into CPOC AFC Design Package.
21. Design Query System – contractor shall implement and maintain a design query system in accordance with Exhibit 7 – Project Co-ordination and Administration Requirement.

22. CONTRACTOR shall provide a calculation manual as a Detail Engineering deliverable upon completion of the work containing all of the assumptions, calculations, datasheets prepared over the course of the work. The Calculation Manual shall be clearly indexed and properly cross-referenced to ensure that it can be easily understand by third party not familiar with the project. The manual shall also include all relevant computer output used during the work including that upon which the Process and Utility flow sheets are based. CONTRACTOR to make all calculations available to COMPANY for their review, as and when required and shall be part of final deliverables.
23. Communication system: CONTRACTOR shall be fully responsible for the design details, installation and wiring of the communication equipment and necessary field tests to provide fully functional and acceptable communication system for Phase - 5 facilities. CONTRACTOR shall engage and coordinate with Vendors of existing system interface / upgrade as necessary, COMPANY communications and IT department to ensure the communication system design for Phase - 5 facilities is compatible with COMPANY's other existing systems and complies with Laws of Thailand and Malaysia.
24. Operability and Maintainability: CONTRACTOR shall design to ensure optimum operability, maintainability and that all operation and maintenance activities can be executed under safe and workable conditions. Some not all such requirements are noted below;
    - CONTRACTOR shall ensure that safe and immediate access exists to all valves which might require isolation and shall avoid the use of ladders where other access can be provided.
    - CONTRACTOR shall further detail out additional material handling requirements and incorporate the recommendation in the design solution, be responsible to ensure that the Design solution provides for Material and equipment handling to install and remove all components with proper material handling equipment.
    - CONTRACTOR shall review process design; operating intent and maintenance functions to identify all risk of discharge of hydrocarbons or hazardous substances to the environment. Ensure that no "weak links" or unacceptable risks in the system exist.
    - CONTRACTOR shall recommend design options which minimize personnel exposure to identified hazardous substances.
    - CONTRACTOR shall maintain the process area segregation intent throughout the design monitoring placement of equipment and routing of piping and shall determine SDV requirements in cases where violation of segregation cannot be avoided.
25. CPOC AFC Design Package: CONTRACTOR shall be responsible for compilation of all detail engineering deliverables to produce 'Approved for Construction (AFC) Design Package' and submit such draft package for COMPANY review and shall also be subject to 'PEER REVIEW'. All comments from COMPANY and PEER REVIEW shall

be incorporated to produce final 'CPOC AFC Design Package'. All necessary changes to 'CPOC AFC Design Package' during construction, offshore installation, offshore HUC shall be recorded on master set of drawings and deliverables to produce "AS BUILT" 'CPOC AFC Design Package' under final submission.

26. PEER REVIEW: CONTRACTOR shall arrange Peer review of compiled draft 'CPOC AFC Design Package' by independent senior discipline personnel along with COMPANY representatives to demonstrate technical correctness as per industry practice and completeness of work scope. CONTRACTOR shall produce Peer Review report for COMPANY agreement and incorporate all such required changes in detail engineering deliverables 'CPOC AFC Design Package'.
27. CONTRACTOR shall assume single point responsibility for all aspects of the work. This shall include timely completion, liaison with the COMPANY, liaison with any Manufacturer or Sub-Manufacturer / subcontractors of specialized items, coordination of the work, performance guarantee and provision of a warranty under the CONTRACT.
28. Where parts of the system / projects / items are subcontracted and purchased by the CONTRACTOR, these become part of CONTRACTOR's package scope and it is CONTRACTOR's responsibility to ensure that the complete system / project / items / package complies with all the relevant specifications.
29. *CONTRACTOR shall engage dedicated and a specialist detail engineering sub-contractor for Phase - 5 engineering activities. CONTRACTOR's in house team shall supervise sub-contractor and overall WORKS.*
30. *CONTRACTOR shall engage a dedicated 3rd party materials and corrosion specialist for performing Material Validation/Verification study for Phase - 5 facilities. CONTRACTOR shall incorporate the conclusions of Material Validation/Verification study into* 'CPOC AFC Design Package' and WORK under the CONTRACT PRICE. *CONTRACTOR shall provide detailed resume of the proposed specialist for COMPANY review and APPROVAL. Only approved Corrosion Specialist shall be nominated on the Project.*
31. *CONTRACTOR shall engage a 3rd party specialist to carry out Human Factor Engineering review as part of PDMS model development and review. CONTRACTOR shall provide detailed resume of the proposed specialist for COMPANY review and APPROVAL. Only approved HFE Specialist shall be nominated on the Project.*

2.1.1 PROCESS

CONTRACTOR shall review and verify the process design requirements provided under Technical requirement in Exhibit – 4 prior to utilizing for Phase 5 engineering and design development. CONTRACTOR is required to utilize SOR and Gap Register for necessary design review, adequacy check and detail design development to produce its design solution in the form of CPOC AFC Design Package. An individual AFC Design Package shall be provided for each facility including WHPs; Subsea pipelines, receiving facilities in

the form of CPOC AFC Design Package. The detail engineering work scope includes the following development but not limited to;

1. Preparation of Process Design Basis (BOD)
2. Preparation of operating, start-up and shutdown philosophy.
3. Preparation of operating manual
4. Preparation of Process Flow Diagrams (PFDs) and Utility Flow Diagrams (UFDs)
5. Preparation of process simulation report using latest process simulation (HYSIS Ver. 10 or latest)
6. Preparation of Heat and Material Balance
7. Preparation of Piping and instrument diagram (P&IDs) including demolition P&IDs for Host Tie-in on existing WHPs. P&IDs shall be updated to include HAZOP Study recommendations prior to issuing to COMPANY for Approval/Acceptance (IFA).
8. Perform equipment sizing, line sizing, instrument sizing (such as PSVs, control valves, shutdown valves, flow instruments, flow and level instruments, Analyzers etc).
9. Perform process calculations and adequacy checks with corresponding reports (equipment, instrument, utility consumption, any study and analysis and etc) related to modifications for host –tie in work on existing platforms.
10. PIPELINE steady state & Transient studies: Perform Transient Study for the operating scenarios as referred under CPOC-GS-PR-0001 CPOC Rev 1, section 4.2.1 and shall include the turndown flow scenario/case for the selected 18" pipeline in order to establish minimum gas flow and maximum liquid holdup without blocking gas production during low well production. The Flow Assurance analysis shall be performed for necessary pipeline studies and for TPB oil production impact, develop operating philosophy & manual including flow assurance risk management plan with consideration of TPB oil production arrival at MDPP Slug Catcher System.
11. A specific “Impact of Oil Study and Recommendation Report” shall be prepared and shall include relevant Flow Assurance analysis for TPB oil production impact to MDPP.
12. Perform all necessary analysis for downstream system at MDPP including Gas Processing and treatment systems, condensate & oil systems. Perform analysis, impact and establish engineering design requirements including options and recommendations for MDPP process and facilities modifications. CONTRACTOR shall prepare a detailed report to include the above for use by COMPANY in future development. The constituents and the format of this report shall be as advised by COMPANY during Detailed engineering design development. CONTRACTOR shall deliver and comply under CONTRACT PRICE.
13. Perform all calculations, analysis, studies, reports, reviews related to Process scope of works but not limited to, TPB Oil well production study, Pipeline steady State and Transient Hydraulic, Low temperature, Hydrate formation, Dynamic WHP Topside

overpressure protection, utility consumption report, etc, providing design measures recommendation and implementation to overcome any of such concern under operating scenarios during facilities life time.

14. Incorporate TPB oil well production study outcome in design, respective impact to pipelines and surface/wellhead facilities including piping, instrument, equipment and others. CONTRACTOR or its specialist 3rd party shall study chemical injection requirements, perform laboratory chemical screening and performance testing including chemical selection. CONTRACTOR shall design the new Chemical Injection Systems accordingly.
15. Perform Acoustic Induced Vibration (AIV) and Flow Induced Vibration (FIV) Studies for piping where calculated pV2 for line sizing exceeds maximum allowable pV2 as per section 11.3.1 of CPOC-GS-PR-0001 Rev.1. Provide mitigations to ensure the integrity of piping against induced vibrations.
16. Establish a “Phase 5 Facilities Operating and Integrity Envelop” determining and defining various variables that could affect the integrity and reliability of the facilities. A specific Engineering deliverable shall be produced to include the objective, method, scope, result and recommendations, etc.
17. Preparation of process datasheets for equipment, instruments, packages and others as necessary.
18. Preparation of Vent and Relief Study report. The calculations shall include network backpressure calculations, PSV sizing, radiation and dispersion; vent stack sizing, blowdown study, etc.
19. Preparation of SAFE chart; Cause and Effect Matrix; and ESD logic diagram / hierarchy. Also update corresponding drawings and documents for host tie-in modification scope on existing platforms.
20. Perform HAZID/HAZOP and SIL studies during detail engineering design. HAZOP / HAZID and SIL finding and close out report shall be completed prior to issuance of AFC P&IDs.
21. Prepare line list with all detail design, operating and testing parameters. Also update existing list for host tie-in modification scope on existing platforms.
22. Prepare detailed utility consumption calculation and list for each platform (both new and existing).
23. Update all process drawings and documents to incorporate vendor data, outcome of QRA/HSE cases; HAZOP & SIL Close out recommendations; alarm and trip setting, etc for both, new WHPs and existing host tie-in WHPs to form the CPOC AFC Design Package under CONTRACT PRICE.
24. Produce a complete set of P&IDs for facilities, which shall integrate the vendor P&IDs. CONTRACTOR shall not make reference to VENDOR P&ID on CONTRACTOR

developed P&ID. CONTRACTOR shall take pertinent information from the VENDOR's P&ID and utilize/incorporate this information to develop the CONTRACTOR's P&ID.

25. Develop Pre-commissioning and commissioning procedures for each facility to provide system breakdown, check sheets, testing procedures, etc. These procedures shall be utilized to compile completed pre-commissioning and commissioning dossier from onshore Mechanical Completion. A similar dossier shall be produced for offshore hookup and commissioning (HUC) and Start-up.
26. Develop operation and maintenance manual for each facility.
27. Develop Performance Testing Procedure (Hydrocarbon and Non Hydrocarbon system) for each facility.
28. Develop a Simultaneous Production and Construction/drilling/commissioning (SIPCOM) procedure for each wellhead platform.
29. Preparation and compilation of all necessary calculations, spreadsheets, back up references, adequacy checks, integrity of interfaces with vendor packages, hydraulic studies, thermal studies, technical notes, operating references, vendor references, design references, etc.
30. Establish temporary Instrument Air System (Compressors and Air Dryer) requirements and tie-in point to Instrument gas header.

2.1.2 STRUCTURAL

CONTRACTOR shall review and verify the structural design requirements provided under Technical Requirements in Exhibit - 4. CONTRACTOR is required to utilize SOR, Gap Register and other technical data including Exhibit - 12 Site Survey and Soil Boring Reports for detail design development to produce its design solution in the form of CPOC AFC Design Package. The detail engineering work scope includes the following but not limited to:

1. Review & update "Goby" Structural Design Basis.
2. Prepare / Review & update weight control procedure
3. Prepare & Maintain weight control reports to represent weight updates.
4. Review all COMPANY supplied documents, highlight anomaly (if any) between various documents and discuss COMPANY for agreed resolution before using it for design. CONTRACTOR shall proactively engage with COMPANY for any other specific data.
5. Develop MTO for Primary, Secondary & Tertiary structural steel to enable procurement by CONTRACTOR on priority basis.
6. Review & update COMPANY provided General drawings for Notes, structural standards, Loading diagrams.

7. Produce Primary, Secondary & Tertiary Structural drawings for Topside, Jacket, Vent boom, Pile, Conductor & Boat landing including their appurtenances.
8. Produce Structural drawings required for Module Installations i.e. Grillage & Sea-fastening, Flooding system, Mudmat, Lifting/upending/leveling padeyes, trunnions and other miscellaneous structures/arrangements.
9. Security gate shall be provided to ensure restricted entry to platform.
10. Perform Structural analysis and Produce design reports for In-service conditions i.e. In-place analysis including foundation design, Spectral Fatigue and other miscellaneous analyses.
11. Comprehensive Dynamic Structural Analysis shall be performed to assess dynamic response of Structure and to obtain Inertia loads.
12. Produce Structural analysis and design reports of various modules for pre-service condition i.e. Load-out, Transportation, Lifting, floatation & upending, on-bottom stability, Pile & Conductor drivability (for at least two suitable hammers) including other miscellaneous Analyses and Design.
13. Fatigue assessment of Pile & Conductor shall be carried out and reported both for In-service conditions & during installation (due to driving). Cumulative fatigue damage at all critical locations shall be assessed & reported.
14. Conductor setting depth shall be sufficient to carry casing loads (250MT). Conductor setting depth shall be determined to avoid any onerous impact on Platform piles due to potential mud flow from cementing of casing wells. Conductor shall be provided with electrical connection to safeguard them against corrosion. This shall be in addition to painting in slash zone/atmospheric zone.
15. Perform Analysis & Produce design reports for accidental events i.e. Boat impact study on boat landing & Jacket structure (Elasto-plastic), Drop object study Report.
16. Miscellaneous Analyses and Design reports i.e. Cathodic protection, Vortex shedding, Nodes & Joint design, structural elements e.g. Plating, Grating, Stringers, stairs, hatches, vent boom rest, TAD skid beam.
17. Design for material handling requirements i.e. crane pedestal (including Fatigue), gantry/monorails, and lifting padeyes.
18. Structural analyses & drawings shall conform to final load-out scheme, Transportation stowage plan, lifting arrangement including weighing COG, Pile driving sequence & methodology, Reserve Buoyancy & Flooding system. CONTRACTOR shall discuss with its T & I team for all necessary installation input for incorporation in design.
19. Structural analyses of miscellaneous secondary & tertiary structures including Equipment support, Piping Support, PAR Support, Burner Boom Support, Vent Boom, Unihead Spacers & Centralizers for well casings.

20. CONTRACTOR shall demonstrate & report through analysis & design that no untoward structural vibrations (frequency & amplitude) occur due to booster compressor unbalanced forces and its dynamic conditions.
21. All potential cases of loadings shall be analyzed as per basis of design i.e. TAD Rig, Hung Casing, Service dead & Live Loads, operating & Extreme storms conditions for wind & waves, Hydrostatic loads and Soft Mooring loads.
22. Assessment of Reserve Structural Strength of Platforms.
23. Structural assessment during fabrication, Installation & other temporary phases i.e. during erection & assembly at yard, Pile handling.
24. All as built & as installed data shall be marked up, QA checked and reported before incorporating in the final as built documents & drawings. This shall include all structural items e.g. Jacket, Topsides, Piles, Conductors, Boat landing etc. CONTRACTOR shall also prepare as built drawing for as installed coordinates of all well slots.
25. CONTRACTOR shall liaise with MWS & COMPANY for comment resolution and incorporate review comments made by COMPANY and MWS. CONTRACTOR shall provide Comment Resolution Sheet (CRS).
26. CONTRACTOR shall provide structural SACS model for COMPANY review at various stages of approval.
27. CONTRACTOR shall prioritize approval of engineering documents to suit construction sequence.
28. Any other structural provisions required by other disciplines and/or defined in Exhibit -1 of the CONTRACT.
29. Scope of WORK defined under Offshore Transportation & Installation Requirements in Exhibit -1 of the CONTRACT.
30. Scope of WORK defined under Offshore Hook up and Commissioning requirements in Exhibit -1 of the CONTRACT.
31. Scope of WORK defined under Host tie-in Requirements on MDE & TPA Platforms in Exhibit -1 of the CONTRACT.

2.1.3 MECHANICAL

CONTRACTOR shall review and verify the Mechanical equipment and system packages design requirements provided under Technical requirements in Exhibit - 4. CONTRACTOR is required to utilize SOR and Gap Register in detail design development to produce its design solution in the form of CPOC AFC Design Package. The detail engineering work scope includes the following development but not limited to:

1. Prepare Mechanical Basis of Design.

2. Prepare Master equipment list (comprehensive for all disciplines).
3. Prepare Mechanical datasheets and equipment, specifications for all mechanical equipment and system packages, prepare technical requisition package for all equipment such as but not limited to test separator, closed drain drum, pig launcher, pig receiver, pedestal crane, closed drain pumps, instrument gas system, corrosion inhibitor injection system, etc.
4. Preform Mechanical handling study, lifting requirement and methodology and produce report, determination of the lifting requirement and methodology. Generate miscellaneous equipment material handling specification, datasheet and requisition.
5. Periodic review and update equipment layout based on latest available data and final design. The CONTRACTOR shall interface with equipment SUPPLIER/VENDORs to establish any specific requirements.
6. Liaise with equipment/ package VENDOR. Perform VENDER Data/ calculations/drawings/documentation review and ensure incorporation of material handling requirements and Human Factor Engineering (HFE) considerations. Incorporate VENDOR data/information into CPOC AFC Detail Design Package. Perform all interfaces as required on the project engineering deliverables.
7. Prepare utility, chemical and lubricant (including first fill) consumption list for equipment and system packages including fuel gas, instrument gas, utility air, diesel fuel, corrosion inhibitor, power consumption, vent and drain requirements, etc.
8. Site surveys for receiving facilities and brown field works at TPA, MDE and MDPP to perform ‘CONSTRUCTABILITY STUDY’ to complete detail design of tie-in requirements, offshore installation arrangement; early tie-in preparation meeting planned shutdown, etc. MTO for brown field activities shall be prepared.
9. CONTRACTOR to ensure all future tie-ins, space for future requirements such as Booster compressor, Pig Receiver, etc. on wellhead platforms are adequately provided. Future installation arrangement shall be considered in interface with equipment supplier/vendor to review/approve all vendor drawings and all necessary vendor data shall be incorporated in detail design. Consideration of future design and installation of Booster Compressor in future shall include provision of space, tie-in, utility consumption list, instrument and control system as a minimum.
10. Prepare maintenance schedule for equipment and system packages.
11. Prepare a consolidated operational and commissioning spare list of equipment and packages including special tools to be purchased and supplied by CONTRACTOR.
12. Prepare of two (2) years operational spare list for equipment and packages (SPIR).

2.1.4 PIPING

CONTRACTOR shall review and verify the Piping design requirements provided under Technical requirement in Exhibit - 4. CONTRACTOR is required to utilize SOR, Gap Register and Project Specification Log Register in detail design development to produce its design solution in the form of CPOC AFC Design Package. The detail engineering work scope includes the following development but not limited to:

1. Prepare Piping Design Basis
2. Prepare Piping Stress Design Basis
3. Review, verify Piping specification; specification of piping valves and specialty items.
4. Preparation of equipment layout, piping general arrangements and carryout detail engineering to include elevations, sections, support details, etc. Consideration of design and installation requirements for future of Booster Compressor and Pig Receivers shall include, but not limited to, space, tie-ins to existing systems, utility consumption list, instrument and control system, offshore installation and construction, etc.

   COMPANY shall provide existing Booster Compressor design for future reference such as sizing, weights, space allocation, etc.

   Layout studies shall also consider the Rig entry/re-entry, set-up and operations on the respective wellhead platforms. **Location of temporary Instrument Air package (Air Compressor and Dryer unit) shall be established with consideration to interface with drilling / well services equipment, lifting and handling of the package.**
5. Pipe stress analysis for critical process piping and pipe support design.
6. Interface with Process discipline for Acoustic Induced Vibration (AIV) and Flow Induced Vibration (FIV) Studies and incorporate the outcome in piping and support design.
7. Prepare 3D PDMS modeling for all WHPs under Phase-5 and receiving facilities at host tie-in locations to include all disciplines and all package interfaces, vendor details, foot prints, etc; to perform clash checks, to provide piping isometrics and material take off (MTO). Operational, Safety and Maintenance access and approaches, electrical and instrumentation details, material handling details, structures and installations, walkways, etc shall be ensured in 3D model and they are clash free. PDMS models for individual facilities in both green field and brown field shall be developed and updated periodically including as-built status. Rig approach/entry and set-up shall be checked for all potential clash with wellhead platform facilities.

   Human Factor Engineering (HFE) review by a 3rd party specialist shall be conducted as part of PDMS model review sessions (at 30% and 60% PDMS review stage).
8. Verify and update piping tie-ins for host tie-in activities shall be produced on priority to allow early installation of tie-in points on first available planned shutdown in these platforms, as required.

9. Identify, design and provide all offshore installed tie-in spools including flowlines tie-in spools for all well slots on WHPs, spools between topside and risers, spools between topside and jacket. All offshore installed spools shall be provided with 150 mm GREEN length for side adjustment.
10. Produce isometrics drawings index for both Greenfield and Brownfield required facilities under Phase - 5 project development.
11. Perform VENDER Data/drawings/documentation review and incorporation in CPOC AFC Design Package.

2.1.5 INSTRUMENTATION AND CONTROL

CONTRACTOR shall review and verify the Instrumentation and Control design requirements provided under Technical requirement in Exhibit - 5. CONTRACTOR is required to utilize SOR and Gap Register in detail design development to produce its design solution in the form of CPOC AFC Design Package. The detail engineering work scope includes the following development but not limited to:

1. Prepare Instrument Design Basis.
2. Prepare control system, fire and gas system and shutdown system philosophy.
3. Prepare Emergency shutdown (PCS, ESD, Telecom) system schematics and specification.
4. Prepare Fire and Gas (F&G) system schematics and specifications.
5. Prepare ESD logic diagram, cause and effect matrix and control narratives (well testing sequence, well blowdown sequence, parallel free flow production and future booster compressor production arrangement and periodic testing arrangement sequencing, inter-platform trips, etc).
6. Detailed instrumentation schematics.
7. Instrument hookup drawings
8. Prepare project specifications; instrument datasheets and develop all other requisite to engineer and procure:
    - Wellhead Control System (WCS)
    - Wellhead Control Panel (WHCP)
    - Sand monitoring system (Intrusive type and clamp on, at Test Header)
    - CO2 analyzers
    - Controlled instruments such as flow, pressure, temperature, level, etc.
    - All instrument valves such as control valves, actuated valves, pressure relief valves, shutdown valves, choke valves, compact ball valves, etc.
    - Pig signalers and corrosion monitoring system.

- Fire and gas detectors (fusible plug loop, point gas detectors, open path detectors and ultrasonic gas leak detectors)
- Field instruments such as transmitters, pressure gauges, temperature gauges, level gauges, etc.
- Any other instrumentation item which are indicated in the P&ID and deemed to be required for the project during detail engineering.

9. Prepare as necessary all sizing calculations taking in account of vendor inputs for Control valves, Choke valves, Actuated Ball Valves, PSVs, Shutdown valves, Instrument gas requirement, Instrument power requirement, etc.
10. Prepare power consumption, instrument gas consumption and selection of low consumption instruments such as that it shall consume low powers. CONTRACTOR shall also ensure that the total power supply shall be at least 20% higher than overall power consumption.
11. CONTRACTOR shall develop as necessary as installation drawings defining locators, interfaces, etc but not listed to
    - Instrument cable layout and block diagrams
    - Instrument tubing tray layout
    - Instrument cable schedule, Junction boxes schedule, I/O schedule, instrument index.
    - Instrumentation and hookup details for both onshore and offshore.
12. CONTRACTOR shall prepare functional logic diagrams for all fire and gas; safety instrumented system (SIS) and provides a written functional description of the logic sequence of all inputs and output internal logics and SIS functions. The logic diagram shall be produced according to ISA requirements.
13. CONTRACTOR shall liaise with package vendors such as WCS, WHCP to review, update and finalize the instrumentation and all interfaces as required on the project.
14. CONTRACTOR shall review, upgrade and develop all relevant engineering and documents/drawings for Host Tie-in WHPs instrument systems such as WCS/WHCP on TPA; WCS/WHCP on MDE, DCS/SCADA/SIS on MDPP to accommodate all requirement of receiving facilities and brown field works under Phase-5 development. CONTRACTOR shall liaise with existing vendor to upgrade and modify all such existing system to integrate all new requirements.
13. CONTRACTOR shall review and upgrade existing control system and shutdown logic for Host Tie-in WHP facilities to integrate Phase-5 requirements. MMI graphics shall be updated for integrated Phase-5 requirements. CONTRACTOR shall also ensure and maintain 20% spare availability after system modification at existing TPA, MDE and MDPP platforms.

14. Site surveys for receiving facilities and host tie-in works at TPA, MDE and MDPP to perform 'CONSTRUCTABILITY STUDY' to complete detail design of tie-in requirements, control system upgrade / update requirements, telecommunication system integrity check and suitable design alignment.

2.1.6 TELECOMMUNICATION

CONTRACTOR shall review, verify and develop design for SCADA system and telecommunication systems for detail design development to produce its design solution in the form of CPOC AFC Design Package. The detail engineering work scope includes the following development but not limited to:

1. **Verification and validation of telecom study and telecom topology including radio frequency and IP address as a first priority.**
2. Equipment layout, block diagrams.
3. Preparation of Telecommunication specification, schedule, MTO, bulk material, etc.
4. Preparation of telecommunication facilities including antennas, support (tower, mast or pole) and telecommunication shelter / equipment room, etc.
5. All necessary calculations and liaise with equipment vendor for line of sight from remote facilities to MDPP.
6. Arrangement and management of field tests from all Phase - 5 Wellhead platforms telecommunication to central complex to demonstrate and guarantee functional superiority of selected system. All observations and necessary modifications from such field tests shall be incorporated in final design to provide necessary additional equipment and integrated system.
7. To acquire telecom hardware and software, licenses, IT support for related equipment.

2.1.7 ELECTRICAL

CONTRACTOR shall review and verify the Electrical design requirements provided under Technical requirement in Exhibit - 5. CONTRACTOR is required to utilize SOR and Gap Register in detail design development to produce its design solution in the form of CPOC AFC Design Package. The detail engineering work scope includes the following development but not limited to:

1. Prepare Electrical Basis of Design
2. Prepare Electrical Load List (AC and DC), equipment list and related calculations for all Well head platforms and Host Tie-in platforms under Phase-5.
3. Prepare Electrical single line diagram, schematic diagrams, wiring diagrams, cable schedule.

4. Prepare Electrical equipment layout; power, control, lighting and auxiliary system layout; cable ladder routing layout
5. Prepare electrical equipment datasheets and specifications including TEG and fuel gas conditioning system, Solar Panels, Nav. Aids, AC/DC distribution board, battery charges, Diesel engine generator, CCU, etc.
6. CONTRACTOR shall size, route, supply and install all electrical items and equipment such as cables, cable ladders, socket outlets, etc.
7. UPS system for instruments and navigational aids.
8. CONTRACTOR to develop electrical power generation system (hybrid with use of TEG for 70% power and Solar Panels for 30% power) on Wellhead Platforms. All required load and optimisation study including update of electrical equipment shall be performed to produce final design solution. The maximum power requirement on any of WHP shall be used with at least 10% design margin to establish overall power generation system required and same shall be uniformly provided on all Phase-5 wellhead platforms.
9. Contractor shall develop all necessary MTO for electrical items and bulk including cables, lighting, cable glands, junction boxes, receptacles, fittings, etc.
10. Electrical & Instrument shelter layout shall be updated based on Vendor information.
11. Produce installation details and incorporate vendors' data for all major equipment and panels.
12. Perform all necessary calculations including lighting illumination, cable sizing, etc.
13. CONTRACTOR shall review, update, design and develop all electrical requirements at receiving facilities on MTA, MDE and MDPP.

2.1.8 SAFETY

CONTRACTOR shall review and verify the Safety design requirements provided under Technical Requirements in Exhibit - 4, and all other relevant Exhibits. CONTRACTOR is required to utilize SOR and Gap Register, perform detail design development to produce accepted design solution in the form of CPOC AFC Design Package. The detail engineering work scope includes the following development but not limited to:

1. Prepare Design Basis with safety concept and philosophy
2. Prepare Safety equipment and escape route drawings
3. Perform Detailed Safety Studies/Assessment, including, Fire& Gas mapping Study, etc. and produce respective reports (refer below).
4. Prepare Safety equipment specifications, datasheets, drawings, equipment layout for all safety, life support and firefighting equipment.

5. Prepare Hazardous Area Classification schedule and drawings for normal operations and SIMOPS.
6. CONTRACTOR shall ensure that all work performed adopts a design philosophy to ensure that the facilities give as low as reasonably practical risk levels to operating personnel, equipment and environment.
7. Perform HAZOP and HAZID studies and produce reports
8. Prepare Vent Radiation and Dispersion study report for normal and emergency venting.
9. Review and approve vendor drawing and document.
10. Prepare Terms of Reference for all workshops.
11. Provide suitably qualified 3rd party facilitator for all workshops (subject to approval by COMPANY)
12. Prepare Safety, Life-saving and Fire-fighting equipment list.
13. Participate and review of 3D PDMS model. The chairperson for the workshops shall be provided by CONTRACTOR.
14. CONTRACTOR must ensure active participation of its all discipline Lead Engineers in safety workshops and model reviews.
15. Prepare Close-out of all recommendations from all workshops and safety studies (e.g. HAZOP, HAZID, SIL, EERA, etc.)
16. Review all vendor packages under all workshops, including but not limited to, HAZOP, HAZID, SIL classification and verification, etc. and incorporate corresponding recommendations.
17. CONTRACTOR shall fulfill all relevant technical requirements of COMPANY's Process Safety Management (PSM) system including all required documentation as detailed in the following procedures (included under Exhibit - 8):
    - Design Integrity Guideline HSE-GMH-GDL-6-12
    - Process Safety Information HSE-GMH-GDL-6-07
    - Operating Procedure HSE-GMH-GDL-6-06

<u>Safety Studies</u>

Contractor shall carry out the following safety studies during detail engineering and produce study reports. Design development resulting from safety studies should be incorporated and documented as part of the detailed design.

- Hazard Identification Study (HAZID)
- Hazard and Operability Study (HAZOP)

- Vent dispersion /radiation Study
- Exhaust Emission Study
- Escape, Evacuation and Rescue Analysis (EERA)
- QRA (both qualitative and quantitative to demonstrate ALARP to personnel, facility including subsea pipeline and risers and environment)
- Safety Integrated Level (SIL) classification and verification analysis.
- Design HSE Case
- Dropped Object study for pipeline and topsides.
- Emergency Systems Survivability Analysis (ESSA) while complying with Peer Review,
- Fire & Explosion Risk Analysis (FERA) in compliance with GMH PSM requirements
- Smoke & Gas Ingress Assessment (SGIA) in compliance with GMH PSM requirement
- Safety assessment (this should include identifying critical activities that need to be addressed by human factors, escape evacuation and rescue, maintenance accessibility.)

2.1.9 PIPELINE

CONTRACTOR shall review and verify the Phase - 5 Pipelines requirements provided under Technical requirement in Exhibit - 4 and all other relevant Exhibits. CONTRACTOR is required to utilize SOR, Gap Register and other technical data including Exhibit - 12 Site Survey and Soil Boring Reports for detail design development to produce its design solution in the form of CPOC AFC Design Package. The detail engineering work scope includes the following development but not limited to;

1. Perform design and optimization of multiphase pipelines based on COMPANY proposed pipeline size and associated risers.
2. Prepare Pipeline and Riser Basis of Design
3. Perform steady state and transient analysis of all pipelines with complete network up MDPP (to determine liquid slugging potential and mitigation measures)
4. Determine pipeline wall thickness with material grade, taking into consideration of internal pressure, installation and corrosion allowances.
5. Perform Pipeline route and Constructability study (pipeline route, approach and tie-in spool configuration) by considering the pipeline routing requirement as per stated in Gap Register.
6. Perform Pipeline On-bottom Stability design
7. Perform Pipeline and Riser End Expansion design

8. CONTRACTOR shall perform Pipeline Lateral and Upheaval Buckling analysis from Level 1 and beyond, identify and design necessary mitigation, supply material and install under CONTRACT Lump Sum price. However, if Buckle trigger is established as the necessary mitigation for lateral buckling, then the supply, fabrication and installation of Buckle trigger/s shall be reimbursed based on unit rates for CHANGES stated under **Exhibit – 2 Payment Terms and Commercial Arrangement**.
9. Perform Pipeline Anti-corrosion Coating design (3LPP - pipeline and riser external corrosion coating and field joint coating)
10. Perform Pipeline Cathodic Protection design
11. Perform Riser, Tie-in Spool and Flange design
12. Perform Riser Clamp design for TPB and MDG. The riser clamp shall be attached to jacket structure/member to enable corrosion protection by jacket anodes.
13. Perform Pipe-lay Analysis (static and dynamic)
14. Perform Pipeline and Cable Crossing and Crossing Support analysis

    CONTRACTOR shall prepare a design package for pipeline crossing/s over the existing 3rd party subsea assets (cables, pipelines). This shall include, but not limited to, the crossing drawings, location and coordinates, schedule of construction, pipeline fluid, etc. This Pipeline crossing package shall be submitted to COMPANY as soon as the pipeline design is complete. The same required to be provided to the respective 3rd party/asset owner by COMPANY as necessary.
15. Perform Pipeline Free Span Analysis
16. Perform Pipeline Free Span Intervention design
17. Perform Pipeline On-Bottom Roughness analysis
18. Prepare Dropped Object Study
19. Perform Pipeline Mechanical Protection design
20. Perform Trench and Backfill design
21. Prepare Pipeline and Riser Detailed Design and As-built drawings including but not limited to:
    - Drawing Index
    - Overall Field Layout drawing
    - Pipelines Route drawings
    - Pipeline Approach drawings
    - Pipeline Alignment Sheets (3 panel drawings showing Pipeline route, profile, geophysical and geotechnical data, existing infrastructure and all Pipeline engineering design data)

- Pipeline Anode details drawings
- Pipeline Corrosion coating, Concrete coating and Field Joint Coating drawings
- Riser General Arrangements and Riser Isometrics
- Riser clamp details drawings (Hanger and Sliding Clamps)
- Expansion Spool make-up General Arrangement drawings
- Expansion Spool Isometric drawings
- Pipeline Crossings and Crossing Support details drawing
- Pipeline schematic drawings
- Pipe laying Installation sequence drawing and procedure
- Flange Protector drawings
- Temporary Knee Brace drawing
- Pipeline Lateral and Upheaval Buckling Mitigations drawing (if required)
- Pipeline Protection drawing

22. Pipeline Pre-commissioning, Pressure testing and Commissioning procedures
23. Pipeline Pigging Philosophy
24. Preparation of Pipeline Survey Procedures, plan and etc (site survey, pre-installation survey, post-installation survey and as-built and CP survey).
25. Prepare final material take off (MTO) for full pipeline system including permanent and temporary material and equipment

CONTRACTOR's scope of work for host tie-ins of Receiving Facilities at TPA and MDE shall include but not limited to the following:

1) Detail engineering and other related engineering studies to utilize of existing 18" riser on TPA and MDE platform. A site survey shall be conducted at TPA and MDE to ensure as-built condition and integrity of existing riser at TPA and MDE. Site survey findings shall be integrated in design works.
2) CONTRACTOR shall prepare all requisitions, specifications, data sheets, drawings, documents, sketches and schematics as required for the project during detail engineering stage and same shall be approved by the COMPANY.
3) Procurement of all necessary material such as riser clamp and others to complete the WORK.
4) Riser and expansion / tie-in spool fabrication and installation.

A) Pipeline Design and Operating parameters:

The design and operating parameters for Phase 5 Pipelines are tabulated as below;

Table 1.1: Design and Operating parameters

Parameter		Unit	Pipeline	
			TPB-TPA	MDG-MDE
Pipeline Size		inch	18	18
Outside Diameter		mm	457	457
Design Life		Year	15	
Design Pressure		barg	70	
System Hydrotest Pressure	Zone 2(2)	barg	98	
	Zone 1(3)		87.5	
Design Temperature		°C	120	120
Corrosion Allowance(1)	Hot End	mm	13	10
	Cold End		8	10

NOTES:

1. The pipeline corrosion allowance is as per Pipeline Internal Corrosion Study report.
2. For riser strength test at fabrication yard, the test pressure shall be min 1.4 x DP.
3. Upon completion of pipeline installation, the pipeline system including riser shall be tested offshore at 1.25 x DP as per ASME B31.8 requirement.

B) Platform Coordinates;

CONTRACTOR shall refer Exhibit – 1 Attachment I and II.

C) Anti-corrosion Coating Data

The pipeline shall be protected from external corrosion primarily by means of an externally applied coating supplemented with a Cathodic Protection (CP) System.

CONTRACTOR shall verify the pipeline concrete coating thickness during Detail Engineering Design. CONTRACTOR shall also perform the anode design to finalize the anode size, thickness and length to protect the pipeline throughout its design life. The sacrificial anode design will be based on CPOC-GS-PL-0017 [Ref. 7] and DNV-RP-F103 [Ref. 8].

Typical anti-corrosion coating materials used for pipeline system are listed in table below;

Table 1.2: Anti-corrosion Coating Data

Coating Type	Section
EPDM Coating	Riser Splash Zone
3 Layer Polypropylene (3LPP)	Pipeline
	Riser
	Tie-in Spool
	Subsea bends
Concrete Coating	Pipeline
	Tie-in Spool

D) Environmental Data

Environmental data shall be as per CPOC-GS-GEN-0002, Site Condition and Climate.

E) Seabed Features and Soil Characteristics

Pipeline route survey and soil data is included under Exhibit-12 of the CONTRACT.

2.1.10 CORROSION AND MATERIAL

CONTRACTOR shall design Phase - 5 Topside equipment with suitable material of construction (MOC) and protection against service corrosion for the design life. CONTRACTOR shall refer to GoBy AFC Package, SOR and Gap Register provided under

Technical requirement in Exhibit - 4 detail design development to produce its design solution in the form of CPOC AFC Design Package. CONTRACTOR shall Prepare Material Verification/Validation Study (for Wellhead platform topside installations, pipelines) and corresponding reports under the following scope, but not limited to;

1 Review and update Goby Corrosion Design Basis and Material Selection Report for topside facilities (including risers) and pipelines.

2 Review and update the following to accommodate TPB and MDG Gas and Oil compositional data on GoBy AFC Package reference documents.

- Material selection study topside and pipeline
- Corrosion protection and corrosion monitoring for pipeline and topside facilities
- Corrosion Inhibitor (and other chemical, if any) injection specification
- Corrosion monitoring tools and fittings datasheet (Datasheet shall be included in piping special items)
- Internal Cathodic Protection (CP)/ Coating design for topside equipment

3. CONTRACTOR shall also undertake the follow scope of work;

a. Review and update Risk-based Inspection (RBI) study for the affected platforms.

b. Develop Risk-based Inspection (RBI) study for Equipment and Piping Inspection Plan during operation of new platforms.

c. Review and update Corrosion Management Plan (CMP) for the affected platforms

d. Develop Corrosion Management Plan (CMP) for the new platforms for corrosion management requirements during operation including the identification of corrosion monitoring locations and measures.

e. Baseline thickness measurement for equipment and piping at new platforms. CONTRACTOR shall carry out topside piping and equipment thickness survey to establish base line reading during onshore fabrication and before ready for Loadout. This baseline thickness survey shall form starting point under corrosion management plan

CONTRACTOR shall engage a 3rd party Corrosion specialist for performing the above scope of WORK. The 3rd party Corrosion specialist shall possess Bachelor's degree in Engineering (Mechanical, Chemical or Materials) with minimum fifteen (15) year experience in oil and gas industry of which more than five (5) years shall be as Lead / Principal Corrosion Engineer.

Corrosion specialist shall be conversant with the offshore oil and gas facilities equipment, corrosion inspection and management.

2.1.11 ARCHITECTURAL

Wellhead platforms are provided with 'Operator temporary weather shelter' at sump deck for use by operators. These shelters are classified as weather shelters during extended operator presence on platform and while stranded during harsh weather.

Temporary shelter on each of wellhead platforms (TPB and MDG) shall be provided for capacity of eight (8) pax with the following facilities:

(1) Table (Qty = 1 per platform, size – 3 M X 1 M)
(2) Chairs (Qty = 8 per platform, office quality robust chairs)
(3) Shelves (Qty= 2 per platform, size – 1.8 M ht X 1 M width X 0.5 M depth, robust quality)
(4) Storage cabinet for food (Qty= 1 per platform, robust quality)
(5) Hot water electric kettle (Qty=1 per platform, 2 Liters capacity, robust quality)
(6) White Board (Qty = 1 per platform, size – 2 M X 1 M)

In general, furniture material shall be non-flammable, resistant to corrosion and suitable for an offshore environment. Temporary shelters shall be provided with roof wind turbines and side louvers to ensure adequate ventilation and natural cooling effect. However, shelters shall provide protection from rain, storm, heat, etc. Shelter doors shall be provided with adequate locking arrangement, industrial push bar door, glass viewing panel and sufficient anti-slamming features. Shelter walls and roof shall be white color painted while floor shall be similar color as platform deck floor paint color. Design feature shall incorporate natural light ingress and also provide LED lamps for sufficient lighting with an average sustained illumination level of at least 300 lux.

2.2 PROCUREMENT

Procurement means all Purchasing, Subcontracting, and Materials Management activities required for the WORK. Purchasing means activities related to the acquisition and delivery of materials, whereas Subcontracting means activities related to the acquisition of services or portions of the FACILITIES having significant labor content. Materials Management means activities related to inspection, expediting, FATs, logistics, customs clearance and custody transfer issues, Spare Parts, warehousing, etc.

The term 'Procurement' includes, but is not limited to, the provision of all services necessary to control, purchase, expedite, inspect, intermediate and trans-shipment storage, ship and deliver the materials, equipment and services for the WORK.

2.2.1 GENERAL

The purpose of this section is to provide CONTRACTOR with a description of WORKS to be performed for procurement of all materials and equipment for WHP FACILITIES; subsea pipelines; receiving facilities, host tie-ins, including but not limited to.

a) CONTRACTOR shall provide all items necessary for completion of the WORKS. This shall include, but not limited to permanent material and equipment, temporary equipment (such as Instrument air package, etc), consumables, tools, spares, PPE, construction and commissioning equipment, etc.

b) CONTRACTOR shall provide all required personnel, systems, facilities and other resources as required to efficiently perform all procurement and related activities for the WORK.

c) Procurement of all materials shall be carried out to the highest ethical standards. All bidder lists, RFQ documents, alternate manufacturers/brand from those recommended under MTJA and CPOC lists, etc., shall be reviewed and approved by COMPANY prior to issuance.

d) CONTRACTOR shall comply with MTJA and CPOC Recommended/Approved Manufacturers List (RML/AML) in selection and purchase of equipment brand. Any deviation to RML, AML or RMEL is subject to CONTRACTOR's demonstration to COMPANY that recommended brands/manufacturers having technical limitations, perished from market or suppliers unable to comply requirements. All alternative brands/ manufacturers if proposed by CONTRACTOR are subject to demonstration and acceptance to COMPANY on its technical suitability or superiority and all other brands in RMEL and/or RML are exhausted meeting the technical requirement. Deviation from AML is not accepted. Refer attachments to Exhibit-1 for corresponding lists.

e) All Technical Bid Evaluation (TBE) report shall be submitted to COMPANY for approval and must contain details of actual manufacturer (Brand) and country of origin of all materials, details of supplier and its location and the final recommended bidder. All TBE

shall be approved by COMPANY and final selection of manufacturer brand is subject to technical suitability demonstration to COMPANY and approval of COMPANY.

f) For the purchase of material, equipment or services qualified under GC-35 CHANGES, COMPANY shall be kept informed and involved throughout the procurement process including technical and commercial discussions with respective supplier/s. CONTRACTOR shall comply with COMPANY directions on technical and commercial discussions and conclusion with respective supplier/s.

g) In executing its procurement activities, CONTRACTOR shall keep COMPANY informed of CONTRACTOR's ongoing procurement activities to maintain alignment with COMPANY via meetings and the issuance of procurement status reports (PSR) on an agreed schedule and also on monthly full update basis. CONTRACTOR shall ensure meetings and reports highlight all problem areas related to procurement and describe actions being taken to resolve these issues.

h) CONTRACTOR shall also invite appropriate COMPANY representative(s) to all bid clarification, technical bid evaluation, pre-production, and other procurement-related meetings between CONTRACTOR and Suppliers in sufficient time for the Representative(s) to attend, if COMPANY requires.

2.2.2 LONG LEAD EQUIPMENT

Long Lead or critical items/equipment in general are defined as that material and equipment where deliveries are potentially longer and are likely to impact critical path of the project, such as material and equipment, namely, Primary Structural steel, line pipe(for risers) and bends, Safety relief valves, Choke Valves, Actuated Ball Valves, Pedestal Cranes, etc.

A list of long lead equipment and their status shall be published and updated for periodic review of COMPANY at least on fortnightly basis.

CONTRACTOR shall nominate the VENDOR(S) from the Approved Vendor's List for each long lead or major equipment.

CONTRACTOR must place orders for all long lead equipment and Material within four (4) months or earlier from the EFFECTIVE DATE. CONTRACTOR shall be responsible to expedite, accelerate and take all necessary measures to mitigate any and all delays and consequences to all parts of project without any additional cost to COMPANY.

NOTE: The delivery of Primary Structural steel is highly critical to start of fabrication/construction WORK. CONTRACTOR shall endeavor to place corresponding Purchase Order (PO) within three (3) months from EFFECTOVE DATE and shall ensure the required delivery in line with APPROVED fabrication schedule. If necessary split / supplementary order shall be considered to manage early delivery of some of the key material required at initial phase of construction. Procurement shall liaise with engineering team to facilitate required MTO and specifications for Primary steel.

2.2.3 COMPANY FURNISHED MATERIALS AND EQUIPMENT – NOT APPLICABLE

2.2.4 CONTRACTOR FURNISHED MATERIAL AND EQUIPMENT

1. CONTRACTOR shall supply all manpower, materials and equipment for complete Fabrication/construction, onshore testing and pre-commissioning and commissioning, sea-fastening and load-out, preservation and protection (onshore and offshore), offshore transportation and installation, offshore HUC (Pre-Drill and flow line hook-up) and host – tie in, first fill, startup, spares, temporary equipment (Instrument Air package), etc., in order to complete the WORKS. Materials and equipment shall conform to the CONTRACT requirements. CONTRACTOR shall be responsible to verify the quantity, quality and the accuracy of the specifications prior to making any procurement.
2. CONTRACTOR shall be solely responsible for performing material take off (MTO) for all materials and shall not rely solely on GoBy Design Package. The GoBy Design Package provides go by for typical arrangement and system configuration and does not provide correctness and completeness assurance in pipe sizes, package and equipment dimension, capacities and design conditions. All such requirements shall be taken from Exhibit – 4 and Exhibit – 5 apart from other Exhibits of the CONTRACT.
3. CONTRACTOR shall submit within thirty (30) days after EFFECTIVE DATE for COMPANY's review the following reports template but not limited to:
   - Procurement Status Report
   - Expediting Status Report
   - Technical Bid Evaluation Summary Sheet
   - Material Deficiency/reject Report
   - Vendor Data Status Report
4. Procurement of materials, equipment and sub-contract services shall be from MTJA and CPOC Recommended Manufacturers Lists and CPOC Approved Manufactures list for Line Pipe Manufacturers, as attached to Exhibit - 1.
5. Special attention shall be paid to ensure timely placement of order and delivery of long lead / critical material and equipment. This include but not limited to High grade steel, Pedestal Crane, Control valves, choke valves, pressure safety valves, etc. **Lead time for compliance with regulatory requirements for Steel importation (mainly for Malaysia) may potentially a high risk material for possible impact of Project execution and necessary mitigation shall be put in place for maintaining Project critical path.**
6. CONTRACTOR shall provide vendors assistance for the onshore activities, offshore commissioning and start-up for all equipment supplied by CONTRACTOR.

7. COMPANY shall have the sole right to accept or reject any deviations. In the absence of formal approval or waiver(s), COMPANY requires CONTRACTOR to supply all equipment and materials in full compliance with the specifications and Drawings.
8. CONTRACTOR shall be responsible for the timely ordering and delivery of all materials to ensure that the completion of WORKS is in accordance with the CONTRACT.
9. The materials which CONTRACTOR supplies shall be new and of good quality. COMPANY reserves the right to accept or reject any materials and demand removal of any materials found defective, corroded and damaged from the Fabrication/construction site at CONTRACTOR's own cost.
10. CONTRACTOR shall be responsible to verify the accuracy of material specifications prior to making any procurement and issuance to suppliers, vendors and sub-contractors. Any changes must be highlighted to COMPANY and are subject to COMPANY approval. COMPANY shall not incur any additional cost on the impact of changes in project technical specifications.
11. CONTRACTOR shall furnish all training materials, training equipment and classroom for training sessions to COMPANY within CONTRACT PRICE.
12. CONTRACTOR shall be responsible for obtaining all original documents or certified true copy endorsed by a third party if original documents cannot be provided (subject to COMPANY's approval) and ensure that all documents are complete and materials conform to the specifications and Drawings, codes and standards. These documents shall include at least the mill certificates, test certificates, and other relevant documents.
13. CONTRACTOR shall ensure that all purchase orders clearly state the vendor data requirement, vendor specialist support requirement during onshore pre-commissioning and offshore commissioning, start-up spares and list of two years operational spares and accessories requirements with price, in accordance with the CONTRACT. All equipment vendor data shall be submitted to COMPANY. “As-Built” vendor data are required for incorporating into the Final Documentation.
14. CONTRACTOR to submit within thirty (30) days after EFFECTIVE DATE the Source Inspection Matrix for COMPANY approval. COMPANY reserves the right to conduct source inspection at manufacturer's mills or vendor's works prior to Factory Acceptance Test (FAT).
15. CONTRACTOR shall preserve and provide proper storage of materials as recommended by manufacturers. These shall include dry and air-conditioned storage rooms at CONTRACTOR’s Fabrication/construction site. CONTRACTOR shall also provide adequate firefighting apparatus not limited to fire extinguisher located permanently at these material storage areas.
16. CONTRACTOR shall be responsible for the receipt, handling, inspection, preservation and storage of all materials and / or equipment:

- Receipt of equipment and / or material packages as packed and shipped by vendors at CONTRACTOR's Fabrication yard/WORKSITE.
- Unpacking / uncrating of materials for inspection.
- Inspection of materials immediately after delivery
- Issuance of inspection report highlighting any loss, damage or defects found within forty eight (48) hours of material arrival.
- Restoration of preservation measures.
- Provision of suitable protected storage areas as per manufacturer's recommendation until materials are required for installation.

17. Forwarding and Shipping: Prior to releasing materials or fabricated packages for shipment, CONTRACTOR shall ensure, in particular, the following requirements are met:
    - All required vendor documentation such as data books, including maintenance and preservation manual, test curves, etc. are available and in suitable format and in conformance with project specifications.
    - All equipment and materials are suitably preserved, maintained and prepared for shipment in accordance with the packing and other requirements in the purchase order, accompanied by shipping lists, material certificates, and an appropriate Inspection Release Notice.
    - All necessary inspection certificates by inspecting agencies or marine warranty surveyors are available, in particular with respect to the characteristics of the means and procedures to be used during packing, weighing, load-out, sea fastening, transportation, offloading and the like. Regardless of any APPROVAL, CONTRACTOR is solely responsible for the adequacy of transportation of any part of the facilities to the onshore WORKSITE(s) and the offshore SITE.
18. CONTRACTOR shall consult with the material and / or equipment vendors to get their recommendations on protective measures. Special preservation may be required to protect against more aggressive environments such as extreme cold or heat, salt spray or salt water and wind-blown sand or dust.
19. CONTRACTOR shall not accept onto any work site or quarantine store materials that do not comply fully with the requirements of the CONTRACT unless prior approval has been obtained from COMPANY to release such materials for use in the WORK.
20. All equipment including valves, pipes and fittings shall not be left directly on the ground. They shall be kept minimum 150 mm above the ground.
21. CONTRACTOR shall be responsible to perform inspection at source for all materials supplied by CONTRACTOR, to ensure that deficiencies are identified and rectified

during manufacturing before they are shipped to fabrication yard. All non-conformances be identified, rectified and documented.

2.2.5 PROCUREMENT ACTIVITIES

CONTRACTOR shall perform all necessary procurement activities including but not limited to:

1. Prepare RFQ specifications and documents in accordance with the Project specifications. Ensure that the terms and conditions of purchase, requirement of Pre-commissioning, Commissioning, Start-Up, Two Years Operational Spares, Warranties, Spare Parts & Interchangeability Record ("SPIR") forms and final documents have been included properly in the enquiry document. RFQ specifications for major equipment shall subject to COMPANY approval.
2. RFQ's shall specify that Vendors' Quality Programs shall comply with the requirements of ISO 9000 series.
3. Where items are detailed on the Approved/Recommended Manufacturers List (CPOC RML, MTJA REML and CPOC AML), CONTRACTOR shall only solicit bids that are on these lists. Procurement of those items, which are not listed in these lists shall be carried out on a worldwide competitive basis except when technical regulations or specifications require otherwise.
4. CONTRACTOR shall be responsible for procurement of all start-up and commissioning spare parts and chemical and lubricants, including first fill of same. Two year operational spare parts will be purchased by COMPANY. However, COMPANY may request CONTRACTOR to purchase these spares as part of his equipment purchase. CONTRACTOR will be reimbursed for all such spare parts purchased by CONTRACTOR in accordance with the contract.
5. CONTRACTOR shall ensure that all equipment Vendor agreements include suitable provisions for Vendor training of COMPANY personnel.
6. Review bids received from Vendor(s) and prepare technical bid tabulations prior to placement of purchase orders. Review all equipment selection and verify their suitability and operability for the service intended. Before placement of purchase orders, assess and ensure the financial status of Vendor and the availability of spare parts recommended by Vendors for Pre-Commissioning, Commissioning and Two Years Operational Spares including Unit Price thereof and Vendor's present work load.
7. Any discrepancy from Vendor's proposal and against the CONTRACT requirements shall be highlighted to COMPANY for resolution.
8. Prepare purchase orders, complete with all attachments (purchase requisitions, specifications, drawings, shop inspection and testing requirements), spare parts

requirements, Vendor's and supplier's assistance requirements. Provide copies of priced purchase orders to COMPANY as part of Vendor's final documentation.

9. Purchase as per the specifications and in accordance with the project scheduling requirements for all equipment, materials, bulks, consumables and the like for the WORK.
10. Issue status reports on purchasing activities to COMPANY.
11. Review and Approval of the Vendor's drawings and documents (drawings/specifications to be submitted to COMPANY prior to Approval by CONTRACTOR).
12. CONTRACTOR shall submit to COMPANY for review all bulk MTOs with supporting documentation on the method used to calculate the required quantities. All overage allowances shall be clearly stated.
13. CONTRACTOR shall obtain guaranties and warranties of all equipment and material for at least thirty six (36) months from supply to fabrication/construction yard or 12 months after commissioning, whichever comes later. Furnishings such guaranties and warranties shall be CONTRACTOR responsibility under CONTRACT PRICE.

2.2.6 EXPEDITING

In accordance with scheduling requirements, CONTRACTOR shall perform expediting of materials, Vendors' data, technical assistance, personnel and documentation from RFQ to delivery at Construction Sites for Vendors' and Suppliers' items including the materials on suborders. CONTRACTOR shall maintain a system to monitor progress on all the purchase orders and prepare and issue a detailed schedule to COMPANY. The system shall be able to identify those items of the materials that are critical or are potentially critical from a schedule point of view and require special attention to ensure timely delivery, along with an action plan to achieve it.

CONTRACTOR shall not limit his expediting activities to only progress reporting. Expediting efforts shall continue until all spare parts, replacements and final vendor documents have been received.

CONTRACTOR shall take appropriate remedial action to expedite delivery by Vendors and Suppliers who are behind schedule. CONTRACTOR shall promptly recommend appropriate alternative remedial action to COMPANY and implement same. Any remedial action, including airfreight as required to maintain schedule, shall be at CONTRACTOR's sole cost.

All expediting efforts shall be directed towards achieving or improving the material delivery dates while maintaining the purchase order design specifications, conditions and schedules. Any actual or potential deviations or slippage from these requirements shall be immediately transmitted to COMPANY in writing.

CONTRACTOR's other expediting activities shall include, but not be limited to, the following:

a) CONTRACTOR shall expedite and take all appropriate actions to obtain all technical data and other documentation from the CONTRACTOR furnished equipment Vendors in a timely manner.

b) During the Warranty Period, CONTRACTOR shall expedite all replacement materials and associated documents.

2.2.7 SHIPMENT AND FREIGHT FORWARDING

CONTRACTOR shall sanction the release of completed goods for shipment after satisfactory completion of final inspections and certification.

CONTRACTOR shall execute forwarding activities for all equipment/material required for WORK.

CONTRACTOR shall organize and co-coordinate packing, marking and transporting of equipment and materials from the source of supply determined in the purchase order to the Fabrication Sites. Such co-ordination work shall include but not be limited to:

- Preparation of packing, marking, shipping and documentation specifications.
- Inspection and certification as the case may be of packing, marking and loading.
- Organize and secure the approval of the marine transport conditions by a Marine Warranty Surveyor.
- Develop plans and procedures for freight forwarding, handling and customs clearance of equipment and materials to ensure that all freight is consigned to arrive at the Fabrication location/WORKSITE on time.
- Organize and ensure timely shipment of materials and equipment to WORKSITEs.
- Prepare, maintain and issue a monthly shipping progress report and monthly shipping forecast in a format approved by COMPANY.
- Arrange for and pay the costs of the importation of all CONTRACTOR Supplied materials and equipment purchased, for receiving and off-loading at WORKSITEs.

2.2.8 CUSTOMS CLEARANCE, CUSTOMS DUTY, IMPORT REGULATIONS, ETC

CONTRACTOR shall arrange and provide all inland transportation, sea freight, marine insurance, payment of custom duties, custom clearance including legalization fees, tax exemption application, transportation of all equipment/material to the Fabrication Sites and to the offshore location. COMPANY may assist CONTRACTOR in submission of exemption request authorities as applicable. However, COMPANY shall not be liable for

any duties paid by CONTRACTOR or require to be paid for any import and export material to meet schedule requirement. CONTRACTOR shall take into account and be responsible for any late approval of tax exemption from authorities and no compensation will be paid by COMPANY for all such delays.

CONTRACTOR shall comply with latest local regulatory requirements (Malaysia/Thailand) for importation of material and equipment. Necessary regulatory clearance from CIBD-Malaysia on Certificate of Authenticity (COA) for importing structural steel into Malaysia is one of such requirements. Similar regulatory clearance as maybe applicable for importing structural steel into Thailand shall be complied with.

2.2.9 RECEIVING INSPECTION OF MATERIALS AND EQUIPMENT

CONTRACTOR shall inspect materials and equipment and shall remedy any non-conformity in conflict with approved drawings and specifications.

The receiving inspection is to be done based on the procedures for receiving inspection of materials and equipment elaborated in the project execution and quality plan (PEQP).

Upon receipt of materials and equipment, CONTRACTOR shall:

- Check the quantity and quality of the material or equipment supplied, and the material certificates, material release certificates, operation manual, catalogs, and other contractual documents that are supplied.
- Inspect, test and identify the received items or lots
- Analyze the quality control documentation supplied by manufacturer or SUBCONTRACTORS.

In case that the material or equipment is in accordance with the purchase document, CONTRACTOR shall issue a result record report, traceable to the identification used by it on the material or equipment. The identification and the traceability are to be made at least in relation to the lot of materials and equipment and at least during storage. In the cases where during the receiving inspection no inspection or test is required, the results record report may be replaced by the material certificates with its record of approval by CONTRACTOR.

In case the material or equipment is not in accordance with the purchase document. CONTRACTOR is to proceed as follows:

- For materials or equipment presenting non-conformities which give rise to restitution, there is no requirement for the issuance of any document.
- For materials or equipment showing non-conformities to be corrected at the construction site, a non-conformity report is to be issued.

For non-conforming materials or equipment to be corrected at the construction site, the treatment of non-conformities shall comply with the provisions of the project execution and quality plan (PEQP).

CONTRACTOR's quality control group is to perform the inspection and issue to COMPANY the corresponding results record report or non-conformity report within three (3) working days prior to issue of materials for installation and not more than five (5) working days after arrival of the material or equipment at the WORKSITE/s.

2.2.10 MATERIAL TRACEABILITY

Materials shall be subjected to an appropriate traceability procedure so as to ensure conformance with specifications and easy retrieval of the documentation pertaining to each item.

The material identification and the traceability plans are to be developed in order to:

a) Correlate each item, part, lot or component with the drawings, specifications or other applicable technical documents from the receiving to the pre-commissioning and commissioning.
b) Identify each item, part, lot or component in a particular manner, to distinguish similar items manufactured in different runs.
c) Record the identification of the item, lot or component used, in the applicable technical documentation, when traceability is required.

The material identification and traceability plans are to be elaborated prior to the start of the services, and presented for approval by COMPANY.

2.2.11 HANDLING AND STORAGE

CONTRACTOR shall be fully responsible for making all necessary arrangements for the supply, delivery, receipt, unloading, safekeeping, storage, issue and stock reconciliation of CONTRACTOR provided materials, in a manner that provides for the uninterrupted progress of the WORK in accordance with the CONTRACT. This shall include the provision of all temporary services to preserve and maintain the equipment by CONTRACTOR until HANDOVER.

CONTRACTOR shall be wholly responsible for the security, safeguard and protection, including environmental protection and preservation of all CONTRACTOR’s supplied equipment and materials upon receipt.

CONTRACTOR shall handle all equipment and materials in such a manner to prevent damage and contamination of exotic materials. Lifting gear, cranes, forklifts, trucks, trailers, barges and vessels shall be properly sized, in good condition, and operated by qualified and experienced personnel. Without limiting CONTRACTOR's obligations under

the CONTRACT, COMPANY shall have the right to stop any material handling that damage or has the potential to damage any CONTRACTOR Supplied equipment and materials.

Under no circumstances shall materials be dragged, dropped, pushed or rolled when handled. Material shall be loaded and unloaded using appropriate lifting equipment. CONTRACTOR shall be liable for repair or replacement for any damaged or missing material and equipment identified subsequent to the Material Receipt Report.

CONTRACTOR shall institute material handling and control procedures, subject to COMPANY review and approval, for the purpose of identifying, inspecting, off-loading, receiving, storing, processing and accounting of all equipment and materials. CONTRACTOR shall prepare and maintain a COMPANY approved material and equipment control procedure to effectively monitor and control the issuance of materials for incorporation into the WORK and to anticipate any shortage.

All equipment and materials shall be insulated from the ground (such as by wood blocks or on shelving), not be standing in water and not be exposed to corrosive environments.

COMPANY shall have the authority to require immediate remedial action by CONTRACTOR for mishandled and improperly stored equipment and materials.

Fragile equipment sensitive to the weather conditions (such as instruments, electrical switchgear, MCC's, UPS equipment, electronic devices, etc.) shall be stored in totally enclosed, heated and air-conditioned rooms. Equipment shall only be installed after the area has been environmentally conditioned (for example but not limitation HVAC operational, clean/dry air and the like). The environment must be maintained until the equipment is preserved for load-out and transportation.

When installed outside, electric equipment shall be suitably protected from the environment (by way of example and not limitation, weather, sand, construction damage) by temporary shelters or plastic sheets.

Handling preservation, protection and storage of equipment and materials shall be carried out in conformance with Vendor's Instructions during fabrication, transportation and installation, drilling and perforation, offshore hookup and commissioning stages till handover to COMPANY / COMPANY Operations.

As a clarification to the skid limits of equipment, it is understood that CONTRACTOR supplied equipment shall be complete with tie-in points provide to which external connections can be made (e.g. Flanges, butt welding, weldolets, union fittings, junction box, terminal block, etc). In the event that items may be required to be removed for transportation, offshore installation, offshore drilling and shipped loose offshore then CONTRACTOR shall, at its expense, reinstate said ship loose items.

2.2.12 INSPECTION AND TESTING

CONTRACTOR shall provide all necessary inspection and testing activities for all equipment and materials including but not limited to:

1. CONTRACTOR shall carry out all inspection and testing required for all equipment and materials and shall be responsible for ensuring that all goods are strictly in accordance with the specifications as defined in this contract.
2. CONTRACTOR shall specify requirements for each material requisition, or alternative procedures designed to ensure an equally high standard of inspection. An approved criticality rating system shall be adopted by CONTRACTOR and shall form part of his overall quality management system and plan.
3. *CONTRACTOR shall submit an "Inspection and Test Plan" to COMPANY for review and approval within thirty (30) days from the EFFECTIVE DATE*. The Plan shall identify the inspection and testing activities, the applicable procedures, the records that will be generated and the type of inspection required: i.e., Random, 100% witness and whether it is a hold point. Separate columns shall be provided for COMPANY to be able to indicate the tests that must be witnessed by COMPANY.
4. CONTRACTOR shall furnish, install and maintain in a safe operating condition, the necessary scaffolding, ladders, walkways, lighting and the like, to allow for safe and thorough inspection by COMPANY. Once the topsides deck superstructure is erected, access to the deck from the ground level shall be by a properly placed stairway. Such stairs shall have permanently attached handrails and stair treads of sufficient width to provide 1" minimum overlap to the stair above.
5. CONTRACTOR's technicians involved in testing shall be suitably qualified and be competent in the operation of the equipment and test equipment described in these specifications. Only qualified inspectors employed by CONTRACTOR shall perform inspection. CONTRACTOR shall implement and staff a Quality Control program. Removal of CONTRACTOR's Quality Control staff shall require COMPANY approval. All Quality Control Inspectors shall submit reports directly to COMPANY Representative on matters relating to quality control.
6. CONTRACTOR shall provide and allow COMPANY access to WORKSITE facilities for inspection of welds. These facilities shall include full time availability on site, as and when required by COMPANY, of radiographic and ultrasonic equipment, isotopes, dark room equipment, viewing facilities, and the full time services of qualified technicians conversant with radiographic, ultrasonic and other inspection techniques. Technicians shall possess current qualifications. Technicians shall be competent in the operation of equipment involved in the testing.
7. Shop inspection shall be carried out by CONTRACTOR at both the point of manufacture and, where necessary, at the source of Vendor(s) and/or Sub-Vendor's materials.

8. CONTRACTOR shall be responsible for all quality assurance activities including Vendor's and Sub-Vendor's inspection.
9. CONTRACTOR shall ensure that adequate provision is made at all times for COMPANY to have the option of participating in pre-inspection meetings, inspection visits and test witnessing. CONTRACTOR shall prepare anticipated testing programs providing COMPANY sufficient advance notice for their participation. All Factory Acceptance Tests shall be witnessed by COMPANY.
10. CONTRACTOR shall submit to COMPANY written reports on inspection and testing carried out in sufficient detail for COMPANY to monitor the effectiveness of the inspection and testing. CONTRACTOR shall issue Inspection and Testing reports to COMPANY within five (5) calendar days of the inspection visit or test. CONTRACTOR shall prepare and provide to COMPANY an inspection co-ordination procedure.
11. CONTRACTOR shall compile all fabrication/construction and manufacturing data folders containing mill test certificates, machinery test and all other relevant inspection data and submit same upon delivery of equipment and/or material to WORKSITEs.
12. CONTRACTOR shall provide competent inspection personnel at all fabrication sites to monitor the quality of the WORK. Personnel qualification shall be submitted to COMPANY for approval.

2.2.13 PRE-COMMISSIONING, COMMISSIONING, START-UP SPARE PARTS

During its RFQ process CONTRACTOR shall ensure that VENDORS provide full details of all spare parts required during each of the following WORK activities:

- Onshore pre-commissioning,
- Offshore commissioning,
- start-up,
- two years operational spares (listed with price)

In the event, that this information is not provided, VENDOR bids shall not be evaluated by CONTRACTOR.

CONTRACTOR shall ensure that while submitting their quotation, VENDOR shall provide, but not limited to, description of the spare part items, number of units recommended and ex-WORKS unit price including seaworthy packing.

CONTRACTOR shall procure and supply Pre-Commissioning, Commissioning and Start-Up spare parts, chemicals and lubricants (including initial fill), special tools and handling gear for each item of equipment as recommended by respective VENDOR. CONTRACTOR shall provide first fill of all lubricants, oil, grease, diesel in the machinery day tanks and in Pedestal crane tanks, emergency diesel generator, hot oil, machine oils, fresh water, gases, chemicals, etc supplied and charged into the WORK, all included in

CONTRACT PRICE. All such chemicals, gases, oils used for flushing, onshore testing, FAT, SAT, offshore HUC shall not be considered as first fill.

CONTRACTOR shall develop a procedure for the proper receipt, stacking, storage, inventory control and handling of spare parts, chemicals and lubricants and shall provide all services in accordance with same.

2.2.14 TWO YEARS OPERATIONAL SPARES

CONTRACTOR shall provide itemized price lists for the Two (2) year recommended operational spares. COMPANY may either purchase the two years operational spares or instruct CONTRACTOR to provide some or all of such spares. In the event COMPANY instructs CONTRACTOR to provide any spares, COMPANY will compensate CONTRACTOR for the price of such spares in accordance with the provision of the CONTRACT. VENDOR's price lists shall be fixed and firm for the duration of the CONTRACT and shall not be subject to escalation for any reason.

2.2.15 SPARE PARTS INTERCHANGEABILITY RECORD (SPIR)

CONTRACTOR shall obtain through the successful Vendors, a completed SPIR form together with all relevant drawings and technical information within two (2) months after placement of Purchase Orders.

2.2.16 VENDOR REPRESENTATIVES

VENDOR specialist representatives and engineers (VENDOR Representatives), as may be required for the supervision of installation, pre-commissioning and commissioning of the WORK, field testing to prove effectiveness of communication equipment, etc shall be provided by CONTRACTOR up to MECHANICAL ACCEPTANCE. CONTRACTOR shall prepare a schedule of the dates for which each VENDOR Representative is required to be on-site. This schedule shall be submitted for APPROVAL prior to mobilization of Vendor Representatives. This schedule shall be updated to meet onshore construction schedule and offshore HUC schedule. CONTRACTOR shall also mobilize all VENDORs as required by COMPANY during plant start-up.

CONTRACTOR shall be responsible for all travel, accommodation and sustenance, entry visa and transport arrangements for VENDOR Representatives as required. VENDOR Representatives shall be under the direction of and shall report to CONTRACTOR whilst on-site.

Upon achieving MECHANICAL ACCEPTANCE and facilities start up, COMPANY may at its sole discretion APPROVE VENDOR representative(s) to remain on site to assist during plant stabilization. In the event that a VENDOR Representative already been mobilized to SITE by CONTRACTOR and is required by COMPANY to extend their stay on SITE after

the plant start-up, any additional cost due to such extension of stay shall be borne by COMPANY.

2.2.17 **RETURN OF CFME SCRAP, SURPLUS AND EXCESS MATERIAL – NOT APPLICABLE**

2.3 CONSTRUCTION

2.3.1 GENERAL

CPOC Wellhead Platforms (WHP) shall refer generally to the topside and substructure. The WHP shall provide well slots to be supported through which gas/condensate wells may be drilled and completed with Xmas Trees. Flowline tie-in spools shall be pre-fabricated and tested for offshore installation under relevant flow line batch hook-up campaigns (BASE CASE - HUC) or shall be sent "shiploose" while mobilization for HUC campaign (OPTION CASE – HUC). A number of other pieces of equipment, including but not limited to, well flow lines, production manifolds, well test facilities, wellhead controls, vent and relief facilities, Booster Compressor (future) system tie-ins, SCADA equipment, pipeline ping launchers and receivers, future pig receivers Tie-ins, chemical injection skids, material handling equipment, E&I shelter, Operator's weather shelter, etc shall also be supported by this platform. WHP design life is required to be fifteen (15) years. The WORK for the WHP includes the installation, hook-up and testing of all vessels, equipment, buildings and other items located on, within or attached to WHP.

CONTRACTOR shall complete the WHP with all components mounted, installed, connected, tested, pre-commissioned and commissioned in all respect in the fabrication/construction yard, except for those items designated to be installed offshore. All offshore installed items and ship loose items for T&I requirements and removal for drilling requirements shall be properly bagged, tagged along with job cards to be delivered offshore and reinstated by CONTRACTOR during offshore HUC PHASE. All such activities shall be under CONTRACT PRICE and Scope of WORK. The Topsides and Sub-structures shall be fabricated on CONTRACTOR supplied Load out structures.

Receiving facility and associated integration on TPA, MDE and MDPP shall be constructed offshore by CONTRACTOR.

The other general requirements of construction includes but not limited to the following:

1. The fabrication/construction and final assembly will be performed in APPROVED yards and locations in yard. Such yards and locations shall be to the acceptance of COMPANY suitable for performance of the WORK including load out and sea fastening.
2. CONTRACTOR shall complete all fabrication/construction, testing and pre-commissioning and commissioning WORK and achieve onshore MECHANICAL COMPLETION in line with the APPROVED CONTRACT SCHEDULE and prior to the

load out. All preservation and protections for platform equipment and facilities shall be completed and inclusive under onshore MECHANICAL COMPLETION.

3. CONTRACTOR shall obtain COMPANY's written acceptance of the proposed construction sequence prior to the fabrication of any major structural/piping component.
4. CONTRACTOR shall establish a COMPANY approved area marking system to ensure restricted personnel access to areas with overhead work, radiographic work or with pressure testing in progress. Barricades and barriers shall be provided where handrails and deck plate have been removed or the work platform is elevated above the ground.
5. Exhibit - 4 Technical Requirements and Exhibit - 5 CPOC General Specification may not, in some cases, show all the specific details required for fabrication/construction of the facilities. CONTRACTOR shall allow for any such items required for the WORK CONTRACT PRICE including detailed design development in the CPOC AFC Design Package.
6. Fabrication/Construction Yard Facilities: CONTRACTOR shall provide the following as a minimum:
   a) All temporary and permanent site offices, stores, warehouses, materials and equipment, yards, roads, hard-standing, load-out, sea-fastening, etc., to the satisfaction of the COMPANY for the proper execution of the WORK.
   b) Competent personnel and proper equipment for satisfactory operation of the yard facilities and for the receipt, handling, storage, and preservation of each and every item of construction material and equipment supplied to and by CONTRACTOR.
   c) Temporary watertight enclosures as necessary to protect the WORK and equipment from weather, dirt, dust and vermin.
   d) All necessary scaffolding required to complete the WORK. All scaffolding shall be in accordance with British Standard BS5973, and CONTRACTOR shall operate a "Scaff Tag" system. There shall be at least one BS-5973 certified scaffolder available on site, who shall supervise all scaffolding activities.
   e) All necessary temporary lifting, slinging and rigging equipment are required. All such equipment shall be tested, certified and color coded. All certification shall be available for COMPANY inspection.
   f) Sufficient lighting for execution and inspection of the WORK.
   g) Sufficient weather shields to protect the WORK that is sensitive to weather.
   h) Access to the WORK for COMPANY personnel at all times.
   i) Assurance that sand, spent grit blast material or other loose material is regularly dampened in order to prevent it from being blown into stored materials or onto the WORK. The entire site shall be maintained in a clean, dust free and orderly condition.

j) Drip trays for any temporary equipment used on the deck that is likely to drip oil.

k) Continuous cleanup of the installation site. As a minimum, CONTRACTOR shall remove excess materials, temporary facilities and scaffolding when no longer needed, rough sweep or clear the area, and pick up and safely dispose of refuse.

l) Washing or further cleanup as required or as directed by COMPANY SITE REPRESENTATIVE and/or their delegates.

m) Arrangements to have yard facilities immediately available upon having been advised by COMPANY to proceed with the WORK.

n) Potable water, sanitation, resting shelters and first aid facilities at ground level in close proximity to the site, for all personnel use.

o) Protection from damage caused by grit blast material, water from hydrostatic pressure tests, dust generated from grinding machines, welding operations and dropped objects for all COMPANY-furnished equipment and CONTRACTOR's equipment up through MECHANICAL ACCEPTANCE. CONTRACTOR shall be responsible for clean-up, repair and replacement of any damaged parts at its own cost.

7. Shop Drawings: CONTRACTOR shall prepare, all shop drawings, spool drawings, transportation grillage and sea fastening drawings, load out structure drawings, installation aids and any other drawings that are required for the WORK. All such drawings shall be reviewed by COMPANY prior to the commencement of fabrication. COMPANY reserves the right to review any or all shop drawings at its sole discretion. Shop drawings shall be revised to incorporate COMPANY and MWS comments.

8. Notification and Access to Work: While work in progress, COMPANY representative and his authorized designates shall be given access to the WORK at all times. COMPANY reserves the right to specify 'HOLD' points in the conduct of the WORK where COMPANY deems that witness inspections or conferences between COMPANY and CONTRACTOR to review accomplished work or plan future work must occur prior to continuation of further work. No work may recommence from a designated HOLD without written approval to recommence work from COMPANY.

9. Risk Assessment: CONTRACTOR shall be responsible for the conduct of Risk Assessment of the WORK. The Date and time of this Risk Assessment shall be established at key milestone points in the project schedule. As a minimum, the Risk Assessment shall be scheduled to coincide with the completion of design confirmation and AFC package issuance. The Risk Assessment shall address cost, schedule, constructability, installation methodologies and all impacts to WORK including concurrent activities with other projects. CONTRACTOR and COMPANY shall provide appropriate personnel to participate in Risk Assessment. All issues identified in the Risk Assessment shall be catalogued in a Risk Register which will be kept current at all times throughout the project as new risks are identified. COMPANY representative and CONTRACTOR shall evaluate the Risk Assessment issues and jointly address all

issues. The action sheets shall be established and closed out and submitted for COMPANY's review and APPROVAL prior to commencing construction. CONTRACTOR shall arrange and conduct Construction Risk Assessment (CRA) Workshops for all major construction, lifting, load out, transportation and installation and HUC activities for both onshore and offshore WORK. Such workshops shall be facilitated by 3rd party experienced industry specialist. Appointment of such 3rd party specialist shall be reviewed by and is subject to COMPANY approval. A CRA procedure stating the methodology and identifying keys /nodes for assessment shall be submitted to COMPANY for approval prior to WORKSITE Mobilization. The procedure shall be reviewed / updated before each workshop. CRA shall not be mixed with JSA. Activity specific JSA sessions shall be conducted by CONTRACTOR and approved by COMPANY.

10. CONTRACTOR shall operate a Permit to Work (PTW) System to control activities up to the point of MECHANICAL ACCEPTANCE. CONTRACTOR system shall also specifically manage and control energizing of sub-systems and systems. CONTRACTOR shall submit said procedures for APPROVAL prior to commencing fabrication/construction activities.

11. During the course of fabrication/construction CONTRACTOR shall undertake all necessary engineering, design and supply to support the fabrication/ construction process. This shall include, but not be limited to:

    a) Design and engineering of all temporary fabrication aids (such as platforms and staging, bracings, supports, lifting points, and others). CONTRACTOR shall also be responsible for the specification, procurement and fabrication of all materials for these temporary fabrication aids.

    b) All required structural analyses to ensure that the fabricated steelwork is not over stressed at any time during fabrication.

    c) Design of all temporary strengthening to structure, including internal sea fastening, weather protection and green water protection

    d) Provision of lifting method statements for lifts above 50 tons including tandem lifting operations and prepare appropriate structural analyses to support a safe lift that does not overstress the structure or lift points/rigging.

    e) Design of main and temporary supports.

    f) Confirmation of yard foundation integrity.

    g) Provision of verifying calculations to support any material / size substitutions to secondary steel (if required).

    h) Assurance that the structure does not suffer from wind Vortex Induced Vibrations (covering both strength and fatigue considerations).

i) Provision of design calculations and structural analyses for WHP to ensure that the steelwork is not over stressed during lifting and transportation from other yard to CONTRACTOR yard.

j) Development of the weighing procedure.

k) All engineering design support for piping and equipment:

- support of pipe spooling
- hydro-test load checks (piping, equipment and supporting steelwork)
- design of field run piping and associated supports
- stress analysis for revised piping or pipe supports

l) All engineering design support for instrument and electrical disciplines:

- design of field run cable trays, MCT's and local conduits
- local supports for instruments and electrical devices
- design of field run tubing
- cable spooling and drumming

m) Miscellaneous engineering support:

n) pre-commissioning, commissioning and operating manuals

o) Design documentation associated with these activities shall be reviewed by COMPANY prior to the associated fabrication activity commencing.

2.3.2 STRUCTURAL

1. CONTRACTOR shall supply all steels, fabricate, paint / coat, install and inspect all structural steel works, including the buildings, as indicated in CPOC AFC Design Package'.
2. It is essential that the fabrication/construction sequence of the structural components includes distortion control to minimize remedial work. All distortions that exceed the tolerances specified in COMPANY specification shall be brought to the attention of COMPANY. All remedial work shall be included in CONTRACT PRICE.
3. CONTRACTOR shall verify and inspect primary steel upon receiving it at yard. All tubular material shall be checked for any possible ovality and will be rectified to meet requirement of project specifications.
4. CONTRACTOR shall be responsible for the detailed design, mounting details and to perform structural strength analysis of equipment seating and the foundation at the point where the equipment will be placed. Such detail design checks and strengthening are required for CONTRACTOR supplied material and equipment.

5. CONTRACTOR shall present erection sequences, plans, component handling schemes, etc, to COMPANY for review at least fourteen (14) DAYs prior to the scheduled execution of such activities.
6. During fabrication/construction and stacking, the different deck sections shall be supported in such a manner that reflects the support condition in the installed condition. CONTRACTOR shall check structural foundation settlement, at least weekly, and immediately adjust if required. CONTRACTOR shall make provision for jacking-up the structure should it be required.
7. CONTRACTOR shall provide all certified lifting devices including temporary staging platforms, spreader frames, link plates, slings and shackles, cranes, forklifts, etc required at the fabrication site.
8. CONTRACTOR shall machine-cut all structural members whenever possible. Field cutting and coping shall be minimized. Work shall be completed indoors wherever possible.
9. CONTRACTOR shall trial fit in the fabrication/construction yard all offshore installed items whenever possible unless agreed by COMPANY. CONTRACTOR shall provide advance notice to COMPANY / MWS for witness.
10. CONTRACTOR shall include in its Lump Sum Price the cost of design, procurement, fabrication, testing and all other associated costs for the fabrication stage aid steel and accessories. Installation aids shall include but not be limited to guides, bumpers, platforms, rubbing strips, sling guards, fenders and barge spacers, flooding system, buoyancy vessels, etc.
11. All structure welders and welding procedures shall be APPROVED by COMPANY.
12. CONTRATOR shall design, supply and install strengthening structure and support to all piping, equipment, electrical and instrument items for CONTRACTOR supplied material and equipment as required and instructed by COMPANY at CONTRACTOR's own cost.
13. CONTRACTOR shall provide all miscellaneous facilities steelwork comprising of but not limited to lifting padeyes, vent structure and support, crane boom rests (both temporary and permanent), handrails, deck coming and perimeter bund at each deck level, deck plate, grating including drains, security gate for platforms, monorails and other mechanical handling padeyes, jacket lifting and upending padeyes, flooding and venting system and mudmat for jacket, walkways, pile and conductor, transition piece, rigging platform.
14. CONTRACTOR shall perform dimensional survey of the topside and jacket structure and advice COMPANY for any adjustments to be made. All inspection, quality assurance and quality control record shall be compiled, retain and submitted to COMPANY as required. It is extremely important that the finished structure be free from any distortion.

15. CONTRACTOR shall provide periodic reports of topside and jacket dimension to COMPANY, specifically noting any deviation from the AFC drawings within acceptable fabrication tolerances.

2.3.3 SKID MOUNTED EQUIPMENT AND OTHER MAJOR EQUIPMENT

1. CONTRACTOR shall supply and install mechanical equipment, skid mounted equipment and packages, ancillary equipment, carryout preservation during all stages, install, level, align, hook-up interconnecting piping and test all mechanical systems, in accordance with the requirements of CPOC AFC DESIGN PACKAGE, project specifications, VENDOR recommendations, and manufacturer's manual.
2. CONTRACTOR scope shall include offloading of equipment, handling and transporting to CONTRACTOR's storage area using contractor or vendor supplied lifting gears, beam and rigging. CONTRACTOR shall maintain preservation of equipment all time during fabrication/construction, transportation, drilling, HUC until HANDOVER. All process equipment and associated system shall maintain positive pressure inert gas blanket to protect from internal corrosion. A log of equipment preservation shall be maintained all the time.
3. CONTRACTOR shall complete all work within the Deck and building structures prior to load-out in accordance with Mechanical Specifications. CONTRACTOR shall connect all instrumentation, cabling, pipework, etc to the equipment. Where equipment is not mounted on a single skid, CONTRACTOR shall install and assemble the items of package, ancillary equipment and appurtenances in accordance with manufacturer's instruction.
4. CONTRACTOR shall assemble and re-install all equipment items that have been removed for shipment, offshore installation, to facilitate offshore drilling, testing, etc. CONTRACTOR shall remove as required and shall calibrate all instrumentation and re-install for pre-commissioning. CONTRACTOR shall open vessels for cleaning, inspection, install internals as necessary and charge the vessels as necessary.
5. CONTRACTOR shall supply all lubricating oils, greases, hydraulic fluids, fuels, chemicals, consumables, etc., required for all the equipment during testing, pre-commissioning, commissioning, to enforce maintenance plan, etc.
6. CONTRACTOR shall arrange all vendor representatives at site as necessary during erection, installation, load testing and commissioning, for CONTRACTOR supplied material and equipment.
7. CONTRACTOR shall provide skilled personnel to level and align rotating equipment, install mechanical seals, guards, supply necessary stainless steel shim plates, grout, anchor bolts, equipment mounting, alignment checks, alignment of connecting piping, etc. General mechanics or pipe fitters are not allowed to perform these tasks.

8. CONTRACTOR shall take due care during installation, fabrication and all other works to ensure no damage to equipment, package items.
9. CONTRACTOR shall develop and submit a Project Quality Plan (PQP) for COMPANY's review in respect of source inspection at supplier's manufacturing / fabrication premises of all equipment and packages, to ensure specifications and standards are being complied with. Source inspection shall also involve CONTRACTOR's own inspection agent, Certifying Authority and CONTRACTOR's engineers.
10. Factory Acceptance Testing (FAT) of all major equipment and packages shall be attended by CONTRACTOR's engineers from all relevant disciplines and COMPANY representative.

2.3.4 MATERIAL HANDLING EQUIPMENT

1. CONTRACTOR shall assemble, reeve, install and load test the pedestal cranes. CONTRACTOR shall supply all lubricating oils, greases, hydraulic fluids, diesel and other consumables required by the cranes. The pedestal crane shall be certified prior to load out. Loads for crane certification shall be provided by CONTRACTOR.
2. Usage of the platform pedestal cranes by CONTRACTOR during construction is not permitted unless APPROVED in writing by COMPANY.
3. All hoists shall be removed for transportation and shipped loose to site or shall be adequately secured for the transportation loads.
4. All maintenance and operational pad eyes and monorail shall be load tested in yard and all such test certificates shall be delivered for system acceptance.

2.3.5 INSTRUMENTATION

1. CONTRACTOR shall furnish all items and shall install and hook-up all instrument items including all off skid instruments, in accordance with project specification and AFC Design Package.
2. Instrument tubing associated with process line and equipment shall be SS904L and tube fittings shall be of SS316 material as a minimum. Where SS904L tubing is not suitable for the application due to the corrosive nature of the medium or pressure rating reasons, the appropriate tubing suitable for the application shall be used subject to COMPANY's approval for such alternate material usage. For high pressure (API 5K and above) application, duplex stainless steel or super duplex tubing and fittings shall be used as per technical suitability and COMPANY's prior approval. For instrument tubing, the clamp shall be STAUFF Anti-Corrosion Technology type.
3. CONTRACTOR shall ensure that all instrument panels and stations are readily accessible and operable. The layout drawings in the CPOC AFC Design Package shall show the general location of the instrument panels and stations. Prior to setting the

final position of the panels, CONTRACTOR shall obtain APPROVAL on the orientation of the panel, access to the panel, method of mounting, etc. Minor adjustments may be required to meet operability requirements. CONTRACTOR shall relocate said stations and panels at its own cost upon instruction by COMPANY where operability or accessibility is impaired or APPROVAL was not obtained.

4. CONTRACTOR shall carryout all of the internal wiring, termination for instruments and system supplied by CONTRACTOR including WCS, WHCP, Telecommunication system, etc.
5. CONTRACTOR shall install, configure and set up all field instruments, mounting supports, cable trays and ladders, cable conduits and junction boxes as per instrument location drawings. However, if site installation shows clashing, safety and operational hazard and incorrect site location then CONTRACTOR should revise his design and relocate all such instruments and supports with prior consent from COMPANY and as directed by COMPANY.
6. All field instruments like transmitters, switches, detectors and valves, analyzers, gauges, etc shall be tested and calibrated prior to installation. These testing and calibration shall be witnessed by COMPANY.
7. All the instruments, junction boxes, transmitters and sensitive electronic equipment shall be properly preserved, wrapped and protected all the time during onshore fabrication and installation, offshore transportation and installation, drilling and pre-commissioning until HANDOVER.

2.3.6 PIPING, VALVES AND FITTINGS

1. CONTRACTOR shall furnish all piping materials, fittings, valves and consumables.
2. CONTRACTOR shall fabricate/construct, install, protective coat, heat treat as required, hydro-test and flush all piping installed as part of the WORK. Piping 2” and greater shall be jet flushed. All piping work shall be in accordance with Piping Specifications.
3. CONTRACTOR shall pre-fabricate, erect, protective coat, flush and clean, pressure test, dewater and dry process and utility piping systems, offshore installed spools, all piping between each of the Deck, between the Modules and the Substructure. Offshore installed piping shall be packaged as ship loose items for delivery offshore with the deck structure or during HUC as per COMPANY directives.
4. All platform piping systems shall be fabricated, installed and tested in accordance with CPOC General Specifications, International recognized codes and standards.
5. All pipe supports shall be isolated from piping by the use of shoes or insulating half round spacers and sleeved U-bolts in accordance with the requirements of Piping Specification.

6. All flange make-up shall be performed by designated personnel who have been trained and CONTRACTOR-certified to perform flange make-up for the COMPANY WHP FACILITIES. These personnel shall be knowledgeable and proficient in flange make-up, recognizing the requirements for flange-face alignments, gaskets, bolting, bolt-tightening sequences, and torqueing with APPROVED certified torque wrenches. Upon completion of each final flange make-up, a tag shall be applied noting time, date, and persons responsible for that flange make-up. No one other than these designated and certified flange-tightening personnel shall be allowed to make up flanges on the process and utility piping aboard the topsides.
7. Hydraulic bolt tensioning is required for all bolt sizes for hot oil service and stud bolt diameter greater than 1 1/8" for other services. The length of these stud bolts shall be increased by a minimum of one nut thickness to allow the use of hydraulic bolt tensioning equipment.
8. Development of welding procedures and qualification of welders. This includes supply of consumables and material for the qualification of weld procedure specifications, welders and the mechanical / chemical and other testing as required for qualification of the procedure and welders.
9. Preparation of spool drawings and shop drawings to suit construction and erection requirements. CONTRACTOR shall make allowances for field-fit and over length while preparing drawings and material supply.
10. Design development, material supply, fabrication and installation of all necessary vents and drains for process equipment and piping, package items, instruments and like to enable operational draining and venting, efficient flushing and hydrotesting, associated pre-commissioning and commissioning activities.
11. *Preparation of detailed flushing and hydrostatic test procedures which shall include marked up P&ID showing the extent of the system or part system to be tested, position of all blinds, dummy spools, items removed and the like. The procedure shall be presented for COMPANY's approval before schedule performance of the test.*
12. Fabrication shall cover construction, erection, inspection, pressure testing, reinstatement and protective coating of all piping works, valves and special items, flange isolation equipment, fitting and supports including any temporary support required for leak testing / hydrotesting.
13. Construction, trial fit, pressure testing, protective coating, identification and Loadout of spool pieces, flowline spools for offshore hook up and tie-ins.
14. Ensure that no excess piping stresses will be imposed on piping, pumps and generally flanged equipment, during and after erection, testing, pre-commissioning, commissioning and normal operation because of CONTRACTOR's construction / erection method.

15. Checking and maintaining valve seats, leak testing, packing and lubrication of valves. Ensure that all valve actuators are fitted and greased in their internal moving parts to allow for safe operation during testing. Any correction, rectification including replacement of faulty, non-operable, leaking valves shall be CONTRACTOR responsibility under Lump Sum price. All valves shall be tagged according to project specification.
16. CONTRACTOR shall adequately protect all piping work and fittings during prefabrication, erection and installation to ensure no damage to flange faces occurs. Pipe ends, floor drains and like are sealed during erection, transportation, drilling, commissioning to avoid ingress of dust, grit, drilling mud, debris, salt accumulation, etc. All exotic material shall be properly protected and preserved during fabrication, drilling and offshore HUC activities to avoid material contamination, corrosion, pitting, etc. All such contamination shall be CONTRACTOR's responsibility to correct, chemically clean or replace material at his own cost.
17. *CONTRACTOR shall carry out topside piping and equipment thickness survey to establish base line reading during onshore fabrication and before ready for Loadout. This baseline thickness survey shall form the starting point under corrosion management plan.*
18. CONTRACTOR shall develop and implement Flange management systems for all flange joints.
19. CONTRACTOR shall supply all temporary and permanent piping materials not shown in project drawings and required for flushing, pressure testing, leak testing, system integrity testing. This shall include but not limited to weldolets, threadolets, valves, nipples, plugs, flanges, blinds, gaskets, temporary spools, support, studs and nuts.
20. CONTRACTOR shall render the platform's piping free from internal scrap, dirt and other debris regardless of who installed such piping prior to the in-situ pressure testing of welded joints and the reinstatement testing of completed systems.
21. Piping with an outside diameter equal to or less than two (2) inches shall be blown clean with utility air at a pressure not exceeding 100 psig, while piping with outside diameter greater than two (2) inches shall be flushed clean with potable water at a minimum velocity of 3 – 4 meters per second.
22. CONTRACTOR shall provide complete system service leak testing using mixture of nitrogen (N2) and Helium (He) of the following piping systems: -
    a) System shall be completed to the maximum extent possible and shall comprise of all instrumentation and instrument impulse lines. Only instrument and equipment items which could be subjected to damage from the test medium or test pressure shall be excluded from the test. CONTRACTOR shall be responsible to identify and list, for subsequent approval by COMPANY all equipment, instruments and connections which cannot be tested.

b) Subsequent to approval by COMPANY all joints which are not included within the system leak test shall be tightened using a torque wrench or bolt tensioning equipment to achieve the required torque value/bolt pre-load. Where joints are completed using a torque wrench the final distance between mating flanges, at for perpendicular points, shall be measured. Bolt torque and flange separation measurements or bolt tensioning details shall be recorded and included in final hand over of documentation to COMPANY Joint tightening shall be witnessed and accepted by COMPANY representative.

23. CONTRACTOR shall field check the slope of the gravity drain lines against the Drawings and Specifications and shall install field shims as necessary to attain the required slope. CONTRACTOR shall free all deck drains, dirt pans and drain lines of scrap, dirt and other debris.

24. CONTRACTOR shall develop and submit for COMPANY's approval the relevant procedures for the internal cleaning of the platform's piping. These procedures shall identify the individual lines to be cleaned, the manner with these lines shall be cleaned, and the method for disposing the debris blown out and flushed out of these lines.

25. With the exception of joints welded by CONTRACTOR on gravity drain and atmospheric vent lines, CONTRACTOR shall perform hydrostatic pressure tests on all welded pipe joints made by CONTRACTOR, regardless if the joints were made by the CONTRACTOR in-situ or on spool pieces fabricated offshore by CONTRACTOR.

26. CONTRACTOR shall also provide vent and drain valves to facilitate hydrotesting of the spools. CONTRACTOR shall ensure all piping flanges be protected by flange protector and bolt/nuts with corrosion shields.

27. CONTRACTOR shall be responsible for verifying vents and drains and to hydrotest the completed installation, It shall be CONTRACTOR responsibility to provide sufficient materials to test piping in addition to materials for final installation, i.e. extra stud bolts and nuts, gaskets, pressure recording devices, inhibitors and all other required items such as tools, equipment, etc.

28. CONTRACTOR shall be responsible for hydro testing of piping system and subjected to a test pressure equal to 1.5 times the design pressure of the line. The test pressure shall be held for a minimum continuous duration of one (1) hour to verify the integrity of the welded joints being tested.

29. CONTRACTOR shall use inhibited water (with certificate from the recognized laboratory) as the test medium for all hydro- tests. Inhibited water is defined as potable water treated with oxygen scavengers and corrosion inhibitors. CONTRACTOR shall submit for COMPANY's approval the manufacturer's chemical safety data sheets and recommended dosing procedures for these water treatment agents.

30. For joints to be tested in-situ, CONTRACTOR shall positively isolate the piping containing these joints from the rest of the platform's piping. In like manner,

CONTRACTOR shall positively isolate and / or remove all instruments on the affected piping. Pressure testing against instruments against closed valves shall not be allowed.

31. CONTRACTOR shall make good the paint work and / or insulation on joints that have been successfully pressure tested. Any welded joint shall not be painted prior to completion of the necessary test.
32. CONTRACTOR shall develop and submit for COMPANY's approval hydrotest procedures and hydrotest packages. These procedures and packages shall, for each group of joints to be tested, identify the limits of the test equipment such as but not limited to pressure chart recorders, pressure indicators, pressurization pumps, etc.
33. CONTRACTOR shall be responsible for isolating and blinding off commissioned piping and tubing of new or future tie-ins. CONTRACTOR shall notify COMPANY of the isolating and blinding requirements at least 24 hours in advance.
34. CONTRACTOR shall inspect the internals of all tanks and vessels after hydrotest.
35. CONTRACTOR shall execute final closure of tanks and vessels after internal inspection.
36. CONTRACTOR shall check for the proper lubrication and operation of pig receiver / launcher quick opening hinged closures fitted with intrinsically safe bleeder locks / valves.
37. CONTRACTOR shall reinstate (leak test) on per system basis all piping, tanks and vessels on the platform to determine and verify the integrity of flanged joint installations.
38. A system containing relief valves shall be reinstated at a test pressure equal to 95% of the set point of the lowest rated relief valve in the system, whereas a system that does not contain any relief valve shall be reinstated at a test pressure equal to 110% of the system's operating pressure. The test pressure shall be maintained for a minimum duration of one (1) hour to verify the integrity of the system.
39. Mixture of 99% nitrogen (N2) and 1% Helium (He) shall be used as the test medium on all systems that shall be reinstated at all test pressure (pneumatic reinstatement).
40. Regardless of the test medium used, the test pressure shall gradually be increased in small increments to allow the system's piping to equalize the strain.
41. CONTRACTOR shall develop and submit for COMPANY's approval system re-instatement testing procedures and test packages. These procedures and packages shall, for each system to reinstated, identify the system's test limits, the test media and pressure, high point vents, low point drains and the connection of the required test equipment such as pressure chart recorders, pressure indicators, pressurization pumps, etc.
42. Pressure indicators and chart recorders used to any testing WORKS shall have a minimum accuracy equal to or better than one-fourth (1/4) of 1% of the instrument's range and pressure indicators shall have a minimum dial size of four (4) inches. These instruments shall be selected such that the test pressure falls between 25% and 75% of

the instrument's range. All pressure indicators and recorders shall be maintained with valid certificate.

43. *CONTRACTOR shall purge and box-in with nitrogen (N2) all piping and vessels of hydrocarbon-bearing systems to reduce the oxygen content of these systems to below 1% taken on appear volume system. CONTRACTOR shall develop and submit for COMPANY's approval N2 purging and boxing-in procedures.*
44. CONTRACTOR shall ensure that final leveling of all rotating equipment is within the tolerances defined by the VENDOR Specifications.
45. CONTRACTOR shall ensure that the final cold shaft alignment between driver and driven equipment and between piping and equipment nozzles are within the tolerances defined by the VENDOR Specifications.
46. CONTRACTOR shall function test all protective features of the respective mechanical equipment.

2.3.7 ELECTRICAL

1. CONTRACTOR shall furnish all electrical materials and consumables, including but not limited to Thermo-Electrical Generators (TEG), Solar Photo-Voltaic Generators, Diesel Engine Generator, Navigational Aids, Battery Banks, Battery Charger, Distribution Boards, electrical cables, lighting, junction boxes, bulk equipment and consumables, etc.
2. CONTRACTOR shall procure and supply as required, install equipment, install and hook-up interconnecting wiring and test all electrical systems onshore prior to loadout, in accordance with the requirements of specification.
3. CONTRACTOR shall complete all wiring and conduit work within the Deck and building structures prior to load-out.
4. CONTRACTOR shall complete installation of earthing system comprising earthing conductors and accessories to provide protection against earth leakage hazard and protection from hazards associated with indirect lightning strike and static electricity. CONTRACTOR shall ensure that the platform structure is earthed all the time during construction.
5. CONTRACTOR shall ensure that all control stations, small power socket outlets and welding outlets are readily accessible and operable. CONTRACTOR shall relocate said stations and outlets at its own cost upon instruction by COMPANY where operability or accessibility is impaired.
6. COMPANY furnished equipment and electrical systems shall not be used by CONTRACTOR for fabrication and installation purposes. This equipment shall only be used for testing, pre-commissioning and commissioning associated systems.
7. CONTRACTOR shall ensure tagging of all devices, equipment, junction boxes, cabling, etc before onshore completion and prior to Load out.

8. All lighting systems aboard the platforms shall be completed, tested and commissioned onshore prior to load-out. CONTRACTOR shall ensure that all normal lighting, emergency lighting and battery powered lighting provide adequate illumination. CONTRACTOR shall at its own cost adjust lighting and add additional units as required to meet the lighting specifications as included under Exhibit – 4 and Exhibit – 5 of the CONTRACT.

2.3.8 HEALTH, SAFETY AND ENVIRONMENT

1. CONTRACTOR shall supply, install and test all items related with fire and gas and safety systems that are necessary to complete the WORK. All of said components and items shall be installed and hooked up by CONTRACTOR and tested, to form a completed, properly functioning system in accordance with Fire and Gas specification, lifesaving equipment vendor recommendations and all other safety equipment, safety signage, etc to meet as low as practically possible risk achievement.
2. CONTRACTOR shall supply and fabricate all necessary mounting and stowage facilities for safety equipment.
3. CONTRACTOR shall maintain a safe and clean working environment at all times. CONTRACTOR shall establish COMPANY approved area marking system to ensure restricted personnel access to areas with overhead work, radiographic work, pressure testing work and like. Where handrails and deck plates have been removed, barricades and barriers shall be provided.
4. CONTRACTOR shall establish safety training program, enforcement of 'you see, you act' and safety audits all time to avoid unsafe operations. Any unsafe operation brought to the attention of the CONTRACTOR shall be immediately rectified. COMPANY will suspend work in areas where unsafe operation and condition exists and not rectified. Any associated cost with the suspension of work will be borne by CONTRACTOR.
5. CONTRACTOR and their sub-contractors shall use certified equipment such as cranes, vessels, lifting equipment, slings, chains, personnel protective equipment and like, on all worksites for the purpose of the WORK. They should be in possession of valid certificate for safe working all time and all such equipment shall be properly and regularly maintained.
6. CONTRACTOR shall maintain full time Safety Officers at fabrication/construction yard and all WORKSITES including offshore activities, who shall be highly experienced and fully qualified to international standard in enforcement of health, safety and environment requirements.
7. CONTRACTOR shall ensure that all personnel engaged in performance of the WORK are aware of and comply with all relevant safety rules and regulations. The Safety Officer shall report to the Project Manager and shall have authority to stop work if there

is a danger to personnel, property and project material. Safety Officer shall be responsible for weekly HSE, security meetings.

8. CONTRACTOR shall provide and ensure all personnel protective equipment (PPE) including hard hats, safety shoes, safety goggles, gloves, ear protection, etc are available to CONTRACTOR personnel and COMPANY personnel. All personnel at site shall adhere to PPE requirement.
9. CONTRACTOR shall ensure that first aid requirement and medical facilities including trained medical staff available at site all times for both CONTRACTOR and COMPANY personnel. A Medevac (Medical Evacuation) emergency procedure should be in place to ensure prompt transport of injured to a medical facility.
10. CONTRACTOR shall maintain the platform and the work environment in a neat and orderly manner at all times. Scrap material, trash, packing material and other debris shall be removed promptly. Items shall not be left which pose tripping hazard to personnel. Access ways and gangways shall be kept open at all times.
11. CONTRACTOR shall conduct Job Safety Analysis (JSA)/HAZID for all work undertaken.
12. CONTRACTOR shall carry out safety audits of WORKSITE(S) (both onshore and offshore locations) at least once in six (6) months throughout project period. COMPANY will participate in all safety audits. CONTRACTOR shall record all observable safety issues and deviation to safe practices and demonstrate correction made and issues closeout within one month of safety audit.

2.3.9 PROCESS CONTROL SYSTEM AND SAFETY INSTRUMENTED SYSTEM

1. CONTRACTOR shall supply all material necessary to complete the WORK.
2. CONTRACTOR shall perform onshore pre-commissioning and commissioning of all distributed control, shutdown and fire and gas cabinets, panels and consoles, instruments, valves, WCS in accordance with Instrumentation specifications. CONTRACTOR shall also install, hook-up and loop check all wiring for the systems.
3. The PCS and SIS shall be made fully operational in the fabrication/construction yard by CONTRACTOR (with VENDOR assistance), so that full pre-commissioning and commissioning activities can be performed.
4. All control valves, shutdown valves, actuated valves shall be checked their functionality from WCS during onshore commissioning. All transmitters shall be connected to WCS and signals checked.
5. Data transmission to the Telecommunication shall be simulated onshore prior to Load out.

2.3.10 COMMUNICATION SYSTEMS

1. All communications equipment on WHPs shall be procured, supplie**d**, installed and pre-commissioned by CONTRACTOR to the maximum extent possible. This shall include the following systems, as applicable, but not limited to:
   - In-field Telecommunications and trunk radios
   - SCADA radio antennas and associated cables and wave-guides
   - 3 ea of Trunk radio portables for each platform
   - 2 ea of Fixed telephone for each platform
2. The communications tower on WHP shall be supplied and erected by CONTACTOR and will provide assistance offshore to support telecommunications at other locations offshore in COMPANY communications network.
3. CONTRACTOR shall be responsible for wiring, installing and testing all communications equipment including wall jacks and distribution frames in accordance with Project Specifications.
4. CONTRACTOR shall furnish all components or materials required to complete each system according to Project specifications.
5. Data transmission to the Telecommunication system shall be 100% simulated onshore.
6. CONTRACTOR shall be responsible for transferring I/O mapping of WCS to SCADA system at least ninety (90) days before offshore HUC or before to enable upgrading of communication within SCADA at MDPP.
7. CONTRACTOR shall test telecommunication systems VENDOR design and coverage study of all Phase - 5 platforms to demonstrate successful communication with MDPP. CONTRACTOR shall obtain COMPANY's approval on such successful test of telecommunication system configuration offshore before implementation in Phase - 5 development.

2.3.11 PAINTING, COATING AND INSULATION

1. CONTRACTOR shall prepare and coat / paint all surfaces on topside facilities, structures in accordance with the COMPANY General Specifications (CGS). The WORK shall include but not limited to surface preparation and coating of all structural steel surfaces, handrails, ladders, floor grating, all pipe works, supports, skids, equipment, etc. CONTRACTOR shall perform remedial painting of FFME where paint has been damaged, either in transit or during fabrication, during drilling or HUC at no additional cost to COMPANY.
2. CONTRACTOR shall supply valves which shall be painted with Protective Coating as per COMPANY specifications. If the manufacturer's standard protective coating is a three-coat system, meeting project requirement and the paint is not damaged then the

valves shall be used without further painting. If any of these criteria is not met then CONTRACTOR shall repaint the valves in accordance with the specifications at no additional cost to COMPANY.

3. CONTRACTOR shall prime coat, as a minimum, all steel prior to installation on the deck structure. Blasting on the deck after equipment has been installed is generally not allowed and requires prior APPROVAL. If COMPANY approves blasting after equipment has been installed then all equipment shall be protected during blasting and painting. Extreme care shall be taken to avoid equipment contamination with blasting medium and any such contamination shall be immediately rectified at CONTRACTOR cost.
4. If APPROVED, blasting after the equipment has been installed shall be either by pencil blast or vacuum blast type operation.
5. Blasting activities during SIMOP, upon drilling and under live/Hydrocarbon producing wellhead platform are classified as controlled and Hot Work activity. Accordingly A Hot Work Permit shall be applied. Standard blasting methods as accepted for onshore activities shall not be accepted for use during SIMOP, upon drilling and under live/Hydrocarbon producing wellhead platform. CONTRACTOR shall use COMPANY Approved Blasting method and within CONTRACT PRICE, if planned to be performed under SIMOP, upon drilling and under live/Hydrocarbon producing wellhead platform.
6. CONTRACTOR shall take precautions to protect equipment during touch-up painting. Touch-up painting will be made with spray gun application wherever possible. Care shall be taken to avoid overspray on equipment, decks, insulation or other areas where colors are different or the items have not been painted. CONTRACTOR shall take care to avoid wind borne spray extending beyond the limits of the work area. Any rectification or removal required resulting from such overspray shall be to CONTRACTOR account. All piping and equipment shall be stenciled as per Piping specifications.
7. CONTRACTOR shall supply, prepare and install all insulation and personnel protection required on piping, vessels, heat exchangers and other equipment as indicated on the drawings, project and general specifications and within the CPOC AFC Design Package.
8. CONTRACTOR shall supply all coating materials including blasting medium, paints, thinners and other consumables.
9. CONTRACTOR shall not install insulation or cover up welds on pipework prior to the hydrotesting or pneumatic testing of pipework.
10. CONTRACTOR shall supply all insulation material including protective cladding, fastening materials (wire, banding, screws, sealants, and anchor stud), blanket, etc according to project specification.

2.3.12 PIPELINE

1. CONTRACTOR shall fabricate and pre-install all pipeline related items including Pig Launcher and Receivers, risers and riser clamps, etc. in accordance with CPOC AFC Design Package.
2. CONTRACTOR shall design, procure and supply all materials and consumables including pipeline flanges, coated and bare line pipes and bends, as required for construction and installation of pipelines.
3. CONTRACTOR shall be responsible for all logistic arrangement related with pipeline coating, transportation and delivery offshore for pipeline installation.
4. CONTRACTOR shall repair any damage to riser coatings and platform coatings resulting from riser transportation and installation activities at CONTRACTOR's cost. A final holiday detection of the riser coatings shall be undertaken during installation and holidays detected shall be repaired in accordance with repair procedures given COMPANY's permission to proceed.
5. CONTRACTOR shall design the riser clamp for TPB and MDG risers and shall have a contact point with platform jacket member for riser clamp corrosion protection from jacket anodes

2.3.13 WEIGHT CONTROL

1. CONTRACTOR shall set up a weight control system and make such adjustments as necessary as a consequence of detail engineering development, revisions and re-engineering to produce and periodically (every month) update weight control report.
2. Weight control is essential for facilities with respect to requirements of offshore transportation, installation and in service condition. CONTRACTOR shall establish an effective weight control program. CONTRACTOR shall ensure the actual weights do not exceed the value established in AFC weight control report.
3. CONTRACTOR is responsible for Weight Control during fabrication, load-out, Sea fastening and hook-up of the WORK.
4. All major equipment and subassemblies shall be weighed upon receipt. CONTRACTOR shall monitor and project weight of the facilities and shall report monthly and discuss the transportation and installation requirements with COMPANY.
5. Topside assembled decks after major equipment and system installation and Jacket structure shall be weighed to confirm weight accuracy at 90% completion of Topside and Jacket. A second weighing of the topside and jacket shall be completed immediately prior to Load out. CONTRACTOR shall submit a weighing procedure for COMPANY approval at least sixty (60) days prior to the scheduled weighing.
6. CONTRACTOR shall compile and submit a final 'As-Built' weight and center of gravity (COG) report after structural weighing.

7. CONTRACTOR shall be solely liable for ensuring that the weights remain inside the capacity of the Marine Spread. In the event that the predicted weight exceeds the capacity of the Marine Spread then CONTRACTOR shall be solely responsible for reducing the weight to an acceptable limit. CONTRACTOR shall submit a weight reduction report to COMPANY for review and approval. All of the cost for said weight reduction and impact on the WORK shall be included in CONTRACT PRICE. There shall be no extension of the onshore MECHANICAL COMPLATION Date of the WORK due to the weight reductions.

2.3.14 SHIP LOOSE ITEMS

CONTRACTOR shall list all ship loose items stating final location on barge/ deck properly marked on drawings. CONTRACTOR shall identify which items shall be shipped loose based on Accepted criteria including but not limited to:

1. Offshore hook-up spools, cables and structural panels
2. Fragile items sensitive to sea transport or high acceleration loads
3. Unsecured items
4. Equipment and items that will clash with temporary transportation and installation equipment.
5. Equipment and items that is required to be removed for drilling activities.
6. Any other components that CONTRACTOR needs to ship loose to remain within MARINE SPREAD capability limitations.
7. All ship loose items shall be properly packaged and secured inside the cargo basket/ container as agreed with company. All ship loose items shall be protected, preserved and tagged.
8. The final location and arrangement of ship loose items, containers, basket, etc on barge shall be governed by COMPANY and T&I CONTRACTOR. Adequate consideration shall be given for offshore lifting and handling ship loose items offshore in packaging ship loose items.
9. Safety equipment such as fire extinguishers, survival craft, life jacket, etc shall be test installed and removed onshore. All such safety equipment shall be installed offshore on platform during offshore HUC.
10. CONTRACTOR shall deliver all ship loose material and equipment for offshore hook up and commissioning and carryover works properly bagged and tagged according to job card description for offshore works.
11. A method statement on handling of shiploose material shall be prepared and submitted for COMPANY Approval sixty (60) days prior to sailaway.
12. Refer additional requirements as stated in Exhibit -7 of the CONTRACT.

2.3.15 FABRICATION AUDIT

1. CONTRACTOR shall be responsible for programming and performing its own audits of construction against the CPOC AFC Design Package. COMPANY reserves the right to perform audits of construction against the CPOC AFC Design Package.
2. CONTRACTOR shall perform a detailed and complete audit of the construction against the Structural Drawings, P&IDs, the Instrument Databases and One-Line Diagrams and shall ensure the fabrication is in full compliance with same. COMPANY shall participate in CONTRACTOR's audit; however it may at its sole discretion perform its own audits at any time throughout the progress of the WORK. CONTRACTOR shall prepare a detailed report of each and every audit fully reporting findings and shall prepare an action plan to rectify any deficiencies. These reports shall be submitted to COMPANY for review. Any and all discrepancies of constructed works against the CPOC AFC Design Package will be identified and rectified by CONTRACTOR under CONTRACT PRICE.

2.4 ONSHORE PRE-COMMISSIONING AND COMMISSIONING

CONTRACTOR shall prepare Testing, Pre-Commissioning and Commissioning procedure and the same shall be reviewed and approved by COMPANY prior to commencement of all such related activities. CONTRACTOR shall be fully responsible for performing the WORK without COMPANY Accepted/APPROVED procedures and CONTRACTOR shall re-test all systems in compliance with COMPANY Accepted/APPROVED procedures.

1. The wellhead platform systems completion organization shall define, prepare, carry out and report all Testing, Pre-Commissioning and Commissioning activities by systems and sub-systems to systematically complete, provide recorded evidence and handover.
2. CONTRACTOR shall develop complete plan and define all systems and sub-systems, schedule for testing, pre-commissioning and commissioning activities, organization chart performing these activities, required chemicals, utilities and consumables, required vendor support, each system dossier to record and report system completion.
3. While the pre-commissioning checks and tests are being performed, all discrepancies, damaged or missing equipment, malfunctions, missing documents, etc are recorded in the subsystem punch list, if the situation does not allow immediate correction. These lists are kept updated during onshore pre-commissioning and commissioning, so as to have a precise status of each subsystem at the stage of sail away from fabrication/construction yard.
4. All documentation pertaining to the Pre-commissioning and commissioning is compiled in a specific dossier, arranged by subsystem, which contains all the information required to demonstrate that a subsystem has reached the ‘Onshore MECHANICAL COMPLETION’ status. Its content shall include system description and marked up drawings, check lists, test sheets, status index, punch list, vendor reports, as-built drawings, specific procedure and tests, list of modifications, onshore MECHANICAL COMPLETION certification, etc.
5. The onshore Pre-Commissioning phase shall include the following as a minimum:
    - Systematic conformity checks, carried out on each item of equipment or components to verify visually the condition of the equipment, the quality of installation, the compliance with Project drawings and specifications, Manufacturer’s instructions, safety rules, codes and standards.
    - Selected equipment static / de-energized tests, to ensure the quality of a number of critical components. This cold testing concerns all discipline e.g. calibration of instruments, machinery alignments, setting of safety valves, pressure testing of piping, cables continuities, etc.
    - Pipe and vessels air and water flushing, cleaning and drying.

6. The onshore Commissioning phase essentially include the following as a minimum:
    - The dynamic verification that each elementary electrical and instrument function that the plant equipment is designed to achieve performs properly. Typical examples of electrical / pneumatic motors uncoupled run, instrument loop test, electrical breakers operation, load testing of crane, load test of power generators (TEG, Solar Panels, UPS), load test of diesel engine generator, etc.
    - A number of related activities such as piping drying out, leak testing, system inerting, loading of chemicals, preservation, etc.
7. *Once onshore Pre-Commissioning and Commissioning is complete with subsequent preservation and protection of wellhead equipment and facilities performed, the facility reaches the status of 'Onshore* MECHANICAL COMPLETION*' and ready for sail away. This will be followed with 'Offshore Hook up and Commissioning (HUC)' after offshore installation of wellhead facilities and in line with the CONTRACT SCHEDULE.*
8. CONTRACTOR shall develop a detail system and equipment procedure and check listing in accord with the Pre-Commissioning and Commissioning plan. This plan shall consist of a detailed task schedule and a resource loading schedule. This plan shall be integrated into CONTRACTOR fabrication, inspection, testing and load out plan.
9. CONTRACTOR shall perform all onshore Testing, Pre-Commissioning and Commissioning activities to achieve onshore MECHANICAL COMPLETION of the WORK.
10. Pre-Commissioning, inspection and testing of each system and package units shall comply with the requirements specified in the relevant package and equipment specifications, data sheets, Company General Specifications, VENDOR documents and recommendations and all other project referenced requirements.
11. COMPANY representatives shall witness the Pre-Commissioning, Commissioning, inspection and testing, functional checks, etc at all the stages of testing. CONTRACTOR shall identify HOLD points in the inspection and test plan and address along with COMPANY representative witness.
12. Diesel generator package will be placed into operation on diesel fuel. Thermo Electric Generator (TEG) will be placed into operation using temporary LPG cylinders and Solar Panel system shall be placed into operation to ensure functionality and system completeness, however shall be dismantled and prepared for transporting as a ship loose item prior to load out from the fabrication/construction yard. All of DC consumers shall be connected onshore and integrity test performed onshore.
13. CONTRACTOR shall prepare lock out / tag out procedures which shall ensure safe and correct isolation of systems and components which could cause harm or physical damage if inadvertently operated during fabrication, testing, Pre-Commissioning or Commissioning. CONTRACTOR shall submit said procedures for COMPANY approval prior to commencing all such WORK.

14. *CONTRACTOR shall prepare complete Pre-Commissioning and Commissioning manual and task sheets for both onshore and offshore activities. The task sheets shall be clearly differentiated into onshore work and offshore work. All such procedures and manuals, work packs, system test packs, etc shall be prepared by CONTRACTOR and obtained COMPANY's approval on or before three (3) months of actual activities and performance testing or on or before three (3) months of planned Onshore MECHANICAL COMPLATION, whichever is earlier.*
15. CONTRACTOR shall provide all chemicals, lubricants, oil, grease, gases (LPG, N2, Air, etc), treated water, etc during Pre-Commissioning and Commissioning as required.
16. All load testing of package items such as Pedestal crane, TEG, Solar Panels, Diesel Generator, WHCP, WCS, Skid packages and like shall be tested in the construction yard to ensure functionality and shall be repeated offshore during hook-up and Commissioning.
17. CONTRACTOR shall carry out all 100% loop checking and functional checks of instrument protected systems during pre-commissioning / commissioning in fabrication yard.
18. CONTRACTOR shall remove in-line instruments (except control valves) before hydraulic test and re-instate all such instruments after pressure test and flushing of process and utility lines.
19. CONTRACTOR shall maintain all valves, equipment, rotating machinery and likes for their scheduled lubrication and maintenance requirements during yard fabrication and shall provide updated maintenance manifest along with sail away documentation.
20. CONTRACTOR shall open all vessels for internal inspection, to carry out vessel cleaning, to ensure correct installation of internals and get final approval from COMPANY before vessel close up.
21. CONTRACTOR shall establish all set points for alarm and shutdown requirements and obtain acceptance/approval from COMPANY. Respective instruments shall be set with this approved list and simulated check onshore for their functional conformity.
22. CONTRACTOR shall establish requirements and perform specific preservation and protection for respective equipment, item, package, system and other platform facilities for protection under offshore environment and under SIMOP conditions as applicable. Necessary preservation shall be performed for the established duration from sailaway until the time of HUC and Start-up of platform facilities. CONTRACTOR shall define preservation and protection requirements in consideration to SIMOP conditions and risk. CONTRACTOR shall be responsible for necessary interface with COMPANY and solicit COMPANY review and acceptance. CONTRACTOR shall follow instructions by COMPANY in this respect however shall remain fully responsible to provide correct preservation and protection within CONTRACT PRICE. Platform facilities are expected remain idle under offshore environment for longer duration, mainly MDG wellhead

platform and that CONTRACTOR as necessary shall plan intermittent visits to offshore facilities to inspect, service, refresh or change out of preservation material.

2.5 SEA FASTENING AND LOAD-OUT

CONTRACTOR shall be responsible to provide all items associated with the load-out and sea fastening activities including, but not limited to:

- Barge strengthening, onshore skid beams / skid ways and bulkhead on barge, transition beams suitable for load out onto cargo barges furnished by CONTRACTOR.
- Fabrication/construction and installation of all sea fastening (internal sea fastening of WHP equipment and installation and external sea fastening).
- Labor, Material and Equipment required for the load out and sea fastening operations.
- Perform engineering calculations and miscellaneous design.

The proposed load out method must be identified in the Bid Proposal. CONTRACTOR shall submit a Load out and Sea fastening procedure minimum 120 days before MCD, second submission 60 days before MCD, third submission 30 days before MCD for COMPANY approval and final submission two (2) weeks prior to plan load out. This shall be applicable to load out for each FACILITY.

The detailed procedures prepared for the load out shall include the following, as applicable, the result of the engineering and design activities.

- Design checks of the load-out truss / skid shoes for structures such as topside.
- Load out equipment and rigging arrangement.
- As-built structural model and analyses showing that at no time during load out is the structure over stressed.
- Skid beam and foundation capacity checks.
- Quayside capacity checks.
- Elevation checks of quayside, barge skid beams and link beams.
- Tide level predictions.
- Ballast sequences.
- Bathymetric survey of load outside and passage to deep water.
- Transportation barge hydrostatic calculations (including barge payload layouts and barge stability checks)
- Allowable barge deck / skid beam loading.
- Mooring bollard checks

- Mooring winch checks
- Demonstration of ballast pump capacity and redundancy
- Jack / winch specifications
- Pull-on system layout
- Pull-off system layout
- Skidding system capacity calculations
- Multi-wheeled transporters specifications, if applicable
- Transportation barge mooring system analysis
- Identification of limiting environmental conditions.
- The final as-built weight reports (including the weighed values)
- Lift point design checks for lifting load outs.

1. CONTRACTOR shall fully satisfy all COMPANY and Marine Warranty Surveyor before the load out procedures are approved.
2. COMPANY shall provide the services of Marine Warranty Surveyor to witness, inspect and certify the load out design, methods, final tie-down and readiness for sail away.
3. CONTRACTOR shall furnish materials and fabricate the load-out structures, transportation grillage and sea-fastening (both internal and external) for all structures and ship loose items as required. All materials used for sea-fastening and grillage shall be new.
4. CONTRACTOR shall carry out the Load out and sea fastening of structures on a continuous twenty four (24) hour a day basis until completion and ready for sail away.
5. All spares, hook-up materials, ship loose items and other devices being part of the facilities or installation operation shall be suitably containerized, packaged, waterproofed and preserved on a long term basis. Said spares, materials and items shall also be loaded onto and sea fastened to the deck structure or directly onto the barge and made ready for transport to the SITE. The final location and arrangement of ship loose items, containers, baskets, etc shall be governed by COMPANY and MWS approval. Adequate design consideration shall be given for offshore lifting and handling of ship loose items and containers. At least sixty (60) days prior to Load out, CONTRACTOR shall prepare and submit to COMPANY a complete list of all items intended to be shipped loose. This list will be subject to COMPANY approval.
6. CONTRACTOR shall ensure that he employs a proper tag identification system of the shipped loose items and provide respective container locations clearly marked on relevant drawings.

7. The installation method statement shall provide a consistency between the final Load out, transportation and installation methods and the initial assumption made within the CPOC AFC Design Package. Installation method statements provided in Design Package are preliminary and shall be superseded by the detailed Load out, transportation and installation procedures developed by CONTRACTOR. CONTRACTOR shall be solely responsible for any implication on their load-out, transportation and installation method have on the WORK.
8. All rigging shall be inspected, tested and certified prior to installation on modules. Test certificate shall be provided to COMPANY / MWS for review. The use of rigging before certification shall not be acceptable.
9. Offshore installation slings and shackles and all necessary equipment shall be delivered to construction yard at least fourteen (14) days prior to Load out schedule for pre-rigging work.
10. CONTRACTOR shall at no additional cost to COMPANY dismantle all necessary piping, E&I, structural, etc items that are potential clash during T&I activities. All such items shall be properly marked, packaged, preserved and sea fastened along with other ship loose items in appropriate manner to smooth reinstatement of all such items offshore. CONTRACTOR shall be responsible for reinstatement of such ship loose items offshore.
11. CONTRACTOR shall review and verify the quayside is of adequate strength to permit a safe and efficient load out of all components and is sufficient to permit mooring of the transportation barges during and after load out operation.
12. CONTRACTOR shall perform an investigation of the area of the load out and the tow channel prior to arrival of the transportation barges. CONTRACTOR shall ensure that there is a minimum of 1.5 m under keel clearance throughout the load out and barge handling operations and shall remove any obstructions and dredge as necessary at no cost additional to COMPANY.
13. CONTRACTOR shall provide all transportation barges for the load out and transportation of all components from the fabrication/construction sites to the offshore installation sites. The barges shall be ready in all respects, including skid beams and under deck support, sufficient mooring points, navigational lightings, etc.
14. CONTRACTOR shall be responsible for gas-freeing the barges prior to commencement of the sea fastening activities.
15. CONTRACTOR shall ballast / de-ballast the barges to the necessary conditions for load out.
16. The topside and sub-structures shall be fabricated/constructed on CONTRACTOR supplied load out structures. CONTRACTOR shall Load out all components on CONTRACTOR supplied transportation vessels in accordance with the project specification.

17. CONTRACTOR shall provide the design, supervision, labor, materials, fabrication/construction and equipment for transferring and supporting all components from their fabrication location to final position aboard the transport vessels.
18. CONTRACTOR shall be responsible for design, procurement, fabrication and installation of the load out structures, transportation grillage and sea fastening (both internal and external) of all topsides, structure, facilities and appurtenances, ship loose items.
19. All structure / platform components shall be securely sea fastened to the barge deck for towing to SITE. Sea fastening shall be designed by CONTRACTOR with inputs of T&I requirements. CONTRACTOR shall procure and fabricate sea fastening in accordance with the approved AFC drawings prepared by CONTRACTOR.
20. Sea fastening shall be installed in such a way as to minimize undue stresses on the platform during offshore transportation. CONTRACTOR shall fabricate and install sea fastening in close coordination and detail requirements of COMPANY's Marine Warranty Surveyor (MWS).
21. All slings and shackles used for sea fastening shall be properly certified and have been inspected not more than two weeks prior to load out.
22. The load out and sea fastening of each major component shall not commence without written approval from COMPANY and Marine Warranty Surveyor and until a load out certificate is issued by COMPANY and/or the MWS. CONTRACTOR shall not perform any load out operation unless COMPANY SITE Representative is on site to witness them.
23. CONTRACTOR shall be responsible for ensuring that no damage is incurred by the equipment, structure or piping during load out. CONTRACTOR shall repair all damages to the structures, appurtenances and its protective coating which occurs during load out, sea fastening and removal of temporary aids. This work shall be completed to the acceptance of COMPANY prior to commencement of the sea transportation. Alternatively, CONTRACTOR shall be responsible to rectify all such damages offshore at no cost to COMPANY.
24. CONTRACTOR shall be responsible to carry out preservation of topside facilities and all load out structure all time during offshore transportation, installation, drilling, offshore hook up until HANDOVER to COMPANY.
25. CONTRACTOR shall plug or seal all open connections (piping, drains, electrical) for protection against debris, weather and salt spray during barge transportation, installation and idle offshore condition. Heavy polyethylene covering with duct tape shall be used to protect all mechanical and electrical equipment. CONTRACTOR shall also protect instrumentation and control equipment with moisture absorbing material suitable for marine environment. All additional preservation requirements shall be provided to protect topside equipment, instruments, piping material from contamination, dust, debris, drilling mud, marine environment, corrosion, rust, etc. CONTRACTOR shall be

responsible to correct and replace defected, corroded, contaminated material and equipment due to any reason including in adequate preservation.

26. CONTRACTOR shall be responsible for transportation of coated pipelines from coating yard to offshore SITE, load out of pipelines on transportation barge and offshore transportation to offshore for pipeline installation.
27. CONTRACTOR shall conduct the line pipe visual and dimensional inspection prior to transporting the line pipe to SITE. CONTRACTOR shall record any pipe damage or defects found at the coating yard and immediately highlight the matter to COMPANY.
28. CONTRACTOR shall be responsible for load out and transportation of wellhead platform structures (topsides and jackets) from its fabrication/construction yard to SITE for installation.

3.0 OFFSHORE

The offshore scope of work under EPCIC includes

1. Offshore Transportation and installation (T&I) of two (2) wellhead platforms (namely TPB and MDG) and two (2) subsea pipelines (namely TPB and MDG).
2. Offshore Hook-up and Commissioning (HUC) of two (2) wellhead platforms (namely TPB and MDG) that includes hook–up, commission, flow line installation and bringing the facilities to READY FOR START UP.
3. Offshore Host Tie-in works at offshore includes installation and integration of receiving facilities at TPA and MDE. This also includes telecommunication and UPS installation and integration at MDPP for Phase - 5 facilities.

3.1 OFFSHORE TRANSPORTATION AND INSTALLATION

CONTRACTOR shall perform Transportation and Installation (T&I) for two (2) wellhead platforms (TPB and MDG) and two (2) subsea pipelines (TPB and MDG). The detailed scope of WORK for Transportation and Installation (T&I) is as stated herein, explicit and implied, including all necessary to complete the WORK incompliance with other Exhibits of the CONTRACT and local and Global guidelines and regulations.

The Scope of WORK for transportation and installation includes, but shall not be limited to:

1. Transportation of wellhead platforms' jackets, topsides, piles, conductors, appurtenances, etc. from quayside(s) to SITE.
2. Transportation of coated line pipes and bends from coating yard quayside(s) to SITE.
3. Transportation of pre-constructed items, i.e. tie-in spools, crossing sleepers, installation aids and other appurtenances from quayside(s) to SITE.
4. Offshore installation of TPB and MDG wellhead platforms. COMPANY requires minimum four (4) weeks duration as a set up period for the completely installed platform before drilling rig arrives at the platform. CONTRACTOR shall strictly adhered to installation milestone as stated in Exhibit-3 CONTRACT SCHEDULE and build up necessary float to maintain set up period from drilling rig arrival plan.
5. Offshore installation of TPB and MDG pipelines
6. Offshore installation of all subsea tie-in spools with flange protectors at both ends of each pipeline.
7. Diving and inspection services.
8. Offshore installation of concrete sleepers for pipeline crossing, cable crossing, and free span rectifications (where applicable)
9. Pre-commissioning of full pipeline system for both TPB and MDG pipelines

10. Pipeline preservation up to one (1) year from offshore pipeline installation completion. CONTRACTOR shall responsible for:-
11. Pipeline preservation method and procedure
12. Pipeline preservation execution plan
13. Chemical dosing requirement
14. Pipeline preservation condition monitoring
15. Re-inject the chemical dosing (if required) within that period and shall include all relevant costs i.e. marine vessel, tools, equipment, consumables, man powers, etc.
16. Conduct site surveys for pre-installation survey, post-installation survey (both pipeline and structures), as-built ROV survey and CP survey of pipelines' system.
17. Incorporating "As installed" information into final documentation.

3.2 CONTRACTOR'S RESPINSIBILITY

1. WORK to be undertaken shall include full responsibility for furnishing of all labor, technical and professional services, tradesmen, divers, supervision, inspection and installed materials, except as otherwise specifically identified, temporary installation aids and works, consumables, safety equipment, marine vessels and equipment, tools, aircraft, watercraft, submersibles, diving equipment and supplies, warehousing, insurance, security and every item of necessary for marine survey, CONTRACTOR engineering, procurement, receiving, handling, hauling, transporting, loading, unloading, clearances, assembly, construction, installation, testing and all operations required to transport and install the wellhead platforms and subsea pipeline in accordance with the Scope of WORK.
2. CONTRACTOR's scope shall include all WORK and provision of all materials, equipment, resources and services required to meet both the explicit and implicit intents of this CONTRACT. Whether or not full details of the WORK are included here, the WORK shall be complete in every respect and operate in the expressed and implied manners with respect to the Scope of WORK.
3. CONTRACTOR shall furnish all materials and equipment (permanent or temporary) necessary to complete the WORK. This shall include but not limited to EPRS line pipe (coated), bends, pipeline coating, flanges, stud bolt and nuts, flange protector, crossing supports , spares, etc., under the CONTRACT PRICE. Material certification shall be available at all time for SITE inspection purpose.
4. CONTRACTOR shall procure, provide temporary storage and deliver EPRS pipes to COMPANY upon completion of offshore installation WORK under CONTRACT PRICE. A total quantity of ten (10) full length joints of EPRS coated pipes (consists of eight(8) plain joints and two(2) anode joints) with the thickest wall thickness (WT) of each OD,

from each of the pipeline routes (TPB and MDG) shall be delivered and offloaded to COMPANY's designated storage location (tentatively in Songkhla, Thailand), to be confirmed during execution.

5. Temporary bracing/frame, installation aids, scaffolding, testing materials and equipment shall be furnished by CONTRACTOR to complete the WORK. Items shall be adequate and be in a safe and serviceable condition. Any items considered unsafe or inadequate by COMPANY shall be removed from SITE by CONTRACTOR and replaced to COMPANY's satisfaction.
6. CONTRACTOR shall be responsible and shall bear all costs in the supply, construction and installation of all installation aids (such as laydown and start-up head, temporary blind flange for riser bottom and top, etc) necessary for a safe and complete installation of the WORK.
7. CONTRACTOR shall furnish a marine spread fully equipped to complete the WORK at SITE, complete with all necessary attendant vessel(s), workboat(s) and barge(s) and warrants that same shall be adequate for their intended use and to fully comply with the requirements of this CONTRACT.
8. CONTRACTOR shall allow CSR and/ or COMPANY's authorized delegates to access the marine spread, WORKSITE(S), SITE and WORK in order to inspect the WORK.
9. CONTRACTOR shall take all necessary measures to protect WORK and shall be responsible for WORK until the installation is completed and accepted in writing by COMPANY.
10. CONTRACTOR shall comply with all MWS's requirements for CONTRACTOR's engineering, reports, calculations, procedures, etc. covering certain aspects of WORK including, but not limited to load-out & sea-fastening, transportation, lifting, tie-ins, installation and pre-commissioning services. CONTRACTOR shall not proceed any work until both COMPANY and MWS approval is granted.
11. CONTRACTOR shall review and thoroughly check all COMPANY's provided information relevant to the WORK in order to identify any errors, discrepancies, inaccuracies and omissions and seek COMPANY's clarification if required. COMPANY's provided information as per Exhibits 4 and 5 shall be used by CONTRACTOR in accessing the complete WORK scope.
12. CONTRACTOR shall be responsible for the true and proper setting out of the facilities, the permanent facilities being constructed or to be constructed and resulting from the WORK or any part thereof, in relation to the original point lines, levels of reference and / or coordinates given by COMPANY and for the correctness of the positions, locations, levels, dimensions and alignment of all parts of facilities. CONTRACTOR shall provide all instruments, appliances, personnel and the like, in connection therewith necessary for the proper performance of such setting out. If at any time, during the performance of the WORK, any error appears in the setting out of the facilities, CONTRACTOR shall

immediately rectify such error to COMPANY's satisfaction. Additional delay and correction expenses shall be under CONTRACT PRICE.

13. CONTRACTOR shall strictly adhere to the General Marine Instructions (GMI) and Manual of Permitted Operations (MOPO) during the course of the performance of WORK for all offshore activities.
14. CONTRACTOR shall fully comply with CPOC's HSE requirements throughout the performance of WORK for all offshore activities.
15. CONTRACTOR shall manage to obtain the approval for Offshore Safety Passport (OSP) for all personnel working offshore in timely manner prior to mobilization to avoid any delay and schedule impact. COMPANY shall not be responsible for any delay or cost impact arising from late approval of OSPs due to the fact that CONTRACTOR's personnel fails to pass OSP's criteria or late application of OSP by CONTRACTOR.
16. Upon completion of the installation of topside, jacket, pipeline, tie-in spool and other appurtenances in their final position, CONTRACTOR shall perform visual and underwater inspection and submit findings report for any damage or defect to COMPANY no later than two (2) calendar days after such installation activity has been completed.
17. CONTRACT's drawings shall be maintained and used as "mark-up" drawings which shall be marked by red ink on a daily basis to indicate all approved modifications during the execution of the WORK. After COMPANY's review and approval, CONTRACTOR shall incorporate all modifications into the original drawings. Approved as-built drawings shall then become part of Final Documentation compilation.
18. CONTRACTOR shall be responsible for reinstallation/ reinstatement of equipment/ fixtures that has been removed in order to facilitate transportation of the facilities and drilling operations on the platform.
19. CONTRACTOR shall clean and tidy up the working areas daily. There shall be no material, scraps, debris, tools, or equipment including cables, hoses and wires left at the working area after working hours unless allowed by COMPANY.
20. All scraps and debris must be secured safely and loaded into CONTRACTOR supplied containers of sufficient size which shall be made of steel. CONTRACTOR shall deliver the rubbish/ construction debris containers to onshore base for disposal. Disposal of scraps or any other materials into the sea or by burning is strictly prohibited.
21. CONTRACTOR shall provide suitable containers to store and transport materials, tools and equipment. These containers must be suitable for transportation and tested with valid certificate. This weight capacity shall be clearly stamped onto the container surface.
22. CONTRACTOR shall ensure that the WORK SITE been clear of any debris, scraps, tools, or equipment include cables, hoses, wires and scaffolding by performing the joint

inspection and site survey and submit the report to COMPANY prior to leave the WORK SITE.

3.3 MATERIAL HANDLING AND CONTROL

CONTRACTOR shall take all necessary and appropriate steps to protect the WORK and their components from loss, damage or deterioration.

CONTRACTOR shall replace all lost or damaged material. Damage, loss, theft or corrosion of material occurring whilst in CONTRACTOR's custody shall not be cause for delay in achieving any milestones key dates.

CONTRACTOR shall be responsible for the cost of damage, repairs, replacement, etc. resulting from whatsoever reason that would render material under its control unsuitable for the purpose intended.

CONTRACTOR shall recover all materials lost overboard at SITE. CONTRACTOR shall collect all its materials, equipment, installation aids and debris from SITE before demobilization.

All rigging and handling procedures used by CONTRACTOR shall be in accordance with specifications, safety procedures and good industry practices shall be tested and certified prior to use. COMPANY have right to prohibit the use of any rigging or handling procedure or practice that it deems unsafe or unnecessarily risky.

3.4 SITE OPERATIONS SUPPORT & COMMUNICATIONS

CONTRACTOR shall ensure adequate and effective onshore communications, supply and logistics support in order for CONTRACTOR's offshore marine operations to be in operation twenty four (24) hours per day throughout the T&I PHASE of the WORK.

3.5 INTERFACES

CONTRACTOR shall cooperate and interface with OTHER CONTRACTORS, any third parties and relevant statutory bodies and authorities involved in COMPANY's projects which are scheduled concurrently with WORK.

If any work performed by COMPANY and/or OTHER CONTRACTORS are undertaken within the vicinity of SITE and/or load-out quayside(s), CONTRACTOR shall cooperate with such others as necessary in order to ensure safe and efficient execution of WORK.

CONTRACTOR shall interface with OTHER CONTRACTORS which shall include, but not be limited to, the followings:

(a) Marine Warranty Surveyor (MWS)

CONTRACTOR shall be responsible for performing all engineering and analysis activities required to effect successful installation of the WORK. The WORK shall include, but not be

limited to, barge strengthening, load transference and sea-fastening on the barges related to sea transportation and installation.

The foregoing design shall all be subject to MWS's approval. Installation of steelwork shall not commence until such time as MWS has approved not only the design but also the seaworthiness of the barges.

CONTRACTOR's proposal for sea-fastening design shall also be subject to MWS's approval.

Tow-away shall not commence until such time as the MWS has agreed to the tow plan, satisfied itself as to the suitability of the proposed tugs for the tow, satisfied itself that the cargos have been sea-fastened in accordance with the approved design, all towing lines, pennants etc. have been inspected and all necessary certificates pertaining to these have been received.

Prior to arrival of the installation vessel at SITE, MWS shall perform a survey of same to ensure it fulfills all internationally recognized criteria, specifications and Health, Safety and Environment (HSE) requirements. CONTRACTOR shall not commence installation WORK until MWS approves to proceed.

(b) Drilling Contractor

CONTRACTOR shall interface with Drilling Contractor should it be necessary and should adhere to COMPANY's Drilling Programme which may influence any WORK.

(c) Host Tie-in Interface

Should Host Tie-in work be executed in the same offshore campaign of T&I work, CONTRACTOR shall carefully manage the interface to avoid clash or disruption to the campaign, especially vessels movements, materials transfer and personnel transfer.

(d) Hook-up and Commissioning Interface

Hook-up and commissioning on new wellhead platforms shall not commence until such time as CONTRACTOR has completed its T&I WORK, with the exception of any punch list WORK that may be outstanding.

Punch list WORK shall be undertaken whilst the hook-up and commissioning in progress and CONTRACTOR shall be responsible for minimizing any disruption and completing all such punch list WORK in an efficient and workmanlike manner.

(e) Third Parties

Where COMPANY has appointed OTHER CONTRACTOR(S), CONTRACTOR shall afford such OTHER CONTRACTOR(S) access following mutual approval with COMPANY. Should CONTRACTOR incur delay as a result of such access, then it shall advise COMPANY immediately, stating the consequences. If COMPANY agrees, it shall issue a

Change Order in order to amend the work schedule for any substantial delay incurred and reimburse any substantiated additional costs incurred.

When crossing over the existing third party subsea assets (such as cables, pipelines, etc), CONTRACTOR shall notify the third party/asset owner of the construction plan. CONTRACTOR shall interface with COMPANY in this respect and shall furnish all necessary documentation and data.

3.6 SAFETY PROCEDURES AND PRECAUTIONS

1. CONTRACTOR shall be responsible for the safety at all WORKSITES and SITE.
2. CONTRACTOR shall adhere to COMPANY's HSE requirements as provided in Exhibit 8 – Health, Safety and Environmental Requirements and all other safety instructions issued by COMPANY for WORKSITE and SITE operation. Work permits shall be required when working in operating plant or platform areas.
3. CONTRACTOR shall ensure that all employees are made aware of the safety practices before commencement of WORK. COMPANY shall have the right to stop WORK at any time if the WORK or its environment inspected by COMPANY is imminently hazardous to persons or property. This shall not in any manner delay completion of the WORK. CONTRACTOR has the responsibility for ensuring that its SUBCONTRACTORS comply with all safety practices and guidelines.
4. CONTRACTOR shall appoint safety officers responsible for all safety related issues at each SITE. CONTRACTOR's safety officers shall be on duty during all SITE 24 hours working operation.
5. CONTRACTOR shall ensure that only authorized personnel are allowed on SITE.
6. Smoking is forbidden at SITE, except within designated locations. Smoking outside accommodation within 500m radius from any platform is prohibited.
7. In case of WORK involving entry into confined spaces or areas where there are or may be flammable substances, CONTRACTOR shall not permit any WORK without prior written notice to COMPANY and COMPANY's review of proper safety procedures and permission to proceed. CONTRACTOR shall comply with COMPANY's 'Permit to Work' system for all WORK.
8. Explosives and hazardous substances shall not be used without prior written notification to COMPANY before use or handling.
9. Safety shall be of paramount concern during diving operations. Construction operations with the potential to compromise diver safety shall be put on hold while diving is in progress. Fishing from any vessel in the vicinity of diving operations is prohibited.
10. Good housekeeping, protective equipment, medical aid, training and safety procedures and their monitoring are CONTRACTOR's responsibility. A medical officer (medic) shall be fulltime on-board each vessel during all offshore operations. CONTRACTOR shall have

provisions and access to emergency medical evacuation by the fastest method possible at all times for all personnel during all offshore WORK.

11. The use, possession, distribution or sale of illegal drugs and controlled substances are absolutely prohibited. Any CONTRACTOR's personnel who violate the Drug & Alcohol policy will be demobilized immediately at CONTRACTOR's sole cost.
12. COMPANY shall be immediately notified of any accident which involves serious bodily injury or death. In case of any fatality, CONTRACTOR shall notify Thai and/or Malaysian police for the proper investigation in accordance with the appropriate legislation.
13. CONTRACTOR shall submit to COMPANY a weekly report outlining in detail the safety record in all operations for the preceding weeks. CONTRACTOR shall conduct a safety meeting on each SITE, first day upon commencing new activity and thereafter weekly. A Safety Inspection shall be investigated for reported violation.

3.7 FIRE PREVENTION AND SUPPRESSION

CONTRACTOR shall take all necessary precautions in order to prevent the outbreak of fire and shall ensure that it has sufficient equipment and personnel at all times to permit the suppression of any accidental fire originating from its installation activities. Field personnel shall report any smoke that cannot be accounted for.

3.8 ENVIORNMENT CONSIDERATIONS

Reference is made to Exhibit 8 for detailed health, safety, environmental and security requirements. However, CONTRACTOR shall take further cognizance of the following:

PREVENTION OF AIR AND WATER POLLUTION

CONTRACTOR shall undertake the WORK using methods and equipment which shall minimize discharge into the atmosphere of smoke, dust, or other contaminants in accordance with the statutes and regulations of the Authorities having jurisdiction and as specified in General Conditions and Technical Requirements herein. Engines, generators, etc. exhibiting excessive pollution shall be repaired, tuned, or replaced by CONTRACTOR. In particular, due care shall be taken by CONTRACTOR during pipeline dewatering and drying when dust and chemically treated water that may be expelled from the pipelines.

CONTRACTOR shall provide suitable equipment and facilities in order to prevent introduction into the sea, any stream, lake or other body of water or into any land of any substances or materials which may be harmful to marine life, wildlife or human health. In particular, care must be taken by CONTRACTOR during filling and disposal of water from the pipelines during cleaning and after hydrostatic testing regarding excessive amounts of solids, sludge and neutralizing chemicals. Any leakages (oil, fuel, lubricants, etc.) from CONTRACTOR's vessels or equipment shall be immediately contained and the source of the leakage shall be rectified.

CONTRACTOR shall at all times maintain equipment on SITE in order to contain, capture and clean up any accidental release of harmful chemicals, pollutants or other materials into the environment. Spills shall be cleaned up immediately. Spills on water shall be removed by vacuum pumping. Land spills shall be cleaned up by using an absorbent material, such as straw, and transporting the contaminated straw to a disposal area.

Disposal of spill material and waste oil can only be accomplished onshore by disposal at a licensed facility with prior notification to COMPANY if recycling is not practical.

In the event of a spill, an investigation shall be made and a report prepared advising COMPANY of the source and cause of the spill, volume and extent of the spill, method of cleanup, environmental effect (if any), disposition of the source equipment and remedial action planned and/or taken to prevent repeat occurrences.

CONTRACTOR is restricted from widespread use of pesticides. Control of biting insects shall be on a personal basis. Any localized spraying around CONTRACTOR premises shall be in accordance with Thailand and/or Malaysian regulations concerning the use of pesticides.

DISPOSAL OF WASTE MATERIAL

CONTRACTOR shall collect all debris resulting from its activities and dispose of such debris in an area and in a manner whereby permission to proceed has been granted by COMPANY and all has been approved by Authorities having jurisdiction.

CONTRACTOR shall not dispose of any liquid or solid wastes without a valid permit. CONTRACTOR shall be responsible for obtaining and maintaining the necessary permits.

Offshore waste shall be disposed of in accordance with requirements given in the General Conditions (GC-23). Nothing shall be thrown or discharged directly into the sea.

HANDLING AND STORAGE OF FUELS AND HAZARDOUS MATERIALS

The use of hazardous materials shall be carefully controlled. All such materials shall be clearly labeled and used only by selected trained and authorized personnel.

Storage facilities for fuels and hazardous materials shall be constructed to ensure that no risk of contamination of water bodies or other sensitive environments would result from an accidental spill and that any leakage would be readily detected and contained.

Extreme care shall be exercised in order to prevent spillage during refueling and oil changing operations. When vessels and equipment have to be fuelled or serviced in stream, it shall be done in a careful manner such that accidental spills do not occur. Should an accidental spill occur, it shall be contained and cleaned up immediately by CONTRACTOR.

CONTRACTOR shall take all necessary measures, securing approvals and certifications from the relevant statutory bodies and/or agencies in the handling, shipping, and storing of

any hazardous materials (biological, chemical, radiological and/or physical) to any location of the WORK as required by the CONTRACT.

ENVIRONMENT DATA

CONTRACTOR shall furnish and deploy adequate instrumentations, systems and all other EQUIPMENT necessary to measure, record and monitor all environmental data relevant to the marine operations (i.e. roll and pitch, heave for marine vessel), including the response of the barge and the structures.

CONTRACTOR shall develop procedures for decision making relevant to the marine operations, based upon the real analysis of the environmental data.

3.9 MARINE SPREAD

General

CONTRACTOR shall finalize the numbers and types of vessels proposed to use to complete the WORK. CONTRACTOR shall be responsible for the adequacy of same. This shall not be subject to change, except with the formal approval by COMPANY, which shall only be granted under exceptional circumstances.

All vessels used by CONTRACTOR shall be subject to COMPANY's and MWS's approval. All vessels shall have valid OVID and current Certificates of Classification certifying their seaworthiness and suitability for WORK intended. CONTRACTOR shall provide COMPANY with copies of all certificates at least ninety (90) days prior to mobilization to offshore.

As a minimum, the following documentation shall be available for marine spread used to complete the WORK:

- Certificate of Class issued by a recognized classification society.
- Certificate of Registry or proof of ownership.
- Tonnage certificate (if not incorporated in any other certification); bollard certificate and other necessary certification where applicable.
- Certificate of Approval of Navigation Lights and Shapes issued by the Authority having jurisdiction subsequent to load-out.
- Certificate of Approval of Life and Fire Fighting Appliances issued by the authority having jurisdiction.
- International Load Line Certificate.

All vessels and equipment shall be in first class working condition and be properly and regularly maintained. CONTRACTOR shall ensure that its marine spread is adequately provided with sufficient electricity, fuel, water, lubricants and consumables throughout the WORK. COMPANY shall be informed of any recent or scheduled dry-docking of vessels

and the nature and extent to such dry-docking. COMPANY shall survey and approve the marine spread prior to the mobilization of the vessels.

CONTRACTOR shall submit its tow route and tow analysis including shelter locations and emergency response plan for COMPANY's approval not later than ninety (90) days prior to scheduled load-out date and, following any COMPANY's comments, issue its final tow route and tow analysis not later than sixty (60) days prior to scheduled load-out date.

CONTRACTOR shall advise COMPANY of the sailaway date to meet the offshore installation schedule, taking all matters into consideration, including the likes of port clearances, customs clearances, vessel entry permits, Offshore Safety Passport (OSP), weather condition and anything else that may affect the tow. COMPANY shall not be responsible for the late arrival of the cargos or components at SITE.

All vessels shall be equipped with communication equipment to enable contact between the vessels, CONTRACTOR's shore base and COMPANY's office.

Rigid type Personnel Transfer Basket shall be provided and used for personnel transfer at offshore.

All material carrying (cargo) barges shall be certified by a recognized certification agency acceptable to COMPANY to be of sufficient size and capacity to operate safely in any sea environment that may develop along the ocean route to SITE.

Additional requirements for marine spread to be utilized for WORK shall include the following:

- SOLAS 1974 along with the 1978 protocol and 1983 amendments applicable to the type of vessels.
- International Rules of Tonnage Measurement (both 1967 and 1969 convention).
- Current anti-pollution regulations for type of vessels – DOT, IMO and MARPOL.
- International Convention for Prevention of Pollution from Ships 1973, along with the 1978 protocol.
- International Regulations for Preventing Collisions at Sea 1972 with subsequent amendments.
- Maritime Laws and regulations of Malaysia and Thailand.
- Noble-Denton Guidelines for transportation and load-out.
- Other international guidelines for transportation and load-out.
- Noble-Denton Guidelines for Marine Lifting Operation
- COMPANY's General Marine Instructions

Platform Installation Vessel/ Heavy Lift Vessel

CONTRACTOR shall provide suitable and capable platform installation vessel. The vessel shall be equipped with sufficient capacity Heavy Lift Crane considering maximum load and Dynamic Amplification Factor (DAF) as per DNV guideline or equivalent international standard. The Heavy Lift Crane shall be equipped with calibrated load cell with recordable digital weight reading device in order to obtain actual weight of the lifted structure real time.

The proposed vessel shall be approved by COMPANY and MWS prior to mobilization to SITE.

If CONTRACTOR uses anchored/ moored barge to perform platform installation, CONTRACTOR shall submit anchor patterns and mooring analysis to COMPANY and MWS for approval sixty (60) days prior to mobilization to SITE.

The vessel shall have sufficient accommodation and facilities for all personnel required to complete the WORK including provision for COMPANY as detailed in the CONTRACT. CONTRACTOR shall perform functional test of the marine equipment, construction equipment and other relevant equipment during the vessel suitability survey. However, construction equipment's (where applicable) functional tests i.e. lifting cranes, hammer, ROV, tensioner, welding equipment, NDT equipment, field joint coating equipment, stinger, pigging equipment, etc. shall also be done prior to mobilization. Findings from functional tests shall be recorded and submit to COMPANY for information. This is to assure all those construction equipment in good conditions to avoid any issue during offshore installation.

Pipeline Installation Vessel

CONTRACTOR shall provide suitable and capable pipeline installation barge/ vessel. The vessel shall be equipped with typical S-Lay Stinger and shall have at least 2 tensioners with minimum capacity of 60 MT each. The proposed pipeline installation barge/ vessel shall be approved by COMPANY and MWS prior to mobilization to SITE.

If CONTRACTOR uses anchored/ moored barge to perform pipeline installation, CONTRACTOR shall submit anchor patterns and mooring analysis to COMPANY and MWS for approval sixty (60) days prior to mobilization to SITE.

CONTRACTOR shall confirm whether the proposed vessel is equipped with Saturation Diving System (SAT). If not, CONTRACTOR shall mobilize Dive Support Vessel (DSV) to perform subsea works.

The vessel shall have sufficient accommodation and facilities for all personnel required to complete the WORK including provision for COMPANY as detailed in the CONTRACT. CONTRACTOR shall perform functional test of the marine equipment, construction equipment and other relevant equipment during the vessel suitability survey. However, construction equipment functional tests i.e. tensioner, ROV, welding equipment, NDT equipment, field joint coating equipment, lifting crane, stinger, etc. shall also be done prior to mobilization. Findings from functional tests shall be recorded and submit to COMPANY

for information. This is to assure all those construction equipment in good conditions to avoid any issue during the pipeline installation. Sufficient spares of critical equipment or tools shall be provided on board to avoid any delay during the pipe lay.

Dive Support Vessel (DSV)

If required, CONTRACTOR shall provide suitable and capable Dive Support Vessel with DP2 or higher class. The vessel shall be equipped with Saturation Diving System (SAT) and ROV.

The vessel and equipment on board shall comply with IMCA and relevant international standards.

The SAT system shall be pressure tested and function tested prior to mobilization.

The vessel shall have sufficient accommodation and facilities for all personnel required to complete the WORK including provision for COMPANY as detailed in the CONTRACT. CONTRACTOR shall perform functional test of the marine equipment, construction equipment and other relevant equipment during the vessel suitability survey. However, construction equipment functional tests i.e. ROV, diving equipment, slings & rigging equipment, welding equipment, NDT equipment, field joint coating equipment, lifting crane, pigging equipment, hydrotesting equipment, etc. shall also be done prior to mobilization. Findings from functional tests shall be recorded and submit to COMPANY for information. This is to assure all those construction equipment in good conditions to avoid any issue during the subsea works.

Cargo Barge

CONTRACTOR shall supply cargo barge suitable for the transportation and offshore lifting of all cargos. The provided barge shall be in full conformance with this CONTRACT.

The cargo barge selected by CONTRACTOR shall be acceptable by COMPANY and MWS and meeting all Malaysian/Thailand and international (if applicable) marine legislation and regulations, etc.

The cargo barge provided shall be tight, staunch, strong, in good order and condition and shall be fit to carry and deliver the cargos safely and efficiently to SITE. Any barge strengthening and/or load spreading required to support the fabricated structures and other cargos shall be of CONTRACTOR's responsibility at no additional cost to COMPANY. The nominal barge deck strength shall be 10 MT/m^2, however, along the bulkheads and frames shall be much greater.

When it is required, CONTRACTOR shall design and install skid beams for the barge. The spacing and elevations on the barges shall match the skid beams' spacing and elevations provided at the various load-out locations by ballasting the barge. Skid beams shall be of sufficient strength to carry the maximum loads in accordance with the transportation / load-

out / installation analyses. Barge skid beams shall be level, straight and shall be coated with Teflon (PTFE) or equivalent material.

CONTRACTOR shall design and install all grillages that may be required to facilitate transfer of the vertical loads from the structures to the barges, in order that there shall be successful implementation of WORK, prior to the arrival of the barges at load-out quayside.

Barges provided by CONTRACTOR shall be fully compatible in all aspects with the various load-out facilities and arrangements including the followings but not limited to:

a) Jetty, quay, dry dock or other berthing facilities, mooring and other marine facilities.

b) Local weather conditions

c) Water depths and tidal movements during load-outs.

d) Load-out facilities (e.g. cranes, trailers, etc.)

All cargo barges shall be fitted with battery powered navigation lights.

CONTRACTOR shall demonstrate to COMPANY's entire satisfaction that all barges proposed for the WORK are adequate and fit for purpose.

CONTRACTOR shall provide complete sets of barge data of the proposed marine spread to COMPANY for review no later than ninety (90) days prior to scheduled mobilization date. This barge data shall include drawings of the barge general layout and all details of its construction, stability data, barge mooring system, ballasting system, navigational equipment and all other pertinent information to justify suitability. This data shall also include indications of deck strengths with respect to the following loading conditions.

i. Uniform deck load.

ii. Line load along longitudinal bulkhead.

iii. Line load along transverse bulkhead.

iv. Point load along longitudinal bulkhead.

v. Point load at intersection of longitudinal and transverse bulkheads.

vi. Line load along skid beams.

vii. Horizontal fender capacity during deck installation (deck barges only).

CONTRACTOR shall make the barges available for COMPANY and MWS inspections at a suitable location, where access is convenient and in non-critical barge time. CONTRACTOR shall make available suitable equipment, consumables and manpower for COMPANY to check the following:

a) Actual ballast pumps capacity (both built-in and supplementary ballast pumps).

b) Level and straightness of skid beams.

c) General condition of barges.

d) Towing bridle and associate fittings.

e) Function test on all navigation aids.

The tug Master/ Captain shall be responsible for and direct all operations on the cargo barge. The tug boat shall be supplied together with sufficient crews and officers in order to enable the tug boat and barge to operate on a continuous twenty four (24) hour basis for the duration of WORK.

Tug Boat

CONTRACTOR shall supply sufficient and suitable tug boats for the transportation of the materials, equipment and consumables from the various load-out locations to SITE. CONTRACTOR shall refer to GMI for additional instructions.

CONTRACTOR shall submit complete tug boat specifications and data which shall include, but not be limited to, general arrangement drawings, towing system, stability data and the like according to MWS requirements.

CONTRACTOR shall submit calculations in order to demonstrate the proposed tug boats' bollard pull strength is sufficient to maintain a safe and efficient tow in adverse weather conditions and maintain a speed of at least five (5) knots.

CONTRACTOR shall undertake a bollard pull test for all the tugs provided under this CONTRACT and submit report to COMPANY. Such test(s) may be undertaken at the discretion of COMPANY and/or MWS. However, if CONTRACTOR holds valid bollard certificates, such tests may not be required.

For line pipe load-out, at least one (1) tug boat shall remain with the transportation barge in standby mode for the entire duration of the load-out. The tug boat Captain shall remain on board the tug boat at all times during load-out.

Supplementary Vessels: Anchor Handling Tug, Supply Vessel, Crew Boat

CONTRACTOR shall provide suitable and sufficient Supplementary Vessel in the Marine Spread to ensure that the WORK will be complete as per CONTRACT requirements.

All Anchor Handling Tugs to be used for the WORK shall have sufficient horsepower and a certified bollard pull certificate indicating that the tugs have enough power to maintain headway in a sea state.

Supply Vessel to be used for the WORK shall have sufficient deck space and deck strength in order to safely transport cargos between SITE(s) and/or port(s). Moreover, the vessel shall have sufficient and certified storage tanks to store, transport and/or transfer consumables throughout the offshore campaign.

Crew Boat to be used for the WORK shall have sufficient and comfortable air-conditioned accommodation for crews. The proposed crew boat shall meet with international hygiene standard for offshore. It shall be able to cruise at maximum speed of at least 20 knots. Crew boat shall have suitable landing area to safely transfer crews from/ to the boat.

The above vessels shall have sufficient numbers of life saving equipment (i.e. life rafts, rescue boat, etc.) and they shall be inspected and accepted by COMPANY and MWS prior to mobilization to SITE(s).

Towing Gear

All towing equipment including safety equipment, radar and communication systems, wire rope, shackles and fittings etc. used for the tow shall be in good condition and acceptable to both COMPANY and MWS.

Each tug shall be manned with a qualified master, officers and seamen who shall clearly understand each other via the communication systems.

CONTRACTOR shall, at all times during the tow, have a transportation crew member assigned the sole duty of watching the tow to report any mishap. The Tow Master shall take immediate corrective action.

Navigation / Positioning Systems

CONTRACTOR shall provide all navigational and positioning equipment and services that are necessary to ensure the structures are installed in the position and level required by this CONTRACT.

All vessels with a positioning requirement shall be equipped with a wide area Differential Global Positioning System (DGPS). The operation of DGPS systems shall be compliant with the Guidelines on the Use of Differential GPS in Offshore Surveying published by the Surveying and Positioning Committee of the United Kingdom Offshore Operators Association (UKOOA).

All survey WORK, positioning operations and reporting performed with respect to this CONTRACT shall meet with COMPANY and MWS approval.

Where any conflict exists with the foregoing, these shall be advised to COMPANY who shall resolve same.

All positioning equipment used for the WORK shall be calibrated by CONTRACTOR to MWS and COMPANY's satisfaction prior to use.

Mobilization

CONTRACTOR shall deliver the transportation barges, tugs and other marine vessels in a clean condition fully fitted out, ready for load-out and for sea fastening of the cargos to the load-out quayside(s).

CONTRACTOR shall deliver the installation vessel to SITE fully rigged up and in a clean condition ready to perform the installation WORK in accordance with the time stated in the agreed schedule.

Clean-up and Demobilization

CONTRACTOR shall undertake all WORK necessary to remove surplus material and scrap, touch-up paintwork and clean up the offshore platform and adjacent areas to leave it in a neat and orderly condition. COMPANY shall check and advise acceptance of the state of cleanliness prior to CONTRACTOR's departure from SITE. CONTRACTOR shall, in particular, survey the jacket and nearby area (500m x 500m) for debris such as wire, ropes, cables, etc. which may be hanging and remove all such items.

After completion of the clean-up and survey up to COMPANY satisfaction, CONTRACTOR shall issue a field report / certificate signed by all parties for the completion of the WORK.

CONTRACTOR shall upon approval by COMPANY, demobilize marine spread or parts thereof upon completion of the respective offshore operations.

The scope shall include, but not be limited to, the following:

(a) Complete demobilization of each unit of marine spread.

(b) Transportation of all scraps and surplus materials to CONTRACTOR's designated location.

(c) Removal of all CONTRACTOR's materials, equipment or other items from SITE.

(e) Demobilization of personnel and equipment.

Weather Forecasting

CONTRACTOR shall employ the services of a professional weather forecasting company approved by COMPANY in order to provide weather forecasts throughout offshore PHASE of WORK and in all offshore campaigns, including the tow. CONTRACTOR shall submit to COMPANY twice daily weather forecasts report, one week look ahead weather forecast weekly reports, throughout the entire duration of the WORK including, but not limited to, load-out, sea-fastening, towing, installation and surveys. However:

- Whilst undertaking the pipeline installation, CONTRACTOR shall distribute the twice daily weather forecasts to all vessels engaged in WORK and ensure that all vessels are aware of and take action in accordance with CONTRACTOR's coordinated plan for response to various weather conditions.
- All such weather information shall be copied to COMPANY's SITE Representative and to COMPANY's head office.

Marine Operations

Marine operations shall include, but not be limited to, towing, positioning, anchor-handling, transfer of personnel and materials between vessels and/ or platforms, standby, approach to congested areas and the like. CONTRACTOR shall develop its own marine procedures, in compliance with COMPANY's General Marine Instruction, for all its marine operations to

be included with the Installation Plan for review, comment and approval by COMPANY and MWS.

CONTRACTOR's Other Responsibilities

1. CONTRACTOR shall make every effort to maximize recruitment, training and employment of Malaysian and/or Thai national employees to undertake the WORK.
2. CONTRACTOR shall be responsible for the travel and living arrangements of CONTRACTOR's personnel engaged in the WORK.
3. CONTRACTOR shall, at all time, keep SITE and marine spread clear of all rubbish and debris resulting from CONTRACTOR's activities. Any material, rubbish or debris dropped overboard shall be located and removed from the sea or seabed by CONTRACTOR, at no additional cost to COMPANY to the extent it is due to the fault on the part of CONTRACTOR. CONTRACTOR shall ensure, prove and record that no any debris left at SITE prior to demobilization. CONTRACTOR shall put this in report and submit to COMPANY for information.
4. CONTRACTOR shall avoid interference with fishermen. If there's fishing gear/ equipment obstructing the WORK, CONTRACTOR shall use its best effort to retrieve/ relocate it, and not to destroy or damage it.
5. CONTRACTOR shall comply with all customs clearance requirements stated in this CONTRACT and observe the following:

a) CONTRACTOR shall give COMPANY a minimum of six (6) weeks written notification of any direct importation of MEL (Material Exemption List) items. For non-MEL items, CONTRACTOR shall import same in its own name. CONTRACTOR shall be familiar with all relevant authorities' requirements.

b) CONTRACTOR shall submit to COMPANY within thirty (30) days from the EFFECTIVE DATE of the CONTRACT, the complete list of items to be imported for WORK.

c) CONTRACTOR shall submit to COMPANY at least thirty (30) days prior to mobilization to SITE the application for Direct Importation (DI) and Direct Exportation (DE) which includes supporting documents for each vessel.

d) CONTRACTOR shall be familiar with Malaysian and Thai customs and other regulatory requirements and procedures.

e) When any of CONTRACTOR's vessels move between Malaysian or Thai or JDA waters or any other international boundaries, CONTRACTOR shall be responsible for the customs clearance and immigration formalities of same.

3.10 MARINE GAS OIL (MGO)

CONTRACTOR shall furnish Marine Gas Oil (MGO) suitable for its approved marine spread. COMPANY shall reimburse the cost of MGO consumed on SITE by CONTRACTOR during offshore PHASE of the WORK based on actual volume consumption without exceeding the cap volume declared in CONTRACTOR's bid proposal.

CONTRACTOR shall propose MGO cost based on cap volume in MT required for each marine vessel in all offshore campaigns at the unit rate of USD 1000/MT as part of the CONTARCT PRICE. The cap of MGO volume shall remain firm and not adjustable throughout the CONTRACT duration. However, the unit price of the MGO will be adjusted and reimbursed by COMPANY as per actual purchased price supported by actual invoices.

3.11 QUALITY ASSURANCE AND QUALITY CONTROL

3.11.1 Quality Assurance (QA)

Within thirty (30) days from the EFFECTIVE DATE, CONTRACTOR shall submit its QA Management System (QA Manual) as per Exhibit - 7 requirements.

Within thirty (30) days from the EFFECTIVE DATE, CONTRACTOR shall submit its PROJECT QA organization chart and internal audit schedule for COMPANY's approval.

Procedures and Welders Qualification

1. All welding including tack welding shall be undertaken by qualified welders and as per approved procedures.
2. Procedures and welder qualifications shall be completed and the proper documentation approved by COMPANY prior to WORK commencing. All welders' qualification costs shall be borne by CONTRACTOR. All procedure and welder qualification tests shall be witnessed by COMPANY REPRESENTATIVE or COMPANY's authorized delegate. All welders shall undertake a welding test regardless of previous qualifications.
3. Qualification of a welder on previous projects does not constitute qualification of the welder in respect to this CONTRACT.
4. All welders shall be qualified in accordance with relevant codes and witnessed by COMPANY REPRESENTATIVE or COMPANY's authorized delegate prior to commencing WORK.
5. During welding procedure and welder qualification tests, CONTRACTOR shall furnish welding consumables, test material and equipment similar to those to be used on WORK.
6. No production welding shall be permitted until appropriate welding procedure specifications and subsequent qualifications have been approved by COMPANY.
7. Only qualified SMAW welders shall be permitted to undertake arc-air gauging operations.

8. CONTRACTOR shall provide suitable protection to welding activities during inclement weather from wind and rain that may impair the quality of welds. CONTRACTOR shall use fire resistant blankets for containment of sparks and hot slag during all welding, cutting and burning operations when performed adjacent to process equipment.

3.11.2 Quality Control (QC)

Equipment and Personnel

CONTRACTOR shall arrange for and undertake all inspection and testing indicated in the various sections of this CONTRACT. CONTRACTOR shall provide all equipment and personnel necessary to undertake the required inspection and testing according to the relevant standards, codes and specifications. In particular, CONTRACTOR shall provide full on-site facilities for radiographic and/or ultrasonic equipment, isotopes, dark room, equipment for developing films, viewing facilities, magnetic particle inspection (MPI), dye penetration and the services of inspecting technicians who are qualified and experienced with radiographic, ultrasonic and other inspection techniques. Technicians shall be competent to operate the equipment and to interpret results pertaining to acceptability of the welding. However, COMPANY reserves the right to use whatever NDT means available to satisfy itself that any part of a weld is of acceptable quality.

On-site Inspection Equipment

CONTRACTOR shall provide sufficient approved paint thickness measuring devices, coating 'holiday' detectors, continuity detectors and other devices as required by COMPANY in order to determine the acceptability of painting and protective coating WORKs being undertaken, along with technicians competent to operate such detectors and devices. Testing shall follow the guidelines set forth in specifications. Functional tests of equipment shall be made prior to mobilization to SITE.

Visual Inspection and records

All materials and WORK shall be subject to visual inspection for surface defects.

Welds found to be out with the defect tolerance as per codes, standards and specifications shall be repaired or replaced to COMPANY's satisfaction and at CONTRACTOR's expense.

Complete records of all weld inspections shall be maintained by CONTRACTOR until final acceptance of WORK. CONTRACTOR shall maintain all weld radiographs and submit the same to COMPANY after final acceptance of WORK.

Regulatory

CONTRACTOR shall be responsible for preparation of and participation in regulatory submittals and meetings with regulatory agencies in order to facilitate regulatory approvals/permits. Most of the regulatory requirements are applicable onshore or near shore. CONTRACTOR shall allow access and respond to requests from regulators to visit

SITE and/or witness key activities (weld inspection, hydrostatic testing, etc.). CONTRACTOR shall assume responsibility for securing all permits/approvals as required by the regulatory agencies.

Information required from CONTRACTOR for submittal to regulatory agencies shall be made available to COMPANY on a timely basis.

CONTRACTOR shall bear all costs associated with the engagement of the regulatory agencies' representative and of providing all necessary support services and complying with their requirements and recommendations.

A table of anticipated regulatory requirements prevailing in both Malaysia and Thailand relevant to the CONTRACT is as follows:

Anticipated Regulatory Requirements

No.	Description	Regulatory Body
1	Approval to conduct research (take soil samples) in JDA	MTJA / COMPANY
2	Notification of Temporary Marine Vessel Operations related to construction activities	MTJA / COMPANY / Malaysian & Thai Marine Depts.
3	Approval to Install facility in JDA	MTJA / COMPANY
4	Notification of Intent to Cross Telecommunications Cable	Malaysian & Thai authorities/ Cable Owner
5	Compensation to Fishermen due to impact of pipelines installation	Malaysian & Thai Fisheries Depts.
6	Notification of Permanent Offshore Installation of Pipelines	MTJA / COMPANY

3.12 HAZARD IDENTIFICATION (HAZID) AND MITIGATION

CONTRACTOR shall arrange and carryout the hazard identification (HAZID) for each transportation and installation activities. In addition, CONTRACTOR shall perform relevant Risk Assessment including Job Safety Analysis (JSA), etc. to ensure that T&I activities are carried out in the safe manner.

The T&I HAZID session shall be chaired by an approved third party facilitator and shall be participated by MWS, COMPANY, CONTRACTOR, SUBCONTRACTORS as a minimum.

The HAZID action sheets of the high risk items which are identified as Major Accident Event (MAE) shall be established and closed out and submitted for COMPANY's review and approval prior to commencing the transportation of line pipe materials and any other facilities.

The act of piracy and / or unauthorized boarding during towing to SITE causing the theft or act of hijacking are determined as a high risk event or MAE as per HAZID. CONTRACTOR shall be responsible to establish and submit for COMPANY's approval the Security Vulnerability Assessment (SVA).

The SVA shall include but not limited to the following content:

- Threat assessment targets (vessels, asset, people and associated consequences)
- Tow Route
- Threats, but not limited to, the consideration of event escalation around the tow route area
- Security plan which shall include the Emergency Response Plan (ERP) flow diagram, in contact with CPOC Emergency Control Centre (ECC) Duty Manager.
- Spread list, Vessel contact details, Organization Security Officer, AIS tracking, etc.

CONTRACTOR shall be responsible to implement SVA recommendations and mitigate hazards under Lump Sum Price.

3.13 MOBILIZATION OF MARINE SPREAD

COMPANY shall undertake a pre-mobilization inspection of the proposed MARINE SPREAD and CONTRACTOR shall have all valid certificates available during such inspection. CONTRACTOR shall advise of the location of each vessel within the MARINE SPREAD in order to allow COMPANY's inspection and acceptance prior to mobilization.

The inspection shall not relieve CONTRACTOR from the responsibility to ensure that its MARINE SPREAD is fully functioned and equipped with suitable and certified equipment to complete the WORK safely throughout the campaign.

Procedures and/or specifications for all test programmes, calibrations and surveys shall be submitted for COMPANY's approval fifteen (15) days prior to commencement of the pre-mobilization survey.

COMPANY shall have the right to witness all tests and CONTRACTOR shall dismantle as required any item or parts to be inspected by COMPANY. If the inspection reveals that any vessel and/or equipment are not in a functional condition, CONTRACTOR shall repair or replace before mobilization.

The MARINE SPREAD shall be inspected as per the guideline and/ or check list provided by COMPANY and MWS including, but not limited to, the Offshore Vessel Inspection Database (OVID). All associated cost of providing support services and complying with requirements shall be under CONTRACT PRICE.

CONTRACTOR shall mobilize, from wherever, the requisite units of the MARINE SPREAD, fully equipped, manned and in full working condition in due time for the commencement of WORK at SITE.

CONTRACTOR shall ensure that adequate back-up systems for key items are available onboard the vessels. This back-up system shall include, but not be limited to, all navigation, positioning, inspection, monitoring survey, communication and ballasting systems. Back-up systems shall be maintained in full readiness for use during the performance of WORK should the primary system fail.

In addition to international regulations, all MARINE SPREAD under this CONTRACT shall observe and comply with, but not be limited to, the requirements of Malaysian/Thai Marine Departments and relevant statutory authorities.

All marine vessels under this CONTRACT shall be certified with LRS, ABS, DNV, BV and any other internationally recognized certifying authority and be classified for manned unrestricted ocean service. Valid copies of all other required marine certification shall be onboard the vessels at all times.

CONTRACTOR has no right to substitute or change any unit of the MARINE SPREAD which has been accepted except where COMPANY's written approval is given on case to case basis. In the event that CONTRACTOR proposes a substitution, CONTRACTOR shall submit the proposal a minimum of ninety (90) days prior to the intended date of substitution, which shall not in itself be less than ninety (90) days prior to scheduled mobilization of said unit, along with all relevant details of the new unit for COMPANY's approval.

Prior to mobilization to SITE, each vessel shall complete/ obtain the followings, but no limited to,

- Submission of OVID to COMPANY
- Vessel Inspection and close out acceptance by COMPANY
- Vessel Inspection and close out acceptance by MWS
- Approval of Vessel Entry Permit (VEP) by COMPANY
- Approved Offshore Safety Passport (OSP) for all personnel working offshore
- Submission of Direct Importation (DI) and Direct Exportation (DE) letter to COMPANY
- Pre-mob briefing including Drugs and Alcohol Tests for all personnel working offshore.

All above requirements shall be under CONTRACTOR's Lump Sum price. All required documents above shall be submitted to COMPANY no later than ninety (90) days prior to offshore mobilization.

3.14 TRANSPORTATION

3.14.1 General

CONTRACTOR shall provide qualified personnel, certified vessel(s), general arrangement drawings, controlling ballast, tugs, material, barges, towing gear, navigational lights and all

other equipment required for transportation of the WORK, including all shipped loose items and containers to SITE.

Following completion of the installation works, CONTRACTOR shall demobilize all of its vessels, personnel, equipment and materials safely from SITE.

CONTRACTOR may utilize the services of an ocean routing consultant, acceptable to COMPANY in order to ensure that all CONTRACT's requirements are met.

3.14.2 Decision to Commence Tow

COMPANY and MWS shall approve CONTRACTOR's decision to commence the tow.

The tow shall not commence until all sea-fastening and barge strengthening has been installed and welded and both COMPANY's and MWS's approvals have been obtained.

CONTRACTOR shall report weather, tide, traffic and other factors that may affect the tow to COMPANY in seeking its approval to commence the tow.

The ultimate decision and responsibility to commence the tow lies with CONTRACTOR's Tow Master and no party shall be authorized to instruct him to commence towing if he deems it unsafe to vessels, equipment, personnel or cargo.

3.14.3 Protection of WORK

CONTRACTOR shall ensure that all structures including open connections, loose items, etc. are secured and suitably protected to survive the tow and at all times when in CONTRACTOR's custody in order to arrive in their original condition. Slings, bridles and other installation aids shall also be secured against barge motion and the effects of wind.

CONTRACTOR shall provide adequate protection of materials and equipment installed in and on WORK from possible damage during transportation and installation of the same.

CONTRACTOR shall at all times during the tow have a transportation crew member assigned the sole duty of watching the tow to report any mishap. The Tow Master shall take immediate corrective action in the event of any such discovery.

CONTRACTOR shall seek shelter in the event the forecasted environmental conditions exceed the design criteria.

3.14.4 Progress Reports and Towing Records

CONTRACTOR shall issue such reports every six (6) hours and shall collate these records as part of the final documentation.

3.14.5 Release and/or Demobilization

CONTRACTOR shall obtain COMPANY's approval to release any vessel, personnel, equipment and/or materials from SITE. COMPANY shall reasonably provide the approval subject to the following aspects; HSE, schedule criticality, humanity, etc. However, COMPANY's approval shall not be used as any basis of claim by CONTRACTOR.

CONTRACTOR shall be responsible for the risks and costs that may arise from such decision.

Following release of the vessel, CONTRACTOR shall clean, repair, restore and demobilize the vessel at its own expense.

3.15 OFFSHORE INSTALLATION

The scope of WORK shall be referred in conjunction with all other associated Exhibits of the CONTRACT.

3.15.1 General

CONTRACTOR shall install the structures in accordance with procedures that have been reviewed and approved by COMPANY and MWS.

Installation of the structures shall include, but not be limited to, the followings:

(a) Installation engineering including a detailed offshore installation plan and installation procedures manual. This shall include design of all temporary installation aids.
(b) Preparation of all other documentation and drawings required for WORK.
(c) Preparation, including acquisition and updating, of all certificates, OSPs, permits and other approval documents as requested by COMPANY and MWS. All such documents shall be valid throughout the duration of WORK.
(d) Provision of weather forecasting services.
(e) Mobilization of CONTRACTOR's installation MARINE SPREAD to SITE.
(f) Installation of the structures, materials, equipment and other items of WORK including appurtenances complete with shipped loose items.
(g) Rectification of all damage occurring during WORK execution, including touch-up of surface preparation and painting, in accordance with specifications.
(h) Removal of all rigging tools, temporary installation aids, access platforms, equipment and any scrap material after the completion of installation WORK.
(i) Cleanup, perform seabed survey and remove all debris prior to demobilization.
(j) Preparation of all completion documentation and as-built dossier.
(k) Demobilization of CONTRACTOR's installation MARINE SPREADs from SITE.

All installation WORK shall be undertaken in strict compliance with specifications and procedures.

3.15.2 Pre-installation Work

Seabed Inspection

Prior to jacket or pipeline installation, CONTRACTOR shall undertake a seabed survey in accordance with specifications in order to ensure that the work location is free from obstructions such as cement, scrap metal, localized outcrops and the like. The survey shall be video recorded and a copy of the record shall be submitted to COMPANY.

Removal of Debris

CONTRACTOR shall remove seabed debris and obstructions and if there is any substantial delay or additional costs incurred as a result of any debris or obstruction not shown in the information or document provided by or on behalf of COMPANY, a CHANGE ORDER shall be issued. CONTRACTOR shall remove such debris at CONTRACTOR's own cost if debris or obstruction is caused by CONTRACTOR.

CONTRACTOR shall provide diving services to enable seabed debris and obstructions removal, where necessary. The area to be covered shall extend up to fifty (50) meters from structure and SITE shall be surveyed and video recorded upon completion of the debris removal operations.

Anchor patterns

CONTRACTOR shall submit proposed anchor patterns including the risk mitigation i.e. protection for any subsea structure, pipeline and/ or cable for COMPANY's approval. The cost of such protection shall be under CONTRACT PRICE.

3.15.3 Slings, Shackles and Rigging

Slings, shackles and rigging (including padeyes, rigging platforms and the like) required for installation of the structures and other structural appurtenances shall be designed for use based upon criteria detailed in specifications.

CONTRACTOR shall verify and be responsible for all lifting padeyes and installation aids and their conformity to its installation scheme.

CONTRACTOR shall supply all lifting gear, slings, shackles and any other item required for lifting. All rigging shall be in good condition and acceptable to COMPANY with valid load test and inspection certificates for the duration of WORK.

CONTRACTOR shall be responsible for the development of all offshore rigging requirements for WORK.

CONTRACTOR shall deliver all slings, shackles and rigging to the fabrication yard in sufficient time to ensure these are installed in accordance with the schedule. No schedule impact shall be permissible due to CONTRACTOR's failure in this regard.

CONTRACTOR shall remove all rigging and padeyes used for lifting from structure(s) after the components are securely installed in accordance with specifications. CONTRACTOR shall touch-up paint and repair the structure(s) as necessary in accordance with specifications.

3.15.4 Construction Vessel Positioning and Anchor Handling

CONTRACTOR shall submit anchor patterns for COMPANY and MWS's approval sixty (60) days prior to scheduled mobilization date, except for the case of Dynamic Positioning (DP) vessel. The anchor patterns should meet the following requirements, as a minimum:

(a) Anchor patterns shall be superimposed on a hydrographic sepia
(b) All structures, pipelines and cables shall be shown on the same hydrographic sepia
(c) The length of the anchor cables shall be indicated
(d) The touch down point of the anchor cables shall be shown
(e) The working tensions shall be indicated on each anchor line
(f) All barge set-ups shall be shown with their associated anchor patterns
(g) Al barge set-ups shall be numbered for easy identification
(h) Anchor patterns shall be accompanied with catenary calculations
(i) Coordinates of all anchors shall be clearly indicated
(j) Alternative anchor patterns shall also be submitted
(k) Clearance/ Distance to existing structures, pipelines and cables shall be shown

In addition to the foregoing, CONTRACTOR shall submit the following information relating to positions of all construction vessels used for WORK:

(a) The intended positions of all construction vessels
(b) Any relocations of the construction vessels that may be required
(c) All anchor movements relative to differing vessel positions

CONTRACTOR shall conduct a hazard survey of the seabed within a radius of 1,000 meters or a radius equal to the distance of the furthest anchor from a particular vessel, whichever is greater and submit the report to COMPANY. No running of anchors shall be permitted until such a report has been submitted. CONTRACTOR shall ensure all parties are made aware of any hazard that is identified in the survey.

CONTRACTOR shall take particular care in the deployment of its vessels' anchors to ensure no damage occurs to pipelines, cables, etc.

CONTRACTOR shall employ precautionary methods during anchor handling, which shall include, but not be limited to, the use of "spring buoys" to prevent the anchor wire coming into contact with coral outcrops and subsea pipelines/structures. All anchors shall be placed on the tug boat during running in and out. In addition, no anchor wire shall be allowed to come into contact with any structure whatsoever.

During all phases of WORK, CONTRACTOR shall submit any revisions to approved anchor patterns to COMPANY and MWS for approval. No anchor activity shall be proceeded prior to COMPANY's approval.

Any damages caused by CONTRACTOR to structures, pipelines or cables shall be repaired by CONTRACTOR at CONTRACTOR's sole cost.

CONTRACTOR shall not hang anchor overboard Anchor Handling Tug to minimize risks of dropping anchor to subsea facilities.

3.15.5 Anchor Holding Test

CONTRACTOR shall deploy all anchors as shown on the approved anchor pattern and proceed with the anchor holding test at a tension not less than 150% of the working tension for a holding period of thirty (30) minutes.

CONTRACTOR shall monitor the tensions diligently for the entire duration of the test and submit a plot of anchor cable tension against time for each anchor to COMPANY upon completion to the test.

3.15.6 Installation Aids

CONTRACTOR shall design, erect and remove all installation guides, fenders, rigging/access platforms, ballast control station, bumpers, stops, etc. required to be installed on the structures or barges in order to ensure safe and accurate installation. These items shall be designed for easy attachment and removal without damage to the parent structure. CONTRACTOR is to provide and installed all pre-installed installation aids.

CONTRACTOR may, at COMPANY's discretion, leave installation aids on the structures that do not affect any subsequent installation work or access to or safe operation of the platform.

CONTRACTOR is responsible for repairing any damage to the structures that does not affect any subsequent installation work or access to or safe operation of the platform.

CONTRACTOR is responsible for repairing any damage to the structures caused by removing said installation aids. CONTRACTOR is responsible for the proper disposal of same following their use.

3.15.7 Removal of Sea-fastening

All scaffolding required for the removal of sea-fastening shall be provided by CONTRACTOR. CONTRACTOR shall remove all such scaffolding upon completion of WORK.

CONTRACTOR shall remove all such sea-fastening and scaffolding upon completion of all installation activities.

CONTRACTOR shall propose its sequence of sea-fastening cutting activities for COMPANY approval in its installation procedure.

CONTRACTOR shall not commence any cutting of sea-fastenings until approved by COMPANY and/or MWS. CONTRACTOR shall have adequate equipment, consumables, power and all other items necessary on board the vessels to weld back all sea-fastening, should the need arise due to faltering weather conditions or any other condition.

All cut sea-fastening materials shall be adequately secured on deck in order to prevent same from rolling and/or falling into the sea.

All sea-fastening braces shall be cut in such a manner so as to avoid interference whatsoever.

3.15.8 Post Installation Work

Removal

After installation works, CONTRACTOR shall remove and dispose of the following items:

(a) All temporary installation aids, including jacket fenders.
(b) All slings, shackles and other lifting gear.
(c) All installation equipment, tools and provisions.
(d) All surplus material, consumables and scrap materials.
(e) All temporary platforms, handrails, guide rails and grating.
(f) All scaffolding materials.
(g) All temporary lifting padeyes.
(h) All internal sea-fastening including bracing, supports, wraps and other temporary protective material from equipment located on the decks.
(i) All anchors and/or buoys which may have been deployed on the seabed.

Remedial WORK

(a) CONTRACTOR shall inspect all installed structures and equipment and report to COMPANY any damage sustained during installation.
(b) Any damage to any part of the installed structures caused by CONTRACTOR or its SUBCONTRACTOR shall be rectified. CONTRACTOR shall supply all engineering, manpower, plant, equipment, materials, vessels, consumables and all necessary items to rectify such damage at no additional cost to COMPANY. Any standby/ assistance of MARINE SPREAD whilst repairs shall be under CONTRACTOR's account.
(c) Blasting and painting repairs to damaged coating areas due to CONTRACTOR's installation activities shall be performed by CONTRACTOR in accordance with specifications.

Painting

CONTRACTOR shall carryout surface preparation and application of all painting on all offshore welds including the supply of consumables in accordance with specifications. This shall include, but not be limited to, the following:

(a) Deck structure/jacket leg connection.
(b) Weld areas at boat landing, staircases, etc.
(c) Sea deck walkway.
(d) Boat landing connections.
(e) Riser Guard.

Work Completion

(a) CONTRACTOR shall undertake any miscellaneous work required to complete the WORK.
(b) The following activities may be performed remotely from MARINE SPREAD with the multi-purpose vessel:

- surface preparation, painting including all touch-up paintings
- removal of temporary access scaffolding/installation aids

The use of multi-purpose vessel shall be subject to COMPANY's approval.

(c) CONTRACTOR shall remove welded temporary access platforms and installation aids by cutting not less than 3mm from the supporting structural member, grinding the remaining 3mm stub flush, NDT of the supporting structural steel member in order to verify integrity and paintwork to the original finish.

(d) All punch list items identified by COMPANY and/or MWS as being part of WORK shall be completed prior to the required completion date. COMPANY reserves right to complete punch list items by OTHER CONTRACTOR and back charged to CONTRACTOR, if CONTRACTOR fails to complete the punch list by the required completion date.

(e) CONTRACTOR shall install two (2) marine lanterns complete with dry batteries and/or solar cell (capable of providing continuous operating power until the topside is installed) onto each jacket installed by CONTRACTOR.

Scrap & Surplus Materials

(a) CONTRACTOR shall correctly and legally dispose of all scrap materials.

(b) Over board disposal of scrap material of any kind whilst at SITE and/or during return voyage is strictly prohibited.

(c) All costs relating to removal, transportation and unloading of any scrap materials shall be borne by CONTRACTOR.

3.15.9 Fire, Safety and Housekeeping

Fire and Safety

A trained and competent fire watch attendant shall be assigned at all times in areas where the naked flame hot work activities including but not limited to, welding or cutting operations are being undertaken. CONTRACTOR shall supply and have portable fire extinguishers readily available in all areas of hot work. All personnel shall observe "No Smoking" areas as defined by COMPANY. CONTRACTOR shall strictly adhere to the requirement as specified under the authorized and applicable hot work permit.

Housekeeping

CONTRACTOR shall maintain the platform and WORK environment in a neat and orderly manner at all times. Scrap material, trash, packing material and other debris shall be removed promptly. Items shall not be left which pose a tripping hazard to personnel. Access ways, gangways, fire extinguisher and all lifesaving equipment shall be kept clear from obstructions at all times.

3.16 PLATFORM INSTALLATION

3.16.1 Substructures Installation

Jacket Installation

Pre and Post Installation Survey

(a) Prior to commencing installation of any marine structures, CONTRACTOR shall undertake a comprehensive and complete a survey of the seabed using suitable survey equipment over an area of 1,000 meter radius around the site of each of the facility to be installed and covering the largest anchor pattern of the construction vessel utilized for WORK, whichever is greater, to identify any hazard or anomalies on the seabed. This survey shall be completed and a detailed report setting out and identifying hazard/anomalies discovered shall be submitted to COMPANY.

(b) CONTRACTOR shall pay particular attention to the jacket foot print area in order to identify any hazard/anomalies or features that may affect jacket installation. CONTRACTOR shall submit a detailed report to COMPANY not later than twenty-four (24) hours prior to commencement of running anchors or position the vessel at SITE. If CONTRACTOR finds that the designated location is not suitable for jacket installation, CONTRACTOR shall propose alternatives in the same report for COMPANY's consideration.

(c) CONTRACTOR shall undertake a comprehensive pre-installation survey prior to commencement of any installation activities on an area within 100 meter radius of the facility to be installed. Another survey shall be undertaken prior to picking up of anchors and all debris from CONTRACTOR shall be removed from the seabed. Such surveys shall be conducted by ROV and a video record of the survey shall be submitted to COMPANY.

(d) An ROV survey shall be undertaken to visually check the general condition of all substructure members upon completion of substructure installation.

(e) A visual survey of all substructure anodes shall be conducted with ROV after completion of pile and conductor driving.

(f) All ROV video record of dives shall be submitted, properly labeled and dated, in VHS format to COMPANY for retention.

(g) ROV underwater survey with regard to WORK or not, may be requested at any non-barge critical time by COMPANY without prior notice and shall be performed at no additional cost to COMPANY.

(h) Clear ROV underwater survey record and video of the jacket set down position with respect to sea bed shall be submitted to COMPANY.

Jacket Lifting

(i) CONTRACTOR shall not cut more than 50% of sea-fastening prior to rigging up all lifting slings to the heavy lift/ derrick crane.

(j) CONTRACTOR shall ensure that there is sufficient equipment and adequate power for the welding sets available on the transportation barge in order to allow for welding back of any cut sea-fastening should it become necessary to do so for whatever reason including adequate power for the welding sets.

(k) CONTRACTOR shall carry out checks prior to cutting off of the final 50% of sea-fastenings.

Jacket Positioning

(a) CONTRACTOR shall ensure that all suitable survey equipment and personnel are available at SITE in order to ensure that the jacket is positioned correctly.

(b) CONTRACTOR shall not commence final flooding (if applicable) until the jacket position, orientation and level are approved by COMPANY.

(c) CONTRACTOR shall ensure safety of the crews who perform jacket flooding and disconnect lifting slings. CONTRACTOR shall submit detailed procedure for COMPANY's approval prior to mobilization (if jacket flooding method is used).

(d) CONTRACTOR shall develop contingency procedures to re-float and subsequently re-set the jacket if position, orientation and level tolerances are not achieved.

Pile Installation

Piles Stabbing

(a) CONTRACTOR shall engineer lifting and upending of piles such that no excessive stress is induced in the piles during lifting and upending operations.

(b) CONTRACTOR shall supply Internal Pile Handling Tool (IPHT)/ Internal Lifting Tool (ILT). Adequate spares and experienced technicians shall be provided at SITE in order to ensure that the IPHT/ ILT is maintained in good working condition. MARINE SPREAD standby due to failure of the IPHT/ILT shall be at CONTRACTOR's own cost.

(c) For underwater operations, CONTRACTOR shall provide ROV services in order to monitor the stabbing and driving of all piles. No pile stabbing and driving operations shall proceed without full ROV coverage. Standby of MARINE SPREAD while ROV is not fully operational shall be at CONTRACTOR's own cost.

(d) CONTRACTOR shall propose a suitable pile stabbing and driving sequence based on batch driving for COMPANY's approval at least ninety (90) days prior to offshore mobilization. Such proposal shall give prime consideration to a pile stabbing and driving sequence that best preserves and/or improves jacket levelness unless stated otherwise on engineering drawings.

(e) CONTRACTOR shall provide proper access and egress for construction personnel during all pile handling operations especially if such activity requires working outboard of the construction vessel, transportation barge and/or jacket.

Drive Piles to Target Penetration

(a) CONTRACTOR shall provide a suitable range of hammers in the MARINE SPREAD capable of driving the specified piles to target penetration.

(b) CONTRACTOR shall make available technicians and adequate spares in order to ensure the full availability of the hammer spread at all times during pile installation. Any standby of the MARINE SPREAD arising out of hammer unavailability or downtime shall be at CONTRACTOR's own cost.

(c) CONTRACTOR shall maintain records of all pile driving and make such records available to COMPANY at any time during pile driving. A summary pile driving record shall be submitted to COMPANY not later than six (6) hours after pile driving and shall contain the following information as a minimum:

- hammer used
- hammer monitoring data
- pile identification
- blow count vs. penetration (blow/ft)
- time
- pile monitoring data
- reason for stoppages, if any

(d) In the event that CONTRACTOR's hammer fails to deliver sufficient energy, or breaks down, CONTRACTOR shall complete the pile driving with backup hammer from the MARINE SPREAD. Pile driving shall not commence on any pile without a sufficient backup hammer. Any standby of the MARINE SPREAD shall be at CONTRACTOR's own cost if piling cannot commence or continue due to hammer inefficiency, breakdown or unavailability.

(e) CONTRACTOR shall make available on standby, jetting/drilling equipment in the event of premature pile refusal.

Pile Restrike Test

(a) CONTRACTOR shall perform a re-strike test on the pile after twenty-four (24) hour set-up period. The length shall be one (1) meter overdrive and the re-strike test shall be conducted on one pile

(b) CONTRACTOR shall perform the installation of other piles whilst the twenty-four (24) hour set-up period lapses.

(c) COMPANY shall not reimburse CONTRACTOR for its MARINE SPREAD's standby cost whilst set-up time and re-strike time lapse.

Pile Monitoring

(a) CONTRACTOR shall provide pile monitoring services for the piling of each of the substructures. The number of piles to be monitored shall be the last two (2) successful

sections of any two number piles. COMPANY shall have the right to vary this quantity at any time during the execution of WORK.

(b) CONTRACTOR shall engage a specialist geotechnical engineering consultant in order to undertake pile monitoring. CONTRACTOR shall submit the prospectus of the said consultant firm complete along with resume/CV of the engineers who shall be involved in the actual performance of such WORK.

(c) CONTRACTOR shall make available at SITE sufficient manpower and equipment including all spares and consumables in order to undertake WORK described herein and in a timely manner so as not to delay piling activities.

(d) CONTRACTOR shall provide continuous pile and hammer monitoring services and shall make available during driving the following information to COMPANY.

- Soil resistance to driving
- Magnitude of maximum pile stresses during driving
- Hammer blows per foot of penetration
- Hammer stroke
- Hammer blow rate
- Hammer efficiency (defined as ram energy at impact as a ratio of hammer rated energy)
- System Efficiency (defined as energy actually transmitted to pile as a ratio of the hammer rated energy)
- Measurement of Incremental Filling Ratio (IFR) (ratio of incremental pile penetration) – CONTRACTOR shall carry out Incremental Filling Ratio (IFR) and Final Filling Ratio (FFR) during the pilling operation.

(e) CONTRACTOR shall provide the following information at the end of driving if pile meets acceptance criteria:

- Final blow count per foot of penetration
- Hammer and system efficiency
- Soil resistance to driving

(f) If pile does not meet acceptance criteria at the target penetration depth, CONTRACTOR shall provide, in addition to information described under (e) above, recommendations on remedial action.

(g) CONTRACTOR shall provide pile monitoring services as described herein during the restrike test and provide the following information immediately after restrike:

- Final blow count per foot of penetration
- Hammer and system efficiency
- Soil resistance to driving

(h) If piles meet premature refusal, CONTRACTOR shall provide the following information immediately after pile driving:

- Final blow count per foot of penetration
- Hammer and system efficiency

- Soil resistance to driving
- Recommendations on remedial action

Any remedial WORK on piles that meet premature refusal shall be undertaken upon agreement by COMPANY Representative.

Hammer Monitoring

(a) Hammer monitoring shall be undertaken for all hammer operations. CONTRACTOR shall ensure that the hammer spread that is supplied complies with this requirement.

(b) The following hammer monitoring parameters shall be measured by CONTRACTOR and reported to COMPANY not later than six (6) hours after the end of piling of each pile and the same shall be made available to COMPANY at any time during hammer operations:
- position of ram
- stroke height (distance) of ram
- impact velocity of ram
- nett striking energy of ram
- blow rate per minute
- number of blows per foot

(c) Hammer monitoring data shall be collected in a central console. CONTRACTOR shall provide person(s) who are fully competent and experienced in operating the hammers in order to supervise and obtain all hammer monitoring data.

(d) Hammer monitoring and pile monitoring shall form part of a coherent and coordinated pile installation strategy. CONTRACTOR shall identify key personnel and formalize the communication channels in order to facilitate successful pile installation.

Boat Landing Installation

CONTRACTOR shall install boat landing at offshore after tidal observation is completed and MSL has been ascertained.

CONTRACTOR shall present the calculation for boat landing elevation adjustment to Company Site Representative (CSR) for approval prior to installation.

3.16.2 Topside Installation

General

CONTRACTOR shall ensure that the elevation and level of the top of the jacket structure conforms to design requirements by leveling the jacket before commencing the MSL observation. Jacket transitions shall not be cut prior to commencing MSL observation. The allowable cut-off level tolerance is ± 12mm.

Preparation for Installation

- Provide and install proper access platform/scaffolding to enable installation of installation aids and execution of the WORK and remove same post installation.
- Survey, mark and cut lines and levels in accordance with the drawings.
- Cut and grind jacket leg weld preparations.

Installation of Deck

- CONTRACTOR shall not cut off more than 75% of sea-fastenings prior to rigging up all lifting slings to the heavy lift/ derrick crane and subject to favorable 72 hours weather forecast, MWS's and COMPANY's approval.
- CONTRACTOR shall ensure that there is sufficient equipment and power available on the transportation barge to allow welding back of any cut off sea-fastenings should it become necessary to do so for whatever reasons.
- The deck/jacket joints to be welded shall be inspected in order to ensure that the weld can be carried out prior to welding.

Decks Miscellaneous Installation

- CONTRACTOR shall install/ reinstate all ship-loose items of deck, including all field welds as necessary.
- CONTRACTOR shall ensure that swing ropes are properly installed, deployed and tested before demobilization.
- CONTRACTOR shall ensure that Navigation Aids lanterns on the platform are functioning before leaving the location.

Final Touch-up Painting

CONTRACTOR shall apply a coating of protective primer paint to all surfaces that has had its paintwork removed or damaged during performance of WORK.

Remove Scaffolding and Clean-up

CONTRACTOR shall remove all scaffolding materials, rigging equipment, installation aids and cleanup the SITE after installation prior to demobilization.

Installation Completion

The installation shall be deemed completed when all WORK activities have been completed and MARINE SPREAD demobilized to a distance of five hundred (500) meters away from the facility.

3.17 PIPELINE INSTALLATION

The scope of WORK shall be referred in conjunction with all other associated Exhibits of the CONTRACT.

3.17.1 General

Installation Plan (Installation Manual)

CONTRACTOR shall submit an Installation Plan that covers all significant marine equipment and a comprehensive series of detailed installation procedures for the entire pipeline system. A draft Installation Plan shall be submitted to COMPANY for permission to proceed at least ninety (90) days prior to the date of any construction or related activity is scheduled to commence.

The Installation Plan shall cover, but not be limited to, the following outline of construction operations in details:

- Pipeline Coating and repair (as applicable)
- Riser, Riser Clamps, Riser Guards and Construction / Installation, as applicable
- Expansion spool and spool piece Construction / Installation
- Startup, Laydown, Abandonment, and Recovery
- Pipelaying
- Pipeline and Cable Crossing
- Coating Repair Procedure (dry and wet damage)
- Lay barge Automatic Welding Equipment
- Welding Inspection and Quality Control
- Field Joints (Installation, QC and Repair)
- Anchor Handling
- Subsea Construction as applicable

  - Free Span Rectification
- Inspection/ ROV Support
- Marine Surveying and Positioning
- Diving Operations
- Environmental Protection and Monitoring
- Pigging Operations
- Flooding, Cleaning and Gauging

- Hydrostatic testing
- Flooding and pipeline preservation including Caliper Pigging prior to pipeline preservation
- Pre-installation Survey, Post-lay Survey and As-built Survey, including CP survey
- Clean-up
- Repairs (Wet Buckle and Dry Buckle)

The Installation Plan shall also include all "for construction" drawings, specifications, procedures, etc.

3.17.2 Pipeline Transportation & Installation

ROUTES AND WEATHER MONITORING

- The pipeline shall be installed along the routes selected and been finalized during CONTRACTOR Engineering.
- CONTRACTOR shall locate and identify obstructions along the routes prior to laying pipeline during pre-installation survey and reroute around obstructions within or external to the pipeline corridor. (Obstructions exclude sub-seabed surface conditions below the depth to which the pipeline can be expected to settle.)
- During installation, CONTRACTOR shall maintain a continuous record of pipeline location and coordinates i.e. KP start and end, pipeline wall thickness transition, pipeline crossing point include touch down point on each end, pipeline curvature etc. CONTRACTOR shall record the position of the barge stern after each joint of pipe has been advanced by weld number.
- CONTRACTOR shall plan anchor patterns in coordination with the pipeline installation and COMPANY's requirements. CONTRACTOR may propose alternative plans for COMPANY review and permission to proceed, which shall also be subject to COMPANY's review and approval.

TRANSPORTATION AND HANDLING

CONTRACTOR shall prepare detailed procedures for linepipe stowage plan, vessel/ barge certificates, loading, hauling, unloading, storing, sea-fastening and handling line pipe for COMPANY permission to proceed prior to commencing the WORK. CONTRACTOR shall obtain an endorsement for all related documents related to the WORK from COMPANY's appointed Marine Warranty Surveyor. CONTRACTOR shall take all preventative measures necessary during transportation to SITE in order to maintain the internal pipe surface in good condition as received from coating yard, including protection from ingress of seawater, rubbish, dirt and/or other contaminants. Any degradation of the internal pipe surface after collecting same from coating yard shall be rectified by CONTRACTOR prior to installation at CONTRACTOR's cost.

CONTRACTOR shall submit the notification for load-out to COMPANY at least thirty (30) days prior to the planned collection from coating yard. CONTRACTOR shall conduct the load-out meeting at coating yard at no extra cost to COMPANY.

Upon collection at coating yard, it shall be CONTRACTOR's responsibility to inspect line pipe and bends and immediately report any damage to COMPANY. Any damage to pipes and bends shall be repaired by CONTRACTOR at CONTRACTOR's cost. In the event that a repair at any anode bracelet joint is required, CONTRACTOR shall confirm electrical continuity between anode bracelet and pipe.

PIPELAY – STRESS CONTROL IN THE VERTICAL PLANE

CONTRACTOR shall provide instrumentation for visual display and permanent continuous recording of pipe hold-back tension and depth of the lower end of the stinger (and optionally stinger angle and height above seabed). The pipelaying technique used shall be equal to the best industry practice available to place the line in its final position on the bottom without damage or distortion. The laying technique and procedure shall be submitted to COMPANY for permission to proceed.

Sufficient stinger length and radius, tensioning, lifting and floating devices shall be used during laying operations in order to ensure that the combined bending and axial stress at the pipeline field joints shall at no time exceed the limits given in the Detailed Engineering Design. CONTRACTOR shall provide drawings and calculations to substantiate such procedures. Procedures must be submitted to COMPANY for permission to proceed for installation at least sixty (60) days before pipe laying commences.

The pipe departure point from the stinger shall be continuously monitored by video camera with a monitor screen in the barge control room in order to ensure sag bend is as predicted by calculations. During each movement of the barge, the video shall be recorded. The pipeline touchdown and configuration from the stinger tip shall be monitored by ROV within certain interval as per required in CPOC-GS-PL-0011, CPOC General Specifications for Installation of Submarine Pipeline.

PIPE ABANDONMENT

CONTRACTOR shall cease pipeline installation operations when weather conditions could cause overstressing of the pipeline or inaccurate positioning. CONTRACTOR shall include within its plan of execution the maximum sea states and conditions under which its equipment can safely maintain position, pipe tension and continue laying pipe without damage to the pipe. Such data shall include barge properties as related to sea states, time required to properly abandon the pipe and plan of action for determining when abandonment is necessary. CONTRACTOR shall submit a plan of action for pipelay abandonment and recovery for COMPANY permission to proceed not later than sixty (60) days prior to start of installation.

If during the laying operation the maximum allowable stress in the pipeline is exceeded or, in the opinion of COMPANY, is likely to be exceeded, CONTRACTOR shall discontinue work on the pipeline until corrective measures are taken.

If CONTRACTOR must abandon the pipe, the end of the pipe shall be securely closed with a welded pull head and the pipe lowered under controlled tension to the sea bottom. Proper tension shall be maintained throughout the lowering operation. The location of the capped end shall be recorded and marked with a buoy.

CALCULATIONS AND SKETCHES

Within its bid submission, CONTRACTOR shall submit sketches, calculations, and procedures showing the method of installation and demonstrating control of pipe stresses for every stage of execution. Such drawings, calculations, and procedures shall include stinger dimensions, recovery and abandonment procedures, riser and expansion spool installation plans, lateral assembly, tie-in spools, pipeline crossing method, tensioner settings, davit lifting procedures, winch and cable sizes and provision for handling the subsea assemblies. CONTRACTOR shall not mobilize its marine spread until after COMPANY's review and permission to proceed with the approved installation procedures.

HORIZONTAL PLANE BENDING RADIUS

Changes in pipeline direction shall be laid with a horizontal plane minimum radius conforming to applicable codes and standards for all offshore pipelines. Lower radii may be used when required for routing in areas with restricted space, provided they are within the calculated limits of permitted stresses, pipe stability and lay barge requirements.

VERTICAL PLANE BENDING RADIUS

Minimum bending radius shall be calculated in each case, conforming to applicable codes and standards for offshore pipeline.

CONTROL OF PIPE JOINTS

CONTRACTOR shall install pipe joints which have been previously fitted with anode bracelets in accordance with the Pipeline Alignment Drawings following COMPANY's approval for installation.

CONTRACTOR shall install pipe joint by their color-coding schedule. The pipe joint number and pipe data including thickness of concrete coating shall be incorporated in the "As-built" drawings.

PIPE INTERIOR CLEANING

All dirt, rust and other foreign substances inside the pipeline shall be cleaned and removed using compressed air and monitored by COMPANY prior to alignment for welding. CONTRACTOR shall maintain the pipe cleanliness in the same state as provided by the coating yard internal cleaning/ coating method.

PIPE MARKING

The joint number shall be clearly painted in sequential order on each joint. The number shall be painted on the concrete coating in both upper quadrants (i.e. approximately 2 o'clock and 10 o'clock positions) at the downstream (higher KP) end of each joint. The joint number shall be of the purest white and water resistant paint with a height equivalent to one quarter the outside diameter of the coated pipe or not less than 150 mm (6 inch).

CONTRACTOR shall record the appropriate attached anode number on each joint of pipe. Anode numbers and paint shall be of the same type and size as the joint numbers. However, the anode numbers shall be clearly distinguishable from joint numbers on subsea black and white video images (e.g. by applying a different format of background color).

CONTRACTOR shall maintain a complete log of numbers used internally and externally on the pipe so that each factory numbered joint can be correlated to an installation joint number on the outer coating of the pipe.

CONTRACTOR shall recommend a method of marking the pipe about every kilometer in order to identify the final pipeline location, such as Kilometer Posts. This marking shall be clearly visible during underwater inspection. The markings shall be designed to last a minimum of five (5) years using special paint. (The Kilometer Post marking shall be correlated to the joint number markings.)

The specification for all paint and markings to be used shall be submitted to COMPANY for permission to proceed not later than sixty (60) days prior to commencement of installation work.

WELDING AND RADIOGRAPHIC INSPECTION

WORK shall be undertaken in accordance with specifications and other technical requirements for welding, radiographic and other NDT and wall thickness matching works.

Welding of Field Joints

CONTRACTOR shall use Automatic welding system for welding of field joints. The automatic welding system shall address details to compensate for bevel geometry, mechanical, physical properties, tensile, ductility, fracture, hardness of pipe supplied.

The alternative option of manual welding shall be avoided unless necessary for specific case and approved by COMPANY. The manual welding shall compensate for bevel geometry, mechanical, physical properties, tensile, ductility, fracture, hardness of the pipe supplied. It shall be CONTRACTOR's responsibility to prove that manual welding is fully compatible to perform high quality welding as good as Automatic welding and as set forth by the specifications. CONTRACTOR shall submit a detailed manual of his welding procedures, ultrasonic and radiographic inspection Quality Control and CONTRACTOR's weld production rates (joints per hour/day/shift) not later than sixty (60) days prior to mobilization offshore for COMPANY's review and permission to proceed.

All requirement and specifications on the welding issues shall refer to CPOC General Specification, Doc No: CPOC-GS-PL-0012.

Field Joint Coating Materials

CONTRACTOR shall purchase and install field joint coating materials conforming to specifications in the technical requirements for field joint coating of offshore pipelines, risers and tie-ins, as applicable.

CONTRACTOR shall also perform the pre-qualification test for the field joint coating material as per required in CPOC-GS-PL-0019.

Buckle Detection

A continuous checking buckle detector shall be pulled through all pipelines during the pipelay. Distance of the buckle detector behind the lay barge shall be sufficient to ensure that the pipe is resting safely on the bottom without buckles or other deformities. The insertion, removal and re-insertion of the buckle detectors shall be witnessed by COMPANY REPRESENTATIVE or COMPANY's authorized delegate. Diameter of the sizing plate shall be no less than ninety six per cent (96%) of the pipe nominal inside diameter. Buckle detectors, trolleys and pulling gear shall not damage pipe internal lining.

Buckle detector pulling force shall be continuously monitored and recorded on a chart. Detection of deformation shall require immediate pipeline repair operations unless otherwise instructed by COMPANY.

Repair operations shall be undertaken by CONTRACTOR's repair procedures as given in the Installation Plan.

REPAIR OF COATING DAMAGE

a) Rejection

CONTRACTOR shall repair any pipe or coating damage which affects the useful life or mechanical integrity of the line. CONTRACTOR shall submit a repair procedure for COMPANY's review and permission to proceed. If COMPANY considers that the damage is beyond repair, CONTRACTOR must reject the joint or cut out the damaged section.

b) Dry Damage

Damage detected prior to lay into the water shall be immediately repaired by a COMPANY approved method.

Significant spalling of weight coating which does not expose the corrosion coating shall be repaired by replacing the lost concrete coating. Sheet metal field joint forms shall be strapped over the repair area if damage occurs whilst the joint is on the pipe laying ramp. Concrete shall be of comparable quality and composition to that used for weight coating of the pipe.

Damage shall be repaired in accordance with COMPANY's approved procedures.

In case the line pipe has been exposed or damaged, the affected joint shall be cut out and replaced.

c) Wet Damage

Damage detected after installation shall be notified to COMPANY and repaired as necessary in accordance with the procedure in the Installation Plan.

Isolated incidences of weight coating damage without exposure of the corrosion coating shall be evaluated for remaining pipeline stability and mechanical protection. Repeated incidences shall be investigated to eliminate the cause of the weight coating damage.

Repairs shall be made in all cases where corrosion coating has been exposed by weight coating damage. Close inspection of each case shall be made to determine if the pipeline steel has been exposed or damaged.

In case of exposure of pipeline steel, CONTRACTOR shall undertake an investigation in order to clearly determine the extent of damage including, if necessary, internal inspection. Pipe exhibiting defects exceeding the limits of ASME B31.8 or the requirements given in this CONTRACT shall be removed and replaced by CONTRACTOR.

PIPE DAMAGE

a) Dents or Buckles

Dents or buckles shall be removed from the pipe by cutting the damaged length from the line. The cutout shall be the length of the damaged area plus one pipe diameter minimum on each side. After cut back, CONTRACTOR shall perform UT for lamination check and the pipe shall then be rejoined by girth weld in accordance with specifications. The pipe ovality or damage shall then be checked by the passing of a buckle detector plate. After repair of a buckle, the coating shall be repaired as described in “Repair of Coating Damage”.

b) Damage Detected Below Water

CONTRACTOR shall provide repair procedures for damage discovered after the pipe has been laid in water. The procedures must be COMPANY approved.

c) Wet Buckle

CONTRACTOR shall submit a detailed procedure for dewatering and retrieving the line in the event of a wet buckle.

DIVING OPERATIONS AND ROV INSPECTION

Diving operations shall be undertaken in accordance with applicable international industry codes and standards.

CONTRACTOR shall provide all equipment, personnel and resources required to undertake lay barge, derrick barge or other diving operations as required for WORK and/or for the inspection of completed WORK. Besides saturation diving, other special diving equipment, as necessary, shall also be provided by CONTRACTOR to undertake any subsea WORK during installation of the Offshore Pipelines including pipeline support or obstruction clearing operations etc., including provision of facilities for video monitoring and recording.

POST-LAY STABILIZATION

CONTRACTOR shall confirm that post-lay stabilization is maintained after free span correction and before hydrostatic testing.

Stabilization shall be strictly in accordance with design and drawing requirements.

PLATFORM APPROACH AREAS

CONTRACTOR shall verify any unstable zones and select construction methods to achieve on-bottom stability at approaches to platforms.

CLEAN UP

CONTRACTOR shall remove all buoys, markers and obstructions placed during installation.

Trash and debris resulting from installation, testing and pre-commissioning shall be removed and disposed of in accordance with environmental regulations.

Platform areas affected by installation shall be cleaned and restored to original condition.

CONTRACTOR shall provide the report for COMPANY information after completion all cleanup activities at SITE include subsea.

3.17.3 Riser and Tie-in Spool

RISER INSTALLATION

A pre-installed riser is available on TPA and MDE jacket structure. CONTRACTOR shall utilize these existing risers to connect the TPB and MDG pipeline and tie-in spool. Prior to TPA and MDE pipeline installation activity, CONTRACTOR shall perform site survey at TPA and MDE to inspect, verify and ensure the integrity of the pre-installed riser at TPA and MDG and confirm as fit to be used for Phase 5 development. CONTRACTOR shall prepare the pre-installed riser inspection and verification procedure and submit to COMPANY for approval during the detailed engineering phase.

CONTRACTOR shall consider in design, the pre-installed riser and riser clamp design loads and model the riser and pipeline tie-in spool for both TPA and MDE platforms. The riser and riser clamps loads are referred under Riser and Riser Clamp design report for

MDE and TPA risers. CONTRACTOR shall inspect, verify and ensure integrity of the existing risers and riser clamps and are fit to use.

CONTRACTOR shall propose the riser and associated tie-in spool assembly configuration and shall be subject to COMPANY's APPROVAL. All constructed spools associated with the risers shall be hydrostatically tested prior to installation and all welds shall be fully NDT in accordance with CGS and the requirements of codes and standards.

The temporary knee brace on the pre-installed riser shall be removed after the completion of the riser and pipeline tie-in spool installation. The pipeline system including riser, tie-in spool and subsea pipeline section shall subject to full pipeline system as per CPOC-GS-PL0015 and CPOC-GS-PL-0016 requirements.

TIE-IN SPOOL INSTALLATION

CONTRACTOR shall be responsible for all the works required to install subsea spools to connect both risers to the pipeline in compliance with CPOC-GS-PL-0014 and other relevant CGS requirement.

CONTRACTOR may choose to construct some tie-in spools (prefab spools) at onshore or offshore. These prefab spools shall be fabricated, inspected and tested as per CGS-PL-0014 requirement. Any damage from handling and/ or transportation to SITE shall be reported to COMPANY and rectified prior to installation of these spools.

The flange's groove shall be protected and preserved properly to avoid damage and corrosion which will have impacts on integrity of the groove seal.

Each gasket, including spares, shall be stored in dry place with proper preservation. Any corrosion or pitting is not acceptable. If corrosion is found, the gasket shall be replaced with brand new one, accordingly. Each gasket shall be supplied with full certificate and traceability.

CONTRACTOR shall propose methodology to install gasket during subsea spool tie-in to minimize the risk of gasket not resting properly in the flanges' grooves and getting pinched. This method shall be approved by COMPANY prior to offshore mobilization.

The flange and gasket dimension shall be checked and trialed fit before construction of any tie-in spool to avoid repair/ rectification works.

CONTRACTOR shall perform subsea metrology to obtain sufficient and correct data to construct closing spool (final spool) to complete the tie-in work. Tolerance of the constructed closing spool shall be in compliance with CGS and agreed with COMPANY to avoid overstress during tie-in spool installation.

Should pipeline or riser be repositioned to accommodate subsea tie-in spool design and construction, CONTRACTOR shall propose the methodology with technical justification and obtain approval from COMPANY prior to commencement.

Flange protector shall be installed at each subsea flange joint as part of the WORK.

VESSEL ACCESS TO SITE

CONTRACTOR shall be fully responsible for directly coordinating vessel access to all areas for offshore installation activities. OTHER CONTRACTORS might be in vicinity throughout CONTRACTOR's offshore installation period (i.e. hook-up, commissioning and/ or drilling, etc.). CONTRACTOR shall minimize the time required to work at or near the platforms. CONTRACTOR's vessels shall adhere to COMPANY's safety practices and General Marine Instructions at all times. CONTRACTOR shall perform the WORK without requiring shut down of any facility.

3.17.4 Span Correction

PRE-LAY RECTIFICATION

Seabed topography identified by CONTRACTOR as potentially causing spans exceeding the maximum allowable length in the empty condition shall be notified to COMPANY along with CONTRACTOR's proposed procedure for seabed modification in order to eliminate the empty condition free span for review and permission to proceed.

POST-LAY RECTIFICATION

CONTRACTOR shall identify and rectify all free spans along the entire route prior to hydrostatic testing of the line in the following manner: After pipe laying, CONTRACTOR shall rectify all free spans exceeding the allowable length in the flooded condition. CONTRACTOR shall then flood the pipeline with water to ensure that it settles and embeds itself under the weight of the water and follows the ground profile more closely. At this stage, CONTRACTOR shall correct all remaining free spans prior to hydrostatic testing of the line.

Unsupported spans greater than the allowable length, must be shortened to less than the allowable length. Free span rectification along the main section of the pipelines shall be by removal of high points. CONTRACTOR may propose permanent alternatives, such as grout bags or placement of structural supports for COMPANY's review and permission to proceed. Sandbags or mastic mats shall not be used for permanent rectification.

CONTRACTOR shall submit the full details of its proposed free span identification, rectification and inspection methods to COMPANY for review and permission prior to commencing the rectification work.

If grout bags are used, they shall be wider than the pipe to ensure stability under highest seabed current and strapped together or stitched in multiple layers when required by the height of the spans. The bags shall be placed on firm level soil and grout strength on setting shall exceed 138 bar (2,000 psi). Grout circulation during bag filling shall be confirmed by visual means. Grout used shall be suitable for permanent structural support in marine environment. Scour skirts shall be used. CONTRACTOR shall demonstrate that the grout bags will provide support throughout the design life of the pipeline.

Provision for Span Rectification

CONTRACTOR shall include the following provisional numbers of pipeline span rectification under CONTRACT PRICE;

Provision for Pipeline Span Correction

No	Pipeline	Estimate Pipeline Span Rectification
1	TPB - TPA	5
2	MDG - MDE	2

The CONTRACT PRICE shall be adjusted based on the actual number of free span rectifications performed by CONTRACTOR. The CONTRACT PRICE shall be adjusted based on the unit rates stated in **Exhibit – 2 Payment Terms and Commercial Arrangement.**

3.17.5 Positioning, Survey and underwater Inspection

CONTRACTOR's scope includes subsea inspection of the pipeline route, including platform and platform's nearby area, in advance of pipelay, pipeline as-laid surveying, plus other detailed requirements throughout the offshore work period via both electronic means and unmanned submersibles.

POSITIONING, SURVEY AND UNDERWATER INSPECTION

CONTRACTOR shall undertake a pre-installation survey for the purpose of carrying out detailed engineering and identifying all hazards in order to select the final pipeline routes, taking into consideration CONTRACTOR's responsibilities and obligations in accordance with the terms and conditions of this CONTRACT.

Should any obstruction or physical condition be discovered during pursuit of WORK making impossible or adversely affecting the performance of WORK, CONTRACTOR shall immediately notify COMPANY. COMPANY shall have authority to decide the realignment of the pipeline routes, if required. Alternatively, should COMPANY require CONTRACTOR to remove obstructions, such removal and/or realignment shall be considered as part of CONTRACTOR's original Scope of WORK.

INSTALLATION SURVEY

It shall be CONTRACTOR's sole responsibility to suitably mark all existing submarine pipelines, subsea facilities, well heads, submarine cables, etc. in order to enable it to proceed with WORK. CONTRACTOR shall use side scan sonar and sub-bottom profiler equipment or any other equipment reviewed and given permission to proceed by COMPANY in order to

locate and mark all submarine pipelines/ wellheads, cables, etc., before dropping anchors, etc. CONTRACTOR shall constantly check and monitor the position of anchors due to possible drift or dragging. In discharge of WORK, CONTRACTOR shall be fully responsible for any damages caused by CONTRACTOR's activities to existing facilities and other facilities of COMPANY or third parties, in accordance with the provisions of this CONTRACT.

CONTRACTOR shall also use the right equipment to detect the existing pipeline for pipeline crossing. As-found existing pipeline shall be plot on the survey screen on board prior to performing the pipeline crossing.

POST-INSTALLATION SURVEY, AS-BUILT SURVEY AND CP SURVEY

CONTRACTOR shall undertake an as-built survey (including CP survey in accordance to CPOC-GS-PL-0017) of the Offshore Pipeline System. CONTRACTOR shall also undertake prior to hydrostatic testing of the Offshore Pipeline System a survey using divers walking the pipelines, or a ROV, submarine or other method acceptable to COMPANY in order to locate any pipeline free spans and record any other hazards to the subsea portion of the Offshore Pipeline System.

CONTRACTOR shall, upon review and permission to proceed by COMPANY, remove or mitigate those pipeline free-spans or other hazards by whatever method(s) suitable to the exigencies of the situation. As-built and CP survey shall covered from the riser bottom tie-in, subsea flanges, subsea tie-in spool, pipeline crossing and along the installed pipeline route.

3.18 PIPELINE PRE-COMMISSIONING

3.18.1 General

This section covers all activities required after completion of construction to prepare the pipeline system for acceptance of hydrocarbons. In general, it includes flooding, cleaning, gauging (with an electronic recording internal geometry tool – Caliper Pig) and hydrostatic testing of the pipeline system prior to putting the pipeline into service. Testing and pre-commissioning shall be undertaken in accordance with COMPANY approved procedures.

CONTRACTOR shall undertake pre-commissioning work on complete pipeline system as soon as practical after installation work is complete.

All requirements and specifications regarding hydrotesting and pre-commissioning works shall refer to CPOC General Specifications, Doc No: CPOC-GS-PL-0015 and CPOC-GS-PL-0016.

CONTRACTOR shall coordinate the availability and operability of platform for pre-commissioning work with COMPANY and ensure that sufficient spare parts, tools and consumables are available for CONTRACTOR's work.

CONTRACTOR shall directly coordinate with COMPANY, OTHER CONTRACTOR(S) and third parties associated with pre-commissioning and commissioning during CONTRACTOR engineering to ensure that all parts of the pipeline system, including the facilities provided by others, are suited for pre-commissioning, commissioning and startup.

CONTRACTOR shall prepare a complete plan and procedure for the pre-commissioning program, including certification and submit same to COMPANY for permission to proceed at least sixty (60) days prior to beginning any pre-commissioning activity in the field. The plan shall include a detailed schedule, description of manpower and equipment requirements and personnel experience information. The plan shall address the following major categories of WORK for the pre-commissioning of the pipeline:

a) Fill, Initial Cleaning, Internal Measurement and Hydrostatic testing

b) Preservation method, chemical dosing requirement and preservation plan for at least one year after offshore pipeline installation

c) Certification and Mechanical Completion

CONTRACTOR shall organize, manage and directly coordinate all pre-commissioning work in cooperation with COMPANY and OTHER CONTRACTOR(S), including utilization of space on and near the platforms, as necessary.

CONTRACTOR shall provide reliable communication for pre-commissioning work between each end of the pipeline.

3.18.2 Cleaning, Gauging and Hydrotesting

CONTRACTOR shall fill with water, clean, gauge, prove the internal geometric cross section of the pipe using an electronic recording internal geometry tool (i.e. Caliper Pig) and hydrostatically test the pipelines. CONTRACTOR shall undertake the hydrostatic pressure test of all pipe and piping components of the Offshore Pipelines System. CONTRACTOR shall supply and install all permanent or temporary facilities and equipment to undertake the hydrostatic testing. Hydrostatic testing shall be undertaken after all free spans have been corrected, after completion of trenching and burial activities (if required) and after completion of any other pipeline-related construction activities.

CONTRACTOR shall obtain permission from relevant statutory authorities, field operators and MTJA, where necessary, before discharging any water from the pipeline system.

CONTRACTOR shall mobilize and utilize all equipment, vessels, labor, tools, supplies, corrosion inhibitor, pigs and other equipment and material as required in order completing all pre-commissioning works for the pipeline system.

Test equipment, calibration certificates and procedures for use shall be submitted to COMPANY for review and permission to proceed as a part of CONTRACTOR's pre-commissioning plan.

All test reports and records for pre-commissioning activities shall be compiled and be part of the final documentation.

3.18.3 Preservation

CONTRACTOR shall include in the pre-commissioning plan a detailed procedure for preservation of the pipeline system prior to commissioning.

CONTRACTOR shall propose suitable chemicals (including the dosage required) to be injected into the pipeline as to withstand the preservation period for COMPANY approval.

CONTRACTOR shall prepare long term preservation procedure for carbon steel pipelines. All necessary chemicals dosing including biocide, oxygen scavenger, inhibitors shall be supplied and dosed to maintain inhibited water at the completion of pipelines installation. Long term preservation means pipelines may remain idle up to twelve (12) months after offshore pipeline installation and may need to deploy all necessary measures including periodic chemical dosing, water replacement, etc. CONTRACTOR shall be responsible for maintaining pipelines preservation until subjected to well fluid introduction and production after platform start up.

CONTRACTOR shall be responsible for pipeline preservation which include monitoring pipeline pressure, pipeline condition, re-inject the chemical dosing as and when required after offshore pipeline installation up to one year period. All and any equipment tools, marine, manpower etc. required for related activities shall be under CONTRACT PRICE.

3.18.4 Certification and MECHANICAL COMPLATION

CONTRACTOR shall provide signed certification for the completion of each stage of pre-commissioning. Final acceptance of pipeline hydrostatic tests must be sought and given from COMPANY's home office and supported by signed field certification.

CONTRACTOR shall notify and obtain COMPANY's concurrence that MECHANICAL COMPLETION has been achieved once all pre-commissioning work is complete and other requirements for MECHANICAL COMPLETION are achieved.

3.18.5 Plan and Procedure

CONTRACTOR shall submit pre-commissioning plan and procedure for COMPANY's review and permission to proceed. Upon COMPANY's permission to proceed, CONTRACTOR shall proceed with the pre-commissioning program as soon as practical. CONTRACTOR shall take the lead in organizing the pre-commissioning program in cooperation with COMPANY, OTHER CONTRACTOR(S) and any third parties.

The principal elements of CONTRACTOR's plan shall include the following as a minimum:

a) 24-hour operation

b) A precise time schedule

c) Water quality monitoring and control Organization and staffing plan

d) A supervisor on each shift having at least ten (10) years of experience in offshore pipeline pre-commissioning operations

e) Redundant communications links

f) Communications technicians

g) Essential transportation

h) Temporary equipment

i) Vent and Drain arrangements

j) Supplementary operators for assistance to permanent staff if required.

k) Step-by-step description of the pre-commissioning operations complete with explanatory drawings or sketches

l) Definition and procurement of all temporary facilities, instrumentation, spares and consumables, etc.

m) Provision of suitable marine spread to access platform's boat landing and standby to support pre-commissioning operations.

3.19 AS-BUILT DOCUMENTATION

CONTRACTOR shall provide "as-built" drawings and documentation of all construction work undertaken including, but not limited to platform's coordinates, orientation and elevation, piles and conductors penetration depths, boat landing elevation, as-built pipeline alignment sheets and pipeline route drawings, as-built drawings of all work performed on the platforms, as-built details of risers, expansion spools and crossings. A proposed index of as-built documentation shall be provided for COMPANY review prior to the start of construction and adjusted as necessary during WORK.

In addition to drawings noted above, as-built documents shall also include:

- Final unpriced purchase orders
- HAZID and Risk Assessment Report
- Vendor/ Subcontractor's data and test report
- Vendor/ Subcontractor's operation and maintenance manuals
- Complete daily reports
- Safety reports
- Inspection records, reports and certificates
- Field reports
- Surveys and Calibration Reports
- MWS's Certificate of Approval for all key activities
- Site Memos
- Final project specifications, procedures, analyses, studies and design reports
- Testing and Pre-commissioning Procedures
- Testing and Pre-commissioning Reports
- Maintenance manual (if applicable)
- Searchable cross-reference table of electronic document filenames.

As-built drawings together with the red-line mark-up drawings shall be submitted to COMPANY for review and permission to proceed. Where CONTRACTOR updates an existing set of drawings, CONTRACTOR shall maintain existing formats, numbering systems, revision systems etc. in order to ensure that the new as-built drawings become smoothly incorporated into the existing drawing set.

CONTRACTOR shall be responsible for assisting COMPANY for notifying the appropriate authorities, including MTJA, of new installations for inclusion within official records such as notices to mariners and navigation charts. CONTRACTOR shall accordingly prepare all necessary documentation for submission to COMPANY.

3.20 HOOK-UP AND COMMISSIONING AND HOST TIE-IN

3.20.1 WORK SCOPE OVERVIEW

The HUC and Host Tie-in scope of works shall be read in conjunction with the drawings, documents, specifications, codes and standards, procedures, statement of requirement, listed in EXHIBIT- 4, EXHIBIT - 5 and other related CONTRACT documents and Exhibits.

The CONTRACTOR's scope of work consists essentially of the following but not limited to:

1. Provision administration and support services for HUC and Host Tie-in WORKs.
2. Undertaking Project Management of the offshore hook-up, Host tie in of receiving facility, testing and commissioning including the management and supervision of all subcontractors, vendors and ancillary or temporary services which are necessary for the expeditious completion of the WORK.
3. Undertake Subcontractor management as well as management of VENDORS. CONTRACTOR shall pay particular attention to interfaces with VENDORS and Sub CONTRACTORS.
4. Preparation and submission of organization charts along with details of responsibilities for CONTRACTOR and Sub CONTRACTORS.
5. Provision of a project management team or teams to manage the Implementation of the WORKS
6. Provision of all Key CONTRACTOR Personnel and its Sub CONTRACTORS as listed in the CONTRACT.
7. Provision of onshore support team which shall be available in CONTRACTOR's office on seven (7) days a week basis throughout the period of HUC (Pre-Drill HUC and Flow lines hook-up) and host tie-in campaigns to support, advise and manage for engineering, materials, consumables, logistic, etc.
8. Prepare execution details and include all the requirements and method statement for Offshore Hookup and Commissioning and Host Tie in of Receiving Facility under Project Execution Plan (PEP) & Project Quality Plan (PQP) for COMPANY for review and approval.
9. Acquaint with the nature and the requirements of this CONTRACT and with matters which may affect WORKS including ports in the vicinity of the Job Site, government rules, regulations, orders, ordinances, codes and laws affecting WORKS including applicable regulations at each port involved and COMPANY policies, guidelines, procedures and practices.
10. Prepare offshore HUC and Host Tie-in plans, procedures and administrative and construction/execution guidelines.
11. Prepare commissioning and start-up procedures, operating and maintenance manuals, Performance test Procedures, etc.

12. Perform overall planning and control of offshore HUC and Host Tie-in WORKS.
13. Plan for the WORKS including identification and familiarization of the overall work scope and specific tasks to be performed, work pack preparation, job card and task sheets compilation etc.
14. Produce all necessary procedures and perform activities offshore for the WORKS including transportation and installation analysis of ship loose items, lifting and rigging analysis, equipment installation, safety habitat for hot works, job safety analysis, pre-installation/construction survey, etc.
15. Provide all necessary and sufficient manpower, management and supervisory team, engineering, project materials, transportation, equipment and consumables to perform the WORKS at SITE.
16. Furnish all materials, construction tools and equipment, utilities supplies, temporary structures, consumable, labor, supervision, marine vessels, transportation and other WORKS and services necessary.
17. Co-ordinate with COMPANY's marine warranty surveyor (MWS) and timely issue documents for MWS approval. CONTRACTOR shall be responsible for incorporating comments in WORK and rectifying deficiencies identified by the MWS.
18. Interface with COMPANY (including its REPRESENTATIVES from Logistics, Drilling, Production and Operations, Safety disciplines) and OTHER CONTRACTORS throughout execution planning, preparation and execution at SITE. All execution procedures and guidelines shall incorporate and comply with COMPANY requirements related to execution of WORK under SIMOP. COMPANY Project Team shall be kept informed on all such interface and communications.
19. Coordinate and control WORK, e.g., Commissioning engineering, Procurement, Project Controls, Contracting, Construction, testing, commissioning and handover to ensure the WORK is completed on schedule and according to the specifications and drawings.
20. Produce and submit Daily reporting for Offshore HUC campaign and weekly progress reporting.
21. Reporting of offshore SITE weather conditions, forecast and actual, from date of mobilization of CONTRACTOR marine spread at SITE until the date of demobilization upon completion of HUC WORK. A specialized 3rd party weather agency shall be assigned for such services.
22. Compliance with General Marine Instructions (GMI) as included under Exhibit - 5 during all offshore HUC campaigns and Host Tie-in Campaigns.
23. Perform Material control and warehousing of material and equipment for Hook-Up and Commissioning WORK.
24. Perform Site survey of TPA, MDE and MDPP platforms for ascertaining site conditions, as-built conditions, tie-in points/locations, constructability study, operational and

maintenance constraints, existing control system, UPS/power system addition/upgrading and SCADA modification and upgrade, etc.

25. All as-built data on host-tie in platforms (MTA, MDE and MDPP), including dimensions and measurement shall be acquired by CONTRACTOR for its design development activity. Undertake laser 3D scanning of host-tie in platforms for inputs into detailed design. Similarly, undertake laser 3D scanning/measurement for flow line hook up spools routing after drilling completion and Xmas tree installation on respective well slots on new platforms to allow prefabrication onshore. Manual stringing is not accepted due to possibility of human error.
26. Verify all required ship loose items at fabrication yard, offshore platform laydown deck area and plan for installation during HUC and Host Tie-in WORK at offshore.
27. Provide onshore/offshore transportation for CONTRACTOR supplied materials and equipment including loose items.
28. Obtain the necessary approvals and certifications from relevant authorities. Apply application/s to relevant government authorities for telecommunication equipment and frequency licensing as required under Phase - 5 Development. Where necessary, CONTRACTOR shall undertake such services on behalf of COMPANY within CONTRACT PRICE and SCHEDULE.
29. Management and coordination of all interfaces associated offshore Hook-up and commissioning, Host tie in of Receiving Facility, Material Management, barge and vessel management etc.
30. Provide and manage mobilization and demobilization of marine spread including construction vessels, supply vessels, anchor handling tugs and crew boats.
31. Provide office space, accommodation, food, transport and facilities for COMPANY personnel on offshore Marine throughout complete execution period.
32. Perform preservation and install protection of facilities on wellhead platform against offshore environment, drilling and perforation operations. CONTRACTOR to prepare a Platform Preservation and Protection Procedure and define requirements based on thorough review of risk from offshore environment, drilling and perforation activities. Necessary interface and inputs from COMPANY Project Team, its Drilling CONTRACTOR and COMPANY Operations shall be solicited while preparing the procedure. Acceptance of this procedure shall not relieve CONTRATOR to its obligations under Lump Sum CONTRACT and any changes/modification, as may be necessary, to installed preservation and protection at onshore or offshore shall be executed under CONTRACT PRICE. Platform Preservation and Protection Procedure shall be submitted ninety (90) days prior to planned sail-away for COMPANY review.
33. Identify shutdown requirements, if any, provide and install early tie-ins on TPA, MDE and MDPP platforms, if necessary. CONTRACTOR shall provide specific plan and execution procedure for host tie-in and receiving facility Works within four (4) months

from the EFFECTIVE DATE. CONTRACTOR shall study and advise / demonstrate if 'shutdown of facility is required at TPA and MDE during offshore works. Requirement of facility shutdown finalization and notification is critical and crucial to enable COMPANY notifying shareholders and authority for approval.

34. Perform offshore construction and operations risk assessment. Arrange a joint HUC Risk assessment workshop with COMPANY (Including COMPANY Representatives from HSE, Logistics, Drilling and Operations), CONTRACTOR and SUBCONTRACTORs. HUC Risk Assessment Workshop shall be conducted together with HUC Readiness Workshop, which shall be minimum forty five (45) days before mobilization offshore. A Risk Assessment Term of Reference (TOR) shall be submitted to COMPANY minimum ten (10) days before the planned Workshop. A Risk Assessment Closeout report shall be submitted for necessary Acceptance by COMPANY within ten (10) days from the date of workshop.
35. Plan and arrange "HUC Readiness Workshop" minimum forty five (45) days before mobilization offshore to demonstrate all aspects of offshore campaign is well planned and ready (reviewed and Accepted by COMPANY as a minimum) in all respect including but not limited to work packs, job cards, work permits, work force, management team, marine spread, bagging and tagging of project material, construction equipment suitability and good working condition, safety measures plan and execution method, reporting and communication in place, change management team in place and effective in managing uncertainties, handover documentation and plan for system handover, Ready for Start-up, etc. The HUC Readiness register shall be updated and submitted to COMPANY on weekly basis, as a minimum, until the date of mobilization to SITE.
36. Implement safety program throughout the execution of the WORK. CONTRACTOR shall ensure that both direct and indirect manpower shall be trained and well aware of COMPANY's HSE requirement prior to offshore mobilization. CONTRACTOR shall conduct both classroom lessons and practical training to qualify all offshore personnel. Refer section 1.3.5 of Exhibit – 1 for training requirements. CONTRACTOR shall provide adequate Life rafts and jackets for its construction crew performing WORK at wellhead platforms in line with the HSE requirements.
37. Implement quality assurance program throughout the Execution of the WORK and submission of periodic reports to COMPANY.
38. Perform Welding and NDT qualification.
39. Perform offshore hook-up and tie-ins of all structural, mechanical, piping, electrical and Instrumentation, safety items at new wellhead platforms and existing host tie-in platforms, progressively in accordance with MILESTONE DATES specified in Exhibit - 3.
40. Perform offshore testing and commissioning of all mechanical, piping, electrical and instrumentation, safety systems for new wellhead platforms and receiving facilities at existing host tie-in platforms.

41. Perform and complete the offshore hook-up, inspection, testing, and commissioning of the Wellhead Platforms (TPB and MDG) and Host Tie-in and Receiving facilities (TPA, MDE, MDPP), in accordance with the CONTRACT documents including manufacturer recommended testing and commissioning procedure.
42. Prepare tie-ins, corresponding tie-in material and equipment based on the CPOC Design package.
43. Perform tie-in of pipeline riser to topside piping and Pig Launcher/Receiver facilities.
44. Testing / retesting, calibration and re-certification of safety equipment, PSVs and all other critical items during offshore HUC, where validity of initial certification has expired or is scheduled to expire within six (6) months after offshore commissioning.
45. Attend all meetings during offshore execution, including interface meetings with COMPANY Operations Team, Drilling and Perforation Teams OTHER CONTRACTORs, daily tool box meetings, PTW, JHA and Work Plan meetings.
46. Handover offshore facilities; system and sub-system wise to the acceptance of COMPANY and establishing ready for Start-up (RFSU) status.
47. Conduct training for COMPANY Operators on specified wellhead platform systems and packages. Refer section 3.20.2 H) Operator Training of Exhibit – 1 for training requirements.
48. Provide assistance to COMPANY for facilities start-up and supply VENDOR assistance as required by COMPANY.
49. Punch list or incomplete portion of WORK, even though minor in nature, is strictly not allowed and COMPANY shall withhold MECHANICAL ACCEPTANCE. Nevertheless, if as may be agreed by COMPANY, CONTRACTOR shall promptly attend and resolve all punch list arising from onshore and offshore HUC until MECHANICAL ACCEPTANCE, during and after plant start-up.
50. Platform clean-up and housekeeping of wellhead facility upon completion of hook-up and commissioning and demobilization.
51. Disposal of sea fastening, packaging, debris and rubbish during hook-up and commissioning.
52. Dismantling and disposal of fabrication aids and temporary facilities except as otherwise directed by COMPANY.
53. Handover commissioning spares to COMPANY SITE Representative and COMPANY Operation at offshore.
54. Return all surplus and/or other permanent material to COMPANY supply base.
55. Complete As-built information, Redline mark-up and Final documentation.
56. Perform seabed survey (Side Scan Sonar Survey) to capture the state of seabed around the wellhead platforms (TPB and MDG) for any debris or fallen construction tools and

material. The field survey report shall be made available to COMPANY within three (3) days after the completion of the offshore operations, or at demobilization of vessel, whichever occurs first. A Final survey report as available within seven (7) days upon completion of survey at SITE shall be submitted to COMPANY.

57. CONTRACTOR shall note that PLANT Start-Up, 1st Gas and initial PLANT operations of wellhead platforms is planned under SIMOP with concurrent Drilling rig operations. Accordingly there are restrictions to full commissioning of some of the platform systems due to hazard of hydrocarbon venting, as noted below;

a. Hybrid Power system (TEG and Solar Panels) could not be commissioned until demobilization of Drilling Rig from respective wellhead platform. This system and relevant equipment shall be commissioned and performance test shall be done as part of the last/final batch of Flow line hook-up and/or upon demobilization of Drilling Rig from the platform.

b. Instrument and Utility Gas (IUG) System could not be commissioned until demobilization of Drilling Rig from respective wellhead platform. This system and relevant equipment shall be commissioned and performance test shall be done as part of the last/final batch of Flow line hook-up and/or upon demobilization of Drilling Rig from the platform.

Hence, in absence of above systems, for the duration until last/final batch of Flow line hook-up on respective wellhead platforms until the commissioning, CONTRACTOR shall make temporary provision of;

i. Power supply: Provision to utilize wellhead platform DEG (supplied under Lump Sum Scope of CONTRACT) for supply of electrical power.

ii. Instrument Air Supply: Provision of temporary Instrument Air package (Air Compressor and Dryer Package). Air Compressor capacity shall be inline with the design requirement/capacity of IUG Package and reviewed during detailed engineering design. Instrument Air shall be tie-in to the instrument gas header. Instrument air maximum particle size of 3/5 microns (solid particle/liquid particle) and Dew point of three (3) degC at operating pressure. The dryer capacity shall be determined by CONTRACTOR corresponding to the instrument gas consumption established during detail design. The temporary Instrument Air package shall be Zone 2 complaint.

The above systems shall be installed during the Pre-Drill HUC campaign of respective wellhead platforms. In case of OPTION 2 execution scenario, the above stated provisions are not applicable on MDG platform. The above temporary provisions shall be supplied (including mob/de-mob, maintenance/repairs, handling, etc) under CONTRACT PRICE.

58. Perform any optional work if requested by COMPANY.

1. GENERAL

CONTRACTOR shall be responsible for Offshore Hook-Up and Commissioning (HUC) of Phase 5 facilities that includes:

- Two (2) new wellhead platforms (namely TPB and MDG)
- Receiving facilities and host tie-in at TPA, MDE and MDPP

HUC of new wellhead platform and associated receiving facilities will be initiated progressively after/concurrent completion of offshore installation of wellhead platform and associated subsea pipelines however prior to planned well drilling activities on respective platforms. Alternatively and incase COMPANY requires, HUC of new wellhead platform and associated receiving facilities upon completion of well drilling activities as referred for OPTION case under Exhibit – 3 of the CONTRACT. CONTRACTOR shall plan HUC campaign(s) as given in Exhibit - 3 to bring facilities progressively ready for start-up (RFSU).

All HUC and Host Tie-in WORK shall be completed on or before the MILESTONE DATES.

CONTRACTOR shall engage dedicated in house resources or a specialist HUC SUBCONTRACTOR for HUC activities. CONTRACTOR's in house HUC team shall supervise SUBCONTRACTOR and overall WORKS.

CONTRACTOR shall pay special attention to platform facilities and required preservation under offshore environment for long duration, mainly for MDG wellhead platform. CONTRACTOR shall plan extensive preservation method and intermediate specific site visits to maintain all such preservations until hook up and commissioning performed and facilities handover for startup. Such plan shall be submitted, for review and acceptance by COMPANY, as part of Platform Preservation and Protection Procedure.

2. WORK PLAN

The HUC and Host Tie-in Scope of WORKS comprises of, but not limited to, work pack preparation, offshore SITE survey on existing platforms, offshore fabrication and installation, hook-up and host tie-in, inspection, testing, pre-commissioning and commissioning of all systems, related appurtenances and equipment of the platform. Scope of WORK also include integrated telecommunication system installation and functional testing with central complex (MDPP) and all WORKS necessary to put into initial safe operation all systems and equipment of the platform facilities as well as any required remedial work under the CONTRACT.

Offshore Hook-up and Commissioning WORK under Phase - 5 Development is planned under various stages or batches with each campaign and batch assigned with specific scope and completion status. CONTRACTOR shall refer to Exhibit – 3 CONTRACT SCHEDULE where the timeline of WORK is defined.

2.1 Hook-Up and Commissioning (HUC) WORK Plan

Hook-up and Commissioning WORK on new wellhead platforms is planned under two scenarios as specified under Exhibit – 3 and referred below:

i. BASE CASE : SIMOPS on TPB and MDG

ii. OPTION CASE : SIMOPS on TPB only

The time line or the MILESTONE SCHEDULE for each CASE is referred under Exhibit - 3 CONTRACT SCHEDULE. Implementation of OPTION CASE is subject to adjustment of CONTRACT PRICE in accordance with Exhibit – 2 Payment and Commercial Terms

a) **HUC plan under BASE CASE:**

Offshore hook-up and commissioning of TPB and MDG shall be completed for MECHCNICAL ACCEPTANCE progressively under separate campaigns and batches;

- Pre-Drill HUC Campaign (Pre-Drill HUC)
- Flow Lines Hook-Up and commissioning (HUC) – Batch 1
- Flow Lines Hook-Up and commission (HUC) – Batch 2
- Flow Lines Hook-Up and commission (HUC) – Batch 3
- Flow Lines Hook-Up and commission (HUC) – Batch 4 (only for TPB)

Pre-Drill HUC

CONTRACTOR shall mobilize to TPB followed by MDG, undertake hook-up and commissioning activities and make the facilities Ready for Start-up (RFSU) prior to the planned mobilization of Drilling Rig.

A detailed wok scope for Pre-Drill HUC shall be defined under offshore HUC Work Pack and submitted for review and acceptance by COMPANY three (3) months prior to the planned sail away of first wellhead platform.

CONTRACTOR shall complete all WORK defined under offshore HUC to the maximum extent as technical feasible and in agreement with COMPANY. All platform systems shall be completed and commissioned to unrestricted ad safe plant operation at RFSU. Any temporary and alternate system arrangement if necessary shall be identified during detail engineering design and provisioned by CONTRACTOR within CONTRACT PRICE. Hybrid power system (Solar panels, TEG system) and IUG System are such systems where commissioning could only be completed until the time drilling operations on the respective wellhead platform are complete and the rig has demobilized from the respective platforms. Such and other systems shall be identified under HUC WORK Pack where commissioning and integration with existing facilities will be completed after demobilization of Rig and shall be completed within CONTRACT Scope and PRICE. Installation of well flow line hook-up

spools and associated instrument tie-in to be connected to individual wellheads (X-Mas Tree) and corresponding commissioning WORK are excluded from the Pre-Drill HUC scope. These shall become part of scope of WORK under subsequent Flow Lines Hook-Up and commissioning (HUC) batches, referred below.

CONTRACTOR shall ensure full onshore MECHANICAL COMPETION of wellhead platforms without any carryover/punch list work to offshore. However any incomplete onshore scope of WORK carryover to offshore shall be completed under Pre-Drill HUC campaign and prior to Pre-Drill HUC completion MILESTONE DATE.

As part of Pre-Drill HUC, all platforms systems and subsystems, except for well flow lines, shall be physically completed, painted, tested and commissioned to reach Ready for Start-up (RFSU) stage.

CONTRACTOR shall make the respective wellhead platform facilities in the condition to accept Drilling rig without any interference and constraint for safe operations. CONTRACTOR shall preserve and put in place all necessary protection, including soft covers and hard protections, to safeguard the wellhead equipment and systems from potential damage from drilling activities. CONTRACTOR shall dismantle any equipment that may potentially interfere with drilling rig operations or are expose to risk of dropped object or other reasons of damage during drilling operations. All such equipment, including solar panels, shall be reinstated at its designed location, re-tested and re-commissioned under CONTRACT Scope and PRICE. Similarly CONTRACTOR shall remove, recover, transport to onshore and dispose all preservation and protection from wellhead facilities, as may be instructed by COMPANY at no cost to COMPANY.

CONTRACTOR shall undertake a review and risk assessment workshop with COMPANY to identify possible damage due to drilling operations, interference with drilling operations and constraints to rig entry on the respective wellhead platform. Necessary measures shall be put in place in order to address such findings and mitigate such risk under CONTRACT Scope and PRICE. Solar Panel is one such equipment that shall not be installed until drilling operations on the respective wellhead platform are complete and the rig has demobilized from the platform.

The Host Tie-in works for the corresponding existing WHPs (TPA and MDE) and MUDA Central Processing Platform (MDPP) shall be inclusive and part of WHP offshore hook-up and commissioning (HUC) and detailed under Host Tie-in WORK scope.

<u>Flow Lines Hook-Up and commissioning (HUC)</u>

CONTRACTOR shall complete, install and tie-in the last flow line hook-up spools and associated instrument to individual wellheads (X-Mas Trees), test, and commission and make ready for start-up (RFSU) to enable COMPANY to start-up and introduce hydrocarbon.

A total of four (4) separate batches for flow line HUC are planned on TPB while a total of three (3) separate batches for flow line HUC are planned on MDG. Refer to Exhibit – 3 for corresponding MILESTONE AND MILESTONE DATES for the timeline of execution.

CONTRACTOR shall meet the stated timeline and in the event of delay in meeting the defined MILESTONE DATE relevant provision of the CONTRACT shall be invoked.

Offshore hook-up and commissioning (HUC) and RFSU of well flow lines on respective wellhead platforms are planned under SIMOP conditions, concurrent with Drilling activities and/or hydrocarbon production. The last or the final batch of flow line hook-up is planned upon demobilization of drilling rig.

Number for flow line for hook-up planned under various Batches is stated below;

WHP	Batch 1	Batch 2	Batch 3	Batch 4
TPB	3	3	3	3
MDG	3	3	2	

NOTE: Variation in number of flow lines per Batch by +/- one (1) flow line hook-up shall not be qualified as a CHANGE and is under CONTRACT PRICE.

The first batch (Batch – 1) of flow line HUC completion and RFSU will enable COMPANY achieve 1st Gas on respective wellhead platforms and is critical for COMPANY. The subsequent batches of well flow line HUC will be executed under SIMOP conditions concurrent with drilling activities and hydrocarbon production. The last batch of flow line HUC will be executed upon demobilization of drilling rig and under hydrocarbon producing wellhead facility. The well head platform will be designated as LIVE (producing Hydrocarbon) throughout the planned flow line HUC execution and relevant procedures and restrictions to execution of work will be in place. CONTRACTOR shall follow such restrictions and consider while preparing and execution of WORK under CONTRACT scope, SCHEDULE and PRICE. A SIMOP Matrix is attached to Exhibit -1 “for reference ONLY” and planning of CONTRACTOR’s WORK during offshore HUC under SIMOP conditions. SIMOP Matrix shall be reviewed as part of risk assessment during the preparation of HUC WORK Pack. Any changes, as necessary, shall be addressed by CONTRACTOR and COMPANY shall approve the same for implementation during HUC WORK. CONTRACTOR shall implement APPROVED SIMOP Matrix under the CONTRACT PRICE.

CONTRACTOR shall complete all WORK and in sequence as defined herein, but not limited to;

i. Measurement of flow line hook-up spools.

ii. Onshore pre-fabrication of flow line hook-up spools.

iii. Offshore installation, testing and hook-up and commissioning (HUC) of flow lines and associated instrument.

Exhibit – 3 provides the planned schedule for Drilling activities and completion of flow lines HUC. CONTRACTOR shall coordinate with COMPANY and perform regular/daily follow up on the progress of drilling activities.

1. Measurement of well flow line hook-up spools

   COMPANY will notify CONTRACTOR the date of mobilization for flow lines measurement at offshore as soon the 3rd well is ready for handover and the X-Mass tree is installed. CONTRACTOR shall prepare in advance and keep ready all necessary resources and tools including Offshore Safety Passports (OSP) for respective CONTRACTOR personnel planned for mobilization to SITE. CONTRACTOR personnel shall report at COMPANY Supply base or Helibase in Songkla, Thailand as instructed by COMPANY. Corresponding provisions of transportation between COMPANY Supply Base and SITE including offshore food and lodging shall be as stated under section for "Services by COMPANY" for Exhibit - 1.

   CONTRACTOR shall ensure, in coordination with COMPANY, that its personnel arrive at SITE on the day of completion of 3rd well (or the last well under respective batch) for performing measurement work.

2. Onshore pre-fabrication of well flow line hook-up spools

   The flow lines measurement data/information as collected by CONTRACTOR personnel shall be utilized for pre-fabrication of the flow line spools.

   CONTRACTOR shall plan its onshore well flow lines pre-fabrication work in most expeditious and accelerated manner. CONTRACTOR's onshore pre-fabrication plan shall be in line with APPROVED CONTRACT SCHEDLUE. CONTRACTOR shall make necessary endeavor and is encouraged to achieve completion of Batch - 1 earlier then the respective MILESTONE DATE.

   CONTRACTOR shall note that any modification of the prefabricated spools as per CPOC AFC Design however required matching the actual "as installed" orientation of the Wellhead (Xmas tree) shall be under CONTRACT PRICE.

   Completed, fully tested and painted well flow line spools shall be prepared for transportation to offshore for execution of flow line hook-up at SITE. All associated instrumentation and other permanent material shall also be prepared and packed for safe transportation to SITE.

   Continuous coordination and interface with COMPANY is critical for timely mobilization at SITE. CONTRACTOR shall prepare in advance all necessary resources and tools including Offshore Safety Passports (OSP) for respective CONTRACTOR personnel planned for mobilization to SITE.

   CONTRACTOR personnel shall report at COMPANY Supply base or Helibase in Songkla, Thailand as instructed by COMPANY. Corresponding provision of transportation between COMPANY Supply Base and SITE and offshore food and lodging shall be as stated under section 1.2.5 Services of Exhibit - 1.

CONTRACTOR shall plan its mobilization and demobilization to/from SITE in consideration of pre-established operating schedule of COMPANY vessels and/or Helicopter services. CONTRACTOR shall align and execute its activities accounting the above avoiding any stand-by of its personal and equipment at onshore or at SITE.

Improper management and coordination with COMPANY that may result in CONTRACTOR standby shall not be reimbursed. Any cost impact due to such stand – by or delay, except as may be caused by COMPANY, shall be under CONTRACTOR. Moreover, any associated cost that COMPANY may incur due to CONTRACTOR failure shall be recoverable under GC – 39 BACKCHARGES.

3. Offshore installation, testing and hook-up and commissioning (HUC) of flow lines;

Offshore installation testing and Hook-up and commissioning of flow lines broadly consist of:

i. The installation, inspection and testing of the flow lines and valves from the respective flow line manifold to the corresponding wellheads.

ii. The installation, inspection, calibration and commissioning of all instrumentation associated with the wellhead flow lines and the wellheads themselves.

CONTRACTOR shall prepare and mobilize to SITE with its construction and commissioning crew, tools and equipment and flow line material as per the pre-agreed plan and CONTRACT SCHEDULE.

CONTRACTOR shall undertake regular coordination and interface with COMPANY for the actual date of mobilization to SITE.

CONTRACTOR personal will be accommodated at MUDA Living Quarter and COMPANY or its OTHER CONTRACTOR vessel throughout the duration of flow line hook-up and commissioning WORK. Due to limitation to the number of construction personal on wellhead platform at any time under SIMOP conditions, CONTRACTOR shall optimize its manpower resources with its construction crew and vendors not exceeding fifteen (15). Such restriction shall be applied for the duration of flow line hook-up during drilling rig operations.

CONTRACTOR shall follow all the instructions, guidelines and procedures as referred under the CONTRACT and established as part of execution of WORK. This shall include all considerations to concurrent activities with drilling and production under SIMOP.

CONTRACTOR shall participate in Daily work plan meetings, SIMOP meeting, PTW and Safety and tool box meetings. These meetings will be chaired by COMPANY Man, MUDA OIM and CSR as designated.

b) **HUC Plan under OPTION CASE:**

Under the OPTION CASE, the HUC of TPB is planned same as BASE CASE. However the HUC for MDG shall be completed under single offshore campaign and upon completion of drilling activities on MDG wellhead platform. CONTRACTOR shall complete all offshore hook-up and commissioning (HUC) works for wellhead platform including well flow line hook-up and make ready for start-up (RFSU) within specified period.

Offshore hook-up and commissioning of TPB and MDG shall be completed for MECHANICAL ACCEPTANCE progressively under separate campaigns and batches;

TPB Wellhead Platform;

- Pre-Drill HUC Campaign (Pre-Drill HUC)
- Flow Lines Hook-Up and commissioning (HUC) – Batch 1
- Flow Lines Hook-Up and commission (HUC) – Batch 2
- Flow Lines Hook-Up and commission (HUC) – Batch 3
- Flow Lines Hook-Up and commission (HUC) – Batch 4

MDG Wellhead Platform;

- Post Drill HUC Campaign

Offshore hook-up and commissioning (HUC) and RFSU of well flow lines on TPB wellhead platform is planned under SIMOP conditions concurrent with Drilling activities and/or hydrocarbon production. The last or the final batch of flow line hook-up is planned upon demobilization of drilling rig. Completion of first batch of Flow line Hook-up and RFSU on TPB is critical for achieving 1st Gas.

Offshore hook-up and commissioning (HUC) and RFSU of MDG wellhead platform is planned under NO SIMOP conditions after demobilization of Drilling g Rig and shall be completed prior to the planned perforation of wells.

Under OPTION CASE, MDG wellhead platform shall reach onshore MECHANICAL COMPLATION with following minimum systems/sub-system commissioned prior to sail away and completion of offshore installation of wellhead and pipeline facilities:

a. Pedestal Crane Site Acceptance Test (SAT);
b. AC System (e.g. Distribution Board(s), lighting fixtures, etc);
c. Open Drain system;
d. Hydrotest and preservation of riser, doglegs and sealines; and
e. Protection and Preservation of Wellhead Platform

Number for flow line for hook-up planned under various Batches is stated below;

WHP	Batch 1	Batch 2	Batch 3	Batch 4
TPB	3	3	3	3
MDG	Post Drill HUC			

NOTE: Variation in number of flow lines per Batch by +/- one (1) flow line hook-up shall not be qualified as a CHANGE and is under CONTRACT PRICE.

The Host Tie-in works for the corresponding existing WHPs (TPA and MDE) and MUDA Central Processing Platform (MDPP) shall be inclusive and part of WHP offshore hook-up and commissioning (HUC) under Host Tie-in WORK scope.

c) **Seabed Survey**

CONTRACTOR shall perform seabed survey (Side Scan Sonar Survey) to capture the state of seabed around the wellhead platforms (TPB and MDG) for any debris or fallen construction tools and material.

CONTRACTOR shall perform seabed survey immediately upon demobilization of HUC marine and construction spread from the SITE (respective wellhead location). Seabed survey is required for TPB and MDG for BASE CASE HUC and only for TBP for OPTION CASE HUC.

CONTRACTOR shall complete the survey activities on or before the finish date as specified under Table – 1 and Table – 2 respectively under Exhibit – 3 CONTRACT SCHEDULE.

The field survey report shall be made available to COMPANY within three (3) days after the completion of the offshore operations, or at demobilization of vessel, whichever occurs first. A Final survey report as available within seven (7) days upon completion of survey at SITE shall be submitted to COMPANY.

Seabed Survey performed post Pre-Drill HUC campaign scope shall cover seabed debris survey operations to identify any significant features around the wellhead platforms (TPB and MDG) for any debris or fallen construction tools and material. The survey positioning shall be achieved using DGPS. The SSS (Side Scan Sonar) shall be utilized for the purpose of feature detection/identification. Single Beam Echo Sounder (SBES) shall be used to counter check the position of the newly installed pipeline as derived from the SSS system. Such survey is to be performed simultaneously.

The final report shall include survey information being provided from the Side Scan Sonar and Echo Sounder devices plus any relevant As-built data from the lay barge. Four(4) survey lines; one on each side around the platform shall be run in opposite directions and each line shall be set 70m from platform. The Side scan slant range shall be 100m for each channel.

The survey vessel shall be fully equipped Positioning system, Geophysical survey acquisition systems, software applications, etc to perform the scope of work. Necessary software applications for data acquisition and analysis shall be available, for example QINSy for both the online and offline computer systems. Similarly adequate survey sensor shall be provided, tested for interface for operations.

A sample report is attached as Attachment – V of **Exhibit 1 Scope of WORK** of the CONTRACT. CONTRACTOR shall comply accordingly for the scope and delivery corresponding o Phase 5 Wellhead locations.

2.2 Host Tie-in WORK Plan

CONTRACTOR shall be responsible for the following Host Tie-In WORKS of the following facilities that include:

1. TPA; Receiving facilities and tie-ins including riser top tie-in to Receiving facilities.
2. MDE; Receiving facilities and tie-ins including riser top tie-in to Receiving facilities.
3. MDPP; DCS and SCADA Telecommunication systems

Receiving facilities includes Pig Receiver, piping, instrumentation and control, early tie-in preparation and installation, associated structural modifications, supports, instrument and electrical cables, etc. Host Tie-in scope include installation and tie-in of pipeline riser top with Receiving facility.

CONTRACTOR shall verify site conditions, as built conditions and required modifications to control and SCADA at TPA, MDE and MDPP. All such required upgrade and modifications shall be under CONTRACTOR's work scope.

CONTRACTOR may sequence the Host Tie-in WORKs at existing facilities ahead of the Pre-Drill HUC of new wellhead platforms or undertake host tie-in execution in parallel. CONTRACTOR shall ensure that Host Tie-in scope (TPA, MDE and MDPP) is completed before the completion of HUC of respective new wellhead platforms.

CONTRACTOR shall consider the provision of additional marine vessels and support for its execution of Host Tie-in WORK, especially if executed concurrently.

Host Tie-in WORK Plan

Host Tie-in WORK at Host platforms, namely TPA, MDE and MDPP shall commence and executed concurrent with major Hook-Up and Commissioning WORK on TPB and MDG, respectively.

Host Tie-In execution plan shall follow corresponding BASE CASE or OPTION CASE Plan of Hook-Up and Commissioning WORK, as referred in previous sections.

Under the BASE CASE plan, the Host Tie-in WORK related to TPB and MDG shall be completed on or before completion of Pre-Drill HUC on respective wellhead platform.

Under OPTION CASE plan, if exercised by COMPANY, the Host Tie-in WORK related to TPB shall be completed on or before completion of Pre-Drill HUC on TPB, while Host Tie-in WORK related to MDG shall be completed on or before completion of HUC executed after demobilization of Drilling Rig.

3.20.2 CONTRACTOR RESPONSIBILITY

A) ONSHORE SERVICES

CONTRACTOR shall provide the following services, but not limited to, for the completion of WORK.

1. <u>WORK Scoping</u>

The full extent of the WORKS to be performed by CONTRACTOR is as specified or implied within Exhibit – 1 and by COMPANY Specifications (Exhibit-5), Technical Requirements (Exhibit-4) or as can be reasonably inferred from the CONTRACT Documents as being necessary for the completion of WORKS.

Tasks to be performed shall include, but is not be limited to, the following:

a) Identify work scope.

b) Identify additional work tools, testing equipment and material required to complete the WORKS.

c) Re-check fabrication as-built and SITE as-built information.

d) Identify construction methods and resource requirement.

e) Identify special HSE hazards and precautions.

f) Identify interference and mitigating actions to resolve.

2. <u>Work pack Compilation</u>

A dedicated work pack team is required to prepare the work pack document, i.e. Work pack team leader, discipline engineer, safety engineer, QA engineer and scheduler/planner as minimum.

CONTRACTOR shall complete work packs for offshore HUC of individual wellhead platforms (TPB and MDG) and associated receiving facility (Host Tie-in platforms TPA, MDE and MDPP) separately at least sixty (60) days before platform sail away. The Work pack shall also include the Seabed Survey work scope and execution details.

An integrated work pack shall contain comprehensive information on the WORKS sufficient for COMPANY and CONTRACTOR personnel to properly implement and complete the WORKS. Essentially, work pack includes:

a) A management summary highlighting the objectives, main work items, estimated duration, criticality and impact on project, safety and other salient points.

b) A detailed job card of work description covering hook-up, testing, inspection, pre-commissioning and commissioning and its bar chart schedule.

c) A complete range of procedures required for WORKS covering construction / hook-up methods, testing, commissioning, progress reporting, change order control, waiver control and other subjects relevant to the nature of WORKS.

d) A complete listing of materials and consumable relevant to completion of all specific tasks.

e) Job Safety Analysis and safety precautions applicable to performing WORKS with reference to CONTRACTOR HSE Manual as well as COMPANY procedures and guidelines as part of Exhibit - 8 and General Marine Instructions (GMI) as part of Exhibit - 5.

f) Documents such as construction drawings, P&ID's, layouts, anchoring patterns, lifting procedures, commissioning procedures, acceptance and handover procedures, and others which are relevant to WORKS.

g) Schedule and Critical Path Network

h) Manpower Histogram

i) Single line bar chart - based on job card

j) VENDOR assistance schedule

3. Job card and Task sheets Compilation

CONTRACTOR shall prepare and produce activity job cards detailed by tasks based on the work pack of HUC and Host Tie-in Scope of WORKS. Each job card shall be unique to an area on the facilities and forming a logical unit of work. Each task sheet representing a part of the job card, will detail out the work content, material and major construction equipment / special tools requirements, drawing reference and man-hour estimate.

The job cards shall be cross-referenced to a logic network, which will establish the priorities of the WORKS and will be used for scheduling.

4. Ship loose materials

CONTRACTOR shall verify all the required shipped-loose items at fabrication sites or onshore Supply Base before load out or shipment to ensure completeness of materials provided and proper packing and preservation are achieved.

CONTRACTOR shall also provide transport for loose materials to be received at fabrication yard, onshore supply base and delivered for work at offshore HUC and Host Tie-ins.

CONTRACTOR shall prepare the Ship loose material list including bagging and tagging details and submit to COMPANY, minimum two (2) weeks prior to planned sail away.

5. Other Materials and Consumables

CONTRACTOR shall provide the necessary materials and consumables required for commissioning.

CONTRACTOR shall provide Material Safety Data Sheets (MSDS) and safe handling procedures for all fluids and consumables considered as hazardous for COMPANY's approval, at least sixty (60) days prior to commencement of delivery to SITE and WORKSITE.

The materials identified in the Work pack shall be delivered to the offshore Jobsite, which is under CONTRACTOR responsibility. COMPANY may request CONTRACTOR to procure additional items as necessary to complete WORKS.

6. Hook-Up, Commissioning, Host Tie-in and Transportation Procedures

a) CONTRACTOR shall develop and submit for COMPANY approval a complete range of detailed procedures required for the WORKS covering construction methods, hook-up and tie-in, modification, dismantling and installation methods, testing, commissioning and other subjects relevant to the nature of the WORKS. This shall include transportation / installation procedures and analysis for loose items.

b) These procedures shall be in accord with the guidelines established by CONTRACTOR and shall be approved by COMPANY.

c) CONTRACTOR shall furnish Welding and Welder Qualification Test procedures as stipulated in Exhibit - 9 for COMPANY approval prior to commencement of WORKS.

d) CONTRACTOR shall furnish all relevant Host Tie-in and modification Procedures for COMPANY approval including but not limited to, piping reinstatement test, instrument loop checks and instrument cable continuity check.

e) CONTRACTOR shall furnish all relevant Hook-up / Commissioning and Transportation Procedures for COMPANY approval including piping reinstatement test, instrument loop checks, equipment energization and start-up and power and instrument cable continuity check

f) CONTRACTOR shall complete all relevant procedures at least sixty (60) days prior to sailaway of platform from fabrication/construction yard.

7. Activities Networking

CONTRACTOR shall prepare the planning and scheduling of WORKS in accordance with the requirements of Exhibit - 7.

8. Manpower and Equipment / Tools Planning

CONTRACTOR shall prepare the planning requirement for manpower, equipment and tools for WORKS in line with the activities networking.

The manpower shall include, but not limited to, indirect and direct personnel as listed below:

a. Project Manager
b) Construction Superintendent
c) Operation Team Leader
d) Work pack Team Leader
e) Planner/Scheduler
f) Construction Engineer
g) Commissioning Engineers
h) Structure Engineer
i) Electrical/Instrument Engineer
j) Mechanical/Piping Engineer
k) Process Engineer
l) QA and QC Inspectors
m) HSE Officer and Inspectors
n) Material Controller
o) Document Controller

CONTRACTOR shall compile and submit certificate of competency of the proposed personnel to work offshore. CONTRACTOR shall submit calibration certificates of toolkit and equipment from recognized Third Party. CONTRACTOR shall be responsible to carryout regular inspection and testing of cranes, rigging and lifting equipment to relevant codes and requirements.

9. Material Take-Off (MTO)

All materials required for WORKS shall be in accordance with the latest project drawings, data and design changes. CONTRACTOR shall be responsible to review and identify whatever materials required for WORKS as shown in the latest project drawings and to advise COMPANY accordingly for such material requirement.

CONTRACTOR shall develop material take off (MTO) for Host Tie-in of Receiving Facilities and procure material within four (4) months after EFFECTIVE DATE. The MTO identified in the work packs shall be procured and delivered to the Job Site**.**

COMPANY may, as an option, request CONTRACTOR to procure additional items of materials required for offshore HUC and startup. Under such circumstances, CONTRACTOR shall obtain a minimum of three (3) quotations from supplier and prepare a bid summary of the quotations including reasonable recommendation for COMPANY review and approval.

Once approved by COMPANY, CONTRACTOR shall proceed with the procurement. CONTRACTOR shall ensure materials delivered to the Job Site or the designated port are in order and shall monitor the issue and return of items accordingly. A proper documentation system to control stock materials is to be established and maintained at site.

B) OFFSHORE SERVICES

CONTRACTOR shall provide under the direction of COMPANY the following offshore project services for the completion of works.

1. Construction Personnel, Equipment and Tools

CONTRACTOR shall provide all construction equipment, tools and consumables, required to execute the WORK.

CONTRACTOR shall be responsible to furnish all construction personnel, equipment and tools necessary for WORKS to achieve the Scheduled Completion Date.

The personnel to be provided shall be competent and technically qualified to the category of work for which the person is intended for as stipulated in Contractor's Organization and Key Project Team personnel.

All personnel shall possess a valid offshore safety passport.

The equipment and tools planned and to be provided for WORKS must be sufficient in quantity and of good operating condition, complete with the necessary safety features for continuous usage in oil and gas industry. Periodic check-up and maintenance of CONTRACTOR's equipment and tools shall be the responsibility of the CONTRACTOR including the provision of spare parts and consumables.

CONTRACTOR shall provide necessary and adequate PPE and safety equipment including life jackets and life rafts for safe execution the WORK

2. Construction Supervision

CONTRACTOR shall make available adequate supervisory personnel covering all areas of WORK such as welding, testing, lifting, hook-up, calibration, commissioning, painting, etc. All supervisory personnel shall be competent and familiar with the nature of COMPANY requirements as stipulated in the CONTRACT, Specifications, Procedures, Drawings and other documents.

3. HSE Supervision

   CONTRACTOR shall make available adequate HSE supervisory and monitoring personnel covering all areas of WORK. All HSE supervisory and monitoring personnel shall be competent and familiar with local and international regulations, nature of WORK, related Hazards, SITE conditions and COMPANY requirements as stipulated in the CONTRACT, Specifications, Procedures, and guidelines.

4. Resources Planning, Schedule and Controls

   CONTRACTOR shall develop a systematic approach to monitor and control the consumption of consumable and the use of any tools and equipment in such a way that replacement and / or additional quantity could be obtained when necessary. Consumable shall include items such as welding electrodes, industrial gases, work gloves, cleaning solvents, NDT films, chemical and sprays, lubricants, abrasives, industrial water, fuel, grinding discs and other items necessary to perform and complete WORKS.

5. Offshore Hook-up and Commissioning

   CONTRACTOR shall complete the entire offshore hook-up and commissioning of the facilities as required for completing the systems or component.

   CONTRACTOR shall be responsible for the complete installation and hook-up of offshore installed items delivered to Job site, shipped loose or identified as field installed in the CONTRACT drawings or as instructed by COMPANY, completion of which shall make the platform and its facilities and systems ready for hydrocarbon introduction and startup.

   CONTRACTOR shall execute the works in line with the time line as stated under Exhibit – 3 of CONTRACT. CONTRACTOR shall liaise with COMPANY to finalize mobilization date for offshore HUC.

   The following are typical offshore commissioning activities but not limited to, need to be carried out by CONTRACTOR:

   1. System re-instatement
   2. Inerting of hydrocarbon systems
   3. Test run of pumps and mechanical equipment
   4. Uncoupled and coupled runs of motors
   5. Instrument loop testing and alarm and shutdown matrix testing
   6. Insulation testing
   7. Retest of safety equipment and recertification
   8. Conductivity and earth resistance tests

9. Wiring and terminal checks
10. Functional tests

6. Non-Destructive Test (NDT) Services

CONTRACTOR shall be responsible to provide NDT services required to complete the WORKS. The NDT procedures (not limited to RT source storage procedure, qualified NDT personnel, etc) shall be in accordance with the relevant specifications and established COMPANY guidelines.

CONTRACTOR shall provide a proper film processing facility associated with the WORKS.

7. Assistance to COMPANY for Facilities Start-up

CONTRACTOR shall upon request by COMPANY, provide technical assistance for the start-up of Facilities after completion of offshore HUC and during introduction of service fluids. Such services of manpower shall be under CONTRACT PRICE.

8. Flow line Tie-ins

CONTRACTOR shall install and commission all flow line spools and associated instruments (eg flexible hoses, junction boxes, Swagelok fittings, etc) for Wells (x-mass tree) to flow after well completion by drilling contractor and shall be part of CONTRACT PRICE. *The work scope includes hook up of all wells on each wellhead platforms, TPB and MDG.*

9. Riser Tie-in

CONTRACTOR shall install and hook up topside piping with risers (pipelines). All associated tie-ins including riser, piping, instrument shall be part of CONTRACT PRICE.

10. Receiving facilities and Host Tie-in

CONTRACTOR shall install Pig Receiver and associated systems and tie-ins to the existing facilities on Host Platforms. CONTRACTOR shall dismantle existing piping, valves and other items as necessary as per design and installation requirements. Major equipment to be installed at offshore on host platforms are Pig Receiver, piping, valves, instruments, supports, etc.

C) MOBILISATION OF CONSTRUCTION VESSEL SPREAD

1. COMPANY shall perform a pre-mobilization inspection of the proposed Construction Vessel Spread (CVS). CONTRACTOR shall ensure that the total Construction Vessel Spread to be checked and tested is in full working order and that adequate back-up are available for key items. CONTRACTOR shall have all valid certificates available during this inspection.
2. COMPANY reserves the right to check, during the performance of the WORKS or any interim re-mobilization, that the CVS is permanently maintained to the standards of the pre-mobilization inspection.
3. CONTRACTOR shall notify COMPANY in writing a minimum of thirty (30) days in advance of the planned date for the mobilization of each vessels (Construction Vessel, Anchor handling tug, Supply Vessel, Crew Boat) for COMPANY's inspection and acceptance prior to vessels mobilization.
4. CONTRACTOR shall test and maintain in working order all equipment necessary for the execution of the WORKS including communication and navigation systems, safety facilities and anchor handling capabilities of vessels.
5. COMPANY has the right to witness all tests and CONTRACTOR shall dismantle as required, any item or parts thereof to be inspected by COMPANY. If an inspection reveals that any equipment is not in serviceable condition, CONTRACTOR shall make repairs to the satisfaction of COMPANY or replace the item.
6. Mobilization in respect of the CVS shall be deemed in good order when all the unit of the CVS are approved by COMPANY and is fully inclusive of all final inspection / checking with respect to the CVS compliance with the requirements of the CONTRACT, including all upgrading works as may be specified. The approval shall be based on statutory codes and recommendations and on tests and criteria specified in the CONTRACT.
7. The CONTRACTOR shall ensure that the back-up for key systems are readily available. The back-up system shall include navigation, testing and calibration equipment, and communication systems. Back-up systems shall be maintained in full readiness for use during the performance of the WORKS should the primary system fail.
8. CONTRACTOR shall not substitute any unit of the CVS except where express approval of COMPANY is obtained in writing. In the event the CONTRACTOR should propose a substitution, CONTRACTOR shall submit the proposal a minimum of thirty (30) days prior to the intended date of substitution giving all relevant details of the new unit for COMPANY consideration and approval.
9. All marine vessels under the CONTRACT shall be certified with one of the approved certification bodies and be classified for manned unrestricted ocean service. Valid copies of all other required marine certification shall be on board the vessels at all times.
10. CONTRACTOR shall refer to section related to Offshore WORK under Exhibit - 1 and shall comply with the stated requirements.

D) MARINE VESSELS (CONSTRUCTION VESSEL / CUM ACCOMMODATION AND SUPPLY VESSEL / CREW BOAT / ANCHORE HANDLING TUG)

1. CONTRACTOR shall make available marine vessels complete with the necessary marine and catering crew and facilities such as fuel supply, potable water, safety equipment, utility equipment, accommodation, etc. in working condition. Marine vessels would be used for transportation of materials, personnel, equipment, tools, etc for WORKS.
2. CONTRACTOR shall, as a minimum requirement, comply with Guideline for Specification of marine vessels and other requirements as may be specified in CONTRACT. Any deviation shall be forwarded to COMPANY for clarification.
3. CONTRACTOR shall provide as a minimum construction support vessel cum accommodation vessel, supply vessel, crew boat, and anchor handling tug during offshore HUC and Host Tie-in of Receiving Facilities.

E) WORK DESCRIPTION

1. General Requirements

1. All facilities calibrated, tested, and pre-commissioned onshore shall be calibrated, tested, and commissioned again offshore unless stipulated or specified otherwise.
2. CONTRACTOR shall be responsible for identifying or completing all tie-ins and interconnections of the topside and systems and the associated commissioning of the system.
3. CONTRACTOR is responsible for offloading, receiving, uncrating and placing all materials and equipment into their final position. The platform crane and other lifting gears may be available for use subject to COMPANY's APPROVAL. CONTRACTOR shall provide competent crane operator to lift any loads as requested by COMPANY. The crane operator shall undergo induction training by COMPANY Crane Operator at SITE. CONTRACTOR shall, at its own cost, service the crane and make all necessary repairs to place the crane in "As-New" condition prior to handover to COMPANY. CONTRACTOR shall be responsible for mobilization of crane VENDOR for inspection, repair, re-condition whenever required at SITE and WORKSITE under CONTRACT PRICE.
4. Upon completion of the installation of the topsides equipment and other appurtenances in their final position, CONTRACTOR shall perform a physical visual inspection of damages and report the findings to COMPANY not later than two (2) days after the installation has been completed.

   CONTRACTOR shall also submit an estimate of the corrective works required to COMPANY no later than five (5) days after the installation has been completed.
5. All approved drawings shall be kept and used as "mark-up" drawings which shall be marked by red ink on a daily basis to indicate all approved modifications during the

execution of the WORKS. CONTRACTOR shall provide two (2) sets of red line marking drawings, where one will be kept on WHP and another will be brought back for incorporating into original AFC Drawings. After COMPANY's review and approval, CONTRACTOR shall incorporate all modifications into the original AFC Drawings. Approved as-built drawings shall then become part of Final Documentation compilation.

6. At the commencement of offshore HUC and Host Tie-in WORKS, CONTRACTOR shall be responsible for providing and setting up temporary facilities including offices, stores, scaffolding, weather protection, safety habitat, etc necessary for the proper and safe execution of WORKS at Job Site in addition to the permanent facilities deemed necessary for the construction and life support.

   CONTRACTOR shall plan for a 12-hour work day schedule, with the possibility of extending the working time for specific activities where necessary at the request of CONTRACTOR and by consent of COMPANY at no extra cost to COMPANY. Break time will be:

Meal break	60 min
Morning tea break	15 min
Afternoon tea break	15 min

   CONTRACTOR may plan for a night shift work provided all safety precautions and safety personnel inclusive of permit to work will be in place and notice to and approval by COMPANY is obtained prior to the implementation.

7. CONTRACTOR shall be responsible for the removal of temporary tie-down points, sea fastenings, weather proof wrapping on equipment and temporary blinds on the entire facilities and its appurtenances. Loose ends of cables, openings in piping / tubing must be adequately protected in the hook-up phase.

8. CONTRACTOR shall be responsible for reinstalling equipment / fixtures that are removed in order to facilitate transportation of the facilities and to facilitate drilling on platforms. Such removal onshore and reinstatement offshore includes but not limited to Solar Panels, DEG, Safety Equipment, etc.

9. CONTRACTOR shall provide compressed air for high volume usage throughout the duration of WORKS.

10. No permanent project equipment shall be used for hook-up and commissioning support except where specifically stated or approved by COMPANY in writing.

11. CONTRACTOR shall clean the working area daily after the day's work is completed. There shall not be any material, debris, tools, or equipment including cables, hoses and wires left at the working area after working hours unless allowed by COMPANY.

12. Any used materials such as welding rods, left over pieces of cables, tubing, piping and structural steels shall be collected daily and disposed into waste boxes or scrap

containers. Materials intended for use at a later time shall be returned to the stores every day after the working hours unless otherwise instructed by COMPANY.

13. The areas where grit blasting is performed and completed shall be cleaned daily. If blasting continues the next day in the same area and approved by COMPANY, cleaning may be deferred until after such blasting is fully completed. However, the accumulated grit due to blasting must be minimal for safety reasons. Blasting media and procedures are dictated while performing the WORK under SIMOP. CONTRACTOR shall comply under CONTRACTOR PRICE.
14. CONTRACTOR shall immediately clean with detergent or steam the area, equipment and piping where oil or lubricant spills over. In connection with this, provision of steam cleaning equipment and detergent is within CONTRACTOR's scope of supply. CONTRACTOR is responsible for the preservation of construction related oil spill from the platform.
15. All scraps and debris must be secured safely and loaded into CONTRACTOR supplied containers of sufficient size which shall be made of steel. CONTRACTOR shall deliver the rubbish / construction debris containers to COMPANY's Onshore Base for disposal. Disposal of scrap or any other materials into the sea or by burning is strictly prohibited.
16. CONTRACTOR shall schedule its work considering the work schedule of equipment VENDOR and OTHER CONTRACTORS, if any, to ensure an orderly progress of WORKS. Conflicts of scheduling WORKS shall be brought to COMPANY Site Representative's attention for resolution.
17. CONTRACTOR shall allow COMPANY's operations and maintenance personnel access at all times to the facilities and shall assist them in becoming familiar with the operation of the new facilities during the testing, pre- commissioning and commissioning of the facilities.
18. CONTRACTOR shall be responsible for each item of equipment, subsystem and / or system including preservation, protection and maintenance until acceptance of WORKS.
19. CONTRACTOR shall be responsible for the maintenance, preservation and protection of all equipment according to manufacturer's instructions and shall supply all tools and necessary items for the commissioning and maintenance while in the custody of CONTRACTOR.
20. Inventory of COMPANY surplus materials (if any) will be CONTRACTOR responsibility and shall be conducted before back loading.
21. CONTRACTOR shall provide containers to store and transport his tools and equipment. These containers must be suitable for transportation and be recently tested to take the container's weight capacity. This weight capacity shall be clearly stamped onto the container wall.
22. CONTRACTOR shall be responsible for the disposal of all combustible and non-combustible waste to be sent to shore.

a. Logistics

a) Transportation of Materials and Equipment/Tools

1. CONTRACTOR shall be responsible for the onshore transportation of all CONTRACTOR supplied materials, equipment, tools, etc. to Onshore/COMPANY Supply Base by providing its own personnel or appointing logistic Agent (to be based at Supply Base). CONTRACTOR shall also be responsible for transportation of CONTRACTOR supplied materials, equipment, tools, etc. from Supply Base to Job Site/SITE and vice versa during the execution of WORKS.
2. CONTRACTOR shall be responsible for onshore transportation of materials, equipment and tools between CONTRACTOR's warehouse and COMPANY Onshore Base including all material handling facilities.

b) Transportation of Personnel

1. CONTRACTOR shall be responsible for onshore and offshore transportation and accommodation of all its personnel, VENDOR representatives and sub -contractors for the execution of WORKS, unless otherwise stated explicitly under Exhibit - 1.

   Initial mobilization of personnel to offshore shall be via the construction vessel (CSV).

   CONTRACTOR shall also be responsible for the transportation of COMPANY and CONTRACTOR personnel from shore/ to construction vessel (CSV) and vice versa.
2. CONTRACTOR shall be responsible for the preparation and mobilization of its personnel for offshore transportation and timely advice to COMPANY. CONTRACTOR shall provide to COMPANY all information required sufficiently in advance and as stated in other sections of Exhibit -1. Last minute change to the schedule or "no-show" shall be at CONTRACTOR's own cost and responsibility. Cost to COMPANY for any additional/alternate transport required for "no- show" confirmed bookings shall be back charged to CONTRACTOR.
3. CONTRACTOR shall comply with both Malaysia and Thailand Government Regulation regarding allowable period for offshore duty for CONTRACTOR personnel (indirect and direct). CONTRACTOR shall duly consider such regulations in its offshore manpower resource and Work planning. **Any crew change/rotation required shall be managed by CONTRACTOR under CONTRACT PRICE without any impact on WORK schedule.** CONTRACTOR shall provide the plan for crew change as per of Offshore Hook-up and Commissioning Execution Plan and corresponding Work Pack.

c) Construction Vessel, Supply Vessel, Crew Boat and Anchor Handling Tug

1. CONTRACTOR shall mobilize construction vessel to SITE and anchor at location. CONTRACTOR shall propose to COMPANY mooring patterns and mooring analysis report at the Job Site for review and approval two (2) weeks prior to any marine vessel

mobilization. Any type of soft mooring to COMPANY's existing structure or new facility under Phase - 5 development project is strictly prohibited.

2. The construction vessel shall be able to accommodate the require number of CONTRACTOR's personnel for hook-up and commissioning WORKS, Host Tie-in of Receiving facilities WORKS, VENDORs, the normal marine crew, the required catering crew with provision for a maximum of ten (10) COMPANY personnel.

3. *CONTRACTOR shall as a minimum provide construction support vessel cum accommodation vessel (CSV), supply vessel, crew boat, anchor handling tug. All four marine components shall be provided for offshore HUC works and offshore Host Tie-in works. Additional marine spread shall be governed by the offshore execution plan and sequence of WORK and requirements based on CONTRACTOR's own assessment of WORK. CONTRACTOR shall at all times remains responsible to plan and provide requisite and suitable Marine spread for execution of WORK on schedule under CONTRACT PRICE.*

4. CONTRACTOR shall provide one (1) self-propelled supply / standby vessel complete with all necessary crew and facilities, fuel and equipment in a working operation mode. The vessel may be used to transport personnel, material, equipment and tools, etc. for WORKS requirement.

5. The consumables such as water, diesel, lube oil and manpower, transportation and lifting equipment during loading/unloading shall be at CONTRACTOR's own cost.

   CONTRACTOR shall also refer and comply with the relevant requirements related to marine spread stated under section for Offshore Transportation and Installation in Exhibit – 1.

d) <u>Accommodation and Catering</u>

1. CONTRACTOR shall be responsible for the provision of accommodation and catering facilities for all CONTRACTOR's personnel during the hookup and commissioning period.

2. CONTRACTOR shall also provide COMPANY personnel with suitably furnished air-conditioned living accommodations and facilities which include meals, laundry, dining facilities, a prayer room, recreational facilities and room maintenance services onboard the construction vessel and as defined under relevant section in Exhibit – 1.

e) <u>Office Facilities</u>

1. CONTRACTOR shall be responsible for providing own office space and facilities on the platform and onboard the construction vessel.

2. CONTRACTOR shall provide offices space including other facilities onboard the construction vessel and other marine spread for COMPANY's Site Representative

(CSR) and other COMPANY Representatives, as defined under relevant section in Exhibit – 1.

3. All office space shall be sufficiently equipped and provided with air conditioning, electric power supply, lighting, drinking water, sufficient office furniture, filing cabinets and lockable doors.

4. COMPANY's Site Representative's and other COMPANY Representatives office shall be equipped with telephone capable of communicating COMPANY Onshore Supply Base. CONTRACTOR shall further provide for COMPANY use all other services such as radio, telex, facsimile and reproduction facilities.

b. Work Pack

1. CONTRACTOR shall develop and submit for COMPANY's review and APPROVAL, the offshore hook-up and commissioning and Host Tie-in execution plan on or before ninety (90) days prior to offshore mobilization to commence work. The execution plan shall address all safety concerns, identified hazards and mitigation measures, functional emergency plan and like. CONTRACTOR shall incorporate all requirements and comments in the execution plan as instructed by COMPANY.

2. The Work pack is critical deliverable and an important part of the execution plan. Work Pack shall be prepared on systems basis containing detailed procedures for the hook-up, host tie-in, inspection, testing, pre-commissioning and commissioning of each item of equipment, systems and sub systems. The Work pack and standard forms shall be submitted for COMPANY review and APPROVAL. CONTRACTOR shall incorporate all requirements and comments in the Work pack as instructed by COMPANY.

3. The equipment commissioning test procedure for all equipment, which is part of the hook-up and commissioning Work pack, shall include but not limited to, equipment inspection, system lube oil flushing, pre-commissioning check, calibration, functional test, loop test, commissioning test run and all modifications and adjustments to the system for the test run. The system must be restored to its intended operating configuration after the completion of the test run. The commissioning procedures and standard forms shall be submitted for COMPANY review and APPROVAL. CONTRACTOR shall incorporate all requirements and comments as instructed by COMPANY.

4. In addition, the acceptance test procedures of the equipment/systems shall include, but not limited to, the following:

   a) The criteria specifying the acceptance limits of the test and the functions to be confirmed.

   b) Test preparation specifying all the utilities, safety systems, and modifications required to be completed prior to the test.

   c) Test start-up procedure specifying the equipment and piping arrangement for the test.

d) Test sequence, limits, duration, process and mechanical parameters to be monitored and recorded.

e) Test conditions for running

f) Shutdown / interlock devices to be overridden to be reviewed by COMPANY before implementing.

g) Piping and Instrument Diagram showing the test line and valve arrangement.

h) Equipment performance curie / load chart showing test points to be confirmed using accurate calibrated instrumentation.

5. The test shall demonstrate the system and equipment have been correctly installed and commissioned to meet COMPANY's Specifications and requirements.

6. The review and approval by COMPANY of the offshore hook-up and commissioning work pack and host tie-in of receiving facilities work pack, shall not relieve CONTRACTOR of its responsibility for proper planning and execution of WORKS. Changes shall not be made to the approved procedures without the written authorization of COMPANY.

7. *COMPANY reserve the right to suspend hook-up and commissioning activity and host tie-ins of receiving facilities works for noncompliance with approved procedures. CONTRACTOR'S equipment and manpower costs for such stoppage will not be reimbursed by COMPANY.CONTRACTOR shall rectify / close out Non Compliance and proceed to complete the WORK within CONTRACT SCHEDULE and PRICE.*

c. CONTRACTOR'S Engineering Responsibilities

1. CONTRACTOR is expected to understand completely all the systems and facilities in the CONTRACT, Drawings and Specifications.

2. During the course of the WORKS, COMPANY may request engineering assistance from CONTRACTOR on an "as required" basis.

3. CONTRACTOR should note, moreover, that inclusion of any design or engineering details within the CONTRACT does not relieve CONTRACTOR of its responsibility for ensuring that the completed WORKS are acceptable for their intended use and constructed in accordance with COMPANY's Specifications and with good engineering practice.

4. CONTRACTOR shall furnish any other drawings, data and sketches that may be requested by COMPANY indicating the progress of WORKS, schedules for material delivery, etc.

5. CONTRACTOR shall be responsible for the design, engineering, equipment, materials and installation required in connection with all temporary works including temporary

platforms and staging, scaffoldings, bracings, support, lifting points, etc. and the specification and procurement of all materials thereof.

6. Prior to any heavy lifting, CONTRACTOR shall perform an engineering check for the suitability of the slings and shackles, the angle of lift and the dewing motion inclusive of all safety factors.

d. VENDOR'S Representative

1. CONTRACTOR is responsible for providing qualified, competent, certified, experienced and highly skilled personnel for carrying out the testing and commissioning of equipment. COMPANY may provide the representative at CONTRACTOR's cost, to assist in commissioning when COMPANY deems that CONTRACTOR commissioning personnel are not capable of performing the testing and commissioning of such equipment. Resume of the VENDOR Representative shall be submitted for COMPANY review and APPROVAL prior to mobilization of the personnel.
2. CONTRACTOR shall advise COMPANY on the VENDOR Representative to be made available for WORKS for planning and scheduling purposes. In order to optimize and to make effective use of VENDOR Representative's time, CONTRACTOR is required to include and define in the Work pack, the VENDOR Representative's activities and to render them whatever assistance is required to complete the WORKS.
3. CONTRACTOR shall ensure prior to mobilization of VENDOR 's representatives that the equipment is properly installed, lubricated, aligned and cleaned internally and externally, all wires have been terminated and tested, all instrumentation has been hooked-up and loop checked and that instrument set point have been checked in accordance with drawings, specifications and data sheets.
4. Although VENDOR Representative's services to assist in commissioning the equipment are made available, it must be emphasized that CONTRACTOR is ultimately responsible for all testing and commissioning of the equipment in accordance with the Specifications, VENDOR Data and other CONTRACT requirements. VENDOR Representative's sole responsibility is to assist in ensuring that WORKS are carried out correctly, to resolve problems requiring VENDOR‘s specialized knowledge and to ensure that the acceptance running test is performed properly.
5. CONTRACTOR shall maintain proper technical documentation for use on all WORKS carried out by VENDOR Representatives.
6. VENDOR representatives shall possess a valid offshore safety passport (OSP) prior to mobilization to offshore.
7. CONTRACTOR shall be solely responsible for VENDOR mobilization as required and requested by COMPANY during HUC and plant startup under CONTRACT PRICE. The typical equipment and systems VENDOR representatives to be made available for offshore assistance shall include but not limited to wellhead control panel (WHCP),

wellhead control system (WCS), Thermo-electric generator (TEG), Pedestal Crane, Telecommunication system, etc.

e. Commissioning Philosophy

1. CONTRACTOR shall develop Project specific Commissioning philosophy in agreement with COMPANY. CONTRACTOR shall ensure that review comments from COMPANY, COMPANY operations and VENDOR requirements are addressed under the Commissioning philosophy. CONTRACTOR shall submit the commissioning philosophy thirty (30) days prior to the planned submission of Offshore HUC work pack.
2. CONTRACTOR shall perform and complete the hook-up, inspection, testing, pre commissioning and commissioning of platform facilities on a system by system basis.
3. CONTRACTOR shall be responsible for correcting deficiencies in the facilities and shall keep them operational at all times before COMPANY's acceptance.
4. CONTRACTOR shall perform a complete commissioning of the electric power and distribution system. All equipment shall be installed and connected for carrying out the commissioning. Equipment that has the potential of being damaged during transportation and drilling activities, e.g. Solar panels, safety equipment, shall be dismantled and properly packed for shipping, and shipped loose for reinstallation offshore.
5. CONTRACTOR shall provide bottled natural gas for fuel gas supply and all associated consumable for pre-commissioning / black startup / commissioning of Thermo Electric Generator (TEGs) and Hybrid power supply system. CONTRACTOR to carry out testing on the thermo electric generator based on testing plan.
6. CONTRACTOR shall perform a complete commissioning of the hydraulic system. All equipment, valves, well head control panel, etc. shall be installed and connected for carrying out the commissioning. The commissioning shall include but not limited to stroking of valves, loop testing, pressure testing using its medium, etc. Upon completion of the commissioning, CONTRACTOR shall replace the hydraulic oil with new oil to its full capacity.
7. CONTRACTOR shall provide temporary 24V DC power supply fully compliant with Zone-2 requirements as necessary for the offshore hook-up and commissioning as required within CONTRACT PRICE.

f. Final Commissioning And Handover For Start-Up

1. Once hook-up, inspection, testing, pre-commissioning and commissioning of each individual equipment / system is completed, CONTRACTOR shall purge all hydrocarbon related equipment / system. COMPANY, in general, will accept equipment / system only in the "Operational" Mode after the hydrocarbon related equipment / system has been purged with inert gas (nitrogen) or inhibited water where applicable. "Operational"

means that equipment is running or stopped in intended service and is on either automatic mode or awaiting manual initiation.

2. CONTRACTOR shall handover the facilities on a system by system basis or part thereof to COMPANY through proper handover procedure on completion of hook-up and commissioning WORKS.
3. CONTRACTOR shall ensure that all outstanding WORKS are completed and COMPANY is to be advised on any outstanding punch list.
4. Start-up will commence after essential parts of hook-up, commissioning and drilling are completed. COMPANY's production operations shall be responsible for the start-up. CONTRACTOR shall, when instructed by COMPANY, provide technical assistance during the start-up and arrange VENDOR representatives for start-up assistance.

g. Final Clean Up

1. After the completion of final commissioning and acceptance of WORKS by COMPANY, CONTRACTOR shall carry out a final clean-up and touch up painting of the topsides.
2. Under no circumstances shall rubbish, waste and wooden / steel scraps and off- cuts be disposed into the sea. CONTRACTOR shall be responsible to provide rubbish and scrap metal bins for disposition to onshore during and / or on completion of WORKS as and when necessary.
3. The clean-up shall include the removal of all debris, surplus materials, equipment, tools, containers and scaffolding used by CONTRACTOR during the hook-up and commissioning period.
4. CONTRACTOR is also responsible to remove temporary facilities such as workshop, site offices, etc. that were required to complete WORKS and return the facilities to its original condition.
5. CONTRACTOR shall also thoroughly clean all rooms, storage areas, work areas, decks, panels, etc. and remove dirt and grease from painted surfaces. All covers, panels, latches, etc. removed for hook-up, commissioning and acceptance shall be refitted to its intended locations.
6. CONTRACTOR shall carry out touch up painting of the topsides on new wellhead platforms and host tie-in platforms to protect all surfaces from marine environment. This shall be last activity before platform handover and shall be carried out to the satisfaction of COMPANY.

h. Daily Progress Report

1. CONTRACTOR shall prepare daily progress reports for offshore works including hook-up, host tie-ins, installation, inspection, testing, pre-commissioning and commissioning, seabed survey WORKS and shall be submitted to COMPANY's Site Representative on

daily basis. A copy of daily report shall also be transmitted electronically to COMPANY Head Office.

2. In order to assure progress monitoring from day one of WORKS, CONTRACTOR shall fill and complete all required information and data on the CONTRACTOR proposed forms and submit in packages to COMPANY for review at least thirty (30) calendar days before the initial mobilization date.
3. CONTRACTOR shall develop all forms which are necessary for reporting daily activity and shall submit for COMPANY approval.

i. Technical Work Description And Offshore Activities

1. General

[A] Offshore HUC of Wellhead Platforms and Pipelines

1. Offshore hook-up and commissioning (HUC) of Phase - 5 platforms (TPB and MDG) and associated subsea pipelines (TPB and MDG) shall commence and executed in line with Exhibit – 3 APPROVED SCHEDULE. Each of such HUC activities shall be standalone offshore campaign per wellhead platform.
2. CONTRACTOR shall perform all hook-up and commissioning WORK in TPB and MDG in accordance with the requirements of the CONTRACT.
3. CONTRACTOR shall visit platform towards tapering of drilling activities and as instructed by COMPANY for Laser survey and to obtain as-built information of X-mas trees to enable finalization of flow line hook-up spools. CONTRACTOR shall be responsible for hook up and commissioning of all the wells on Phase – 5 platforms.
4. CONTRACTOR shall install and tie-in the pipeline riser top to the launcher on respective wellhead platform.
5. CONTRACTOR shall be responsible for re-instatement and commissioning of all platform systems and equipment to achieve MECHANICAL ACCEPTANCE.

[B] Host Tie-ins of Receiving Facilities

1. Offshore Host Tie-in and commissioning (HUC) of Phase - 5 Host platforms (TPA, MDE and MDPP) shall commence and executed in line with Exhibit – 3 APPROVED SCHEDULE. Host Tie-in activities shall be complete on or before the hook-up and commissioning of the corresponding new wellhead platforms. Each of such execution shall be standalone offshore campaign with corresponding wellhead platforms.
2. The production from TPB wellhead platform will be delivered by subsea pipeline (18” TPB pipeline) to TPA wellhead platform. The required ‘Receiving Facility at TPA platform’ comprises of Pig Receiver, Pipeline riser, shutdown valve, isolation valves, tie-

in to existing system, piping, structural works, safety, instrumentation and control system integration, fusible plug extension and all necessary changes required to make integrated system.

3. The production from MDG wellhead platform will be delivered by subsea pipeline (18" MDG pipeline) to MDE wellhead platform. The required 'Receiving Facility at MDE platform' comprises of Pig Receiver, shutdown valve, isolation valves, tie-in to existing system, piping, safety, instrumentation and control system integration, fusible plug extension and all necessary changes required to make integrated system.

[C] Phase - 5 Telecommunication Systems

1. Phase - 5 telecommunication systems will comprise of supervisory control and data acquisition (SCADA) between new wellhead platforms (TPB and MDG) and central processing platform (MDPP).
2. SCADA of new wellhead platforms will be directly communicated to central processing platform (MDPP). However if due to long distances of platforms from MDPP, or as may be defined under detailed Scope of WORK and CPOC AFC Design. SCADA of these platforms may require communication via other existing intermediary Wellhead facility at in JDA. In that case all associated antennas, support, cabling, electrical power tie-in and integration on intermediary wellhead platform shall be part of offshore installation and successful functional testing.
3. Trunk Radio systems required on new wellhead platforms (TPB and MDG) shall be suitably compatible for digital voice data communication with MDPP.
4. All necessary equipment, antennas, supports, cabling and integration of SCADA and Trunk Radio system on MDPP shall be part of offshore installation and successful functional testing.

[D] General Requirement of Offshore Works

1. The Scope of WORKS shall include hook-up installations and systems tie-ins for each major discipline (piping, mechanical, electrical, instrumentation and structural) which are referenced to the appropriate drawings detailing the general tie-in WORKS requirement. CONTRACTOR shall be responsible for identifying all tie-ins in all disciplines. Failure of CONTRACTOR to identify any particular tie-in shall not relieve CONTRACTOR of his responsibility to execute such tie-in.
2. CONTRACTOR shall be responsible for all field installation, field welding, testing, inspection, commissioning and documentation WORKS unless otherwise clearly specified. CONTRACTOR shall execute such WORKS safely and in strict compliance with the approved procedures, Drawings, Specifications and other relevant provisions of the CONTRACT.

3. Host tie-ins and Receiving Facilities at TPA, MDE and MDPP shall cover all required modifications, changes, tie-ins, system upgrading, system mapping upload, etc for smooth and integrated production, operation and communication of new wellhead platforms (TPB and MDE) and integrated remote control from MDPP.
4. Unless otherwise clearly specified CONTRACTOR shall provide all materials, tool, equipment, and personnel necessary to execute WORKS as defined in this Exhibit and other Exhibits of the CONTRACT.
5. Unless otherwise clearly specified CONTRACTOR shall submit for COMPANY's approval all procedures necessary to execute WORKS as defined in this Exhibit and other Exhibits.
6. Upon mobilization and arrival at the Job Site CONTRACTOR shall immediately check and perform the inventory of shipped-loose items on the platform against the actual requirements of the WORKS. Any discrepancies and / or shortages found by the CONTRACTOR shall be brought to the attention of COMPANY.
7. CONTRACTOR shall inform COMPANY in writing of CONTRACTOR's intent to carry out individual testing and / or commissioning WORKS at least twelve (12) hours before the planned start of such WORKS. Such notification shall identify all safety precautions necessary to ensure the safety of personnel, material and equipment during the course of such WORKS.
8. In the event that remedial, re-testing, and / or re-commissioning WORKS are necessary due to the failure of any part of WORKS to pass its required tests, where such failure is not due to defects / faults of COMPANY, the cost of all such remedial, re-testing, and / or re-commissioning WORKS shall be borne solely by CONTRACTOR.
9. CONTRACTOR shall upon completion of individual testing and / or commissioning WORKS submit to COMPANY two (2) sets of all records for these WORKS no later than twenty-four (24) hours after the completion of such WORKS.

2. **Structural**

The CONTRACTOR's Scope of WORKS with regard to the installation of the platform's structural appurtenances and Host tie-ins of receiving facilities shall include but not be limited to the following:

1. CONTRACTOR shall carry out all structural WORKS necessary to complete the installation of all ship-loose structural items. Such WORKS shall include cutting, trimming, fitting, welding / bolt-up of structural ship-loose items, and the non-destructive testing of welded structural joints made by CONTRACTOR as required by the Drawings and Specifications.
2. CONTRACTOR shall carry out other miscellaneous design such as for equipment support, lifting lugs, monorails, etc.

3. CONTRACTOR shall be responsible for the design, engineering, supply of materials, fabrication, and installation of additional supports and temporary structures required to complete the WORKS or as instructed by COMPANY.
4. CONTRACTOR shall, in accordance with the Specifications, undertake the surface preparation and the application of protective coating on all structural appurtenances installed by CONTRACTOR.
5. CONTRACTOR shall, in accordance with the Specification and at no cost to COMPANY, prepare, re-prime and re-coat, cosmetic coat the deck floors and surfaces which finish coatings were damaged during the course of execution of WORK.
6. CONTRACTOR shall produce an "As-Built" revision of all AFC drawings of the completed WORKS at the end of fabrication/construction and installation.
7. Unless otherwise noted CONTRACTOR shall perform all the necessary work to install and remove all the scrap and surplus materials, equipment, consumables, etc from the platform upon completion of the hook-up work.
8. The CONTRACTOR shall make good any painting damage during welding, erection or lifting, so that the finished work is completed and fully protected, as per the relevant COMPANY specification.
9. The CONTRCTOR shall be responsible to all damages to the existing structure due to the execution of WORK and it shall be repaired and make good to the acceptance of COMPANY.
10. The CONTRCTOR shall provide electrical connection including cleats, as per detail provided by COMPANY, for cathodic protection of 660mm dia. conductors of MDE Platform (8 Nos.) at Jacket sea deck Level.

3. **Pipeline**

CONTRACTOR's scope of WORK for host tie-ins of receiving facilities at MTA and MDE shall include but not limited to the following:

1. Pipeline Rise and Topside piping Tie-in: CONTRACTOR shall install and hook up topside piping with pre-installed pipeline risers on new wellhead platforms and to existing pipeline risers on Host Tie-in platforms. The interface scope between riser and topsides between Transportation and Installation WORK and HUC WORK shall be explicitly defined and scheduled.
2. CONTRACTOR shall perform necessary verification of as-built conditions, dimensional and visual inspection at SITE for the existing Risers on Host Tie-in platforms.
3. CONTRACTOR shall note the existing Riser top and topsides piping on Host Tie-in platforms shall be connected with single weld joint classified a "golden weld joint' since this could not be hydrostatically tested and will only undergo NDT. No additional weld

joint shall be allowed. Accordingly the tie-in of the riser top and topsides piping shall be engineered accordingly.

4. CONTRACTOR shall prepare the red line mark up and also as-built drawing of the connected riser and topside piping. All details of length, field joint welds etc. shall be captured in both drawings.

4. Mechanical and Piping

CONTRACTOR shall be responsible for all WORKS necessary to ensure that the Mechanical and Piping Systems are ready to put into their normal operational state.

1. CONTRACTOR shall inspect all the installed piping, tanks, vessel and mechanical equipment to verify the conformance to these installations with the VENDOR Data, Drawings and Specifications. Any damage and / or discrepancies found by CONTRACTOR shall be brought immediately to the attention of COMPANY.
2. CONTRACTOR shall ensure that all slings used to handle pipe spools are wrapped with soft material or preferably using nylon slings of appropriate capacity to avoid damaging the paint work on these spools.

   CONTRACTOR shall, at no cost to COMPANY, repair any paint work, cosmetic paint on pipe spool damaged by CONTRACTOR through improper handling and during the course of WORKS.
3. CONTRACTOR shall remove all temporary load out supports and equipment sea fastenings.
4. CONTRACTOR shall install all ship-loose tie-in pipe spool, pipe support, pipe fittings and accessories and specialty items as indicated on the Drawing and shall re-install and re-test as required all piping items removed onshore for protection during transportation.
5. CONTRACTOR shall install, tie-in and commission all ship-loose equipment and shall re-install and re-commission as required all equipment removed onshore for protection during transportation and as necessary for drilling activities.
6. CONTRACTOR shall perform laser survey – 3D scanning and produce required drawings and isometrics of flow lines and hook up spool (after drilling and X-mas tree installation) in order to minimize or negate offshore hot works, NDT and hydro-testing.
7. CONTRACTOR shall fabricate, hook-up and tie-in each well flow line to its respective wellhead in accordance with the Drawing and Specifications. CONTRACTOR shall carry out laser survey of drilled wells with respect to required offshore installed spools and prefabricate spools accordingly. The hook-up and tie-in of the well flow lines shall include:

   a) The installation, inspection and testing of the flow lines and valves from the respective flow line manifold to the corresponding wellheads.

b) The installation, inspection, calibration and commissioning of all instrumentation associated with the wellhead flow lines and the wellheads themselves.

8. CONTRACTOR shall properly preserve, crate and store all un-installed flow line materials on the wellhead area. All such material shall be finally delivered to COMPANY's onshore supply base.
9. CONTRACTOR shall be responsible for the insulation of tie-in sections not completed onshore and the insulation of the sections removed onshore for protection during transportation. All materials, tools, equipment and personnel required by such insulation WORKS shall be provided by CONTRACTOR.
10. CONTRACTOR shall apply pre-heat and perform post-weld heat treatment as per applicable specifications of standard code.
11. CONTRACTOR shall render the platform's piping free from internal scrap, dirt and other debris regardless of who installed such piping prior to the in-situ pressure testing of welded joints and the reinstatement testing of completed systems.
12. CONTRACTOR to implement Flange management systems for flange joints on all offshore installed piping and equipment connections.
13. CONTRACTOR shall provide complete system service leak testing using mixture of nitrogen (N2) and Helium (He) of the following piping systems: -

    c) System shall be completed to the maximum extent possible and shall comprise of all instrumentation and instrument impulse lines. Only instrument and equipment items which could be subjected to damage from the test medium or test pressure shall be excluded from the test. CONTRACTOR shall be responsible to identify and list, for subsequent approval by COMPANY all equipment, instruments and connections which cannot be tested.

    d) Subsequent to approval by COMPANY all joints which are not included within the system leak test shall be tightened using a torque wrench or bolt tensioning equipment to achieve the required torque value/bolt pre-load. Where joints are completed using a torque wrench the final distance between mating flanges, at for perpendicular points, shall be measured. Bolt torque and flange separation measurements or bolt tensioning details shall be recorded and included in final hand over of documentation to COMPANY Joint tightening shall be witnessed and accepted by COMPANY representative.

14. CONTRACTOR shall be responsible for hydro testing of piping system and subjected to a test pressure equal to 1.5 times the design pressure of the line. The test pressure shall be held for a minimum continuous duration of one (1) hour to verify the integrity of the welded joints being tested.
15. CONTRACTOR shall use inhibited water (with certificate from the recognized laboratory) as the test medium for all hydro- tests. Inhibited water is defined as potable water treated with oxygen scavengers and corrosion inhibitors. CONTRACTOR shall submit for

COMPANY's approval the manufacturer's chemical safety data sheets and recommended dosing procedures for these water treatment agents.

16. For joints to be tested in-situ, CONTRACTOR shall positively isolate the piping containing these joints from the rest of the platform's piping. In like manner, CONTRACTOR shall positively isolate and / or remove all instruments on the affected piping. Pressure testing against instruments against closed valves shall not be allowed.
17. CONTRACTOR shall make good the paint work and / or insulation on joints that have been successfully pressure tested. Any welded joint shall not be painted prior to completion of the necessary test.
18. CONTRACTOR shall develop and submit for COMPANY's approval hydrotest procedures and hydrotest packages. These procedures and packages shall, for each group of joints to be tested, identify the limits of the test equipment such as but not limited to pressure chart recorders, pressure indicators, pressurization pumps, etc.
19. CONTRACTOR shall execute final closure of tanks and vessels after internal inspection.
20. CONTRACTOR shall check for the proper lubrication and operation of pig receiver / launcher quick opening hinged closures fitted with intrinsically safe bleeder locks / valves.
21. CONTRACTOR shall reinstate (leak test) on per system basis all piping, tanks and vessels on the platform to determine and verify the integrity of flanged joint installations.
22. A system containing relief valves shall be reinstated at a test pressure equal to 95% of the set point of the lowest rated relief valve in the system, whereas a system that does not contain any relief valve shall be reinstated at a test pressure equal to 110% of the system's operating pressure. The test pressure shall be maintained for a minimum duration of one (1) hour to verify the integrity of the system.
23. Mixture of 99% nitrogen (N2) and 1% Helium (He) shall be used as the test medium on all systems that shall be reinstated at all test pressure (pneumatic reinstatement).
24. Regardless of the test medium used, the test pressure shall gradually be increased in small increments to allow the system's piping to equalize the strain.
25. Pressure indicators and chart recorders used to any testing WORKS shall have a minimum accuracy equal to or better than one-fourth (1/4) of 1% of the instrument's range and pressure indicators shall have a minimum dial size of four (4) inches. These instruments shall be selected such that the test pressure falls between 25% and 75% of the instrument's range. All pressure indicators and recorders shall be maintained with valid certificate.
26. *CONTRACTOR shall purge and box-in with nitrogen (N2) all piping and vessels of hydrocarbon-bearing systems to reduce the oxygen content of these systems to below 1% taken on appear volume system. CONTRACTOR shall develop and submit for COMPANY's approval N2 purging and boxing-in procedures.*

27. CONTRACTOR shall ensure that final leveling of all rotating equipment is within the tolerances defined by the VENDOR Specifications.
28. CONTRACTOR shall function test all protective features of the respective mechanical equipment.
29. CONTRACTOR shall perform all pre start-up checks and verifications such as the equipment fuel / lubrication / cooling system, removal of shipping stops, and equipment barring in accordance with the approved procedures and VENDOR Data.

5. Electrical

CONTRACTOR shall be responsible for all WORKS necessary to ensure that the electrical system is put into its correct operational state. WORKS shall include but not be limited to the following;

1. CONTRACTOR shall execute the WORKS in accordance to relevant specifications / standards.
2. CONTRACTOR shall visually inspect all electrical installation to verify the conformance with the Drawings and Specifications. Any damage and / or discrepancies found by CONTRACTOR shall be brought immediately to the attention of COMPANY.
3. CONTRACTOR shall remove all preservations and protective coverings applied to electrical items onshore for protection during transportation. However under Hook-up and Commissioning as performed under Pre-Drill HUC, protection and preservation shall be re-instated on all electrical and relevant equipment to ensure damage due to subsequent drilling operations.
4. All electrical items that are dismantled at fabrication yard for protection during offshore transportation and drilling activities shall be reinstalled and tied-in offshore at their respective locations as per drawings. These include solar panels, coiled cables, lighting fixtures, DEG, etc. The exception to Solar Panels is made where these shall be re-instated upon demobilization of Drilling Rig from the respective wellhead platforms.
5. CONTRACTOR shall install and commission all ship-loose electrical items such as solar panel supports, electrical supports, cable tray sections and cable tray accessories.
6. CONTRACTOR shall verify that all markings and identifications for all cables and terminals are in accordance with the Drawings and Specifications.
7. CONTRACTOR shall perform all inspection and testing required for the installation and hook-up of electrical items and equipment in accordance with CONTRACT requirements.
8. The installation shall be checked for its suitability with respect to the hazardous area classification. The installed electrical apparatus and equipment shall be checked against the hazardous drawings and certificates.

9. All electrical circuit shall be checked for continuity and IR tested. Bonding jumpers between sections of cable trays and earthing connections shall be inspected for continuity and bolt tightness.
10. CONTRACTOR shall be responsible for re-installing any electrical items which have been removed during load out for transportation and perform the necessary inspection, testing and commissioning.
11. CONTRACTOR shall cut, pull, terminate and dress all ship-loose electrical cables and shall complete the pulling, glanding, termination and dressing of electrical cables that were partially completed onshore in accordance with the approved procedures, drawings and Specifications. CONTRACTOR shall, at no cost to COMPANY, make good any cable shortage resulting from CONTRACTOR's pulling and cutting of cables from the wrong cable drums.
12. CONTRACTOR shall adequately support and protect cables during cable pulling to prevent both external and internal damage. Adequately sized cable rollers shall be used at intervals no greater than two (2) meters on straight cable runs and the four-roller type of cable rollers shall be used at all turns within a cable run and at a cable take-off point on the cable drum. Cables shall not be bent to a radius less than that allowed by the Specifications or the cable manufacturer's recommendations, whichever is greater.
13. CONTRACTOR shall ensure that the connections of all bonding jumpers across cable tray sections are adequately tightened and that all cable sheaths are properly made up and earth through their respective gland.
14. CONTRACTOR shall provide all cable lugs required for the termination of ship-loose cables and cables partially terminated onshore.
15. CONTRACTOR shall, for all electrical cables on the platform regardless of who installed these cables, ensure that these cables are glanded with the proper glands and that all cables and individual terminations are properly marked using the correct cables / wire markers in accordance with the Drawings and Specifications.
16. CONTRACTOR shall dress all cables, whether on cable trays or on individual cable supports, in accordance with the Drawings and Specifications.
17. CONTRACTOR shall test the continuity and insulation of all cables in accordance with the approved procedures and Specification regardless of who installed these cables. Measured insulation values shall be compared against the values required. Any discrepancies between these measure and required values shall immediately be brought to the attention of COMPANY shall immediately be brought to the attention of COMPANY.
18. Testing and commissioning of all equipment and facilities after connecting up shall include electrical activation and functional checks on all electrical equipment.

19. All outgoing circuits shall be isolated and padlocked in the "OFF" position and suitably worded cautionary notices (DANGER) be prominently displayed. Non-returnable padlock and key shall be provided by the CONTRACTOR.
20. Electrical installations and equipment erected by CONTRACTOR and any installation which has been completed and is ready for operation shall be subjected to COMPANY approved Handover Procedures to prove their operational fitness to the acceptance of COMPANY.
21. Prior to test runs, all associated electrical equipment must be checked and tested as per vendor's instruction manual, Specifications and other requirements of CONTRACT documents.
22. CONTRACTOR shall be required to check all equipment, distribution board, battery charger, cabinets, skidded equipment, vessel etc., for proper earthing and in full compliance with the Drawings and Specifications.
23. CONTRACTOR shall torque all equipment bus bar connections, incoming / outgoing power and control cable terminations to the values defined by the Vendor Specifications.
24. CONTRACTOR shall measure the insulation levels of all equipment bus bars in accordance with the approved procedures and shall compare these measured values against the values required by the Specifications. Any discrepancies between these measure and required values shall immediately be brought to the attention of COMPANY.
25. CONTRACTOR shall measure the resistance of all equipment earthing and shall compare these measured values against the values required by the Specifications. Any discrepancies between these measured values and the required values shall immediately be brought to the attention of COMPANY.
26. CONTRACTOR shall ensure that the proper polarities are observed with regards to the connections between the platform's solar array panels and the battery charge regulator and between the battery charge regulator and the DC board and the battery bank.
27. Before any circuit is energised, it shall be IR tested and tested for continuity, shorts and polarity, etc. Care shall be taken not to exceed the voltage specified for the test. Each test shall be documented and witnessed by COMPANY.
28. CONTRACTOR shall provide all necessary test equipment which includes but is not limited to IR testers, continuity testers, ohmeters, voltmeters, ammeter, earth impedance testing equipment, multi-amp tester and secondary current injector. All the test equipment shall be calibrated prior to their use.
29. Final inspection and testing shall be carried out immediately prior to commissioning the equipment and / or before leaving it in its normal operating condition. Equipment that is not required in service or that cannot be left energized shall be isolated and padlocked "OFF". Equipment that is left in the latter position for any significant period shall be

subjected to such tests as are deemed necessary by COMPANY immediately prior to energizing, to prove that it is in a satisfactory condition.

30. CONTRACTOR shall prepare the platform's electrical field devices such as lighting fixtures, small power receptacles, NAV-Aid lanterns, etc. for energization in accordance with the approved procedures, Drawings and Specifications.
31. CONTRACTOR shall develop and submit for COMPANY's approval electrical lockout procedures to ensure that no electrical circuit, equipment or device on the platform is energized or rendered "live by whatever means without prior approval from COMPANY.

6. Instrumentation and Telecommunication

CONTRACTOR shall be responsible for all WORKS necessary to ensure that the instrumentation and controls systems are put into their correct operational state. WORKS shall include but not be limited to the following:

1. Instrumentation hook-up WORKS include the installation of instrument tubing and tubing supports, cable and cable supports, pulling and terminating cables, insulation resistance, tests, continuity check, loop checks and other jobs which are required to complete all the instrumentation hook-up WORKS. The installation shall be checked for its suitability with respect to area classification.
2. CONTRACTOR shall remove all preservatives and protective coverings applied to instruments onshore for protection during transportation. However under Hook-up and Commissioning as performed under Pre-Drill HUC, protection and preservation shall be re-instated on all instrumentation and relevant equipment to ensure damage due to subsequent drilling operations.
3. CONTRACTOR shall install all ship-loose instrument items such as instrument supports, tubing tray sections, tubing tray accessories and MCT (multi-cable transit) components.
4. CONTRACTOR shall install and test all ship-loose instrument cables and complete the installation and testing of all instrument cables partially terminated at one end onshore.
5. CONTRACTOR shall install, calibrate and loop check all ship-loose instrument and shall re-install, re-calibrate, loop check all instruments removed onshore for protection during transportation.
6. All "installed" and "shipped loosed" instruments shall be inspected and tested. Installed instruments include those installed by others and those furnished with package equipment. The inspection shall be visual, to identify damaged instruments, defective installation or deviations from specification sheets.
7. CONTRACTOR shall carry out all cable insulation resistance and continuity test, tubing pressure/leak tests, trip settings, calibration, loop tests, functional testing, instrument and system commissioning.

8. Instruments, control panel and accessories dismantled and shipped loose shall be re-installed in their respective original position by CONTRACTOR. After installation, CONTRACTOR shall carry out loops/system checks in the presence of COMPANY and VENDOR's representative (as required) in accordance with the COMPANY approved test procedure provided by the panel VENDOR /CONTRACTOR.
9. CONTRACTOR shall leak test relevant tubing lines whether installed by CONTRACTOR or by others using the soap bubble method (SNOOP Liquid). Prior to this test all tubing lines shall be flushed using dry air and CONTRACTOR shall confirm the cleanliness to the satisfaction of COMPANY.
10. All instruments shall be isolated from tubing to be tested through their respective instrument manifold valves.
11. Test to be conducted at pressures equal to or less than 100 psig shall use either instrument air or bottled nitrogen (N2) as the medium (pneumatic tests) while test to be conducted at pressure greater than 100 psig shall use hydraulic fluid as the test medium (hydrostatic tests).
12. All tubing shall be blown free of dirt and debris before and after using either instrument air or bottled nitrogen. The pressure of instrument air or bottled nitrogen blown through the tubing shall not exceed 100 psig. CONTRACTOR shall supply additional N2 bottles.
13. CONTRACTOR shall develop and submit for COMPANY's approval system tubing pressure test procedures and packages. These procedures and packages shall identify the limits of each test, the test media and pressure, the manner in which leaks shall *be* detected and the connection of the required test equipment such as but not limited to pressure indicators, pressurization pumps, etc.
14. CONTRACTOR shall verify the platform's Process / SIS Cause and Effect Chart through the function testing of the platform's Wellhead Control System (WCS) and Wellhead Control Panel (WHCP) in accordance with the approved procedures, VENDOR Data, Drawings and specifications. These tests shall be done from Central Control Room (CCR) located in MDLQ up to WHP Wellhead Control System through SCADA radio and shall include ESD test for all shutdown levels, well testing, well blow down, well unloading and all control and monitoring functions. Inputs to these panels shall be actual simulation (hydraulic hand pump, etc.) from the field and the response of these panels to include the actuation of the respective field devices such but not limited to blow down and shutdown valves, shall be checked against the platform's Process / SIS Cause and Effect Chart. All of the data shall be available in WCS of WHP as well as CCR SCADA. Any discrepancies found shall be brought to the immediate attention of COMPANY.
15. All instrument gas headers and tubing shall be purged with dry instrument air and regulators shall be checked for appropriate setting.
16. CONTRACTOR shall strictly adhere to manufacturer's recommended calibration and testing precaution and procedures where applicable. All instruments shall be calibrated within the guaranteed prescribed accuracy range of the manufacturers, with the average

ambient temperature during calibration being noted. Span and zero changes resulting from instrument operation at process temperature shall be calculated and noted on the appropriate calibration record sheet and the necessary adjustment made prior to commissioning.

17. CONTRACTOR shall provide test and calibration equipment and qualified personnel as deemed necessary for the proper testing (including witness) of all checks, calibrations and commissioning.

18. Test equipment shall be of high quality, reliability and accuracy. Test equipment shall include but not limited to such items as manometers, dead-weight testers, continuity boxes, stem glass thermometers (°C), portable potentiometers, temperature oil/sand bath, test gauges, regulators (including nitrogen bottle regulators), air compressors, electronic calibration meters, etc. Air used during testing shall be dry and free of contaminants (oil, water, dirt, scale, etc.).

    All test equipment shall be calibrated and the calibration tags shall be maintained valid throughout the Hook-up and Commissioning WORKS period.

19. Gauges, meters and measuring equipment used in the calibration of instrumentation shall be of good quality and have accuracy better than that of the instrument being calibrated.

20. The test equipment shall be certified as accurate by recognized Test and Calibration Authority e.g. SIRIM. These certificates and other records shall be submitted to COMPANY prior to starting work. The certificate must be valid for at least six (6) months while performing the WORKS.

21. After calibration, instruments shall be clearly label with date calibrated, range and set point using self-sticking labels. Calibration certificates and testing certificates shall be prepared and provided by CONTRACTOR for COMPANY approval prior to system commissioning.

22. After installation and testing, isolation valves of all instruments shall be left closed. Prior to this isolation all testing fluid must be drained from instrument.

23. Any instrument damaged by CONTRACTOR during calibration testing and commissioning shall be replaced by CONTRACTOR at his own cost and arrange for timely delivery for WORKS.

24. CONTRACTOR shall perform the continuity and loop testing of all instrument cables, tubing and related instruments including those installed by OTHERS. All controls loops shall be checked in total. Control loops will not be accepted in partial.

25. All process control instruments, alarm / shutdown instruments shall be individually checked for their performance using bench test kits and shall be tested as a complete loop to demonstrate the desired function in accordance to COMPANY Specification and manufacturer's recommendation. All instrumentation loops shall be returned to their original configuration and shall be made ready for operation after the test.

26. CONTRACTOR shall provide the measuring instruments, related / associated equipment, tools, fittings, etc., required for the testing and checking of measuring data settings, reset values, proportional band and set values of pressure switches.
27. CONTRACTOR shall check all flow, temperature, pressure, level and other instrumentation (such as orifice plates, transmitters, controllers, switches, gauges etc.,), including fire & gas related devices/system and instruments furnished together with or mounted on equipment for completeness and operability. Set points of all instruments shall be field tested.
28. *CONTRACTOR shall check and test all safety relief valves (PSV) offshore. CONTRACTOR shall furnish bottled nitrogen gas required for use with the test fixture.*
29. All blow down and shutdown valves are to be fully stroked in order to demonstrate that stem position indicating switches are operating correctly.
30. All tubing and electrical tie-ins including grounding/earthing connection must be checked for proper connection, tightness and identifications ***/*** tagging.
31. Alarm operation checks shall be made by CONTRACTOR to functionally check all alarm and trip systems. Process conditions shall be simulated to check the operation. Faults in wiring shall be corrected. All testing shall be witnessed by COMPANY.
32. CONTRACTOR shall complete all relevant and associated instrumentation works for completion of systems.
33. CONTRACTOR shall establish total communication between WCS and platforms radio-telecommunication system and shall demonstrate that data transmission between WCS and MDPP SCADA are within 99.99% availability or higher and bi-directional. CONTRACTOR shall perform pre-survey and testing to ensure workability of communication system.
34. CONTRACTOR shall develop and submit for COMPANY's approval procedures to ensure the safety of personnel during the calibration of relief valves and the pressure testing of instrument tubing.
35. Onshore HUC scope of work of X-mas tree for CONTRACTOR is from WHCP up to wellhead bulkhead. CONTRACTOR scope of work and supply for offshore X-mas tree HUC is including from instrument bulkhead tubing near to wellhead to the X-mas tree hydraulic connection of DHSV, MV and WV. X-Mas tree. Pressure impulse line from instrument flange of X-MAS trees to pressure transmitter location, supply and installation of junction boxes and adaptor for MV and WV actuator position switches and their cabling are in scope of work and supply of CONTRACTOR.
36. CONTRACTOR’s WORKS at Host Tie-in locations, includes all instrument items installation, tie-in with the existing wellhead control system (WCS). These signals shall be transmitted to MDPP via SCADA system for remote operation. These signals shall be configured in DCS at MDPP and Host Tie-in locations. This shall include but not limited to configuration, data base update, graphic modification, logic modification, I/O mapping

and all its associated activities as per existing operating philosophy in the SCADA system / Telecommunication system / WCS.

37. CONTRACTOR's work scope shall include procurement, installation and testing of all the instruments, bulk materials, valves, hardware and software related to DCS, WCS, Telecommunication system, SCADA system etc and availing services from the respective manufacturers / suppliers/ vendors.

38. CONTRACTOR shall install offshore all necessary telecommunication equipment (for SCADA and Trunk Radio) at host tie in platforms, remote wellhead platforms and at central processing platform (MDPP) to enable smooth data and voice communication. An integrated field test shall be performed to demonstrate successful communication and commissioning of overall telecommunication system under Phase - 5 development.

7. Surface Preparation and Protective Coating

Surface preparation of steel and application of protective coatings shall follow the requirements of the relevant Specification.

CONTRACTOR shall be responsible for the proper preparation, to re-prime and to re-coat in accordance to COMPANY Specifications of all damaged coatings on equipment and components already installed and tie-ins which have been altered and/or rendered damaged as a result of CONTRACTOR works.

Also, CONTRACTOR shall blast, prime coat and touch-up to Specifications paint work damage by CONTRACTOR or by OTHERS.

All efforts shall be undertaken to minimize damage to existing coating on all COMPANY facilities

8. System Commissioning

1. CONTRACTOR shall define all systems on the platform to the extent of identifying the limits of individual pieces of equipment within a system, as per the COMPANY Specific Procedure CONTRACTOR shall submit this system definition as part of the Work pack for COMPANY's approval.

2. CONTRACTOR shall commission the platform on as per system basis in accordance with the approved system definitions and shall conduct test runs on each system to prove that the system shall be safe to operate and shall function in accordance with the system's design intent. CONTRACTOR shall develop and submit for COMPANY's approval system commissioning procedures.

3. CONTRACTOR shall make all necessary modifications to a system and / or individual pieces of equipment within the system, such as the provision of temporary utilities necessary to carry out system and / or on individual pieces of equipment within the system. CONTRACTOR shall remove all such modifications and restore the system and

/ or individual pieces of equipment within the system to its normal operating state after completion of the test runs.

4. System test runs shall be conducted under the conditions that represent normal operating condition of the system. This shall entail but not limited to the actual use of the system's operation fluid and the imposition of dummy and / or actual loads on the system during the test run.
5. Trip-free operation of the platform's power distribution, small power and lighting, and navigational systems for a minimum continuous duration of ninety six (96) hours.
6. Where available and installed, the live testing of the safety devices on the platform's jib crane such as limit switches, load indicator and anti-two block valve.
7. Live shutdown testing of the platform's Wellhead control, Instrument Control Panels, Fire & Gas System, Alarm (sounder, status lights) and Telecommunication system to verify that the platform's control and shutdown system response to process upsets and emergency conditions are in accordance with the platform's Process / ESD Cause and Effect.
8. All check sheets, testing and commissioning reports shall be prepared immediately after each performance of individual testing and commissioning, and shall be endorsed by COMPANY Representative who witnessed such testing and commissioning. These reports shall form part of the WORK Handover procedure and Final Documentation.
9. CONTRACTOR to do integrated test for DC & AC power system. DC power system shall be included solar panels, Charge Controller Unit, DC Distribution board, TEG, battery chargers and batteries as minimum. AC system shall be included of Diesel Engine Generator (DEG), AC Distribution Board and lighting system. Wellhead Control System shall be commissioned in conjunction with WHCP, Sand monitoring system, coriolis flow meter, electrical systems and all other sub-system. SCADA loop check shall be done from field instrument, WCS, WHP SCADA radio and CCR SCADA system and vice versa.

j. Interface

General

1. In the course of completing WORKS, CONTRACTOR shall be required to interface, cooperate and work alongside with OTHER CONTRACTOR(s) appointed by COMPANY which are scheduled concurrently with CONTRACTOR's WORK to complete other aspects of the work not defined by CONTRACT Scope of WORK. These include Drilling CONTRACTOR, Well Services CONTRACTOR and/or Maintenance CONTRACTOR as well as equipment VENDORs.
2. CONTRACTOR shall also be required to interface with COMPANY Operation Personnel, COMPANY Drilling Supervisor/Superintendent or COMPANY Man, COMPANY Well Services Supervisor/Superintendent.

3. Such interface and coordination for planning and execution of WORK shall be performed by CONTRACTOR under CONTRACT PRICE and SCHEDULE.
4. CONTRACTOR shall communicate with COMPANY wherever there is uncertainty in defining the Scope of WORK between CONTRACTOR and OTHER CONTRACTOR(s). All official communications between CONTRACTOR and OTHER CONTRACTOR(s) shall be via COMPANY. CONTRACTOR shall make due allowance for these interface WORKS.
5. Any agreement reached between CONTRACTOR and OTHER CONTRACTOR(s) executing respective portions of the work which have a cost, schedule or quality impact on any parts of the WORK, either within or outside CONTRACTOR's scope, shall be subjected to COMPANY's APPROVAL.
6. Any potential impact to the schedule of WORKS and for CONTRACT PRICE due to interfacing with OTHER CONTRACTOR(s) shall be brought to the attention of COMPANY for resolution. Retroactive presentation and qualification of quality, cost and/or schedule impact by CONTRACTOR shall not be accepted and shall be considered within CONTRACT Scope of WORK, PRICE and SCHEDULE.
7. CONTRACTOR shall immediately inform COMPANY Site Representative of any directions or request by COMPANY Operation Personnel, COMPANY Drilling Supervisor/Superintendent or COMPANY Man, COMPANY Well Services Supervisor/Superintendent. CONTRACTOR, while following such directions or request, identifies potential impact to cost, schedule or quality of WORK, notify COMPANY seeking necessary APPROVAL and/or INSTRUCTION. Proceeding with execution of effected WORK without prior APPROVAL by COMPANY, shall be within CONTRACT PRICE.
8. COMPANY Site Representative shall the sole focal person at SITE for CONTRACTOR during performance of Offshore Hook-up and Commissioning and Host Tie-in WORK. Any CONTRACT related matters concerning PRICE and SCHEDULE shall be immediately notified to COMPANY Representative (Project Manager) at COMPANY Head office.

<u>Interface with Drilling and Well services</u>

1. CONTRACTOR's hook-up, inspection, testing, pre-commissioning and commissioning shall make due allowances for drilling operations running concurrently with its own activities. CONTRACTOR shall adhere to COMPANY's requirements for simultaneous drilling / well services / hydrocarbon production and plant operations and hook-up and commissioning activities.
2. (If applicable) CONTRACTOR shall take due account of the drilling rig position when planning position of its construction vessel, in order to avoid or minimize any

interferences. COMPANY's decision on permissible anchor patterns, anchoring procedures, platform soft moorings, etc., shall be final.

3. CONTRACTOR shall consider and account for intermittent disruptions and stand by due to Drilling related operations/activities while executing WORK under SIMOP. Such disruptions and stand by time shall be considered while preparing the offshore Hook-up and Commissioning schedule. **CONTRACTOR shall not be reimbursed for any stand-by of less than four (4) hours continuously, caused due to Drilling or Well Services operations.**

4. In order to ensure timely provision of gas for final commissioning and start-up purposes, CONTRACTOR shall at the earliest possible stage and in line with CONTRACT SCHEDULE, complete all the installation, hook-up, testing, pre-commissioning and commissioning activities necessary to allow Well Services to commence respective activities including well preformation .

5. To avoid working interference between CONTRACTOR and Well Services, CONTRACTOR shall plan the completion of its WORKS at the wellhead area prior to arrival of the Well Services. In the event that this is not accomplished, the Well Services shall have the right-of-way and CONTRACTOR shall be responsible for its own downtime due to interferences.

6. CONTRACTOR shall perform well flow line hook-up concurrent with drilling operations on the adjacent wells. CONTRACTOR shall plan the completion of its WORKS at the wellhead area with due consideration of drilling operations. In the event that WORK is not accomplished as planned for reasons due to CONTRACTOR, CONTRACTOR shall be responsible for its own downtime or delay in completion of WORK. Drilling shall have right-of-way at all times.

7. CONTRACTOR shall provide and manage interface between the equipment and material provisions as may be rendered upon request by CONTRACTOR or as referred to in other sections of this Exhibit.

8. CONTRACTOR shall take into account, of all working restrictions and constraints which will exist on the wellhead area, cellar deck and complete WHP in general due to the drilling operations. These constraints shall include compliance with COMPANY's hot work procedures at all times, restricted access to the wellhead area and / or suspension of all hot work during certain "hazardous" drilling period including commencement of pay-zone drilling, running of casing, well completion, well perforation and special wiring work. CONTRACTOR shall refer and follow the instructions as defined under SIMOP Matrix and Procedure to be provided by COMPANY after the EFFECTIVE DATE. A copy of SIMOP Matrix from previous development phase is included for reference. CONTRACTOR shall comply with requirements of APPROVED SIMOP Procedures within CONTRACT PRICE.

9. CONTRACTOR shall take into account periods of radio silence during well perforation, where all equipment that can generate and emit radio signals, including radios, handled walkie-talkie and particularly helicopter beacon, all transmitters, crane, welding equipment and radiographic equipment, shall be placed out of service.

10. CONTRACTOR shall consider maximum allowable construction crew including its Supervisors and VENDORs on wellhead platform during SIMOP with Drilling Rig, as seventy (70) for major Hook-up and Commissioning operation. However under the CONTRACT for Pre-Drill HUC plan, there are no such restrictions as major HUC works are planned for execution prior to Rig mobilization.
11. CONTRACTOR shall consider maximum allowable construction crew including its Supervisors and VENDORs on wellhead platform during SIMOP with Drilling Rig, as fifteen (15) for well flow line hook-up and Commissioning operation as per the BASE CASE for offshore HUC.
12. CONTRACTOR shall take into account reduced efficiency and lower execution productivity due to SIMOPs. This include interface with others, stand-by, work restrictions, additional constraints, enhanced HSE requirements, constrained/restricted work area(s), unclean platform decks including well bay area due to frequent spillage of drilling, limitation of maximum CONTRACTOR construction manpower on the wellhead platform, etc.
13. There are no such restrictions or constraints on Host Tie-in platforms due to Drilling and Well services. However these facilities are LIVE and producing hydrocarbon and applicable work restrictions and work procedures apply. CONTRACTOR shall interface and coordinate with COMPANY MUDA Operation Personnel and Maintenance CONTRACTOR (if planned) as referred above.

k. Demobilization of the Construction Vessel Spread

CONTRACTOR shall upon approval by COMPANY, demobilize the Construction Vessel Spread or part thereof upon completion of the respective Hook-up and commissioning and Host Tie-in WORK including completion of a preliminary set of commissioning dossier documents and successful handover to COMPANY at SITE;

1. Complete demobilization of each unit of the Spread.
2. Removal of any and all CONTRACTOR materials, equipment or other items from any of COMPANY's installation including scrap items.
3. Demobilization of materials , personal and equipment (offshore and onshore)
4. Seabed Debris survey and clearing upon offshore construction campaign and prior to Drilling rig mobilization.

F) AS-BUILT INFORMATION

a) CONTRACTOR shall maintain accurate stick files of all Drawings. CONTRACTOR shall mark all as constructed/installed information/data related to actual execution of Offshore Hook-Up and Commissioning and Host Tie-in WORK. CONTRACTOR shall ensure that all changes must be recorded and marked up (clouded) in RED color, on the appropriate AFC drawing produced and included under CPOC AFC Design Package. Such marked up

drawing/documents, namely the Red-lined mark ups, shall record changes/as-built conditions along with the following information:

i. Date the change was recorded.

ii. Initials of individual making the change.

iii. Reference to the reason for the change, i.e., site instruction, number, as-built condition, defect rectification, incorrect AFC drawing/detail, etc.

b) CONTRACTOR shall provide two (2) complete sets of Red-lined markup drawings for COMPANY's exclusive use at the completion of offshore Hook-Up and Commissioning and Host Tie-in WORK.

c) CONTRACTOR shall ensure that the information recorded Red-lined markup drawings generated as part of Onshore MECHCNICAL COMPLETION and prior to sail away, are incorporated in AFC drawings utilized for Red-lined mark ups during offshore Hook-Up and Commissioning and Host Tie-in WORK. There shall be no errors or incorrect information as marked up and shall represent the correct and actual As-built conditions upon installation completion of WORK.

d) CONTRACTOR shall make available updated Red-line markup drawings at all times at WORKSITE and SITE for COMPANY review.

G) FINAL DOCUMENTATION

CONTRACTOR shall be responsible for preparing and submitting the final documentation as outlined in COMPANY document (refer to relevant CGS).

CONTRACTOR shall prepare and submit preliminary Final Documentation Table of Contents to COMPANY within the timeline as referred to under other sections of this Exhibit -1.

CONTRACTOR shall prepare and submit the Table of Content for the final documentation for offshore Hook-Up and Commissioning and Host Tie-in WORK as part of overall Phase 5 FINAL DOCUMENTATION for COMPANY approval, before any compilation commence.

CONTRACTOR shall incorporate all Red-lines mark-ups information/data, as recorded during execution of offshore Hook-Up and Commissioning and Host Tie-in WORK, in AFC drawings and develop as AS-BUILT Drawings for compilation under FINAL DOCUMENTATION.

All Red-lines mark-ups and corresponding AS-BUILT drawings shall be submitted to COMPANY for review and APPROVAL prior to including under FINAL DOCUMENTATION package.

Notwithstanding the APPROVAL by COMPANY, CONTRACTOR shall update/revise and re-submit relevant drawings incase COMPANY notifies of incorrect recording of as-built information. CONTRACTOR shall also revise the FINAL DOCUMENTATION Package, both Hard Bind (Original and copy) and Electronic submissions.

H) OPERATOR TRAINING

a. CONTRACTOR shall make provision for equipment/package trainings to COMPANY Operators, at onshore and/or offshore SITE, classroom and/or On-Site, within CONTRACT PRICE.

b. COMPANY Operators means Offshore Operations and Maintenance personnel (Operators).

c. CONTRACTOR shall provide training for the COMPANY Operators before start of equipment commissioning phase. The main objective of the training shall be to prepare COMPANY Operators involved in wellhead platform commissioning activities and PLANT operations and maintenance activities. The training shall provide technical knowledge on how to operate and maintain the equipment supplied by CONTRACTOR.

d. CONTRACTOR shall prepare the list of equipment/package for COMPANY Operator's trainings in agreement with COMPANY. CONTRACTOR shall ensure that COMPANY Operator's training requirements are included in Purchase Orders (PO) issued to respective VENDORs / suppliers of equipment. Following Operator's trainings shall be provided as a minimum, **but not limited to**;

1. Mechanical
    i. Pedestal Crane – Auxiliary wire rope replacement
2. Electrical
    i. Hybrid DC Power System
    ii. Fuel Gas Conditioning System
3. Instrumentation and telecommunication
    i. Well Head Control Panel
    ii. Wellhead Control System
    iii. CO2 Analyzer
    iv. Coriolis Flow Meter
    v. Sand Monitoring and Detection – Clamp-on type
    vi. Intrusive Sand Detection
    vii. Corrosion Probe with transmitter
    viii. Gas Detectors – Ultrasonic/Acoustic type
    ix. Telecommunication equipment - DCS and SCADA
4. Other, as identified during execution and based on the Phase – 5 wellhead platform systems/equipment and provisioned under CONTRACT PRICE.

e. For the training sessions conducted at SITE, CONTRACTOR shall consider two (2) training sessions per equipment/package to cover COMPANY Operators assigned on day and night shifts.

f. CONTRACTOR shall develop plan for operator's training and submit for COMPANY's review and APPROVAL minimum ninety (90) days prior to the planned Load Out of first wellhead platform. The Plan shall identify the schedule, location (Onshore and SITE), type of training session (classroom and on-Site), equipment/package, VENDOR/Supplier and Manufacturer, Trainer, training content outline, estimated training duration per session, etc.

g. CONTRACTOR shall provide all required office facilities, tools, equipment and training materials for the COMPANY personnel attending the training. The onshore training sessions shall be conducted at the CONTRACTOR office and/or facilities. Training sessions conducted at SITE shall be in MUDA LQ and/or On-Site at Phase 5 wellhead platforms.

I) PRESERVATION, PACKING, HANDLING AND SHIPPING

a. General

1. CONTRACTOR shall be fully responsible for packing and protection of CONTRACTOR supplied/furnished equipment and their accessories for shipment to the job site/SITE in accordance with the Purchase Order. All crating and boxes if required shall be clearly labeled on three sides with description and equipment numbers, CONTRACTOR shall prepare detail packing list by box and crate number.
2. CONTRACTOR shall be responsible to ensure the site condition are suitable and ready to receive and store the materials and/or equipment at Fabrication/Construction yard such as requirement to store equipment inside air- condition rooms, enclosed area etc.
3. CONTRACTOR shall be responsible for shipping and handling of all the equipment supplied by CONTRACTOR including Custom clearance, Marine Insurance, Goods Insurance, Inland transportation etc. from the offshore site up to the Job Site. All Shipping and handling arrangement shall be in accordance with the technical specification for the respective equipment if any.
4. The equipment shall be delivered in a condition which is dry, clean and free from moisture, dirt and loose foreign materials of any kind.
5. The equipment shall be protected from rust, corrosion and mechanical damage during transportation, shipment and storage.
6. Any item likely to be damaged during shipment shall be dismantled and supplied loose along with the main equipment/package. CONTRACTOR shall minimize such loose supplies. CONTRACTOR to provide the list of loose supply items.

b. Packing, marking and labelling of spare parts

All spare part items shall be provided with a weatherproof tag or label showing the following:

a) Article/Item number as specified in the Purchase Order

b) CONTRACTOR's name, Manufacturer's name, Manufacturer's unique part number

c) Item description

d) Expiry date for parts that have a limited shelf life

Small identical items can be packed together in a plastic bag or box and provided with proper label or tag on the outside of the plastic bag or box.

J) WHP PERFORMANCE TEST

1. The Performance Test for Hydrocarbon (H) Systems shall be carried out by COMPANY with assistance and in presence of CONTRACTOR. The Performance Test for Non Hydrocarbon (N) Systems shall be carried out by CONTRACTOR. The performance test requirements and related obligations of CONTRACTOR and COMPANY are defined in Exhibit – 1 Scope of WORK and Exhibit – 10 Performance Tests Requirements, of the CONTRACT.
2. The Performance Test for Hydrocarbon Systems shall be conducted by COMPANY within six (6)/three(3) months of the 1st Gas on respective wellhead platforms, referred to as the date specified under Table – 1 and Table – 2 of Exhibit – 3 CONTRACT SHEDULE. This shall be subject to full commissioning of all Hydrocarbon Systems up to RFSU status by CONTRACTOR.
3. A detailed Performance Test Procedure shall be prepared by CONTRACTOR and submitted COMPANY review and approval. The procedure shall cover all non-hydrocarbon and hydrocarbon systems, sub-sub-systems, equipment and packages on wellhead platform. Pre-Commissioning and Commissioning execution shall not be construed as Performance Test.
4. CONTRACTOR shall assign relevant Commissioning Engineers to be present at SITE on respective platform during the Performance Test for Hydrocarbon Systems conducted by COMPANY. This shall be under CONTRACT PRICE.
5. CONTRACTOR shall comply with all requirements as stated under Exhibit – 10 Performance Tests Requirements, of the CONTRACT. These include performance criteria, reporting, correction of deficiencies, etc.

K) WARRENTY HANDLING

CONTRACTOR shall manage all warranties from the EFFECTIVE DATE until FINAL ACCEPTANCE. Management of warranties claims for the duration staring 1st Gas date shall be performed by CONTRACTOR. Relevant guidelines and forms are included under COMPANY procedure for Warranty management and coordination and will be provided to CONTRACTOR upon EFFECTVE DATE.