| | | | |
|---|---|---|---|
| PETROBRAS | **EXHIBIT I – SCOPE OF WORK** | | |
| | **CLIENT:** | PETROBRAS | 1 of 2019 |
| | **PROJECT:** | P-88 | |
| | **TITLE:** | **TECHNICAL SUPPORT SERVICE FOR FPSO PROJECT** | |

## REVISION INDEX

| REV. | DESCRIPTION |
|---|---|
| 0 | Original |

| | REV. 0 | REV. A | REV. B | REV. C | REV. D | REV. E | REV. F | REV. G | REV. H |
|---|---|---|---|---|---|---|---|---|---|
| DATA | 27/01/2026 | | | | | | | | |
| EXECUÇÃO | ER5Q | | | | | | | | |
| VERIFICAÇÃO | ELYN / E2B3 / EIX6 | | | | | | | | |
| APROVAÇÃO | U3HK | | | | | | | | |

## 1. GENERAL

1.1. This Exhibit I defines the overall responsibilities for the performance of the activities which are the object of the Contract for Technical Support Services for P-88 FPSO Project (the "**Agreement**") between PETRÓLEO BRASILEIRO S.A. – PETROBRAS ("**PETROBRAS**" or "**BUYER**") and [XXXXXXXX] ("**CONTRACTOR**").

1.2. The requirements set forth in this Exhibit I, and all the other Exhibits of the Agreement, shall apply to the entire Agreement.

1.3. The Services consist in technical support for the planning, analysis, monitoring and control, supervision and other similar activities related to FPSO project, including design, procurement, construction and assembly and commissioning phases, as further detailed in Section 3.2 below.

1.3.1 The Services shall be performed at engineering offices, shipyards and construction sites to be defined according to **"FPSO PSA"** strategy, as further explained in item 3.

1.3.2 The Services are meant to be performed at sites located mainly in Asia. However, part of the services may be required to be performed in other locations according to FPSO Project strategy. In order to determine the values for the services supplied in different countries, SELLER must consider the "Region Adjustment Factor" indicated on EXHIBIT II-B and item 6.5 bellow.

1.4. According to the FPSOs schedules, the Services may be required to be performed during night periods and/or weekends.

1.5. Capitalized terms used but not defined in this Exhibit I shall have the meanings provided in the Agreement.

## 2. PETROBRAS RESPONSIBILITY

2.1. PETROBRAS shall be responsible for providing documents and appropriate information related to the FPSO project, as set forth in the Agreement.

2.2. PETROBRAS shall provide to CONTRACTOR the relevant access to Project EDM system (Electronic Document Management), for the CONTRACTOR obtain the necessary documents to perform the Services.

2.3. PETROBRAS shall be responsible for supervising the Services, as set forth in the Agreement.

2.4. PETROBRAS shall grant access to employees or other personnel engaged by CONTRACTOR at the Sites where the Services shall be performed.

2.5. PETROBRAS shall provide workstations at each Site to be used by employees or other CONTRACTOR Group personnel performing the services at such Site, including chairs, desks and internet access (Wi-Fi). PETROBRAS shall not be responsible for supplying computers or other computing equipment, the CONTRACTOR shall furnish it pursuant to Section 4.1 below.

2.6. Any other service or resource not clearly stated as falling under PETROBRAS responsibility for supply shall be provided by CONTRACTOR.

## 3. CONTRACTOR SCOPE OF WORK

### 3.1. GENERAL REQUIREMENTS

3.1.1. CONTRACTOR must bear and provide all necessary means for its employees and any personnel of the CONTRACTOR Group, related to travel, air and/or ground transportation, work visas, transportation to and from sites, proper accommodations, meals, health, safety and environment ("HSE") personnel protective equipment ("PPE") in accordance with Section 3.1.13 below, such as uniforms, medical and health insurance, computers or notebooks and any other device or tool or any resource required to perform the activities described herein (Scope of Work).

3.1.2. Health exams, training and compliance with Site access requirements: CONTRACTOR shall comply with all access, HSE requirements, and Applicable Laws at the Site(s), and present all necessary documents requested by any authority responsible for granting access to work at the Site(s). CONTRACTOR shall be responsible for bearing all costs related to the fulfillment of any of the foregoing Site requirements to all its personnel.

3.1.3. CONTRACTOR shall comply with any special health requirements for prevention of contagious diseases, including COVID-19. If required under special health provisions, CONTRACTOR shall be expected to undertake and supervise quarantine periods for personnel, carry out RT-PCR and/or serologic testing, and comply with any other health recommendations from local or international authorities.

3.1.4. The professionals engaged to perform the services by or on behalf of CONTRACTOR should preferably be resident near the designated location and/or be available for immediate mobilization, according to deadlines defined below at item 3.1.5, due to government restrictions on the entry of foreigners.

3.1.5. Upon written request by PETROBRAS, CONTRACTOR shall submit within five (5) business days following receipt of such request, one (1) resume previously analyzed and selected by CONTRACTOR, according to the requirements defined on item 5 of this Exhibit. The request will indicate the professional profile required, the location of the mobilization and the expected duration. The expected duration shall not be considered binding by the Parties.

3.1.5.1 The resume shall be presented in English language. Complementary documents such as certificates, diplomas, and other probe documentation may be accepted in their native language, however and upon PETROBRAS requests, they may be subjected to additional clarifications.

3.1.5.2 CONTRACTOR is responsible for the complete process of professionals' selection including resumes analysis, document verification, interviews, and other good practices of human resources selection process. PETROBRAS may not validate the indicated professional if any qualification requirement is not attended.

3.1.5.3 If PETROBRAS considers necessary, any additional document, information, or clarification regarding the professional selected by CONTRACTOR shall be promptly presented, guarantying that the mobilization plan will be attended. In case it is identified that the candidate does not comply with the requirements, CONTRACTOR shall present in 02 (two) Business Days the professional (candidate) classified on the 2nd place of its selection process for PETROBRAS evaluation, to fulfill with the contractual requirements.

3.1.5.4 CONTRACTOR shall mobilize its professionals within ten (10) business days following receipt of PETROBRAS validation of such resume

3.1.6. CONTRACTOR shall preferably rely on the same professional throughout the entire duration of each mobilization. Substitutions will be allowed only in exceptional cases, and then only upon request to, and with the prior written agreement of PETROBRAS.

3.1.6.1. As per item 3.1.5, PETROBRAS will indicate for each mobilization its expected duration. This expected duration is only a preliminary estimate and may be revised by PETROBRAS at any moment. Petrobras shall inform the Contractor of demobilization at least 30 days in advance.

3.1.7. Employment of Personnel. In connection with its performance under this Agreement neither CONTRACTOR nor any member of CONTRACTOR Group shall employ or contract with any unfit Person or anyone not skilled in the work assigned to such Person.

3.1.8. Substitution: CONTRACTOR shall promptly remove from the Site(s) where the Works are being carried out any Person who does not meet the foregoing requirements or who obstructs or is disruptive to the Works, or whose presence at the Site(s), under justified reason, is not necessary. In addition, CONTRACTOR agrees that within twenty-four (24) hours after receipt of written notice from PETROBRAS, it will remove from the Works and the Site(s) any employee or agent of CONTRACTOR, who in PETROBRAS opinion, is interrupting, interfering or impeding the timely and proper completion of the Works. PETROBRAS reserves the right to request, at its sole discretion, the substitution of any professional engaged to perform the Works by or on behalf of CONTRACTOR and CONTRACTOR shall comply with the request and shall mobilize new professionals suited to the demand, in accordance with the mobilization forecasts already set out in this Exhibit I.

3.1.9. CONTRACTOR shall issue Monthly Control Reports detailing all activities performed for each professional, as any other information reasonably requested by PETROBRAS in respect of the services and Contract performance during that period. PETROBRAS shall provide its requirements as to the format and content of each monthly report to the CONTRACTOR within thirty (30) days following the Effective Date. CONTRACTOR may propose such reasonable modifications to the format and content of the report as it considers appropriate, and any modifications agreed between the Parties shall be incorporated by CONTRACTOR into its subsequent monthly reports.

3.1.10. The macro schedule, containing the major milestones and an overall plan of the Purchase and Sale Agreement for the supply of FPSO to PETROBRAS (“FPSO PSA”), and in respect of which the Works under this Agreement are to be performed, will be furnished to CONTRACTOR by PETROBRAS at the beginning of this Agreement. The term and planning for this Agreement is independent from the FPSO PSA.

3.1.11. Before any mobilization requested by PETROBRAS, specific meetings may be arranged between CONTRACTOR's designated professionals and PETROBRAS to discuss and highlight important technical issues to be observed by CONTRACTOR's professionals. PETROBRAS may also request the participation of the CONTRACTOR's designated professional in other meetings to discuss issues regarding services in progress or already completed. These meetings may also involve the participation of Manufacturers and FPSO Seller representatives.

3.1.12. CONTRACTOR must foresee resources for internet live transmission, with at least 4G cellphone data plans, to PETROBRAS of inspected services in factory or at construction site, will be accepted any device capable of make live transmission with enough quality to supervise the activity previously approved by PETROBRAS. The resource must consider safety requirements for its professional (operator), granting proper movement and both hands free, such as chest or head camera straps. The live transmission must be agreed with PETROBRAS and shall use common applications such as MS Teams or Zoom. The live transmissions will be requested eventually by PETROBRAS and is part of the scope of work.

3.1.13. CONTRACTOR must provide the suitable PPEs for its personnel when the mobilization occurs to the FPSO construction and assembly Sites.

According to IOGP Report 577

"Personal Protective Equipment is specified for all work activities based on the risk assessment.

Based on typical construction activities the basic Personal Protective Equipment in the work areas is:

•hard hat

•safety-toed shoes

•safety glasses

•gloves

•hearing protection (ear plugs and/or ear covers)

•long sleeves and trousers or coveralls.

Additional Personal Protective Equipment use is based on risk.

A risk assessment is completed to identify Personal Protective Equipment needs based on the site conditions and the scope of work. Where job conditions change, Personal Protective Equipment selection is reviewed to ensure it is still valid.

Specialty Personal Protective Equipment (e.g. flame resistant clothing, fall protection, goggles, face shields, specialty gloves, respiratory protection, personal floatation devices) is specified by procedure and work activity or work area.

Areas where specialized Personal Protective Equipment is required (e.g. high noise, radiation, chemical storage areas, hydrocarbon process areas) are marked with prominent signage, universal symbols or language of the workforce to ensure that personnel are aware of the additional hazards and requirements for Personal Protective Equipment."

These PPE must comply with the legal requirements of the countries where the services are performed, with the developed activities, and any specific requirements of the local shipyard, factory, or site.

CONTRACTOR shall nominate a focal point at each site to be responsible for all relevant daily communications with PETROBRAS and there is no restriction that this person to be part of execution team.

## 3.2. SUPPORT SERVICES

3.2.1. Support Services consist of day-to-day activities, which will be developed to supporting PETROBRAS team at FPSO Project, supervising construction and assembly routines; schedules' follow up and control for the construction, erection, integration and commissioning activities; analysis, monitoring and control of the detailed design and equipment procurement process; analysis and checking out the overall quality of every step/period of the Project; supervising the requirements and performance of HSE at the Construction and Integration Sites; supervision of inspection services; as well as reports, spreadsheets and other project documents analysis and elaboration, and other similar activities related to management of FPSOs projects. The performance of the Services shall comply with, but not limited to:

3.2.1.1. Classification Society rules and applicable international rules, regulations, standards and industry good practices;

3.2.1.2. FPSO PSA documents and requirements, including standard specifications, plans, and special provisions, to be delivered to CONTRACTOR, according to item 2.1.1; and

3.2.1.3. Quality requirements such as work methods and instructions, welding procedures, qualification of workers, non-destructive tests, water-tightness tests, etc.

3.2.2. In performing the services, CONTRACTOR shall:

3.2.2.1. Analyze and follow-up on the Project activities schedule and identify and raise with PETROBRAS team any issues related to risk or delay of physical progress of the project;

3.2.2.2. Prepare and issue to PETROBRAS Monthly Control Reports, in accordance with Section 3.1.9 above, and Specific Technical Reports, when requested by PETROBRAS; and

3.2.2.3. Monitor shipyards or construction Sites, checking and alerting PETROBRAS' team on any HSE or labor issues.

## 4. FACILITIES AND SERVICES

4.1. All direct and indirect costs for providing all facilities and services, including costs associated with CONTRACTOR's acquisition of devices and tools, including notebooks, mobile network services, and others, for use in the performance of the Works, shall be included in each Unit Rate, and shall fall under CONTRACTOR's responsibility, unless expressly indicated otherwise.

4.2. Upon completion of the Works, CONTRACTOR shall return all facilities and Equipment provided by PETROBRAS during the performance of the Works, except for laptops, software licenses, cellular phones, consumables, disposables, or other items acquired by CONTRACTOR for use in the performance of the Works and the cost of which has been included in CONTRACTOR's Unit Rates.

## 5. PERSONNEL QUALIFICATION

5.1. CONTRACTOR shall deploy skilled professionals for the specifics of the planned activities at the Site(s), with the minimum qualification and education background as noted:

- PLANNING AND CONTROL ENGINEER: major in engineering required;
- INSTRUMENTATION, TELECOM AND AUTOMATION ENGINEER: major in Electronic/Automation engineering required;
- ELECTRICAL AND NR-10 ENGINEER: major in Electrical engineering required;
- MECHANICAL, TURBOMACHINERY, PIPING, HVAC AND NR-13 ENGINEER: major in Mechanical engineering required;
- NAVAL STRUCTURES AND NAVAL SYSTEMS ENGINEER: major in Naval engineering required;
- QUALITY ENGINEER: major in engineering required;
- COMISSIONING ENGINEER: major in engineering required
- ERGONOMICS, PROCESS SAFETY AND HUMAN FACTORS ENGINEERING SPECIALIST: major in Architecture, Engineering, or related formations with postgraduate in Ergonomics and/or Human Factors Engineering.
- PROCESS ENGINEER: major in engineering required
- DIGITAL ENGINEER: major in engineering required

5.1.1. CONTRACTOR shall deploy professionals with different skills and background experience depending on the stage of projects. The requirements for each professional profile are set forth hereinafter and grouped into "Engineering Design" and "Field Services".

5.1.2. The professional qualifications required by PETROBRAS for the performance of the services shall be as per the following criteria:

- Professional shall preferably be fluent in spoken and written local language and be able to successfully communicate in spoken and written English.
- Able to use successfully basic software such as Microsoft Power Point, Word and Excel, to document activities, and communication softwares such as Microsoft Outlook and Teams.
- General understanding of offshore/marine construction and interaction between the various activity categories such as structural, piping, painting, etc.
- Engineer shall be formally graduated and with more than five (5) years of work experience in the Oil and Gas or similar industries, preferably in FPSO projects, and with upgrades achieved through various continuing educational training or Professional Qualification, and capable of successfully performing his/her duties with minimal supervision.

5.1.3. Personnel must be physically and psychologically fit, able to perform the services in a Shipyard environment, including, but not limited to confined spaces and/or locations at height. Medical confirmation of such capability shall be presented and updated from time to time. Exceptions to this requirement shall be submitted for PETROBRAS approval specially when professionals are to be deployed exclusively for Engineering Design.

5.1.4. Personnel Qualification: CONTRACTOR shall comply with the qualifications below for each mobilization, with the following being considered minimum requirements:

5.1.4.1. **PLANNING AND CONTROL ENGINEER** - Minimum work experience as follows:

- 5 (five) years experience in similar services in the Oil and Gas industry;
- Expert understanding of planning software Primavera P6;
- Expert understanding of project management parameters such as WBS, Risk, Project Schedule, and others within the PMBOK area of knowledge;
- Execution of daily reports and activities controls;
- Expert understanding of Key Performance Indicators (KPIs);
- Advanced use of basic software such as Power Point, Word and Excel;
- Experience in FPSO project planning (Hull and/or Topside Modules Construction also Commissioning planning);
- Desirable basic knowledge of MS Power BI.

5.1.4.2. **INSTRUMENTATION, TELECOM AND AUTOMATION ENGINEER** - Minimum work experience as follows:

- 5 (five) years experience in similar services as Instrumentation, Telecommunications or Automation engineer or similar in the Oil and Gas industry;

- Knowledge of applicable codes and standards, such as CS Rules, ISA etc.

5.1.4.2.1. Engineering Design specific requirements

- Expert understanding of instrumentation detailed engineering design process and documents such as interconnection diagrams, loop diagrams, instrument data sheets, valve sizing and other instrumentation criteria, including hazardous areas requirements;

- Expert understanding of automation detailed engineering design process and documents such as cause and effect matrix, automation architecture, network diagrams, automation software specification, automation systems' interfaces, field panel design requirements;

- Expert understanding of telecom detailed engineering design process and documents such as interconnection diagrams, network diagrams and telecom systems specifications and requirements;

- Expert understanding of Automation, Instrumentation and Telecom equipment and material procurement requirements and sizing;

- Expert understanding of the interfaces among Instrumentation, Telecom and Automation and the other disciplines of the Engineering design such as Process, Electrical, Mechanical etc.;

- Experience in FPSO detailed engineering design.

5.1.4.2.2. Field Services specific requirements

- Reading/Interpretation of schematic drawings, arrangements, layouts, P&I drawings, data sheets and specifications;

- Experience in services of preservation, calibrating, assembling, tests and commissioning of field instrumentation (electronic transmitters, control valves, pneumatic actuators, etc.) for offshore/marine units;

- Knowledge in control systems (PLC and DCS) functional and field testing, including Safety, and Fire& Gas systems; Industrial Ethernet network; HMI Server; Ladder logic;

- Expert understanding of equipment/material application in hazardous areas;

- Expert understanding of factory test of the Instrumentation, Telecommunications and Automation equipment.

5.1.4.2.3. Package Engineering specific requirements

- Expert evaluating equipment technical proposals and adherence to contractual requirements;
- Desirable familiarity with procurement processes, including vendor selection, evaluation, and management;
- Ability to identify and address issues that may arise during the procurement and construction phases, and to implement effective solutions;
- Ability to work effectively in a multidisciplinary team environment, coordinating with various departments like planning, engineering, procurement, construction and commissioning;
- Advanced use of basic software such as Power Point, Word and Excel;
- Desirable basic knowledge of MS Power BI.

5.1.4.3. **ELECTRICAL AND NR-10 ENGINEER** - Minimum work experience as follows:

- 5 (five) years experience in similar services as Electrical engineer or similar in the Oil and Gas industry;
- Execution of daily reports and activities controls;
- Knowledge of Applicable Codes and Standards, such as CS Rules, IEC etc.

5.1.4.3.1. Engineering Design specific requirements

- Expert understanding of electrical detailed engineering design process and documents such as one-line, multiline, functional, logical and interconnection diagrams;
- Expert understanding of Electrical studies such as Load Flow, Short-circuit, Harmonic Analysis, Electromagnetic Transient etc. and their results application in the design;
- Expert understanding of Hazardous area and IEC 60079;
- Expert understanding of IED network and Electrical automation systems;
- Expert understanding of Electrical equipment and material procurement requirements and sizing;
- Expert understanding of the interfaces among Electrical and the other disciplines of the Engineering design such as Process, Automation, Mechanical, etc.;
- Experience in FPSO detailed engineering design.

5.1.4.3.2. Field Services specific requirements

- Experience in services of assembly, preservation, commissioning and pre-operation in complex electrical systems for offshore/marine units;
- Reading/Interpreting of single-line diagrams, arrangements, layouts, power and grounding drawings, lighting drawings, control diagrams and specifications;
- Knowledge in complex electrical system; safety regulations; PMS (Power manager system); electrical motors; VFD; UPS systems;
- Expert understanding of equipment/material application in hazardous areas;
- Expert understanding of installation and commissioning of the electrical equipment, including equipment/material incoming inspection.

5.1.4.3.3. NR-10 specific requirements

- IEC 60079-14, 60079-14 and 60079-19 specialization desirable;
- Expert understanding of Brazilian regulatory standard NR-10 (Safety in Electrical Installations and services).

5.1.4.3.4. Package Engineering specific requirements

- Expert evaluating equipment technical proposals and adherence to contractual requirements;
- Desirable familiarity with procurement processes, including vendor selection, evaluation, and management;
- Ability to identify and address issues that may arise during the procurement and construction phases, and to implement effective solutions;
- Ability to work effectively in a multidisciplinary team environment, coordinating with various departments like planning, engineering, procurement, construction and commissioning;
- Advanced use of basic software such as Power Point, Word and Excel;
- Desirable basic knowledge of MS Power BI.

5.1.4.4. **Note on 5.1.4.2 and 5.1.4.3 Consolidate Roles**:

- For simplifying the Price Schedule, the roles INSTRUMENTATION, TELECOM AND AUTOMATION ENGINEER and ELECTRICAL AND NR-10 ENGINEER have been grouped under one consolidated entry in the Price Schedule. Each role shall maintain its specific responsibilities, qualifications, and requirements as described in this Scope of Work. Payment will be made according to the consolidated entry in the Price Schedule, regardless of which specialty is performed.

5.1.4.5. **MECHANICAL, TURBOMACHINERY, PIPING, HVAC AND NR-13 ENGINEER** - Minimum work experience as follows:

- 5 (five) years experience in similar services as Mechanical engineer or similar in the Oil and Gas industry;
- Execution of daily reports and activities controls;
- Knowledge of Applicable Codes and Standards, such as CS Rules, ASME etc.

5.1.4.5.1. Engineering Design specific requirements

- Expert understanding of Mechanical detailed engineering design process and documents such as piping specifications, pipe stress analysis, line lists, piping isometrics, piping plans etc.;
- Knowledge in 3D modeling for detailed engineering documents;
- Expert understanding of standards and specifications for rotating equipment such as gas motocompressors, gas turbocompressors, turbogenerators, centrifugal pumps, riser pipe sea water lift pumps etc;
- Expert understanding of auxiliary systems' design for rotating equipment;
- Expert understanding of piping standards and specifications and piping material procurement;
- Expert understanding of pressure vessels and heat exchangers requirements and standards, as well as applicable calculation memories;
- Expert understanding of Mechanical equipment and material procurement requirements and sizing;
- Expert understanding of HVAC equipment and material procurement requirements and sizing;
- Expert understanding of the interfaces among Mechanical, Rotating Equipment, HVAC and the other disciplines of the Engineering design such as Process, Structure etc.;
- Experience in FPSO detailed engineering design.

5.1.4.5.2. Field Services specific requirements

- Experience in service of preservation, assembly, tests, commissioning and pre-operation of turbomachine, static and rotating mechanical equipment for offshore/marine units;
- Expert understanding of fabrication and assembly of static (pressure vessel, heat exchange), rotating (pumps, air compressor, hydraulic unit) and

turbomachinery (gas turbine, gas compressors, Water Injection pump, lift pumps, etc.) equipment and valves;

- Expert understanding of piping fabrication, assembly and test;
- Reading/Interpretation of diagrams, arrangements, layouts, mechanical drawings and designs, and specifications;
- Expert understanding installation and commissioning of the static, rotating and turbomachinery equipment, including equipment/material incoming inspection.

5.1.4.5.3. Package Engineering specific requirements

- Expert evaluating equipment technical proposals and adherence to contractual requirements;
- Desirable familiarity with procurement processes, including vendor selection, evaluation, and management;
- Ability to identify and address issues that may arise during the procurement and construction phases, and to implement effective solutions;
- Ability to work effectively in a multidisciplinary team environment, coordinating with various departments like planning, engineering, procurement, construction and commissioning;
- Advanced use of basic software such as Power Point, Word and Excel;
- Desirable basic knowledge of MS Power BI.

5.1.4.5.4. NR-13 specific requirements

- Knowledge of Applicable Codes and Standards, such as CS Rules, ASME etc.
- Expert understanding of pressure vessels and heat exchangers requirements and standards, as well as applicable calculation memories;
- Expert understanding of documentation for NR-13 compliance, such as NR-13 Dossier, Safety Record Book, etc
- Expert understanding of Mechanical detailed engineering design process and documents such as piping specifications, pipe stress analysis, line lists, piping isometrics, piping plans etc.;
- Knowledge in 3D modeling for detailed engineering documents;
- Expert understanding of piping standards and specifications and piping material procurement;

- Expert understanding of Mechanical equipment and material procurement requirements and sizing;
- Expert understanding of the interfaces among Mechanical and the other disciplines of the Engineering design such as Process, Structure etc.;
- Experience in FPSO detailed engineering design.

5.1.4.6. **NAVAL STRUCTURES AND NAVAL SYSTEMS ENGINEER** - Minimum work experience as follows:

- 5 (five) years' experience in similar services as Naval engineer or similar in the Oil and Gas or Naval industry;
- Execution of daily reports and activities controls;
- Knowledge of Applicable Codes and Standards, such as CS Rules, ASTM etc.

5.1.4.6.1. Engineering Design specific requirements

- Expert understanding of Naval Architecture standards and specifications;
- Expert understanding of Naval Architecture detailed engineering design process and documents such as Capacities Plan, Freeboard Plan and Calculation, Trim and Stability analysis, Motion Analysis etc.;
- Expert understanding of standards and specifications for Naval Systems such as Mooring, Offloading, Inert Gas Generator, Ballast pump, Cargo pumps, Riser Pull in etc;
- Experience in interfaces and requirements by Classification Societies and Marine Warranty Surveyors for procedures and test such as inclining tests, stability analysis for lifting operations, towing operations etc..
- Expert understanding of Naval equipment and material procurement requirements and sizing;
- Expert understanding of the interfaces among Naval and the other disciplines of the Engineering design such as Process, Safety, Structure etc.;
- Experience in FPSO detailed engineering design.

5.1.4.6.2. Field Services specific requirements

- Knowledge in naval and offshore structure construction and erection at shipyard. In compliance with Classification society, Flag and Port State;
- Expert understanding of installation, assembly and commissioning of marine hull system such as Mooring, Offloading, Gas Inert Generator, Ballast pump, Cargo pumps, Pull in, etc.;

- Reading/Interpretation of diagrams, arrangements, layouts, structural drawings and designs, and specifications.

5.1.4.7. **QUALITY ENGINEER** - Minimum work experience as follows:

- 5 (five) years experience in similar services in the Oil and Gas industry;
- Experience with ISO-9001 2015 (Quality System Audit Certification) desirable
- Expert understanding of inspection and audit in welding, NDE tests, including dimensional inspection, and related execution procedures;
- Expert understanding of inspection and audit documentation process, data-books, checking documents content, approval and workflow, in physical or in digital way;
- Expert understanding of inspection and audit the Classification Society Rules;
- Expert understanding of inspection and audit to complying requirements to fabrication, assembly and test of equipment;
- Knowledge in inspection and audit in the painting, metallizing and coating process.

5.1.4.8. **COMISSIONING ENGINEER** - Minimum work experience as follows:

- 5 (five) years experience in similar services in Oil and Gas plant commissioning, upstream or downstream;
- Expert understanding of inspection and audit in services of preservation, pre-commissioning, commissioning and pre-operation;
- Reading/Interpreting of P&ID, P&FD, logical diagrams, layouts, drawings and commissioning manuals;
- Expert understanding of inspection and audit in commissioning data-books, checking documents content, approval and workflow, in physical or in digital way;
- Experience in analyzing commissioning KPIs, curves, controls, and data bank. The professional must be able to execute crosscheck between data bank and controls;
- Multidisciplinary capability of perform the system´s commissioning, with an integrated understanding of instrument loops, electrical circuits, automation, static and dynamic equipment and process in oil and gas plants;
- Experience in operate commissioning management tool (FIC) or similar system.

5.1.4.9. **ERGONOMIC, PROCESS SAFETY AND HUMAN FACTORS ENGINEERING SPECIALIST** – Minimum work experience as follows:

- 5 (five) years experience in application of HFE within high-hazard industries, including at least two years experience in the energy sector;
- Execution of daily reports and activities controls;
- Desirable knowledge and ability to lead discussions between disciplines, monitoring and controlling all the points raised and their interfaces, implementing the necessary and validated changes, with due traceability throughout the process.
- Knowledge of Applicable Codes and Standards, such as CS Rules, ABS Ergonomics and ASTM F1166 and IOGP 454, among others. Knowledge in Brazilian Regulation as NR-17, NR-37 and ANP SGSO are also desirable.

5.1.4.9.1. Engineering Design specific requirements:

- Ability to support identification, tracking and resolution of HFE issues;
- Ability to manage the identification, tracking and resolution of HFE issues;
- Ability to manage HFE activities throughout the project in accordance with the HFE plan, including the monitoring of progress against project programmed and defined milestones;
- Experience in manage close out of recommendations from VCA (valve criticality analysis), TRA (task requirements analysis); Vendor Package Screening and Review (VPAR); Control Room Analysis (CRAR); HMI Analysis and Review (HMIAR), Alarm System Analysis and Review ( AAR) and Design Reviews ( DR’s);
- Knowledge about human reliability analysis (HRA);
- Knowledge about risk studies (HAZOP and APR);
- Experience in FPSO detailed engineering design;
- Expert understanding of the interfaces among Ergonomics/HFE and the other disciplines of the Engineering design such as Process, Automation, Mechanical, etc.;

5.1.4.9.2. Field Services specific requirements

- Experience in manage HFE activities throughout the construction in accordance with the HFE plan, including the monitoring of progress against project programmed and defined milestones;
- Experience in manage close-out of ergonomics recommendations in field with proper evidence, when applicable.

- DIGITAL ENGINEER – Minimum work experience as follows: Five or more years experience in application of DIGITAL ENGINEER within high-hazard industries;

- Execution of daily reports and activities controls;

- Knowledge and experience in data science at least POWER BI, SQL, Python, SPPID, skilled in computing 3D modeling and Electronic Document Management (EDM).

5.1.4.9.3. Engineering Design specific requirements:

- Ability to support identification, tracking and resolution of DIGITAL ENGINEER issues;

- Ability to manage the identification, tracking and resolution of DIGITAL ENGINEER issues;

- Ability to manage DIGITAL ENGINEER activities throughout the project in accordance with the DIGITAL ENGINEER plan, including the monitoring of progress against project programmed and defined milestones;

- Experience in FPSO detailed engineering design;

- Expert understanding of the interfaces among DIGITAL ENGINEER and the other disciplines of the Engineering design such as Process, Automation, Mechanical, etc.;

5.1.4.10. **PROCESS ENGINEER** – Minimum work experience as follows:

- 5 (five)years experience in application processing in FPSO process plant or ten years refinery plant for oil and gas

- Execution of daily reports and activities controls;

- Knowledge of Applicable Codes and Standards.

- Experience in process simulator, which can be Hysys or Unisim

5.1.4.10.1. Engineering Design specific requirements:

- Ability to support identification, tracking and resolution instrumentation and process plant using process simulator, which can be Hysys or Unisim;

- Knowledge and experience in Aspen Flarenet or similar, Smart Plant PI&D, Navisworks and Pipenet

- Ability to manage the identification, tracking and resolution of Process issues as a minimal Drainage System Sizing Calculation, Relief and blow down Calculations, Utility Consumption Calculation, Settle-out and anti-surge gas systems Calculation; Mass, Energy, and Hydraulic balances calculation and analysis, Feasibility study and performance improvement of process plants,

Preparation of P&IDs and Data Sheets, Design calculations (lines, safety valves, process properties), Interpretations of P&IDs and PFDs, Preparation of Cause and Effect Matrix; ;

- Ability to manage Process activities throughout the project in accordance with the Process plan, including the monitoring of progress against project programmed and defined milestones;
- Experience in manage close out of recommendations from VCA (valve criticality analysis), TRA (task requirements analysis) Vendor Package and recommendation from safety studies.
- Knowledge about risk studies (HAZOP and APR);
- Experience in FPSO detailed engineering design;
- Expert understanding of the interfaces among Process the other disciplines of the Engineering design such as, Instrumentation, HVAC, Automation, Mechanical, etc.;

5.1.4.11. **Note on 5.1.4.9 and 5.1.4.10 Consolidate Roles**:

- For simplifying the Price Schedule, the roles ERGONOMIC, PROCESS SAFETY AND HUMAN FACTORS ENGINEERING SPECIALIST and PROCESS ENGINEER have been grouped under one consolidated entry in the Price Schedule. Each role shall maintain its specific responsibilities, qualifications, and requirements as described in this Scope of Work. Payment will be made according to the consolidated entry in the Price Schedule, regardless of which specialty is performed.

5.1.4.12. **DIGITAL ENGINEER** – Minimum work experience as follows:

- Five or more years of experience in the application of DIGITAL ENGINEERING in high-risk industries.
- Execution of daily reports and activity controls.
- Knowledge and experience in data science at least POWER BI, SQL, Python.
- Skill in 3D computer modelling and Electronic Document Management (EDM).
- Desirable knowledge in Autodesk Navisworks, Aveva Marine and Smart 3D tools.

## 6. PAYMENT AND MEASUREMENT CRITERIA

6.1. All payments will be governed by Article 8 of the Agreement.

6.2. CONTRACTOR shall provide to PETROBRAS until 15th day of each month, all Unit Rate calculations, Monthly Control Report and Specific Technical Reports, timesheets, and such other documentation as PETROBRAS may reasonably request to evidence the services provided in the period between the 11th day of the previous month and the 10th day of the current month. All documents presented as evidence of the services provided during such period shall be signed by PETROBRAS Contract Supervisor(s), confirming the service acceptance, if approved. CONTRACTOR's failure to provide satisfactory evidence of the services provided, including the presentation of documents containing materially incorrect or incomplete information or which have not been signed by PETROBRAS Contract Supervisor(s), shall result in the rejection of CONTRACTOR's Invoice for such services.

6.3. Measurement will be calculated as per worked man/day at each engineering office, construction shipyard or other Site. CONTRACTOR shall present a monthly timesheet for each professional detailing all Days worked during that period.

For the avoidance of doubt, the measurement reports with detailed activities shall not be a substitute in any way for the specific technical reports agreed by the Parties.

6.4. All reports and timesheets must be summarized in one Measurement Report (MR), consolidating all Unit Rate calculation records in accordance with Exhibit II – Price Schedule.

6.5. The Services will be measured considering the Unit Rates set forth in Exhibit II and the Region Adjustment Factor (CF) defined at Exhibit II-B.

The number of daily quantities, duly approved by PETROBRAS, shall be multiplied by the Region Adjustment Factor (CF) according to the specific country where the services were performed. The Unit Rates shall not be adjusted by this Region Adjustment Factor in any way.