EPC for Onshore Processing Facilities and Associated Onshore Pipelines for Aung Sinkha Development Project (ASK) Phase 1A

SPECIFICATION FOR INSULATING FLANGE KITS AND MONOLITHIC ISOLATION JOINT

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REVISION CODE: A = Issued for Review – B = Issued for Approval – C = Approved for Construction

PTTEP	**PTTEP INTERNATIONAL LIMITED**	
	EPC for Onshore Processing Facilities and Associated Onshore Pipelines for Aung Sinkha Development Project (ASK) Phase 1A	中国电工 CNEEC CPECC
	MM-ASK-1A-APF-COR-SPE-0008	**REV** A1

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1.0 INTRODUCTION

1.1 Project Overview

PTTEP International Limited (PTTEPI) intends to develop and produce hydrocarbon from the offshore Block M3 named Aung Sinkha (ASK) field. The project is under Production Sharing Contract (PSC) with Myanmar Oil & Gas Enterprise (MOGE) signed on 7th August 2004 while the PSC effective date was on 1st November 2004.

PTTEPI as an Operator had performed 2,842 line-km of 2D seismic, 619 km2 of 3D seismic, and drilled 11 Exploration and Appraisal wells. After successful exploration and appraisal drilling campaigns in 2015, PTTEPI completed the ASK Field Development Plan and submitted to MOGE for approval. MOGE approved ASK Field Development Plan in April 2021.

The ASK field is located at offshore in the Gulf of Moattama, Myanmar, as illustrated in Figure 1-1. The field is located approximately 70 km from Land Fall Point (LFP) at Daw Nyein village and 200 km south-west of Yangon with water depth range 15-25 meters.

The feed gas will be transported from two (2) offshore wellhead platforms through an offshore export pipeline to ASK Onshore Processing Facilities (APF) located in Daw Nyein village for processing. The sales gas after processing will be exported to ASK Metering Station (AMS) which is located nearby the MOGE Pipeline Center Station at Daw Nyein Village, via gas export pipeline 2.5 km from APF and tied-in to the existing MOGE gas pipeline network. The condensate will be stabilized and stored at APF before being transported via pipeline to ASK Condensate Offloading and Personnel Transfer Facilities (ACP) at Kyon Kaw river and offloaded to customers via tankers barge.

The design of the surface facilities will be based on a Contractual Daily Capacity (CDC) of 60 MMscfd with provision for future expansion to 100 MMscfd.

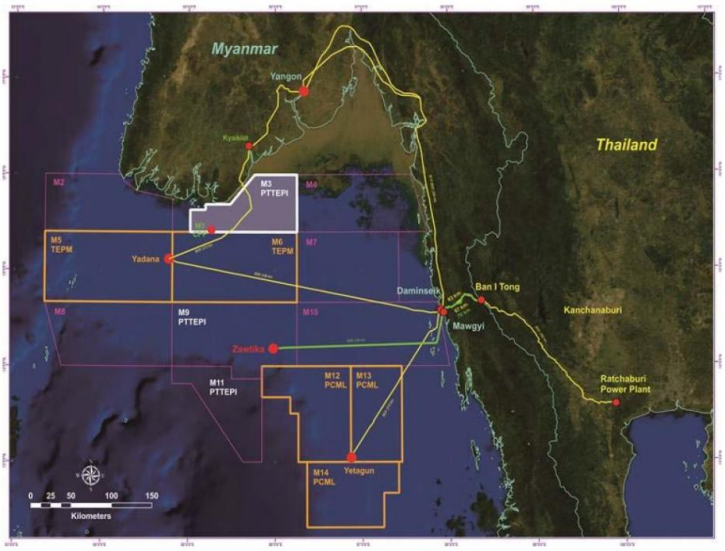

Figure 1-1: Block M3 – Aung Sinkha Field, Offshore Myanmar

The development of Phase 1A consists of the following facilities, as illustrated in Figure 1-2.

- Two (2) - Wellhead Platforms (WPA01 and WPA02) with jacket weight of 1,200 MT approx. and topside weight of 1,000 - 1,400 MT approx.
- One (1) - 12” x 6 km approx. Intra-field Pipeline which links between WPA01 and WPA02
- One (1) – 20” x 90 km approx. Multiphase Offshore Export Pipeline to transport combined fluid of WPA01 and WPA02 to Daw Nyein Land Fall Point
- APL01 One (1) – 20” x 2.5 km approx. Multiphase Onshore Export Pipeline to transport combined fluid from Daw Nyein Land Fall Point to ASK Onshore Processing Facilities (APF)
- ASK Onshore Block Valve Station No.1 (ABV01)
- ASK Onshore Processing Facilities (APF)
- APL02 One (1) – 8” x 18 km approx. Onshore Condensate Export Pipeline from APF to ACP
- APL03 One (1) – 12” x 2.5 km approx. Onshore Export Pipeline from APF to MOGE PLC at Daw Nyein Village
- ASK Metering Station No.1 (AMS01)
- ASK Condensate Offloading and Personnel Transfer Facilities (ACP) i.e., Condensate Offtake Facilities, Accommodation, Personnel and Material Transfer Facilities, Telecommunication System, road, etc.

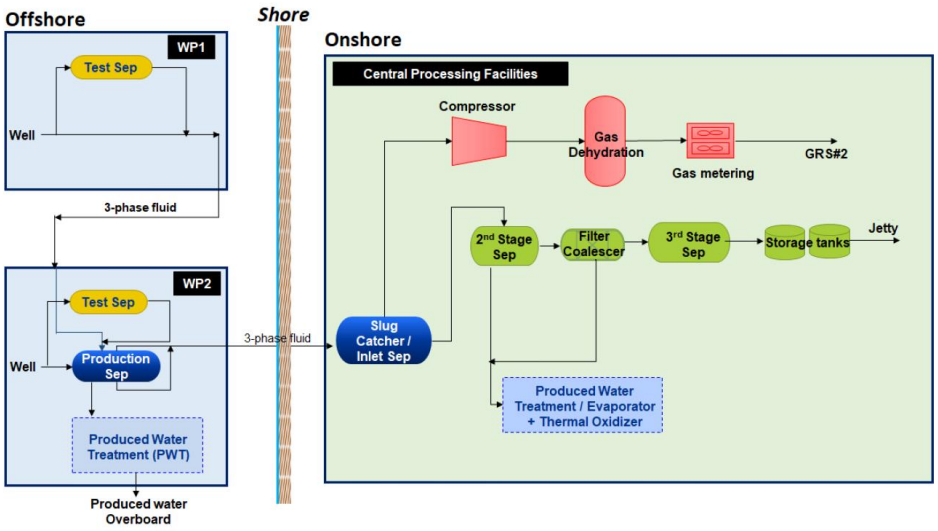

Figure 1-2: Field Block Flow Diagram

1.2 Abbreviation

For the purposes of this document the following abbreviations shall mean.

ABV	ASK Onshore Block Valve Station
AC	Alternating Current
ACP	ASK Condensate Offloading and Personnel Transfer Facilities
AMS	ASK Metering Station
ANSI	American National Standards Institute
APF	ASK Onshore Processing Facilities
API	American Petroleum Institute
ASK	Aung Sinkha
CDC	Contractual Daily Capacity
CP	Cathodic Protection
CIPS	Close Interval Potential survey
DC	Direct Current
GRE	Glass Reinforced Epoxy
I/F	Insulating Flange
IP	Ingress Protection
ITP	Inspection and Test Plan
LFP	Land Fall Point
MIJ	Monolithic Isolation Joint
MOGE	Myanmar Oil & Gas Enterprise
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association
PCR	Polarization Cell Replacement
PCRH	Polarization Cell Replacement for Hazardous area
PCRX	Polarization Cell Replacement extra CIPS compatibility
PPS	Project Particular Specification
PSC	Production Sharing Contract

PVC	Polyvinyl Chloride
PTFE	Polytetrafluoroethylene
PTTEP	PTT Exploration and Production Public Company Limited
PTTEPI	PTTEP International Limited
QA	Quality Assurance
RMS	Root Mean Square
SAE	Society of Automotive Engineers
SSD	Solid State Devices
WPA	Wellhead Platforms

1.3 The Parties Involved

COMPANY	PTTEP International Limited (PTTEPI)
CONTRACTOR	China National Electric Engineering Co., LTD (CNEEC)
SUBCONTRACTOR	The party who provides services to perform part of the contractual scope of work on behalf of CONTRACTOR
SUPPLIER or VENDOR	The organization selected to supply equipment that has overall responsibility for the equipment. The term VENDOR shall include vendors of any tier.
SUB SUPPLIER or SUB VENDOR	The organization selected be the supplier to supply part of equipment, service or material scoped by this specification.

2.0 GENERAL INFORMATION

2.1 Purpose of Document

This Project Particular Specification is to describe the minimum requirement for design engineering, fabrication, assembly, inspection, testing, surface preparation and painting, documentation and preparation for shipment and supply of insulating flange kits and monolithic isolation joint to be installed at Aung Sinkha Development Project Onshore.

All pipelines are operated and in “Severe Sour Service” condition.

Cathodic protection, coatings, supply of flanges, fittings and additional requirements for the supply of bends and other items pertaining to subsea pipeline systems are presented in separate specifications.

2.2 Language

The English Language shall be used in all project communications, reports, correspondences, drawings, specifications, calculations, and invoices etc., submitted to COMPANY. All drawings and documents shall be annotated in S.I. units with other units in parenthesis, where applicable.

In this document, the words should and shall have the following meanings:

Shall	Used to indicate that a provision is mandatory.
Should	Used to indicate that a provision is not mandatory but is recommended as good practice.

2.3 Unit of Measurement

The Aung Sinkha Phase 1A Project will use metric or SI system of units for all calculations, drawings and in all project documentation.

The units of measurement to be used in this project are summarized below in the **Table 2-1**.

Table 2-1: Units of Measurement

PARAMETERS	UNITS
DIMENSIONS	
Equipment Dimension	mm, m
Pipe Length	m
Pipe Size	inch/ mm
Area	m^2
Volume	m^3
Time	d, hr, s
Distance	m, km
PRESSURE	
Pressure (absolute)	bara (psia)
Pressure (gauge)	barg (psig)
Liquid Head	mbar, bar, mmH_2O
Stress	MPa (MN/m^2 or N/mm^2), kPa (kN/m^2)
Static Pressure	Bar
Pressure Drop	Bar
TEMPERATURE	
Temperature	°C (^oF)
FLOWRATE	
Mass Flowrate	kg/hr
Gas Volume Flowrate (Standard Conditions)	MMSCFD
Actual Liquid Volume Flowrate	BPD, m^3/hr, L/hr, L/day
Liquid Volume Flowrate (stock tank conditions)	BPD

PARAMETERS	UNITS
Actual Gas Volumetric Flowrate	m^3/hr (ft^3/d)
PROPERTIES	
Amount of Substance	Kmol
Density	kg/m^3
Dynamic Viscosity	cP
Kinematic Viscosity	cSt
Weight/Mass	kg, tonne (1000 kg)
Thermal Conductivity	kW / m-^oC
Fouling Factor	m^2.hr.°C/kJ
Velocity	m/s
Interfacial Surface Tension	dyne/cm
Mass Velocity	kg/s
Particle Size	Micron
Head	m
Contaminant Concentration (mass)	ppm
Contaminant Concentration (volume)	ppmv
Concentration	mol %
HEAT, ENERGY, WORK AND POWER	
Heat	kJ
Heat Flow/Duty	kJ/hr
Heat Flux	kJ/m^2.hr
Latent Heat	kJ/kg
Specific Heat	kJ/kg.°C
Heat Transfer Coefficient	kJ/hr.m^2.°C
Heating Value (Liquid)	kJ/kg
Heating Value (Gas)	Btu/scf
Specific Enthalpy	kJ/kg
Volumetric Heat Release	kJ/hr.m^3
Power	W
RADIATION, CONDUCTIVITY AND NOISE	
Radiation	kW/m^2
Noise	dB(A)

Notes:

a. Imperial Units may be given between brackets following the SI Units.

b. Standard Condition are: 1.01325 bara and 15.55 °C (SI).

c. Standard Conditions are: 14.7 psia and 60 °F (Imperial).

2.4 Regulation, Standards and Code of Practice

The Aung Sinkha Development Project Phase 1A shall be designed primarily in accordance with PTTEP's general specifications (PEGSs) and corporate specifications, as appropriate, and the applicable Myanmar legislative requirements. Where such standards are not applicable, accepted international codes / industry good engineering practice will be adopted. Unless otherwise stipulated, the applicable version of these documents, including relevant appendices and supplements, is the latest revision published on the effective date of a contract.

Any deviation from the standard, shall be documented for derogation and proper permission from COMPANY in writing.

The order of precedence of the applicable documents shall be:

1) Government Laws, Rules and Regulations
2) Purchase Order/ Service Order/ Contract Documents
3) Data Sheet, Drawings and Project Particular Specification (PPS)
4) PTTEP Engineering General Specification (PEGS)
5) Other COMPANY specifications, standards, and documents
6) International Codes and Standards

In case of conflicts / contradictions between the various codes, standards, regulations and specification, unless otherwise agreed or decided by Company, it is understood that the more stringent requirement shall apply.

2.5 Reference Document

This specification defined as the Project Particular Specification (PPS) shall be read jointly with the following COMPANY's general specification.

MM-ASK-1A-APF-COR-SPE-0003	Specification for DC Decouplers and Over Voltage Protector
MM-ASK-1A-APF-COR-SPE-0004	Specification for Cathodic Protection System Installation
MM-ASK-1A-APF-COR-SPE-0005	Specification for Soil Resistivity Survey & Testing
MM-ASK-1A-APF-COR-SPE-0006	Internal Cathodic Protection Calculations Notes
MM-ASK-1A-APL01-COR-RPT-0001	Cathodic Protection Design and Calculation Report

MM-ASK-1A-APL01-COR-TYP-0001	Typical Drawing for Cathodic Protection
MM-ASK-1A-APL01-COR-SPE-0003	Material Specification for Cathodic Protection
MM-ASK-1A-APL01-COR-MTO-0002	Material Take-Off for Cathodic Protection

The present PPS provides confirmations and/or modifications and/or additional requirements to the COMPANY's general specification. The matters covered in the general specification, which are not mentioned under this specification, shall apply in full.

2.6 CONTRACTOR/ SUPPLIER's Responsibility

All work shall be carried out in compliance with this specification, reference documents, Codes and Standards, and Specifications listed unless otherwise stated. The SUPPLIER's submissions should provide sufficient data to allow the equipment to be evaluated against the total life and field costs estimated to be incurred. In this respect, equipment capital cost, weight, size, cost of spares, utility and power requirements, maintenance, reliability and production downtime costs may be considered.

SUPPLIER is required to have relevant proven prior experience in the fabrication and testing of line pipes, which is to be supplied.

3.0 AMENDMENTS/ SUPPLEMENTS TO 10008-STD-6-COR-033-R00

This section details the additions, amendments, and deletions to Company's general specification for Insulating Joints, Document No. 10008-STD-6-COR-033-R00 based on the requirements of this project. The paragraphs hereinafter have the same numbers as the relevant paragraphs in the COMPANY's general specification.

Paragraph 7.1.3: Miscellaneous

[Amend]

Insulating rings shall be internally coated with an insulating lining of glass epoxy type. Other types of coating may be acceptable if they are compatible with the effluent and operating conditions. It is subjected to COMPANY approval. Thickness of the full coat shall not be less than 0.40mm. The pipe shall be internally abrasive blasted before the product is applied. This internal coating shall be applied up to 10 cm of ends of the pipe pups and cover at least a length equal to 2 pipe diameters.

Paragraph 7.2.2: Insulating Materials

[Amend]

The materials used for manufacturing of insulating parts shall be fiber glass epoxy. Several types of material may be used such as Bakelised glass fabric or, when it is needed to have

low water absorption and a good resistance to the mould (wet climate, tropical climate), the following materials:

3. Filler material

Paragraph 7.2.2.3: Characteristics of Glass Flake Filled Vinylester and Polyester

[Amend]

Characteristics of Fiber Glass Epoxy

NEMA grade G-11 Glass-Reinforced Epoxy (GRE) laminate material:

Compressive Strength	50,000 PSI
Dielectric Strength	500 VPM Max.
Continuous Operating Temp	392° F (202° C) Min.
Continuous Operating Temp minus)	-50° F
Water Absorption	0.085%
Flexural Strength	57,700 PSI
Tensile Strength	41,000 PSI
Bond Strength	2,200 lb.
Shear Strength	21,200 lb.

Paragraph 7.4.2: Acceptance of Insulating Joints Assembled in Factory

[Amend]

This resistance should be more than 10MOhm at 1000VDC minimum in dry atmosphere:

1. Breakdown voltage tests at 5 kV (3KV AC, 50Hz for 1 minute)

Paragraph 7.7.2.3: Dry Test of Joint Insulation Resistance

[Amend]

This test shall be carried out when the coating is dry. The electrical resistance of the joint in air shall be measured with an ohmmeter and the value obtained shall be greater than 10MΩ.