PHỤ LỤC 01- PHẠM VI CÔNG VIỆC

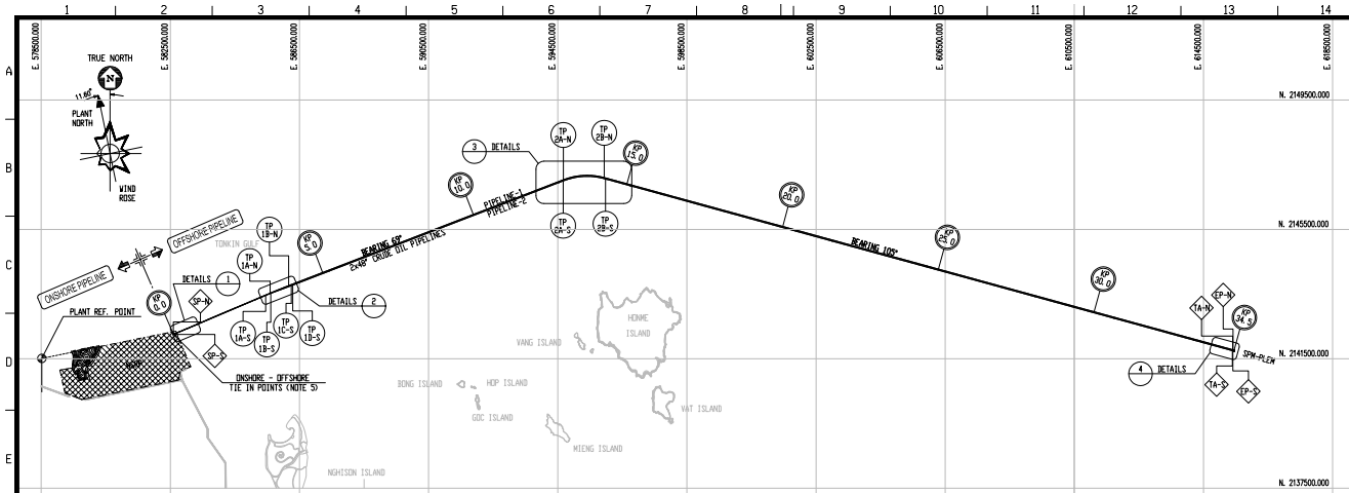
Contents

1. INTRODUCTION

The Single Point Mooring (SPM) system is located approximately 35 km offshore in 27 m water depth. It consists of SPM structure, floating hoses, submarines hoses, mooring hawsers, PLEM, and two 48" pipelines transporting crude oil to onshore plant. Location of worksite is shown in Picture 1.1 below.

The SPM installation was completed in 2015 and starts receiving crude oil in August 2017. As per recommendation from Operation and Maintenance Manual of SPM manufacturer, various SPM facilities shall be performed detail inspection or replacement after 3 years operation.

With long time in-service of submarine hose & bent/twisted signs at 3rd section hose, *NSRP wishes to replace 1st & 2nd Submarine Strings in July-August 2023 for keep being safety of crude oil importing.*



Picture 1.1 WORK SITE LOCATION

2. INTRODUCTION OF FACILITIES

2.1 Calm buoy

The Calm buoy was designed, supplied by SOFEC and has information summarized in Table 2.1 below.

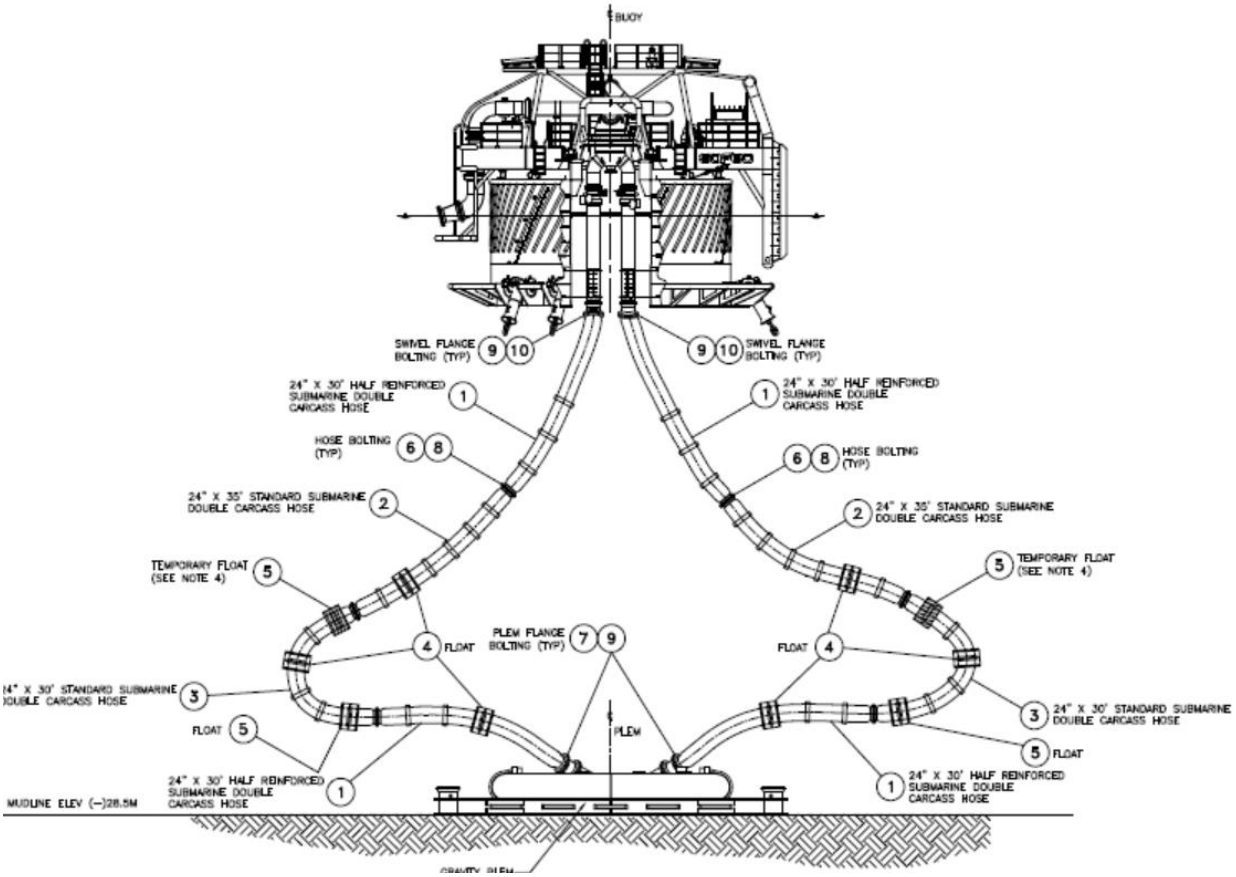
Description	Value
Number of Compartments	06 radial Compartments
Buoy body diameter	11 meters (36.1 feet)
Centre well diameter	3.7 meters (12.1 feet)
Skirt diameter	15.0 meters (49.2 feet)
Buoy body height	5.8 meters

Centre well piping	2 x 24 inch piping + 2 x 24 inch butterfly valves
Turntable piping	2 x 24 inch piping + 3 x 24 inch butterfly valves
Total weight	345.7 metric tons
Instralled draught	3.96 meters
Maximum free board	1.84 meters

Table 2.1 Information of Calm Buoy.

Information of submarines hoses, and mooring hawsers are summarized in section 2.1, 2.2, and 2.3 below. Detail information can be referred to section 6.0 APPENDIX.

2.2 Submarine hoses



Picture 2.1 Submarine hoses assembly

ITEM NO.	QTY.	SOFEC PART NUMBER	DESCRIPTION	EST.WT. KG.EA.
–	1	6302–00030	SUBMARINE HOSE ASSEMBLY	–
1	4	6302–00032	HALF REINFORCED SUBMARINE HOSE WITH FLOAT LOCATION COLLARS, DOUBLE CARCASS, 24" X 30' LG, 285 PSI WORKING PRESSURE, ASME CLASS 300 FF FLANGE ON REINFORCED END, ASME CLASS 150 FF OTHER END.	–
2	2	6302–00033	STANDARD SUBMARINE HOSE WITH FLOAT LOCATON COLLARS, DOUBLE CARCASS, 24" X 35' LG, 285 PSI WORKING PRESSURE, ASME CLASS 150 FF FLANGES ON BOTH ENDS.	–
3	2	6302–00034	STANDARD SUBMARINE HOSE WITH FLOAT LOCATON COLLARS, DOUBLE CARCASS, 24" X 30' LG, 285 PSI WORKING PRESSURE, ASME CLASS 150 FF FLANGES ON BOTH ENDS.	–
4	6	6302–00035	HINGED BODY FLOAT FOR 876MM COLLAR DIAMETER (NET BUOYANCY 360 KG)	–
5	4	6302–00036	HINGED BODY FLOAT FOR 946MM COLLAR DIAMETER (NET BUOYANCY 420 KG)	–
6	120	6302–00037–001	STUD, 1 1/4–8UN–2A x 7 1/2" LONG, ALL THREAD ASTM A193 GR B7 C/W TWO HEAVY HEX NUTS 1 1/4–8UN–2B, ASTM A194, GRADE 2H.	–
7	48	6302–00037–002	STUD, 1 1/2–8UN–2A x 9 1/2" LONG, ALL THREAD ASTM A193 GR B7 C/W TWO HEAVY HEX NUTS 1 1/2–8UN–2B, ASTM A194, GRADE 2H.	–
8	6	6302–00037–003	COMPRESSED FULL FACE GASKET, PER ASME B16.21, NON–ASBESTOS, FIBER/RUBBER, 24" ASME CLASS 150	–
9	4	6302–00037–004	SPIRAL WOUND GASKET PER ASME B16.20, 316 STN STL WITH NON–ASBESTOS FILER WINDINGS, 316 STN STL INNER AND OUTER RINGS, 24" ASME CLASS 300	–
10	48	6302–00037–005	STUD, 1 1/2–8UN–2A x 12" LONG, ALL THREAD ASTM A193 GR B7 C/W TWO HEAVY HEX NUTS 1 1/2–8UN–2B, ASTM A194, GRADE 2H.	–

Table 2.2 Submarine hoses part list

3. SCOPE OF WORK

3.1. General Scope of works

CONTRACTOR shall provide an Anchor Handling Tug Service (AHTS) vessel which adapts working area, accommodations, a clear deck large enough to perform the work which minimum 300m2 clear-deck, on-deck crane, AHTS has to been classified to work in SPM where distance 35km from shore.

CONTRACTOR shall provide a vessel which adapts working area, accommodations, a clear deck large enough to perform the work, on-deck crane, Vessel has to been classified to work in SPM where distance 35km from shore.

CONTRACTOR shall provide all necessary tools, divers, diving equipment, consumable, and the likes to perform submarine hoses replacing work which includes but not limited to: replacing 02 submarine hose strings & ancillaries (the umbilcal, fiber optic cable,…), offshore leaktest 02 full string submarine hoses:

- Replace 02 submarine hoses by new ones.
- Hydrostatic testing system
- General Visual Inspection underwater facilities after successful hydrostatic testing
- Function & Commissioning the Fibre Optical Cable & Hydraulic System after completion GVI.

Closely coordinate with NSRP/PTSC NSRP's other CONTRACTORS (including but not limited to Routine Maintenance CONTRACTOR, and NSRP's third parties for detailed development and integration of the execution plan, schedule for the WORKS. CONTRACTOR shall prepare interface management plan and submit to NSRP for approval.

CONTRACTOR shall submit construction-engineering documents, schedule, and working procedures, HSSE related documents, QA/QC related documents, and other documents required for performance of WORKS to PTSC for approval prior to work execution.

CONTRACTOR shall develop Job safety analysis (JSA) for all activities executed where required as per HSSE regulation and standard industrial practice. The JSA's shall be submitted to NSRP/PTSC for approval at least 02 weeks prior to work execution.

After completion of the WORKS, CONTRACTOR shall hand over to NSRP/ PTSC a complete set of hardcopy and native softcopy of all related documentation for the WORKS (including updated work packages, execution plan, work method statement, job safety analysis, detail work steps, related standard or specifications, all kind of reports, inspection results, pictures, etc.) and all necessary required certifications for all the work executed.

3.2. Detail Scope of Works

PTSC hereby instructs contractor the workflow of this scope but PTSC does not limit the appropriate ways of Contractor upon its facilities, sources & conveniences. Nevertheless, these steps below is minimum mandatory to complete the work.

1st String means for the Submarine String which assembled and being stocking in PTSC TH Port.

2nd String means for Submarine String which shall be tested and assembled by Contractor after withdrawing spare parts in NSRP's Warehouse.

In-service Strings means for the strings which being installed in SPM and shall be replaced.

Number	Description	Source	Remark
1.	Disconnect In-service Strings in SPM.	Contractor	NSRP supports fleet Contractor can disconnect one by one upon its facility & manpower
2.	Transfer In-service strings' component to its Port	Contractor	
3.	Towing 1st and 2nd strings to SPM to install.	Contractor	NSRP supports fleet Contractor can tow & install one by one upon its facility & manpower
4.	Hydrostatic testing system	Contractor	Hydrotesting only performs after completion work.
5.	General Visual Inspection underwater facilities after successful hydrostatic testing	Contractor	NSRP support fleet
6.	Function Fiber Optical Cable & Hydraulic System after completion GVI.	Contractor	NSRP supports fleet
7.	Submit final report.	Contractor	

DETAIL REQUIREMENTS FOR WORK:

CONTRACTOR is responsible to prepare methods, tools, consumable, vessel, diving equipment, divers and the likes to perform following scope of works:

a. Disconnect Hose String at SPM:

   CONTRACTOR is responsible to prepare appropriate method to disconnect **submarine strings (both non-umbilical and umbilical strings)** safety and properly in SPM. The string during disconnecting has not allowed to create damaged to each other SPM's facilities such as PLEM, Umbilical String, Buoy, Anchor Chains, Fiber Optical Cable ….

b. Transfer successful string to NSRP's SPM:

   CONTRACTOR is responsible to Transfer string from PTSC TH shipyard to SPM by CONTRACTOR's source & with high manner. Transfer operation shall comply

with applicable rules and regulations on marine operation. CONTRACTOR shall develop and submit string transferring procedure to NSRP at least 15 days prior to starting of works. The transfer procedure shall present:

- Methodology to sea-fasten hoses, protect hoses from damage and clashing with harbor facilities and other vessel.
- How to arrange string on AHTS deck properly.
- How to prevent hoses from damaged during transferring.
- Towing speed.

c. Installing & leakage test system at SPM:

CONTRACTOR is responsible to prepare appropriate method to re-install string without damage to other facilities (e.g subsea valves, fiber optic cables, umbilical, PLEM, and SPM structure).

After completion of installation for submarine hoses, CONTRACTOR shall perform leak testing for the hoses and valves. If any leaking occurs during testing, CONTRACTOR, at its own cost, shall repair the leaking and perform leak test again and until leaking rate less than acceptable standard mentioned in applicable rules and regulations.

The test must have witnessing by Vietnam Register.

4. TECHNIQUE REQUIREMENT

4.1. General requirement

CONTRACTOR's execution methods, tools, equipment, personnel must comply with the latest version of following standards:

1. OCIMF- Guidelines for the Handling, Storage, Inspection and Testing of Hoses in the Field - Latest edition.
2. IMO- Recommendations on the Safe Transport, Handling and Storage of Dangerous Substances in Port Areas - Latest edition
3. OCIMF- SPM Hose Ancillary Equipment Guide - Latest edition
4. All testing equipment supplied by Contractor have to certificated and certificates of each equipment has to be valid at least 1 months prior to site execution starting duration.

4.2. Quality Requirement.

Contractor shall provide NSRP/PTSC the service at the best quality delivery.

During the work, Contractor is not allowed to:

- Make over bend 4xD MBR of any hose during work execution.
- The FOC & Hydraulic system has to function well after contractor completion work. any malfunction shall be re-worked by Contractor's sources without compensation of NSRP.
- Angle of Anchor chain has to be within tolerance angle after completion of work.
- There shall be no other facilities of NSRP damaged which forced by Contractor's source, any damaged forced by Contractor shall be compensated by Contractor cost without compensation of NSRP.

4.3. Requirement for CONTRACTOR's personnel.

CONTRACTOR must have sufficient and competent personnel to perform the WORKS. Minimum qualifications and experience required for the WORKS are as follow. CONTRACTOR shall submit CV of key personnel in proposal.

1. Project Manager
    a. Minimum 10-year working experience in oil and gas or petrochemical industry.
    b. Bachelor degree in technical field. Project Management is preferred. . English level requirement at least IELST 6.5 or TOEIC 650.

2. Offshore superintendent.

    a. Minimum 7-year working experience in oil and gas or petrochemical industry, minimum 5-year working experience in offshore works.
    b. Engineer degree in marine operation or mechanical field.

3. Diving supervisor
    a. At least 10 years of experience in diving work and have Air Diving supervisor Certificate
    b. Experience of working in at least 3 projects with the same nature.

4. Diving Team
    a. Diver Lead with at least 5 years of experience
    b. All divers with at least 3 years of experience
    c. Diver Lead with at least 3 years of experience in Air Surface Supplied diving
    d. All divers with at least 3 years of experience in Air Surface Supplied diving and have Air Diving supervisor Certificate
    e. 3 years of experience in inspection and maintenance activities and at least two-year experience in SPM maintenance activities.

4.4. Schedule requirement

CONTRACTOR shall start and complete WORK as per following milestone. CONTRACTOR shall complete the WORK within 30 days inclusive of weather downtime.

a. Work complete: within 30 days from start date.
b. There shall be no impacting to Crude Importing Plan of Refinery where imported Crude every calendar days.

5. APPDEDIX LIST

Category	Activity	Owner	Contractor	Remark
Document	• Drawings (P&ID, Isometric drawing, Detail DWG, etc.)	X		If necessary
	• Related Technical Document	X		If necessary
	• Maintenance work procedure	X	X	Contractor shall develop detailed procedures for approval. Available OWNER maintenance work procedure is for reference only.
	• Detailed method statement for work execution		X	
	• Template (or Form)		X	for Report, Check Sheet, etc
	• Execution plan		X	
	- Organization chart			
	- Manpower Mobilization Plan			
	- Resource Mobilization Plan (Construction Equipment, Tools, Materials, Consumables, etc.)			
	- Quality control plan			
	- Critical work execution plan			
	- HSE control plan			
	- Temporary facility operating plan			
	- Communication plan			
	• Daily performance report		X	
	• Total performance report		X	

Category	Activity	Owner	Contractor	Remark
Materials	• Permanent material: Submariner string.	x		Contractor to supply temporary materials for maintenance work (temporary valve, blind flange ... etc) & Mounting Block of Hydraulic Umbilical
	• Consumables • Transportation for materials		X X	Contractor provide the transportation inside & outside NSRP
Equipment & tools	• Heavy Construction Equipment (Crane, Forklift, Truck, etc.) • All kinds of tools and equipment, etc • Transportation for equipment and tools - In case of Contractor-supplied things + Transportation inside and outside NSRP - In case of Owner-supplied things + Transportation inside NSRP • Fuel for operation of Equipment and Tools		X X X X X	
Quality Control	• Test & Inspection Report • Performance Test and Calibration (Construction Equipment and Tools)		X X	
Schedule	• Daily work progress check and report • Report of planned schedule impact item		X X	

Category	Activity	Owner	Contractor	Remark
HSE	• Safety equipment & device • PPE (Personal protection equipment)		X X	