**EXHIBIT VIII**

**DIRECTIVES FOR COMMISSIONING PROCESS**

**FPSO PETROBRAS 91 (P-91)**

 **\*\*\*\*\*\*\*\*\*\*\*\*Revision Control\*\*\*\*\*\*\*\*\*\*\*\*\***

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**SUMMARY**

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1. OBJECTIVES
	1. To define the scope of Commissioning services for the object of this Agreement.
	2. To define the requirements to be followed and the results to be achieved by Seller and its Subcontractors in the execution of Commissioning services.
	3. **General**
		1. The main target of the Commissioning process, as described in this Exhibit, is to achieve the full operational condition of all systems of the Unit prior to Sail Away, as much as technically possible, and reach full operation condition at offshore phase.
		2. Seller shall convey to its suppliers, Subcontractors and engineering partners, all requirements stablished in these directives, as well as enforce full compliance with it, being responsible for its accomplishment.
		3. The Unit shall be commissioned, tested, started-up and transferred to Operation Contract Team partially and sequentially. For this purpose, Seller shall consolidate the Operational System list and elaborate subsystem list and the Precedence Network, indicating the startup sequence that shall be followed and incorporated at the overall schedule. In order to have all complete information prior to system/subsystem transfer, all lists, spread sheets and controls shall contain subsystem number.
		4. Buyer, at its discretion, will witness tests on the Sites, inspect materials and equipment and follow up any other phase of Seller's Scope of Supply, whenever it deems necessary, upon prior notice to Seller.
		5. Seller shall perform the commissioning services considering the stages of the planning, preparation, execution and transfer of the operating systems. These services shall be fully integrated with acquisitions, engineering design and fabrication of the Unit.
		6. All system Performance Tests shall consider the situation as close to the operating condition as possible, regarding to the fluids and design parameters. The Performance Tests, special tests included, shall be planned and prepared by Seller, who shall provide all the facilities, Vendor’s support and temporary supplies required for its full execution.
		7. All Performance Tests for systems/subsystems shall encompass the requirements stated in the Appendix 1.
		8. Seller shall deliver to Buyer all required documents on this Exhibit as per Exhibit III – Directives for Product Development.
2. COMMISSIONING PROCESS TERMS AND DEFINITIONS

“Area/Compartment Completion”: Check list with items related to design documents and field inspection that defines the area readiness which complies with, but not limited to:

* Painting;
* Insulation;
* Fire protection materials (passive protection, MCT’s - Multi Cable Transit, etc.);
* Furnishings;
* Maintenance and operations facilities;
* Outfitting installations;
* Arrangement of lighting fixtures;
* Ventilation and Air Conditioning systems;
* Clashes;
* Drainage system;
* Safety plan devices and arrangements;
* Equipment preservation;
* Fire & Gas detection system;
* Fire & Gas fighting system.

“Assisted Operation”: A set of activities including troubleshooting support and Vendor technical assistance provided by Seller to Operation Contact during a period subsequent to:

* System/subsystem start of offshore operation in real condition.

“Cause and Effects Matrix”:List of all interlock tests, divided by subsystem.

“Certification Test”:Any test applied to a Commissionable Item or control loop during the Mechanical Completion Phase in order to assure the assembly quality.

“Commissionable Item”:Any tagged instrument, equipment, accessory, piping test pack, area, control loop and automation function that can change any process or that will be subjected to a governmental or Classification Society inspection/requirement.

“Commissioning (Process)”:Structured set of knowledge, practices, procedures and skills applicable in an integrated way to an installation, aiming to make it operational within the desired performance requirements, with the main objective of certify the system operability according to the design conditions, its trustworthiness and the traceability of the information, as well as to permit the transference of the installation (systems) in an organized and safe way. The Commissioning Process shall take into account at least the following events:

* FAT (Factory Acceptance Test)
* Preservation plan and activities
* Mechanical Completion phase
* Mechanical Completion Certificate (MCC)
* Area/Compartment Completion
* Pre-Commissioning
* Training program
* Performance Test
* Preliminary Acceptance
* System Transfer Certificate.
* Assisted Operation
* Maintenance Plan
* Operation Plan

“Commissioning Management Plan”: shall have the meaning specified in section 3.1

“Commissioning Manual”:A set of documents establishing how the Commissioning Process should be planned, organized, coordinated, accomplished and controlled in a project. Once prepared by Seller, these documents will be the guidelines for the Commissioning Process and should be kept up to date regarding the conditions of the job to be performed.

“Commissioning Procedure”: Document issued by the Seller containing a detailed procedure to perform the Commissioning, by subsystem.

“Commissioning Spare Parts”:List of parts that will be required for the Pre-Commissioning, Commissioning, Start-up and endurance of the systems/subsystems.

“Control Loop Check List”:A form applicable for all commissionable loops used to manage Mechanical Completion and functional tests, where Commissioning activities are recorded.

“Critical Outstanding item”: any condition, under Buyer sole discretion, that may impose a risk for sail-away, manned voyage, mooring and pull-in hook-up operations, First Oil Start-up, Gas Injection, Flare-out and Reservoir Water Injection.

“FAT" or “Factory Acceptance Test”: Set of functional and Performance Tests to be executed in any equipment, electrical, instrumentation and telecommunications panels or any other Commissionable Item carried out on the Vendor factory or in specialized test facilities, in order to demonstrate its compliance with the Project specifications and allow its release to shipyard.

“Functional Test”:Set of tests in a system or subsystem to be executed during the Pre-operation & Start-up phase, beginning after the achievement of the Mechanical Completion and required to start applicable Performance Test.

“Flare out”:Term used in reference to the moment during normal operation that gas production is being injected into the wells and one Vapor Recovery Unit is operating continuously.

“Habitability Preliminary Acceptance”: Acceptance from Buyer that accommodation systems and subsystems were commissioned, and no Critical Outstanding items remain. Noncritical outstanding items shall be included in the Habitability Preliminary Acceptance Punch-list. Seller and Buyer shall jointly define the list of systems and subsystems scope of Habitability Preliminary Acceptance considering, at least, the following:

* Helideck;
* Sea water;
* Fresh water;
* Potable water;
* Fresh water maker;
* Hot water;
* Cooling water;
* Diesel;
* Compressed air;
* Start-up air;
* Normal electrical distribution;
* Normal lighting;
* Electrical hull generator;
* Essential electrical distribution;
* Essential lighting;
* Ventilation;
* Air conditioning;
* Electrical emergency generator;
* Electrical auxiliary generator;
* Emergency lighting;
* Telecommunication power;
* Direct current and ups;
* Emergency electrical distribution;
* Sewage;
* Drainage/slop (open drain);
* Firefighting water;
* Helideck Foam System;
* Active Fire Fighting Suppression System (Inergen, Novec if applicable, etc);
* Life saving;
* Telecommunication specialized;
* Telecommunication transmission;
* Closed-circuit television (CCTV);
* Operational radio;
* Telecommunication voice;
* Telecommunication data;
* Public address and general alarm (PAGA);
* Fire and gas detection;
* Automation / supervision and operation control;
* Automation network;
* Filling station;
* Galley;
* Hospital system;
* Radio room;
* Central control room & LER;
* Mechanical workshop/electrical workshop/welding workshop/paint store;
* Stores system;
* Laundry;
* Male and female change room;
* Cabins and accommodation deck system;
* Recreation rooms/gymnasium;
* Auditorium;
* Library.

“Habitability Preliminary Acceptance Certificate”: Document issued by Seller and approved by Buyer when Habitability Preliminary Acceptance is completed.

“Habitability Preliminary Acceptance Punch-list”: Noncritical outstanding items identified by Buyer from the inspection of systems and subsystems scope of Habitability Preliminary Acceptance. The due dates for each item shall be mutually agreed between Seller and Buyer. The Habitability Preliminary Acceptance Punch-list shall be attached to the Habitability Preliminary Acceptance Certificate.

“Hibernation”:Activities to be executed in a Commissioning item or installation due the decision of delay or interruption of its operation for a long term, with the goals of maintain the preservation conditions by means of use of preservation and corrosion control methods, avoid of contaminations, hazard reactions and damages.

“Item Check Sheet”: A form applicable for all Unit Commissionable Items where all Commissioning activities are recorded.

“Instrumentation Loop”:All of the hardware and software necessary to work together for the measurement, communication and/or control of a process variable.

“Mechanical Completion Phase”: Set of construction activities and Certification Tests (if applicable) necessary to achieve, Modules, Equipment, Integration and system/subsystem completion in accordance with Drawings, specifications, instructions, and applicable codes and regulations.

“Mechanical Completion Certificate” or “MCC”: Document issued when subsystem Mechanical Completion Phase is completed.

“Onshore Scope Preliminary Acceptance”: Buyer’s acceptance that all tests required by Buyer according to Appendix 1 and all audits and inspections set forth on item 6.1.2 of Exhibit IV (see Figure 1) have been successfully completed, without Critical Outstanding items. Buyer is hold point for the tests listed on Appendix 1 and all audits and inspections set forth on item 6.1.2 of Exhibit IV.

“Onshore Scope Preliminary Acceptance Certificate”: Document issued by Seller and approved by Buyer when Onshore Scope Preliminary Acceptance is completed.

“Onshore Scope Preliminary Acceptance Punch-list”: Noncritical outstanding items identified by Buyer from all tests required by Buyer according to Appendix I and all audits and inspections set forth on item 6.1.2 of Exhibit IV (see Figure 1). The due dates for each item shall be mutually agreed between Seller and Buyer. The Preliminary Acceptance Punch-list shall be attached to the Onshore Scope Preliminary Acceptance Certificate. Substantial Completion shall have the meaning specified in section 9.

“Operational System” or “SOP”: Integrated set of equipment, control loops, instruments and other properly associated facilities, capable to perform a productive function or support to the process whose operation produces or maintains a situation, process, utility and operational facility in a safe condition.

"Operational Subsystem” or “SSOP”: Part of an Operational System capable of performing a productive or process support function, the operation of which produces or maintains a specific operating condition, process, utility, or facility in a safe condition.

Performance Test: Tests with the objective of evaluating whether the system/subsystem is ready to initiate continuous operation and to operate with the definitive fluid. During the shipyard phase the test shall be conducted as close as possible to the operational condition using safe fluids and other methods where necessary, targeting to evaluate the operation of the subsystem aligns with the parameters specified in the performance test procedure.

Preservation Plan:Consists of a document that lists all preservation activities per Commissionable Item and presents all resources (material and workforce) that will be provided by Seller to execute the plan.

Preservation:Set of activities executed on Commissionable Items in order to keep them at same condition that they were received at field until the Handover of the Operational System.

Precedence Network of Systems and Subsystems (Precedence Network):Logic diagram that represents the Start-up sequence of Operational Systems/Subsystems of the Unit, according to its physical and functional dependencies network.

Pre-Operation & Start-Up:Set of field activities executed on Commissionable Item, subsystems and systems with the objective to take them from the Mechanical Completion to full operation. After the Pre-Commissioning phase activities and before full operation, some test must be performed with the equipment under real condition such as fluids and power. The main event in this phase is the Performance Tests of the systems/subsystems. Pre-Operation & Start-up phase is subdivided in Pre-Commissioning and Performance Tests.

Punch Item Impeditive (Type A):Nonconformity that impact the safe, compliance with legal or standards regulations or the reasonable sequence of Commissioning activities, acceptance test or system Start-up, or interferes with operability of a system or in its environment.

Punch Item Non-impeditive (Type B):Nonconformity that does not impact the safe and reasonable sequence of Commissioning activities, acceptance test and system Start-up and does not interfere with operability and its environment.

“Start-up”:Start-up is the activities carried out to commence the flow of hydrocarbons when all Commissioning is complete. Start-up is complete when the facilities have been proven and operate in accordance with the design.

“Substantial Completion Punch-list”: Prior to the issuance of the Substantial Completion Certificate for the Unit, in order to achieve Substantial Completion, Buyer and Seller shall inspect the Unit, following the scope of Substantial Completion set forth in the Agreement and related Exhibits, to identify the pending items to be completed. Seller shall promptly provide the Substantial Completion Punch-list to Buyer for approval. Buyer shall review the Substantial Completion Punch-list to ensure that it includes only items of a minor nature. The due dates for each item shall be mutually agreed between Seller and Buyer. Seller shall immediately initiate measures to complete or correct, as appropriate, any item Buyer required to be completed to ensure the proper operation of the Unit or protection of the Equipment or personnel safety. The failure to include any items on the Substantial Completion Punch-list shall not alter the responsibility of Seller to complete all Scope of Supply in accordance with the terms and provisions of this Agreement. The remaining open items from Habitability Preliminary Acceptance Punch-list and Onshore Scope Preliminary Acceptance Punch-list shall be consolidated into the Substantial Completion Punch-list. All activities on the Substantial Completion Punch-list shall be completed no later than the due dates previously agreed between the Parties. If Seller fails to complete such activities during such period of time, Buyer will have the right, but not the obligation, to complete such Substantial Completion Punch-list items at the expense of Seller.

System Transfer Certificate:Document issued by Seller, subscribed by Operation Contract representative and accepted by Buyer, attesting full functionality of an Operational Subsystem (SSOP). It formalizes the transference of the systems/subsystems to Operation Contract Team (see Figure 1). No punch item impeditive (Type A) shall remain for System/Subsystem Transfer.

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Figure 1 – Commissioning Process General Diagram – System View and Substantial Completion View

1. MINIMUM REQUIREMENTS FOR COMMISSIONING SERVICES
	1. **Commissioning Management Plan**
		1. Seller shall start the preparation of the Commissioning Management Plan after Agreement Effective Date.
		2. The plan details the methodology to analyze the project and implement actions that enhance their value.
		3. The Seller shall present the Commissioning Management Plan in four steps regarding the following minimum requirements (Table 1).

|  |  |  |  |
| --- | --- | --- | --- |
| **STEP** | **SCOPE** | **MINIMUM REQUIREMENTS** | **TIME** |
| 1 | Commissioning Manual  | Commissioning macro plan of full Project (Hull, Modules, Topsides Integration and offshore Commissioning) describing main Milestones, resources, documents package issuance and locations. | At least one hundred and eighty (180) days after the Agreement Effective Date |
| 2 | Hull Commissioning detailed plan  | Detailed executive planning of Hull Commissioning, listing all resources and activities used. | At least three hundred (300) days after the Agreement Effective Date  |
| 3 | Modules and Topsides Commissioning detailed plan  | Detailed executive planning of Modules and Topsides Commissioning, listing all resources and activities used  | At least three hundred (300) days after the Agreement Effective Date. |
| 4 | Offshore Commissioning detailed plan  | Detailed executive planning of offshore Commissioning, listing all resources and activities used.  | At least ninety (90) days before Sail Away. |

**Table 1: Requirements and timeline for planning steps**

* + 1. For each step, Seller shall issue the documentation and schedule a meeting to present all content. All steps shall be submitted to Buyer for information, however if Buyer finds any inconsistency in the presented documents, Buyer will inform Seller, that shall correct the plan and resubmit it within a period to be agreed between the parties
		2. **Commissioning Manual (Step 1)**
			1. The objective of this manual is to define the execution strategy for Commissioning services, presenting how the Commissioning Process will occur during the project, the responsibilities, engineering/construction interfaces, organization and the macro schedule.
			2. The Commissioning Manual shall include the following items, but not limited to:
		3. Detailed responsibility matrix for the Commissioning activities.
		4. Macro Commissioning time schedule containing at least: Main phases, steps and packages forecast.
		5. List of engineering documentation necessary for the Commissioning activities, including the required delivery dates.
		6. List of planning and control documentation necessary for the commissioning activities, including the required delivery dates.
		7. Commissioning team organization chart, for the various stages of the project.
		8. Commissioning Process histogram, including the various stages of the project.
		9. Procedure for punch list items control and clearance.
		10. Preliminary procedure of systems transfer for the Operation Contract Team.
		11. List of procedures to be issued with the respective delivered dates such as, but not limited to:

Instrument calibration procedure.

Piping cleaning methods and procedure.

Leakage test procedure.

Hydrostatic tests procedure.

Electrical Functional Tests procedure.

Mechanical Equipment tests procedure.

 NR-13 and SPIE (Serviço Próprio de Inspeção) inspection procedure.

Instrumentation loop tests procedure.

 NR-10 inspection procedure.

N2/He leak test procedure

Tubing leakage test procedure

* + 1. **Detailed executive plan (Steps 2 and 3)**
			1. Seller shall submit Commissioning documentation for Buyer information in three packages according to the deadlines set out in items below:

Note: Seller's corporate documents can be used in their entirety since these documents include the information requested and comply with requirements of the Agreement and other Exhibits.

* + - 1. **PACKAGE 1 (Full Project Commissioning engineering):** Three hundred (300) days after Agreement Effective Date, Seller is expected to present the following typical documents listed below, which shall be kept up to date. All lists below shall include system/subsystem information:
			2. Sets of Process Flow Diagrams (P&IDs), containing the identification of all systems and subsystems with the respective limits and interfaces;
			3. Operational Systems/Subsystems list;
			4. Detailed time schedule for Commissioning by Operational Systems/Subsystems, according to the Project Schedule and the sequence defined in the planning;
			5. Detailed Precedence Network, including subsystems;
			6. List of Commissionable Items;
			7. List for control loop, electrical, piping, automation, instrumentation and telecom possible to be issued in accordance with Project development;
			8. Receiving or arrival inspection procedure;
			9. Storage procedure;
			10. Preservation procedure;
			11. Hibernation procedure;
			12. List of all Equipment subject to NR-10 and NR-13 (NR-13 list shall include all pipelines applicable) requirements with the respective TAGs and categories, related to the respective systems and Subsystems;
			13. NR-13 inspection procedure;
			14. NR-10 inspection procedure;
			15. List of Equipment, installed in a classified area and those installed in the external area that are kept energized during ESD (Emergency Shutdown), containing all the information necessary to comply with current regulations;
			16. Instrument loop test procedure;
			17. Piping cleaning and testing procedures (shall be informed the method to be used in each kind of line);
			18. Leakage test procedure (shall be informed the method to be used in each kind of line);
			19. Hydrostatic tests procedure.
			20. Vendor Technical Support plan, with the identification of all equipment, manufacturers, contacts, qualification of manpower required for Commissioning activities, resources required and supplier visits calendar, in accordance with the Project Schedule.

**Note:** This package shall be detailed for Hull, Modules and Topsides Commissioning detailed plan, according to item 3.1.3.

* + - 1. **PACKAGE 2 (Mechanical Completion):** Up to 30 (thirty) Days prior to the date set forth in the Commissioning schedule for the commencement of the respective Pre-Commissioning activities, the following typical documents must be released for use (all lists shall include system/subsystem number):
			2. Factory Acceptance Test Equipment reports (this item shall be delivered 30 days after conclusion of FAT);
			3. Instrument and safety devices calibration certificates (this item can be delivered 30 days before Mechanical Completion);
			4. Brazilian regulatory standards Equipment inspection procedure;
			5. Electrical Equipment testing certification procedures;
			6. Procedures for cabling certification tests (power and control);
			7. Procedure for Mechanical Completion and Area/Compartment Completion inspection;
			8. Training plan, including programs and schedules;
			9. Operational and maintenance manuals;
			10. List of special tools and spare parts required to Pre-Commissioning and Commissioning;
			11. List of software and licenses of any electrical, automation or telecommunication system or Equipment.

Note: This package shall be detailed for Hull, Modules and Topsides Commissioning detailed plan, according to item 3.1.3.

* + - 1. **PACKAGE 3 (Pre-Operation & Start-up):** Up to 60 (sixty) Days prior to the date set forth in the Commissioning schedule for the start of the respective Commissioning phase activities, the documents below shall be released for use:
			2. Procedures for equipment and systems startup;
			3. Special operations plan and temporary mobilization of facilities (loading of membranes, refrigerated containers, test containers, load banks, transportation of chemicals, etc.);
			4. Functional testing procedures (with power and operating fluids);
			5. Systems/subsystems Performance Tests procedures;
			6. Commissioning Spare Parts list containing all supplier-defined information, including Vendor part number per item;
			7. Procedures for control loops operation tests (electrical and instrumentation);
			8. Procedures for Cause and Effects Matrix simulation;
			9. Energy control management plan;
			10. Maintenance plans.

Note: This package shall be detailed for Hull, Modules and Topsides Commissioning detailed plan, according to item 3.1.3.

* + - 1. Seller shall submit the system/subsystem Performance Tests procedure for Buyer review. If Buyer finds any inconsistency in the presented documents, Buyer will inform Seller, that shall correct the plan and resubmit it within a period to be agreed between the parties.
			2. Seller shall submit the other documents of the PACKAGES 1, 2 and 3 to Buyer for information. However, if Buyer finds any inconsistency in the presented documents, Buyer will inform Seller, that shall correct the plan and resubmit it within a period to be agreed between the parties.
		1. Seller shall elaborate and submit to Buyer, for information, a monthly Commissioning report, including at least the following information:
			1. Relevant documents issued;
			2. Relevant commissioning works performed;
			3. Documents to be issued in the following months;
			4. Work program for the next weeks/months, according to the Commissioning schedule;
			5. Physical advance curve (planned x performed)
		2. Seller shall provide a periodic coordination meeting with Buyer to present the progress of the Commissioning activities as well as forwarding relevant matters.
		3. **Detailed offshore Commissioning (Step 4)**
			1. Seller shall present the planning for Commissioning, Pre-Operation and integrated Start-up activities for offshore phase, including at least:
			2. Scope of supply (mooring, pull-in, remaining scope, others);
			3. Manpower plan, by specialist and per activity;
			4. Organization chart and histogram, by specialist;
			5. Mobilization plan, including all necessary documentation (for Vendors and direct and indirect manpower);
			6. Subcontractors plan (including workshops and warehouse for support);
			7. Acquisition procedure, overseas procurement and transport procedure;
			8. Logistic procedure for materials and Equipment;
			9. Preservation plan.
	1. **Receiving or arrival inspection**
		1. Seller shall inform Buyer about the arrival of any Commissionable Item received at the shipyard.
		2. Seller shall execute a receiving inspection on all Commissionable Items, including those supplied by Buyer, generating and properly keeping the record of the inspection, forwarding to Buyer whenever requested.
		3. Seller is the only responsible for guarantee the meeting requirements for all received items, even in case of Buyer’s team participation on the receiving inspection.
	2. **Preservation**
		1. Seller is responsible for the preservation of all material and/or equipment, including those supplied by Buyer, up to formal system transfer to the Operation Contract Team (System Transfer Certificate accepted by Buyer). It is Seller’s obligation maintain resources necessary and compatible with the activities to be performed.
		2. Equipment’s preservation shall begin immediately upon start the fabrication on Vendors facilities.
		3. Preservation shall be applied in accordance with manufacturer’s recommendations and as recognized best practices of that activity. The procedure shall specify the materials to be used in each type of preservation routine.
		4. Manufacturers' technical recommendations for equipment preservation are mandatory. Vendor technical assistance for preservation can be necessary and, in this case, shall be provided by Seller in order to follow manufacturer’s recommendations, when applicable.
		5. The Seller shall submit to Buyer a Preservation procedure including the identification, handling, packaging, storage and protection of the equipment and their spare parts. This procedure should clearly specify the techniques, materials and routines for carrying out the preservation activities.
		6. Seller shall submit to Buyer a winter Preservation Plan, 90 (ninety) days prior to the beginning of winter season, for all systems for Sites in which temperatures falls below 4ºC. Especially for equipment or piping filled with fluids. Lack of preservation shall be borne by Seller. This statement is applied to both Buyer and Seller’s supply.
		7. Seller shall provide proper storage condition for all items into warehouse, on storage area and stored on Site during assembly phase.
		8. Seller shall provide a sheltered area when the storage is established out of warehouse, in order to store valves, equipment, cable trays and any other items deemed under this requirement by the Vendor’s or Buyer’s inspection.
		9. Preservation activities and actual status of all equipment to be preserved shall be recorded and controlled using a software to be chosen by Seller.
		10. Seller shall apply plastic caps, plastic blind flanges and VCI (or similar appliance) on piping spools and valve extremities as a preservation method. Plastic caps shall be applied during storage, construction and assembly phases in order to avoid any dirty or debris entrance. The appliance of such protections shall be detailed in the Preservation Plan submitted for Buyer’s information.
		11. Seller shall guarantee permanent and continuous power supply for heating elements of electrical equipment with local means to confirm such energization. In case of heating system shutdown, Seller shall communicate Buyer, and present shutdown time report and justify.
		12. Seller shall provide the Hibernation of subsystems until their formal transfer to the team mobilized in the Operation Contract under the following conditions:
			1. Hull subsystems that will not operate during the Integration phase;
			2. Hull subsystems for trip from Hull construction shipyard to Integration Yard, if occurs;
			3. All Hull subsystems for Hull towing voyage to Integration Yard, if applicable;
			4. Topside subsystems that will not operate in a short term (to be agreed with Buyer’s representatives) after system transference to Operation Contract Team.
		13. Seller shall execute the Hibernation plan, if applicable, for systems not formally transferred to operation. The Hibernation activities include cleaning, drying, metal passivation, N2 inertization, application of corrosion inhibitor, lubricants and other means of protection to guarantee physical and operating integrity of subsystem components until it´s return to operation.
		14. Seller shall prepare facilities distribution in order to allow nitrogen and dry air preservation on equipment as needed. Critical Equipment such as main generator, gas compressor, main gear box shall be preserved as per Vendor requirements, but in case of no clear information, nitrogen or dry air shall be continuously applied to the mentioned equipment in order to keep the environment clean and dry, with a minimum positive pressure. Humidity condition shall be periodically verified and recorded.
		15. Seller shall provide preservation for all stainless steel (SS) surfaces using a clear varnish-like product as coating. This preservation shall cover items like piping, tubings, cable trays, cable ladders, panels, junction boxes, tanks and other SS items submitted to harsh environment such as construction yards. This coating shall be applied upon receiving items at warehouse and touched-up after installation; during all fabrication and Commissioning period this coating shall be maintained and restored upon coming off. A specific procedure shall be submitted by Seller.
		16. All costs associated with the lack of preservation shall be borne by Seller. This item is applicable to equipment/items supplied by both Buyer and Seller.
	3. **Mechanical Completion phase**
		1. Seller shall perform the assembly and certification tests to demonstrate that all equipment/items for all disciplines within a system/subsystem have been supplied, installed, non-energized testing completed and can be handed over to the responsible Pre-Commissioning team.
		2. Seller is the responsible to perform all prior construction activities and certification tests activities in accordance with applicable standards recording them on the Item Check Sheet and Control Loop Check List.
		3. All NR-10 inspections shall be planned and executed by Seller in order to guarantee that assembly of all items are in full compliance with the standard, including Ex equipment.
		4. Seller shall ensure the clearance of the FATs (Factory Acceptance Tests) pending issues, updating the Commissioning software management.
			1. Seller shall issue and submit to Buyer the Inspection and Test Plan (ITP), based on Vendors’ proposition and containing activities to be carried out at the factories and construction Sites.
			2. Seller shall submit to Buyer’s and Classification Society’s approval, whenever required by them, the Inspection and Test Plans (ITP) of Seller’s supplied equipment, compatible with the scheduled completion and delivery dates of the equipment.
		5. All instruments and safety devices shall have their calibration certificate valid for functional testing. The calibration requirements for each instrument shall be according to the regulatory agencies’ rules, technical standards, manufacturers' manuals.
		6. Systems/subsystems shall be subjected to a formal Mechanical Completion inspection, which shall be physically, and documentary proven, meeting applicable legal and contractual requirements.
			1. Seller shall notify Buyer for all tripartite inspections of Mechanical Completion achievement. Buyer will attend each event at its own discretion.
			2. Seller shall issue a Mechanical Completion Certificate (MCC) upon the system/subsystem inspection approval.
			3. Buyer will inform Seller any inconsistency in the process of the Mechanical Completion issuance and approval. In such cases Seller shall rectify or present justification to Buyer analysis and approval.
		7. **Module completion**
			1. Seller shall carry out an inspection to verify the completion of the Module before lifting to the Unit. Seller shall guarantee the Mechanical Completion and exceptionally justify pending issues. Buyer shall be notified on all inspections and will attend each event at its own discretion.
		8. **Mechanical equipment**
			1. All rotating equipment shall be leveled, aligned, balanced (if necessary), oil flushed (if necessary) and shall have its lubrication system filled with the specified lubricant, prior to Mechanical Completion achievement.
			2. Static equipment shall be cleaned, hydrostatically tested, internally/externally inspected (video boroscopy) and preserved, prior to Mechanical Completion achievement. All recorded videos shall be kept by Seller and forwarded to Buyer whenever requested as evidence.
			3. Seller shall apply video boroscope inspection whenever required by Vendor. All recorded videos shall be kept by Seller and forwarded to Buyer whenever requested as evidence.
		9. **Instrumentation**
			1. Seller shall recalibrate any instrument replaced or damaged during any tests, as well as in accordance with the due date defined by manufacturer. All instruments shall have their calibration certificates according to regulatory and standard requirements, such as ANP Flow Measurement System and NR-13. For other cases, only range verification shall be performed during Commissioning phase.
			2. Seller shall re-calibrate all Pressure Safety Valves (PSVs) after final alignment of piping in subsystems, independently of the calibration certificate supplied by valve manufacturer. This calibration shall be in accordance with recognized standards such as API-RP 576 and API-RP 520. Seller shall provide a PSV calibration facility on board for this activity, preferably placed on Topsides.
			3. Requirements described at IEC-62337 - "Milestones and Activities during Commissioning of Electrical Instrumentation and Control System in the Process Industry” shall be foreseen by Seller as requirements for the Mechanical Completion activities.
			4. Requirements described at IEC-62381 – “Automation systems in the process industry – Factory Acceptance Test (FAT), Site Acceptance Test (SAT), and Site Integration Test (SIT)” shall be foreseen by Seller as requirements for the Mechanical Completion activities.
			5. Seller shall inspect all field instruments.
			6. Seller shall perform Certification Test of all instruments after assembly at field in order to confirm its integrity.
			7. Seller shall provide calibration certificates for all instruments under its Scope of Supply. All calibration shall be performed by laboratories that comply with the requirements of ISO/IEC 17025.
			8. Seller shall guarantee on pressure sensing instruments the correct manifold assembly, where applicable, following manufacturer recommendations about tightness to be applied to the bolts, as well as parallelism and gap between manifold and instrument.
			9. For all pressure sensing instruments, Seller shall perform a static pressure test, at project operational pressure, in order to confirm the correct manifold assembly.
			10. Seller shall include all instrument impulse lines in piping leakage tests plan in order to guarantee its integrity.
		10. **Automation**
			1. Seller shall perform a Mechanical Completion inspection and execute Certification Tests in all equipment within CSS (Control and Safety System) and SOS (Supervisory and Operating System) in accordance with design requirements, standards and regulatory bodies.
		11. **Electrical**
			1. Seller shall issue tightness report applied to all “Motor Control Center” and switchboard connections, including a specific tightness report related to the fixation of the panel to the base. The location and torque values shall be confirmed by the specific Vendor documentation.
			2. For insulation tests in rotating machinery and transformers, Seller shall follow the IEEE STD 43-2000 – “Recommended Practice for Testing Insulation Resistance of Rotating Machinery”.
			3. For electrical equipment insulating oil, Seller shall proceed according to IEC - 60296 – “Fluids for Electro technical Applications Unused Mineral Insulating Oils for Transformers and Switchgear”.
			4. Seller shall follow the Vendors documentation for the following tests:
			5. Insulation tests on electrical cables, electrical panels and components (e.g. breakers, drawers, and contactors), Uninterruptible Power Supply (UPS), battery chargers and similar tests;
			6. Hi-Pot tests on medium voltage cables, panels and components (when applicable);
			7. Duct resistance tests on bus bars (all panels, exception to small lighting panels and control panels), circuit breakers (low voltage power breakers and medium voltage circuit breakers) and medium voltage contactors.
			8. About circuit breakers phase simultaneity and plotting test, Seller shall apply opening, closing and re-opening (trip free) tests to ensure it is according to the breaker operating curve and check time discrepancies between different phases.
			9. About the Transformer Turn Ratio Test (TTR), Seller shall determine transformation ratio, terminal identification and winding polarity, using the ratio-measuring instrument.
			10. About the transformer winding ohmic resistance test, Seller shall perform the transformer winding resistance measurements according to equipment type and Vendor standards.
			11. Seller shall perform the polarity test, saturation curve, current ratio and insulation test for the current transformers (TCs).
			12. Seller shall perform the polarity test, Transformer Turn Ratio test and insulation test for the voltage transformers (TPs).
		12. **Bolted flange joint management**
			1. Seller shall establish a procedure for bolted joint management in order to ensure that all bolted joints are consistently leak-free during testing and operation. Procedure requirements in Exhibit IV – Directives for Product Fabrication, item 5.3.10.
		13. **Brazilian regulation standards**
			1. Seller shall comply with all the requirements described by the current Brazilian ordinary laws, decrees, ordinances, normative resolutions, regulatory standards, and others, issued by the Brazilian regulatory government departments, such as but not limited to: Brazilian brazilian labor & job ministry (“Normas Regulamentadoras” – “NRs”), national agency of sanitary monitoring (“Agência Nacional de Vigilância Sanitária” – “ANVISA”), environment national council (“Conselho Nacional do Meio Ambiente” – “CONAMA”), Brazilian national oil agency (“Agência Nacional do Petróleo, Gás Natural e Biocombustíveis” – “ANP”), Brazilian armed forces (navy and air force), and others.
			2. Seller shall present a technical report, stating that electrical equipment/installations of the Unit comply with all safety requirements of NR-10 according to NBR IEC 60079 -17. Seller shall also require, if applicable, individual reports to Subcontractors, for equipment/installation under their responsibility.
			3. Seller shall submit the documents of the NR-13 book of records to Buyer for information. However, if Buyer finds any inconsistency in presented documents, Buyer will inform Seller that shall correct the book of records and resubmit it within a period to be agreed between the parties.
			4. Seller shall perform an internal inspection of all equipment, even that one not under NR-13 requirements. An internal inspection report shall be issued in order to certify the properly cleanness conditions and the suitable integrity status of the equipment.
			5. Seller shall perform the initial thickness measurement, where required, of all Equipment under NR-13 and SPIE requirements. The ultrasonic method shall be applied. The points to be tested by ultrasonic measurement on the main parts of equipment shall be defined by Seller and submitted to Buyer on Integration Site. For each measurement point shall be foreseen an inspection access when thermal insulation is required.
		14. **Classification Society**
			1. Seller shall carry out all the activities and tests necessary to ensure full compliance with the Classification Society requirements.
	4. **Pre-Operation & Start-up phase**
		1. Seller shall perform and evidence all Pre-Commissioning and Commissioning phase activities of Commissionable Items, loops and subsystems.
		2. Seller shall notify Buyer for all Pre-Commissioning and Commissioning activities. Buyer will attend each event at its own discretion.
		3. Related to Hydraulic Valves System, the opening and closing time for every SDV shall be inspected and recorded during Functional Tests of these items. During the Performance Tests of this subsystem, all SDVs shall be evaluated together regarding opening and closing times, and results shall be recorded in order to ensure the system is working as per design requirements.
		4. Seller shall provide a winter commissioning plan, 90 (ninety) days prior to beginning of winter season, for all systems at Sites in which temperatures falls below +4°C. The winter commissioning plan must ensure the proper functioning of the essential systems for the continuity of commissioning activities during the winter, ensuring the integrity of the systems and complying with the material specifications as well as the recommendations of the equipment manufacturers.
		5. Seller shall bear the costs of renew all cooling water inventory plus anticorrosion fluid before Sail Away. All residues such as water mixtures and other chemicals must be given proper destination as per Exhibit IX – Directives for Health, Safety and Environment.
		6. Seller shall generate specific procedures for Functional Tests execution.
		7. Seller shall provide all documentation necessary for the execution of the Performance Tests, including any legal mandatory authorizations.
		8. Not Applicable.
		9. Performance Tests execution procedures shall cover all subsystem Commissionable Items and cannot be considered complete if performed in part or by sampling.
		10. Seller shall elaborate and submit, for Buyer’s review, the procedures for Performance Tests of the systems and subsystems identifying the SSOPs required for the tests in accordance with Precedence Network. If Buyer finds any inconsistency in the presented documents, Buyer will inform Seller, that shall correct the procedures and resubmit it within a period to be agreed between the parties.
		11. All Performance Tests procedures shall take into consideration the requirements stated in the Appendix 1.
		12. It is also Seller's scope to carry out the tests, retests and verifications to restart the Hull systems and subsystems kept in Hibernation until the transfer of the systems to the team mobilized in the Operation Contract.
		13. If any punch item were identified during the Performance Tests execution it shall be classified in Type A or B and shall be updated at the database. After all the Type A punch list items have been solved, a technical evaluation shall be performed by Seller to define whether or not a retesting is necessary. Such evaluation shall be submitted to Buyer.
		14. During tests, if any materials, equipment or work were reported faulty, it shall be corrected. The cost of repair or replacement of the faulty material or equipment shall be borne by Seller. In this case, a technical evaluation shall be performed by Seller to define whether or not a retesting is necessary. Such evaluation shall be submitted to Buyer.
		15. After the successful execution of Performance Tests Seller shall submit the results for Buyer’s review. If Buyer finds any inconsistency, Buyer will inform Seller that shall clarify, justify and eventually take action to correct it. Buyer shall be notified for all Performance Test execution scheduled and will attend each event at its own discretion.
		16. **Instrumentation and automation**
			1. Requirements described at IEC-62337 – “Milestones and Activities during Commissioning of Electrical Instrumentation and Control System in the Process Industry” shall be foreseen by Seller as requirements for the Commissioning activities.
			2. Requirements described at IEC-62381 – “Automation systems in the process industry – Factory acceptance test (FAT), Site Acceptance Test (SAT), and Site Integration Test (SIT)”, shall be foreseen by Seller as requirements for the Commissioning activities.
			3. Requirements described at IEC-62382 – “Control systems in the process industry – Electrical and instrumentation loop check”, shall be foreseen by Seller as requirements for the Commissioning activities.
			4. Seller shall perform all subsystem cause and effect tests (interlock tests) prior to subsystem Functional Tests or Performance Test.
			5. Seller shall perform tests in the automation networks to guarantee the performance and cybersecurity requirements described at IEC-62443.
		17. **Electrical**
			1. Seller is responsible for providing all electrical power needed for Commissioning activities.
			2. Seller is allowed to use the electrical turbo generators to supply power for testing loads in 13.8 kV during Commissioning phase.
			3. During Commissioning activities, Seller shall be responsible for all necessary maintenance actions (predictive, preventive, and corrective);
			4. Seller shall be responsible for all necessary consumables and spare parts;
			5. Seller shall be responsible for the operation of the generator sets;
			6. Seller shall be responsible for all safety conditions related to operation of the generator sets;
			7. Seller shall be responsible for any damage to the generator sets, personnel, other equipment, systems or installation due to operation of the generators;
			8. After Commissioning activities Seller shall provide all necessary actions to make the whole generator sets “as new”, including all parts, auxiliaries, accessories, spares and other related equipment, systems or installations.
			9. Seller shall verify and implement protection relays parameters. The parameters table for each relay shall be developed by Seller according to the selectivity study. Seller shall simulate the performance of each protection function for several points of time x current characteristic. All parameter table for every relay shall be tested and recorded at reports. No sampling test will be accepted. In order to ensure all relay tests, Seller shall provide a specific and specialized team to perform tests, including all equipment as needed, or hire a specialized company or hire Vendor to carry out all tests.
			10. Seller shall perform Functional Tests of electrical panels and between them, including logical selectivity, interlocks, network communication and performance.
		18. **HVAC**
			1. The Seller Commissioning team shall proceed the steps of the Commissioning Procedure, which has, among others, the following items:
			2. Pre-startup: check if the subsystem is ready to run with all necessary adjustments performed, if all instruments are operational and if all necessary information about the subsystem (i.e. nameplates, signs etc.) is properly provided. Also, check if the environment is following the safety procedures.
			3. Start-up: execute the necessary steps to start the system and test all starting modes (remote, local, interlocked by control logic, etc.) to verify if the manual and automatic control systems are working properly.
			4. Performance Test: subsystem running to verify all design parameters, air balancing, set points and to check if all equipment and accessories are working properly.
			5. Preservation: perform the steps to preserve the subsystem and the routine to keep the preservation along the necessary time to ensure the proper conditions of the equipment since ducts fabrication until the Unit Handover.
			6. Punch List: all observations, deviations, inconsistences, punches or attention points shall be registered in this section.
			7. Seller shall perform HVAC ducts cleaning in accordance with Brazilian standards (ANVISA RDC Nº 72, Resolução - RE Nº 09) and exchange the air filters.
			8. Closing time for every fire damper shall be inspected and recorded during Functional Tests of these items in order to ensure the system is working as per standards and design requirements.
		19. **Safety systems**
			1. Seller shall test helideck firefighting foam system according to Classification Society, Brazilian navy (NORMAM / CAP 437), national civil aviation agency (“Agência Nacional de Aviação Civil” - ANAC) and Buyer’s requirements, including the foam generating liquid supply. After the test being performed, the system shall be filled up and prepared by Seller for normal operation. Helideck drainage system shall also be verified for their containment of oil spillage and foam.
			2. Seller shall test the foam and water firefighting systems, according to Classification Society, Brazilian navy, NFPA (National Fire Protection Association) standards and Buyer’s requirements, assuring its required coverage and functionality. Seller shall supply all materials, consumables and resources for this test, such as foam concentrate liquid, which shall have proper validity for Sail Away. Seller shall provide foam concentration test according to NFPA16.
			3. Seller shall test all water and foam firefighting system and verify each remote-actuated valve as well as area coverage and flooding with water, monitoring pressure at worst point condition and flow for each test executed. Drainage system shall also be verified in order to verify its capacity to flow the deluge according design requirements.
			4. Seller shall check all firefighting subsystems and verify their correct functionality. Seller shall execute real discharge test before Unit Sail Away for all protected rooms/compartments considering the inert gas defined by safety design for each case. All cylinders shall be reloaded after real discharge test approval. This test shall comply with Buyer and Classification Society requirements as well as NFPA 12, NFPA 2001, IMO SOLAS and IMO FSS code.
			5. Firefighting devices, including all portable fire extinguishers, hydrant stations, safety lockers, hoses and connections, shall be checked upon their area coverage and functionality, as per Classification Society and/or Brazilian naval authority requirements. Escape routes shall be checked according to safety plan and design requirements.
			6. Seller shall inspect all safety plan items compliance with design document approved by Classification Society and present applicable certificates (INMETRO, NBR 12543, NBR 13716, NFPA 1852, IMO/SOLAS). It shall include lifeboats, inflatable life rafts, fast rescue boat, hand flares, davits, EPIRB (Emergency Position-Indicating Radio Beacons), SCBA (Self-Contained Breathing Apparatus), EEBD (Emergency Escape Breathing Devices), fire extinguishers, firefighting hoses, fire man clothes, inert gas cylinders and others.
			7. Seller shall test and calibrate fire and gas detection system, assuring detectors’ proper positioning, direction and sensibility set, in accordance with design requirements, manufacture requirements, safety studies and NFPA 72.
			8. Seller shall test integration between Fire and Gas (F&G) system and Public Address (PA) systems (general alarm).
			9. Seller shall check the functionality of the lifeboats and rescue boats as well their hoisting/lowering system.
			10. Seller shall test the safety interlock system, assuring that the actions foreseen for each emergency shut down level were performed.
		20. **Special tests**
			1. Seller shall execute special tests listed below in accordance with this section:
			2. **On-shore N2/He leak test**
				1. Seller shall perform the leak test after the cleaning and closing the system (Module construction) and before the start up activities. After cleaning, the piping system shall be dry and nitrogen preserved (or other method to be agreed with Buyer). Seller shall consider the costs associated to the leak test of all Unit systems, including those ones associated to the Modules and packages supplied by Buyer, if applicable.
				2. The leak test procedure and its boundaries for the tests shall be submitted to Buyer for information. If Buyer finds any inconsistency in the presented procedure, Buyer will inform Seller, that shall correct the procedure and resubmit it within a period to be agreed between the parties.
				3. Seller shall comply with the requirements stated in the Appendix 1**.**
			3. **On-shore Full Load Test**
				1. Seller shall submit for Buyer’s approval a procedure for the full load test of the turbogenerators with PMS (Power Management System), at least 120 (one hundred twenty) days before start the first test, including load sharing, load shedding, full-load’s resistivity, parallelism, synchronism, verification of the turbogenerators’ protection system and all other tests related to the safe jointly operation of the turbogenerators, emergency generators and auxiliary generators.
				2. The tests shall be performed with own Unit’s utilities and auxiliary equipment installed onboard of the Unit. Cooling water, sea water, instrument air, diesel supply, fire fighting and other required systems shall be operating and available prior the execution of the tests. Any deviation to this requirement shall be presented to Buyer for approval.
				3. For accomplishment of these activities, it shall be included the supply, installation and operation of the variable electric load banks temporary connected to the main distribution panel and necessary to perform the tests. The load bank sizing shall be in accordance with the Classification Society requirements, which defines that the generator supplies 100% of its rated power. It is important to consider power variations due to load bank's manufacturing and voltage drop on load bank's terminals. So, the load bank sizing shall be greater than the generator rated power in order to compensate for both factors mentioned above.
				4. Seller shall also perform full load tests for auxiliary and emergency generators which shall include all above requirements.
				5. Seller shall include to test all PMS functions and operation modes required during the full load test encompassing emergency generator, auxiliary generator and turbogenerators.
				6. Seller shall carry out the tests in accordance with contractual guidelines, current standards and procedures, focusing on achieving the full execution of the tests for obtaining the acceptance of the Classification Society.
				7. Seller is responsible to supply all resources required, such as diesel, instrument air, lubricants, hydraulics fluids and cooling water required in quantity enough to perform all tests required.
				8. Seller shall comply with the requirements stated in the Appendix 1.
			4. **On-shore gas compression and injection systems tests**
				1. Seller shall conduct the Functional Tests of the compressors of the compression gas systems with inert gas (N2 closed circuit running) at the Integration Site, for each set of compressors, with technical assistance by compressors’ Vendors, with participation of Buyer and Classification Society.
				2. The procedure for testing of the compressors with inert gas (N2) shall be submitted to Buyer for information, at least 30 (thirty) days before testing. If Buyer finds any inconsistency in the presented procedure, Buyer will inform Seller, that shall correct the procedure and resubmit it within a period to be agreed between the parties.
				3. Seller shall provide all necessary test resources such as, but not limited to, manpower, consumables and temporary devices.
				4. Seller shall follow API RP 686 directives for all services concerning to machinery installation and Commissioning.
				5. Seller shall perform an internal inspection of the compressors using boroscopy, once the machine and adjacent piping installation are finished at final location offshore, to ensure that any debris or dirty shall be removed in order to preserve the machine integrity.
				6. For the systems partially tested at the Integration Sites using simulation with inert gas (N2) given the limitations on the availability of the process fluid, the tests shall be concluded at the final location offshore utilizing gas.
				7. Seller shall comply with the requirements stated in the Appendix 1.
			5. **On-Shore Plant Simulation**
				1. All systems shall have, whenever technically possible, the Performance Tests at Seller’s Integration Sites. For systems that handle crude oil and natural gas, Seller shall consider to carry-out a simulation test applying fresh water and inert gases as process fluids. This simulation shall be performed on Integration Site and shall simulate a continuous flow as close as possible to the plant design parameters. Seller shall supply all necessary resources in order to perform the process plant simulation.
				2. The plant simulation procedure shall be presented to Buyer at least 60 (sixty) days before the scheduled date for the test. If Buyer finds any inconsistency in the presented procedure, Buyer will inform Seller, that shall correct the procedure and resubmit it within a period to be agreed between the parties.
				3. Seller shall comply with the requirements stated in the Appendix 1.
			6. **Energy control management**
				1. Seller shall prepare and submit to Buyer an energy management plan to be followed during onshore phase. The energy management plan shall follow, at least, the good practices of IOGP – Report-577/2018 (chapter 5, 7, 11, 12, 14).
	5. **Training requirements for operation and maintenance**
		1. Seller shall provide to the Operation Contract Team the theoretical and practical training for systems/subsystems operation and maintenance.
		2. The scope of training program for operation and maintenance is not limited to equipment and shall cover all system/subsystem.
1. SYSTEMS/SUBSYSTEMS TRANSFER
	1. Seller shall issue to Buyer up to 24 months from Agreement Effective Date, the first revision of the system transfer plan to the Operation Contract Team. The plan shall be prepared in line with the Precedence Network and shall describe the system, procedure and associated milestone (Sail Away, Substantial Completion, First Oil, First Offloading, Gas Reinjection, Flare Out, Water Injection and Offshore Start-up Processes), as well as the schedule for transferring the systems from the Commissioning team to the team established in the Operation Contract.
	2. The System/Subsystem transfer shall be issued by Seller, subscribed by Operation Contract Teams, and submitted for Buyer’s approval, when the system can operate continuously and on stable conditions according to Vendors and Buyer’s requirements and with the following conditions:
2. Successful accomplishment of all tests that is possible to be executed at shipyard (if it is not technically feasible to perform the tests under project conditions, it shall be performed with safe fluids and with parameters as close as possible to the operational condition) and there is no impeditive outstanding items (Type A) for continuous and safe operation, according to safety studies;
3. The special tools, licensed software and hard keys handed over to Operation Contract Team;
4. All operation and maintenance manuals delivered to Operation Contract Team;
5. All training has been provided to Operation Contract Team according training program;
6. All data of Commissionable Items, loop, SSOPs, SOPs and spare parts updated in the control Commissioning tool;
7. All SOP-related design and legal and regulatory documentation updated, including data-books, P&IDs, PFDs;
8. All non-impeditive punch item (Type B) addressed to treatment.
	1. Seller shall issue a System Transfer Certificate for each system/subsystem, formally recording the transferring of the system to the Operation Contract Team. The certificate shall contain the formal consent of the Operation Contract Team.
	2. When System Transfer Certificate is approved by Buyer and Operation Contract Team, the definitive transference of the system/subsystem is confirmed, but Seller is still responsible to close all non-impeditive punch items mentioned on item 4.2 g) and execute the Offshore Start-up Processes.
		1. Buyer will inform Seller any inconsistency in the process of the System Transferring to Operation Contract Teams. In such cases Seller shall rectify or present justification to Buyer analysis and approval.
9. OPERATION AND MAINTENANCE OF SYSTEM, SUBSYSTEM AND EQUIPMENT
	1. No system/subsystem shall be used as facilities, or any other type of resource, for construction and assembly activities, except upon written Buyer’s authorization. As the normal sequence of Commissioning and Performance Tests will require, the systems shall be operated according to the Precedence Network, previously presented to Buyer.
	2. Seller shall be capable to operate and perform the maintenance of all systems/subsystems up to their transference to the Operation Contract Team.
10. COMMISSIONING MONITORING AND CONTROL
	1. **Commissioning activities management system**
		1. Seller shall use a software to control and manage all Commissioning activities, comprising a database enabled to generate management reports and control of the Commissionable Items in order to immediately guarantee the Commissioning status of the Unit's operating systems, further ensuring that all necessary pre-checks of Commissionable Items were carried out before the beginning of functional tests. Full access to this system in view-only mode shall be granted to the Buyer.
		2. The database system shall control the progress of completion, Pre-Commissioning and Commissioning, as well as the systems and subsystems transference process, according to Seller completion and Commissioning management plan. The systems shall contain at least the following information, not limited to:
* TAG;
* System and subsystem identification;
* System and subsystem completion status;
* System and subsystem categorization (prerequisite for Sail Away, first oil, first gas, flare-out and first water);
* Inspection Test Record of Mechanical Completion (ITR-A) status;
* Inspection Test Record of Pre-Commissioning (ITR-B) status;
* Commissioning Procedures;
* Punch list status;
* Mechanical Completion, Commissioning Procedures and System Transfer Certificates status.
	+ 1. Seller shall commence operation of the Commissioning software management system at least 30 (thirty) calendar days prior to receipt of the first Commissionable Item at construction Site. Before this date, the professionals responsible for this activity shall be mobilized and trained.
		2. Seller shall maintain the Commissioning software management system updated and compatible with the physical progress of the Commissioning. The records shall be displayed and certified by signatures of the person responsible for the task and Seller's quality control.
	1. **Punch items control**
		1. Seller shall use an electronic system to control all the pending issues identified during the Scope of Supply so that, at any time, it is possible to obtain a single and reliable list of pending items of the project.
		2. Seller shall keep the records and the progress of punch items updated in its electronic system for punch items control.
		3. Seller shall monitor and inform Buyer about the progress of punch items resolution.
		4. In addition, Seller shall control and shall be able to obtain at any time of the project, a list including the status of treatment and/or response of open notations related to Unit’s safety studies (for example, but not limited to: Preliminary Risk Analysis – APR and Hazard and Operability Studies – HAZOP) and related to non-conformities generated in audits performed by Buyer.
		5. In addition, Seller shall control and shall be able to obtain, at any time of the project, a list containing the status of non-conformities relating to inspections carried out by Brazilian authorities (ANP, ANVISA, port authority, etc), flag state, Classification Society, etc.
	2. **Equipment for use in explosive atmosphere inspection control**.

Seller shall prepare an inspection plan that ensures compliance with ANP's Ex equipment requirement:

“*Inspect, after commissioning, equipment designed for use in explosive atmospheres, ensuring proper installation and that this equipment is suitable for the nature of the gas and its probability of occurrence (zone 0, 1 and 2)”*

This plan shall be submitted for Petrobras appraisal and contain at least:

* + - * Ex inspection methodology, including inspection phases and equipment access control;
			* Ex equipment list and certificates;
			* Ex inspection form in compliance with IEC 60079;
			* Inspector shall be certified according to Personel Competence Certification Units “Ex”, based on IECEx OD 504;
			* Inspection control.
1. COMMISSIONING MATERIAL SUPPLY
	1. Seller shall supply all materials, consumables and resources for Pre-Commissioning, Commissioning, operation tests and start-up.
	2. Seller’s Scope of Supply regarding lubrication systems includes:
		1. Mineral and synthetic lube oil to be used on compressors and turbo-generators lubrication systems, according to specifications provided by Vendor.
		2. All lube oil tanks fully loaded, plus 20% in storage drums, at system transfer for each specific system. This requirement of plus 20% is not applied to the main compressors and turbo generators mineral lube oil systems.
		3. Flushing oil, temporary pump and all devices necessary to perform the flushing on the lube and hydraulic oil systems. The same fluid or lube oil defined on the Vendor specifications for equipment operation shall be considered for flushing purpose.
		4. A NAS analyzer shall be available in case of oil NAS evaluation be required by Vendor as a flushing approval condition. Seller shall send oil samples to a certified laboratory for analysis and present reports to ensure oil NAS, water content and other parameters as needed.
		5. Lubricant and hydraulic oil analysis in order to ensure integrity of all oil features described on the oil Vendor datasheet. Oil analysis shall be performed after flushing and equipment tests accomplished during the Commissioning.
	3. Seller shall provide, but not limited to, hydraulic fluids and grease. All tanks fully loaded at system transference for each specific system.
	4. Seller shall provide, but not limited to, turbo generator firefighting bottles recharge. After turbo generators firefighting systems tests, Seller shall take into its account the bottles recharge.
	5. Seller is responsible for the supply of electric power for all Scope of Supply activities.
	6. Seller shall supply electrical load banks compatible with thermographic tests, electrical generators tests and battery systems tests.
	7. Seller shall be responsible for all temporary materials such as joints, gaskets, unions, additional supports, dummy spools, drain and vent valves and other materials needed for hydrostatic tests, as well as all other materials deemed necessary for construction, assembly, inspections and Commissioning.
	8. All other Commissioning consumables necessary to carry out the Commissioning activities shall be considered under Seller’s Scope of Supply.
2. COMMISSIONING SPARE PARTS
	1. Seller shall provide Commissioning Spare Parts to perform all Commissioning and Start-up activities, as well as consumables for Commissioning, including:
		1. All consumables spare parts and special tools recommended by equipment and material Vendors for the construction, testing, Commissioning, Pre-Operation & Start-Up phases up to the Offshore Start-up Process.
		2. All special tools required for construction, Pre-Commissioning, Commissioning and all levels of maintenance and operation.
	2. All spare parts and special tools for Commissioning and startup shall be in accordance with manufacturers’ recommendation and Classification Society (C.S.) requirements.
	3. All spare parts and special tools for Commissioning and Start-up shall be supplied along with the delivery of each piece of equipment at construction Site.
	4. Seller shall keep properly preserved, identified and inventoried in the warehouse all spare parts and special tools for Commissioning and Start-up.
3. SUBSTANTIAL COMPLETION
	1. **SUBSTANTIAL COMPLETION CERTIFICATE**
		1. The approval of the certificate of Substantial Completion by Buyer is mandatory condition for Sail Away of the Unit from the Integration Yard to the final location.
		2. “Substantial Completion” shall mean that the following have occurred:
4. Mechanical Completion of the Hull, Modules, systems and subsystems of the Unit has been achieved. Buyer, under its sole discretion, may waive partially this requirement based on justification presented by Seller.
5. Habitability Preliminary Acceptance Certificate issued by Seller and approved by Buyer;
6. Onshore Scope Preliminary Acceptance Certificate issued by Seller and approved by Buyer;
7. System Transfer Certificates have been issued by Seller, subscribed by the Operation Contract representative, and approved by Buyer, for the systems defined in the system transfer plan agreed between Parties (Notes 1 and 2), which must include at least:
	1. 65% of all systems/subsystems (including mooring and pull-in systems) in case the last integration yard is not in Brazil;
	2. 75% of all systems/subsystems (including mooring and pull-in systems) in case the last integration yard is in Brazil;
8. The onshore part of the Scope of Supply has been completed (including manuals and the delivery of all documentation required for operation) except for works on the Substantial Completion Punch-list;
9. Inclining tests and special tests have been successfully performed and approved by Class Society.
10. The delivery to Buyer of all the necessary certificates from the relevant Classification Society and all Permits and Consents required by the Governmental Authorities for the transportation of the Unit from the Integration Yards to the final location as well as for its operation.
11. The helideck inspections have been completed and the relevant homologations obtained.
12. Unit is ready to leave the Integration shipyard, to be transported to the final location and is capable of being safely and reliably operated in accordance with the specifications contained in this Agreement and without damage to the Unit or any other property and without injury to any Person;
13. Additional Substantial Completion requirements, if any, stablished in the Agreement, GTD and all Exhibits have been fully achieved.
14. Seller has taken all necessary steps, pursuant to this Agreement, to support Buyer during Unit customs clearance.
15. Seller has delivered to Buyer the Substantial Completion Certificate and Buyer has reviewed and approved such certificate in accordance with established in this Section.
16. Capital Goods, Special Tools Essential for the Safe Operation of the Unit and Operational Goods are available.
17. Mooring Components have been delivered within the period defined in Exhibit I of the Contract or within a period accepted by the Buyer, which allows timely pre-installation of the mooring lines.

**Note 1:** The systems transfer plan and the SOP/SSOP list to be transferred to the Operation Contract Team before Sail Away shall have its final version agreed with Buyer and the representative of the Operation Contract up to (7) seven months before the scheduled date to achieve the Substantial Completion.

**Note 2:** The systematic proposal for a system transfer plan shall comply with the requirements applied by laws, decrees, ordinances, normative measures, regulated norms and others in force in Brazil, issued by Brazilian regulated departments such as, for example, the national agency of the oil, natural gas and biofuels (ANP).

* + 1. Seller shall provide written notification to Buyer according to items 16.3.1 and 16.3.2 of the Agreement.
		2. Seller shall provide to Buyer, together with the written notification mentioned in item 9.1.3, the Unit Substantial Completion Punch-list. In addition, Seller shall inform the estimate time needed to complete or correct each item on the punch list.
		3. Buyer will not accept the Substantial Completion Certificate if the Substantial Completion Punch-list contains items related with operational safety, habitability, survival at sea, legal compliance and impeditive pending from Classification Society that prevents the Unit Sail Away.
		4. The failure to include any items on the Substantial Completion Punch-list shall not alter the responsibility of Seller to complete all works in accordance with the terms and provisions of this Agreement.
		5. All works on the Substantial Completion Punch-list shall be completed no later than the due dates agreed between Parties following the effective date of Substantial Completion or such other period as previously agreed between the Parties.
		6. Buyer at its sole discretion may accept the Substantial Completion with some deviation to the stated in this Section 9 due to a mandatory or reasonable motivation comprehensively justified by Seller.
1. OFFSHORE START-UP PROCESSES
	1. Seller shall comply the Offshore Start-up Processes listed in Table 2 to have the Final Completion Certificate signed by Buyer for the Unit.
	2. SELLER shall classify each SSOP in the Offshore Start-Up Processes listed in Table 2.
	3. The Offshore Start-up Processes can only be carried out after the System Transfer of each of the systems involved.
	4. The Performance of the UNIT for purposes of the Guarantee is determined by Offshore Start-Up Processes carried-out by Operation Team on stable flow rate and conducted in accordance with the procedures set forth herein in the presence of SELLER’s Representative.
		1. SELLER shall provide utilities, laboratory analysis and all other supplies necessary for the Offshore Start-Up Processes, including spare parts, filter elements and others that must be provided by SELLER at its own cost.
		2. SELLER shall guarantee:
			1. Unit constructed and mechanically completed in accordance with drawings, specifications and engineering information supplied by Seller.
			2. The machinery, Equipment and material are in compliance with the applicable specifications provided by Seller.
			3. Unit provided with enough fresh water, instrument air and electricity, at the design conditions and meeting the specifications set forth in the operating manuals.
			4. Not applicable.
		3. The responsibility of Seller regarding the Equipment, machinery, instrumentats and piping of the Unit includes, but is not limited to, guarantees offered by suppliers and manufacturers.
	5. SELLER shall guarantee that the UNIT will be capable of meeting the Requirements and Performance Criteria of Table 2 during the Offshore Start-Up Processes conducted in accordance with this Exhibit.

| Offshore Start-Up Processes | Requirements | Performance Criteria |
| --- | --- | --- |
| (i) Systems without provision for additional tests in the offshore phase | For the systems fully tested in the onshore phase under process conditions and with process fluids, the Offshore Start-up occurs on the Handover date. | -- |
| (ii) Continuous operation test of oil production and treatment plant | SELLER shall give written notice, after 72 hours of continuous oil treatment, achieving the specifications established in the General Technical Description (GTD), that to the best of its knowledge, the systems of the Oil Process Plant have been completed, are fully commissioned and operate according to design specifications with the exception of the outstanding items type B listed upon the attached Punch List. | The oil flow achieves the Exported Oil specification as established in the General Technical Description (GTD), shall be at least the flow achieved by one production well. |
| (iii) | Not applicable |  |
| (iv) Continuous complete offloading operation (bow and stern station) | SELLER shall notify in writing, after performing two offloading operations without interruptions (one by bow and one by stern), achieving the specifications established in the General Technical Description (GTD), that, according to its best knowledge, the systems have been completed, are fully commissioned and operate according to design specifications with exception of the outstanding items type B listed upon the attached Punch List. | Continuous complete offloading operation one for bow and other for stern station, in compliance with the General Technical Description (GTD). |
| (v) Continuous operation test of sea water treatment and injection plants | SELLER shall give written notice, after 72 hours of continuous sea water treatment and injection, achieving the specifications established in the General Technical Description (GTD), that to the best of its knowledge, the systems of the Seawater Treatment and Injection have been completed, are fully commissioned and operate according to design specifications with exception of the outstanding items type B listed upon the attached Punch List. | The treated sea water minimum treatment and injection flow defined by vendors achieving the specification as established in General Technical Description (GTD). |
| (vi) Continuous operation test of gas treatment and compression plants | SELLER shall give written notice, after 72 hours of continuous gas treatment and compression, including VRU operation, achieving the specifications established in the General Technical Description (GTD), that to the best of its knowledge, the systems of the Gas Compression have been completed, are fully commissioned and operate according to design specifications with exception of the outstanding items type B listed upon the attached Punch List. | Gas Injection minimum flow defined by Compressor Vendor, achieving the specification as established in the General Technical Description (GTD). |
| (vii) Continuous operation test of produced water treatment and disposal and water injection plants | SELLER shall give written notice, after 72 hours of continuous produced water treatment and disposal, achieving the specifications established in the General Technical Description (GTD), that to the best of its knowledge, the systems of the Produced Water Treatment have been completed, are fully commissioned and operate according to design specifications with exception of the outstanding items type B listed upon the attached Punch List. | Produced water minimum flow defined by Vendors, achieving the specification as established in the General Technical Description (GTD). |
| (viii) Continuous operation test of other systems and plants (only Systems that can only be tested offshore, due to operating conditions and process fluid) | SELLER shall give written notice that all other systems not directly related to the achievement of the Offshore Start-Up Processes (i) to (vi) are fully commissioned and operate according to design specifications established in the General Technical Description (GTD) with exception of the outstanding items type B listed upon the attached Punch List. | Operate according to design specifications established in the General Technical Description (GTD) with exception of the outstanding items type B listed upon the attached Punch List. |

Note: for warranty period purposes, each standby system/equipment/train shall also be tested according to the content of the above table in order to also define the Warranty Start Date for the respective standby system/equipment/train.

**Table 2: Offshore Start-Up Processes**

* 1. Seller or Buyer shall reasonably stop the time counting for any Offshore Start-up Process if:
		1. Alterations, adjustments, repairs and/or replacements which cannot be made safely with the Equipment in operation must be made or;
		2. The data obtained during the Offshore Start-up Processes will not be sufficiently accurate or complete to establish the actual performance of the plant.
	2. If a Offshore Start-up Processes time counting is stopped as provided in this Section, Seller shall solve the plant non-conformity as soon as possible for a new Performance Test.
	3. Analysis of Test
		1. Analysis of samples taken during the tests shall be performed by methods mutually agreed by Buyer and Seller before the starting of the Offshore Start-up Processes. Seller shall conduct such analysis with competent experienced personnel, but the analysis shall be observed or witnessed by Buyer. In case of disagreement, a third-party laboratory shall be selected by approval of both parties, and Seller shall bear the cost of such third-party laboratory. Seller shall not have to bear the costs of the third-party laboratory, in cases in which Seller is proved to be right.
		2. Seller shall calculate the results of the Offshore Start-up Processes and summarize them in an Offshore Start-up Processes report, prepared and issued within ten (10) days from the date of test completion. The Offshore Start-up Processes report shall state whether or not the plant met the specified performance. If the plant failed to meet the specified performance, the report shall state the cause of such failure and provide recommendations to achieve the required specified performance.
		3. In case of disagreement with any Offshore Start-up Processes report, Buyer will issue to Seller a written notice stating the issues/reasons of such disagreement. The written notice shall be issued within fifteen (15) days after receipt of the Offshore Start-up Processes report.
	4. Remedies
		1. If any system fails to meet the guaranteed performance during the first complete Offshore Start-up Processes or if the process is halted because Buyer and/or Seller deem it obvious that such test cannot lead to a successful result, Seller, at his own expenses, shall adopt the following measures:
		2. Perform of process design studies;
		3. Revise the design;
		4. Implement the corrective required measure to put the system in condition to meet the performance.
		5. Seller will be responsible for any failure of operation in the system from ordinary wear and tear, corrosion, erosion, normal maintenance or normal operation, or failure of conditions described herein to occur. If the system fails to pass the Offshore Start-up Processes because of any of these conditions, the test shall be deemed invalid and Seller shall promptly take corrective actions to eliminate the adverse condition or conditions and a new Offshore Start-up Processes shall be conducted.
1. OFFSHORE PROCESS WORKFLOW
	1. The following figure presents a simplified workflow of the processes that must occur in the offshore phase (see Figure 2).



**Figure 2 – Offshore process General Diagram**

1. APPENDIX

Appendix 1 – Minimum Requirements for Testing in Systems and Subsystems

Appendix 2 – Habitability Preliminary Acceptance Certificate Form

Appendix 3 – Onshore Scope Preliminary Acceptance Certificate Form