PETROBRAS	TECHNICAL SPECIFICATION	Nº:	I-ET-3203.6D-1519-940-P9U-001
	CLIENT: E&P ÁGUAS ULTRA PROFUNDAS	SHEET:	1 de 9
	JOB: GASODUTO ROTA SEAP		-
	AREA: UN-BS/ATP-SSU		DR22388
-	TITLE: **GASODUTO SUBMARINO SEAP – TECHNICAL ADMISSIBILITY REQUIREMENTS FOR RIGID PIPELINES**		EDA/EDR
			-

INDEX OF REVISIONS

REV.	DESCRIPTION AND/OR REVISED SHEETS
0	ORIGINAL
A	REMOVAL OF PLETs 01, 02, 03 & 04 – CHANGES HIGHLIGHTED IN YELLOW

	REV. 0	REV. A	REV. B	REV. C	REV. D	REV. E
DATE	16/04/2025	21/01/2026				
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CHECK	B9BZ	ER48				
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1. INTRODUCTION

1.1. PROJECT DESCRIPTION

1.1.1. The SEAP Route Integrated Gas Pipeline project considers the installation of a gas export pipeline to meet the production development projects of Sergipe Deep Waters – Modules I and II (SEAP-I and SEAP-II), towards the coast of Sergipe state.

1.1.2. Steel risers and flowlines are planned for the gas export system. Each riser from SEAP I and SEAP II FPSOs is followed by an associated flowline up to an in-line skid ESDV. Following, a long flowline section from each branch terminates in PLETs, vertically tied by diverless rigid spool (DRS). These PLETs are connected to a PLEM and a final PLET (also tied by vertical DRS), converging the gas exportation through a trunkline to shore, with two in-line skid valves interconnected by horizontal DRS composing the underwater diverless tie-in in approximately 80 m of WD, as illustrated in Figure 1 and Figure 2. Riser concept (SLWR) schematic is shown in Figure 3.

1.1.3. CONTRACTOR may propose, during the bid phase, the replacement of structures PLET-SEAP-06, PLET-SEAP-07 and PLEM-SEAP-01 (Figure 2) by a single ILY piggable structure, in accordance with its installation vessel capabilities, provided that it meets the requirements specified by PETROBRAS.

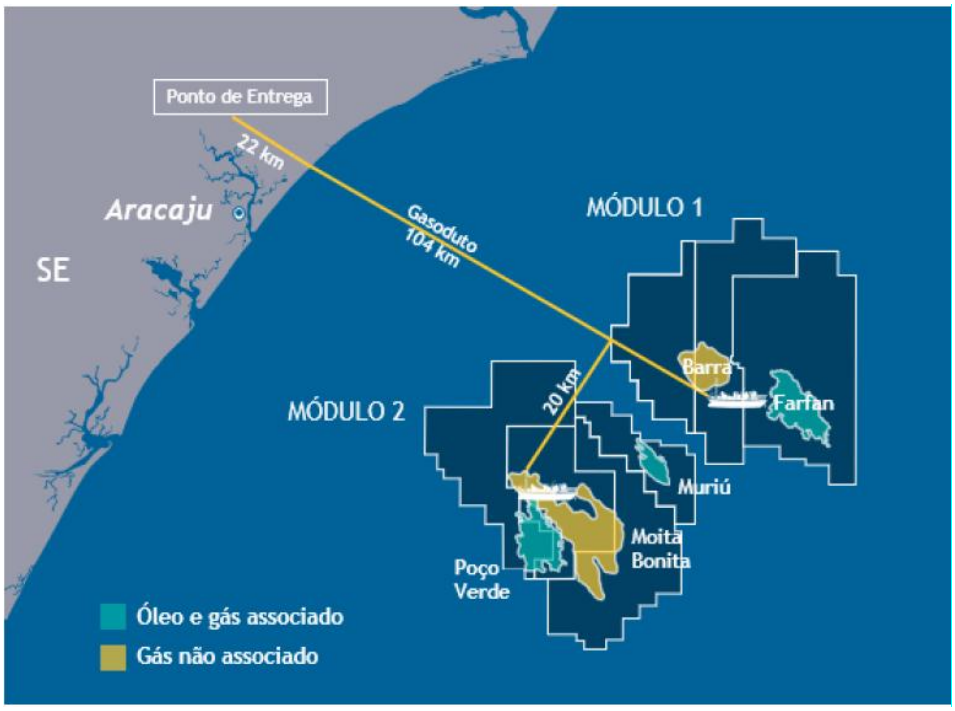

Figure 1 – SEAP Field Location.

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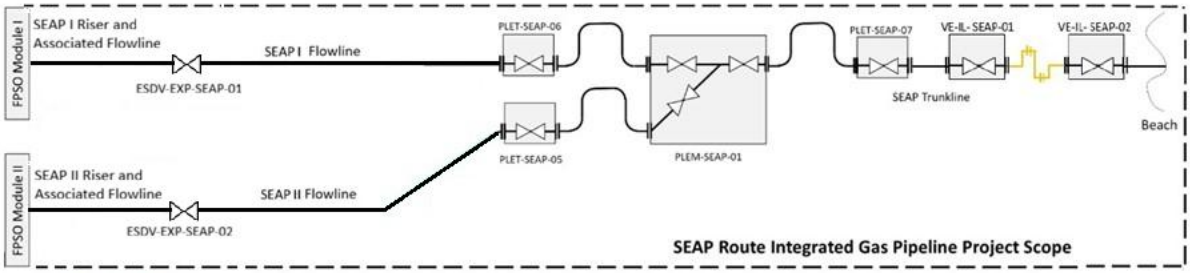

*Figure 2 – SEAP **Route Integrated Gas Export Pipeline – Scope** of Work from EPCI Project.*

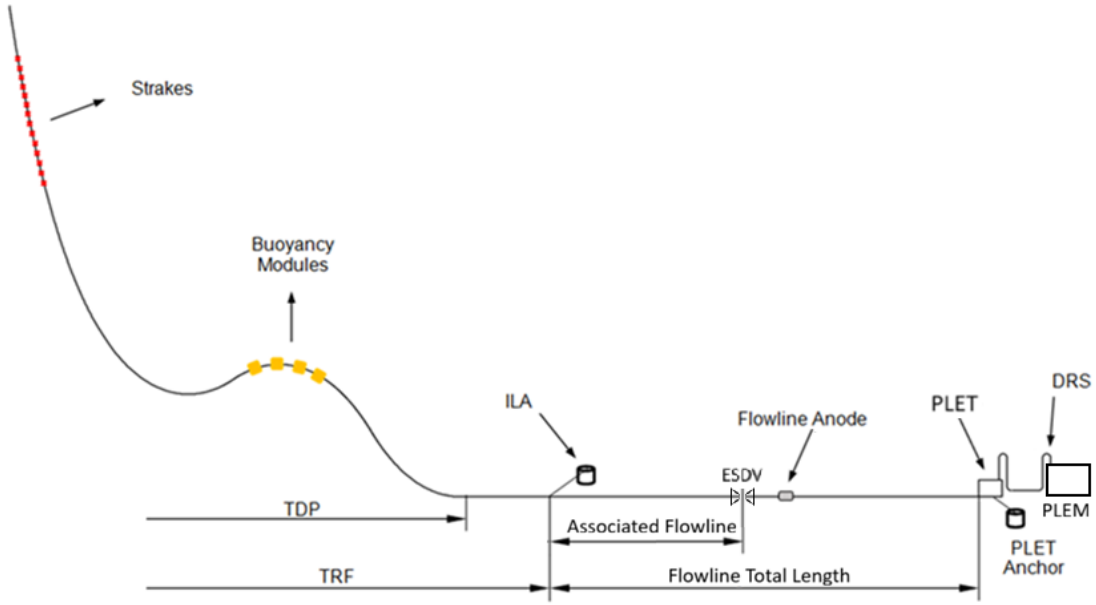

*Figure 3 – SEAP Route **Integrated Gas Export** Pipeline – Riser Schematic.*

1.2. TERMS AND ABBREVIATIONS

1.2.1. The terms and abbreviations used in this Technical Specification are according to [C1] and [C2].

1.2.2. Additional terms and abbreviations are used as presented in Table 1.

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Table 1 – Terms and Abbreviations

A&R	Abandonment and Recovery.
BIDDER	Company participating in the tender process.
DRS	Diverless Rigid Spool.
EPCI	Engineering, Procurement, Construction, and Installation.
ESDV	Emergency Shut Down Valve.
ILA	In-Line Anchor.
PLEM	Pipeline End Manifold.
PLET	Pipeline End Termination.
RAO	Response Amplitude Operator.
SEAP	Sergipe Águas Profundas (Sergipe Deep Waters).
SLWR	Steel Lazy Wave Riser.
TDP	Touch Down Point.
THIRD PARTY	Independent company responsible for verification that an activity, a product or a service is in accordance with the specified requirements.
TRF	*Transição Riser/Flowline* (Riser/Flowline Transition).
Verification	Definition in accordance with [C3].
WD	Water Depth.

1.3. REFERENCES

1.3.1. PIPELINE DATA AND CONTRACT ANNEXES

[A1] CONTRACT – ANNEX I, MEMORIAL DESCRITIVO DO ESCOPO CONTRATADO, REV. 0;

[A2] I-ET-3203.6D-6520-940-P9U-001, GASODUTO SUBMARINO SEAP – ENGINEERING, PROCUREMENT, CONSTRUCTION AND INSTALLATION OF RIGID PIPELINES, REV. C;

[A3] I-FD-3203.6D-1519-940-P9U-004, GASODUTO SUBMARINO SEAP – SEAP I RISER AND FLOWLINES - PIPELINE DATA SHEET, REV. A;

[A4] I-FD-3203.6D-1519-940-P9U-005, GASODUTO SUBMARINO SEAP – SEAP II RISER AND FLOWLINES - PIPELINE DATA SHEET, REV. A;

[A5] I-FD-3203.6D-1519-940-P9U-006, GASODUTO SUBMARINO SEAP – SEAP SHALLOW AND DEEP TRUNKLINE - PIPELINE DATA SHEET, REV. A;

[A6] I-FD-3203.6D-1519-940-P9U-007, GASODUTO SUBMARINO SEAP – SEAP ULTRA SHALLOW TRUNKLINE - PIPELINE DATA SHEET, REV. A;

[A7] I-DE-3203.6D-6520-942-R1N-004, SEAP GAS EXPORT SYSTEM - EPCI SCOPE, REV. B.

1.3.2. TECHNICAL SPECIFICATIONS

[B1] I-ET-0000.00-0000-966-P9U-001, INSTALLATION ANALYSES, REV. 0;

[B2] I-ET-0000.00-0000-966-P9U-002, TECHNICAL SPECIFICATION FOR PRE-LAY, WET STORAGE AND RECOVERY, REV. 0.

1.3.3. CODES, STANDARDS AND RECOMMENDED PRACTICES

[C1] DNV-ST-F101, SUBMARINE PIPELINE SYSTEMS, 2021;

[C2] DNV-ST-F201, RISERS SYSTEMS, 2021;

[C3] DNV-SE-0475, VERIFICATION AND CERTIFICATION OF SUBMARINE PIPELINES, 2021.

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2. OBJECTIVE AND SCOPE OF WORK

2.1. OBJECTIVE

2.1.1. This technical specification establishes the minimum requirements for technical admissibility of proposals for the EPCI of SEAP Route Integrated Gas Export Pipeline Project.

2.1.2. All requirements presented in this document shall be fully met by BIDDER for acceptance of the technical proposal.

2.2. SCOPE OF WORK

2.2.1. BIDDER shall be responsible for contracting a THIRD PARTY to verify the technical admissibility of the proposal.

2.2.1.1. THIRD PARTY selected for the verification service shall be a recognized company with experience in certifying subsea pipeline design. The THIRD PARTY shall present a track record of certifying at least five similar subsea pipeline projects.

2.2.2. THIRD PARTY shall issue a Statement of Conformity and a Verification Report. Verification Reports containing any caveat or constraint will not be accepted.

2.2.3. THIRD PARTY shall perform a verification service as defined in Section 1.1.3 of [C3] (Verification Service), considering a “medium” level of verification involvement in accordance with Section 2.2.4 of [C3] (Risk-differentiated levels of verification involvement).

2.2.3.1. The verification scope shall comprise all requirements defined in Section 3.

2.2.3.2. BIDDER shall supply for THIRD PARTY all information defined in Section 3.

2.2.3.3. If necessary, BIDDER shall supply any other information required by THIRD PARTY and not specified within this document.

2.2.4. THIRD PARTY shall verify the analyses provided by BIDDER and confirm they are in accordance with [B1] and that the vessel is able to lay the pipeline based on PETROBRAS’ technical data and schedule supplied.

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3. TECHNICAL ADMISSIBILITY REQUIREMENTS

3.1. LIST OF VESSELS

3.1.1. BIDDER shall provide the explicit list of vessels considered essential for the accomplishment of the scope of Route Integrated Gas Export Pipeline Project, in accordance with the proposal supplied by BIDDER.

3.1.1.1. All vessels shall comply with requirements defined in Item 4.3 of [A2].

3.2. POSITIONING SYSTEM

3.2.1. BIDDER shall supply the specification of the positioning system, which shall be in accordance with Section 10.4.5 of [C1] (Dynamic positioning).

3.2.2. BIDDER shall provide the dynamic positioning capacity, documented by capability plots, in accordance with Section 10.4.5 of [C1] (Dynamic positioning).

3.3. VESSEL INSTALLATION CAPABILITIES

3.3.1. BIDDER shall supply data sheets and general arrangement drawings of the vessel with dimensions and all necessary pipelaying equipment to perform the scope of work.

3.3.2. BIDDER shall provide the layout of pipelaying equipment, including all pipelaying auxiliary devices. Scaled drawings with main dimensions shall also be provided.

3.3.3. BIDDER shall provide the specification of tension machine, clamp and A&R winch and valid certificates issued by an internationally recognized Certification Company.

3.3.4. BIDDER shall provide a description of the pipelaying tension monitoring system confirming that tension is monitored and recorded continuously.

3.4. VESSEL RAO

3.4.1. BIDDER shall provide the vessel RAOs for wave incidence angles from 0 to 360 degrees and wave frequencies from 0.1 to 2.0 rad/s in table and graph format. The RAOs shall be provided for both maximum and minimum operational drafts used during pipelaying operations. The maximum incidence angle increment shall be 22.5 degrees, and the maximum frequency increment shall be 0.05 rad/s, i.e. at least 16 directions and 39 frequencies for each RAO.

3.4.2. BIDDER shall provide the reference system for the vessel RAOs, showing the compatibility with the reference system used in the dynamic analysis. Scaled drawings showing the center of motion, the center of gravity and the reference system for the RAOs shall also be provided.

3.5. PIPELAYING ANALYSIS

3.5.1. BIDDER shall perform pipeline installation analysis, considering extreme limits of water depth for each pipeline presented in [A3], [A4], [A5], [A6] and [A7], the proposed configuration, and fulfill the requirements defined in [B1] for “normal pipe lay” and “platform transfer and pull-in” operations, where applicable. The analysis shall also include the installation of the PLET, skid valve and radius curves presented in [A7] within a lay corridor tolerance defined in [A2].

3.5.1.1. BIDDER shall provide the INPUT and OUTPUT of the analysis.

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3.5.1.2. BIDDER shall issue an installation analysis report.

3.5.2. If pre-lay, wet storage and recovery scenario is required in [A1], they shall be included in the pipeline installation analysis and also fulfill the requirements defined in [B2] for recovery operations.

3.5.3. BIDDER shall clearly state the pipeline installation condition (empty or flooded) to be adopted and consider the defined condition in the aforementioned installation analysis.

3.5.3.1. In case of empty pipeline installation, BIDDER shall demonstrate that in case of accidental flooding, the integrity of the pipeline is not jeopardized, and the vessel is capable of supporting the pipeline.

3.5.4. BIDDER shall present the maximum significant wave height (Hs) for the proposed vessel considering the following conditions: 16 wave directions equally spaced with respect to vessel axis, starting at 0 degrees (vessel bow) clockwise direction, in a range of wave spectrum peak period (Tp) from 5 to 15s (for each second).

3.5.5. BIDDER shall provide an installation schedule to confirm compliance with PETROBRAS' activities milestones.

3.6. DETAILED DESIGN AND EXECUTIVE PROCEDURE

3.6.1. If BIDDER do not expect to perform Detailed Design and Executive Procedures with its internal resources, a Service List with the potential SUBCONTRACTORS to perform the service shall be submitted for THIRD PARTY evaluation.

3.6.1.1. BIDDER shall also submit a Track Record List of each SUBCONTRACTOR proposed.

3.6.1.2. In addition, BIDDER shall submit the Service List and Track Record List to PETROBRAS with the proposal.

3.6.1.3. The potential SUBCONTRACTORS shall have track record of execution in the last 5 years of at least one similar service to the Route Integrated Gas Export Pipeline Project.

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4. DELIVERABLES

4.1. BIDDER shall present the following deliverables for PETROBRAS, issued by THIRD PARTY:

4.1.1. Statement of Conformity, in accordance with Section 4.2.2 of [C3] (Statement of Conformity).

4.1.2. Verification Report, in accordance with Section 4.2.3 of [C3] (Verification Report).

4.1.3. Statement of Conformity or Verification Report containing any caveat or constraint will not be accepted and will exclude BIDDER from the process.

4.2. The Verification Report shall be in the following format:

4.2.1. Repeated description of each one of the items of Section 3 of this document;

4.2.2. Declaration that for each item:

4.2.2.1. BIDDER supplied all information required;

4.2.2.2. BIDDER fulfills all the technical requirements.

4.3. In case PETROBRAS identifies any deviation regarding the requirements herein specified, then BIDDER will be considered NOT classified.

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