PETROBRAS	MATERIAL REQUISITION	Nº: I-RM-3A17.01-1231-321-1J5-001	
	CLIENT: BS/ATP-IMI/OP-PMXL		SHEET: 1 of 31
	JOB: PROJETO COMPLEMENTAR PMXL-1		
	AREA: 1231 - PRIMARY PROCESSING UNIT		
	TURBOCOMPRESSOR – UC-1231002		BS/PCM/PROJDP
			INTERNAL

INDEX OF REVISION

REV.	DESCRIPTION AND/OR REVISED SHEETS
0	ORIGINAL ISSUE
A	REVISED WHERE INDICATED AFTER APR, HAZOP AND GRS
B	REVISED WHERE INDICATED
C	REVISED WHERE INDICATED
D	REVISED WHERE INDICATED

	REV. 0	REV. A	REV. B	REV. C	REV. D	REV. E	REV. F	REV. G	REV. H
DATE	10/31/2025	01/12/2026	02/06/2026	03/13/2026	04/17/2026				
EXECUTION	ITEM 14	ITEM 14	ITEM 14	ITEM 14	ITEM 14				
CHECK	U32A	CTFQ	CTFQ	CTFQ	CTFQ				
APPROVAL	BEGS	BEGS	BEGS	BEGS	BEGS				

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FORM OWNED TO PETROBRAS N-0381 REV.M.

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15 ANNEX ..... Error! Bookmark not defined.

1 ATTENTION NOTE

This document shall be considered as a template with minimum requirements to be complied. Any deviation from the requirements mentioned in this document shall be clearly stated by the PACKAGER and submitted to PETROBRAS for approval, during clarification phase.

2 DEFINITIONS

PETROBRAS Contracting and operating company as PURCHASER.

PACKAGER Company responsible for design, assembly, construction, fabrication, test and furnishing of main equipment and design, assembly, tests, integration and furnishing of all other equipment in the skid, including the auxiliary systems and components, even if supplied loose.

INTEGRATOR Company hired by PETROBRAS to be responsible for project, design, assembly, erection, construction, test, lift, hook up, installation and integration of Packages at Platform, with complete and fully operative systems in accordance with the requirements of this specification, codes and standards referenced therein.

VENDOR Company hired by the PACKAGER or INTEGRATOR to supply equipment, components of equipment, instruments, control systems, etc. that will be part of the main system to be supplied.

3 SCOPE OF REQUISITION

Applicable to: ☒ Proposal ☐ Purchase Order ☐ As Built

Main Equipment:

The main equipment below, included in the turbocompressor packages, shall be supplied with all the components and accessories required for their safe, economical and efficient operation and maintenance:

ITEM	TAG	QUANTITY	LOCATION	DESCRIPTION
1	C-UC-1231002	1	Top deck M-04	Centrifugal Compressor
2	TS-UC-1231002	1	Top deck M-04	Gas Turbine
3	VV-UC-1231002	1	Top deck M-04	Gearbox
4	PN-UC-1231002-01	1	Automation and Turbomachinery Room	Turbocompressor Control Panel
5	PN-UC-1231002-02	1	Top deck M-04	Heater Panel of Seal Gas
6	Z-UC-1231002	1	Trird deck M-01	Fuel Gas Conditioning Skid

Note: The supply of electrical equipment shall follow the I-ET-3926.01-5140-700-PPC-003 – GENERAL ELECTRICAL REQUIREMENTS FOR PACKAGES FOR OFFSHORE

UNITS and I-ET-3926.01-5140-700-PPC-002 - GENERAL SPECIFICATION FOR ELECTRICAL MATERIAL AND EQUIPMENT FOR OFFSHORE UNITS.

Summary Description:

The objective of this Material Requisition is to define the minimum requirements for the design, fabrication and assembly of the Compression Package Unit for operation on the PMLX-1 area development, offshore Brazil.

Compression Package Unit shall be supplied as complete package, in compliance with the provisions of this document and its attachments, all applicable codes, standards, regulations and Classification Society requirements.

Complete package means skid of main equipment (one centrifugal compressor casing, gearbox and gas turbine driver) and all auxiliary equipment integrated for perfect functioning of the required service (accessories, control panel, machinery protection system, oil system, seal gas system, etc.).

PACKAGER shall be entirely responsible for ensuring any additional information pertaining to the execution of the project, as well as for delivery of the equipment, complete and in perfect conditions of assembly, operation and productive capacity.

Equipment shall be designed to meet PETROBRAS requirements and for unattended, fail-safe, continuous service as well as for idle periods up to several months in saline atmosphere (marine environment) on the Platform. Prime importance is given to approve of a high degree of reliability, durability and maintainability.

Equipment shall be designed and constructed for 30 (thirty) years of service life, without the need for replacement of any major component due to wear, corrosion, fatigue or material failure.

Any conflict of information found in the documents that comprise this Material Requisition shall be brought to the attention of PETROBRAS, in writing, before presentation of the proposal, for clarification.

4 SCOPE OF SUPPLY

4.1 PACKAGER shall assume unit responsibility and shall assure that all subvendors comply with the requirements stated herein.

4.2 PACKAGER shall be responsible for the design, development, engineering, coordination procurement, fabrication, assembly and shall guarantee overall performance (fully functional and operable) of the whole package, including as a minimum:

1. ☒ **Gas Turbine**:
   - 1.1. ☒ Auxiliary gearbox
   - 1.2. ☒ Auxiliary equipment
   - 1.3. ☒ Couplings and guards:
     - ☒ *Main equipment*
     - ☒ *Auxiliary equipment*
   - 1.4. ☒ Baseplate (skid):

☒ *Main equipment* ☒ *Auxiliary equipment*

1.5. ☒ Inlet system:
☒ *Filter s* ☒ *Ducts* ☒ *Silencer*

1.6. ☒ Exhaust system:
☒ *Ducts* ☒ *Silencer* ☒ *Expansion joint*

1.7. ☐ Waste Heat Recovery Unit ☐ By-pass stack

1.8. ☒ Fuel system:
☒ *Gas* ☐ *Liquid* ☐ *Diesel daily tank*

1.9. ☒ Ignition system (non-radioactive components)

1.10. ☒ Starting system (Electrical or electrical-hydraulic)

1.11. ☒ Gas turbine cleaning system:
☒ *On-line* ☒ *Off-line*

1.12. ☒ Instrumentation, automation and control:
☒ *Unit control panel*
☒ *Local gauge board*
☒ *Machinery protection system*

1.13. ☒ Enclosure:
☒ *Turbine* ☐ *Gear* ☐ *Compressor*
☒ *Ventilation system* ☒ *Fire & gas protection system* ☒ *Firefighting system (water mist)*

2. ☒ **Centrifugal compressor:**

2.1. ☒ Gearbox ☒ Auxiliary equipment

2.2. ☒ Couplings and guards:
☒ *Main equipment* ☒ *Auxiliary equipment*

2.3. ☒ Baseplate (skid):
☒ *Main equipment* ☒ *Auxiliary equipment*

2.4. ☐ Inlet system:
☐ *Heat exchanger* ☐ *Silencer* ☐ *Knock-out drum*
☐ *Temporary strainer* ☐ *Permanent Filter*

2.5. ☐ Interstage system:
☐ *Heat exchanger* ☐ *Silencer* ☐ *Knock-out drum*

2.6. ☐ Discharge system:
☐ *Heat exchanger* ☐ *Silencer* ☐ *Knock-out drum*

3. ☒ **Instrumentation, automation and control:**

3.1. ☒ Unit control panel ☒ Local gauge board ☒ Machinery Protection system

3.2. ☐ Load sharing control:
☐ *Design & supply* ☐ *Design data*

3.3. ☒ Capacity control:
☒ *Design & supply* ☐ *Design data*

3.4. ☐ Throttle valve:
☐ *Design & supply* ☐ *Design data*

3.5. ☒ Turbine speed:
☒ *Design & supply* ☐ *Design data*

3.6. ☐ VFD:
☐ *Design & supply* ☐ *Design data*

3.7. ☒ Anti-surge system:
☒ *For each stage* ☐ *Common for all stages*

3.8. ☒ Monitoring / controls:
☒ *Design & supply* ☐ *Design data*

3.9. ☒ Control valve:
☒ *Design & supply* ☐ *Design data*

3.10. ☒ Instrumentation:
☒ *Design & supply* ☐ *Design data*

3.11. ☐ By-pass line:
☐ *Design & supply* ☐ *Design data*

3.12. ☐ By-pass cooler:
☐ *Design & supply* ☐ *Design data*

3.13. ☒Relief valves:
☐ *Design & supply* ☒ *Design data*

3.14. ☒Non-return valves:
☐ *Design & supply* ☒ *Design data*

3.15. ☒ Operational:
☒ *Design & supply* ☒ *Design data*

4. ☒ **Lube oil system**:
4.1. ☒ Lube oil tank ☒ Control

5. ☒ **Sealing system:**
5.1. ☒ Main equipment ☒ Auxiliary equipment

6. ☒ **Seal gas treatment system:**
6.1. ☒ Main equipment ☒ Auxiliary equipment

7. ☐ **Deluge system**

8. General supply: (Rev. D)

☒ Piping and accessories for all utility system within skid limits
☐ MCC ☐ Transformers ☒ Uninterruptible power supply (if required)
☒ Grounding
☒ All safety equipment and systems such as emergency shutdown valves, pressure safety valves, etc. within skid limits
☒ Cables, cables trays, junction boxes and accessories within skid limits
☒ Lateral analysis (whole train, with model & report): ☐ Typical ☒ Dedicated
☒ Torsional analysis (whole train, with model & report): ☐ Typical ☒ Dedicated
☒ Transient torsional analysis (whole train, with model & report): ☐ Typical ☒ Dedicated
☒ Forced unbalance rotor response analysis, with model & report: ☐ Typical ☒ Dedicated
☒ Operating Speed Balancing (for compressor rotor; balance quality grade G 2.5 as per ISO 21940-11)
☒ Recommended special tools list for main & auxiliary equipment maintenance (all maintenance levels), list with itemized prices (only list)
☒ Special tools and devices for compressor and turbine installation, assembling and removal
☒ Spare parts for tests, commissioning, start-up and assisted operation

☒ Recommended Spare Parts List for maintenance for two years of operation

☒ Capital spare (minimum: gas turbine, compressor bundle, and gearbox rotor and gears; provide the container for each item)

☒ Design and coordination of complete arrangement within package limits

☒ Painting and procedures

☒ Preparation for shipment including a single spreader bar for package lifting

☒ Packing, coating, anticorrosive protection and preservation

☒ Factory acceptance tests and inspections, as required:

- ☒ Hydrostatic Test, as required
- ☒ Performance Test, as required
- ☒ Mechanical Running Test and inspections, as required
- ☒ Control Panels: Inspection and Functional Tests, as required
- ☒ Sound Level Test, as required
- ☒ Post-test Inspection, as required
- ☒ Factory Integrated Tests, as required
- ☒ Other Tests and Inspections required in the Datasheets listed in item "7. *ATTACHED AND REFERENCED DOCUMENTS*"

☒ Site acceptance tests and inspections, as required

☒ Supply & application of thermal insulation, where applicable

☒ Supply & application of support system, where applicable

☒ Supply & application of heat tracing devices, where applicable

☒ Supply & application of noise attenuation devices

☒ All consumables (mineral oil, synthetic oil, greases, fluids, products, etc.) for installation, commissioning and start-up

☒ Nameplates

☒ Full package documentation

☒ Full compliance with local codes & regulations

☒ Certification by Classification Society

☒ Quality assurance program

☒ Technical assistance (see item 12) (to be quoted separately)

☒ Training and daily costs for mobilization/demobilization in Brazil (see item 13)

Remarks:

If electric motors are used for the emergency oil system and the emergency ventilation system, the PACKAGER must use electrical power supplied from the platform panels. For detailed information on the platform's electrical system, refer to specification I-ET-3926.01-5140-700-PPC-004 – General Electrical System Specification.

The PACKAGER shall be responsible for the complete supply of the package, even if certain sub-items are not explicitly described (such as bolts, gaskets, expansion joints, etc.). The PACKAGER shall identify, consider, and include all such items within the scope of supply.

5 REQUIRED DOCUMENTS

5.1 Besides the documentation listed in Annex "B" (Vendor Drawing and Data Requirements) of API 617, which shall be considered as required, vendor shall submit the following documents:

Item	Description	With Proposal	For Approval		Certified		Final
		Document	Document	Schedule	Document	Schedule	
A	**Centrifugal Compressor Package**						
A01	Certified Dimensional Outline Drawing and List of Connections	X	X	4W	X	2D	X
A02	Cross-Sectional Drawings and Part Numbers	X	X	6W	X	2D	X
A03	Rotor Assembly Drawings and Part Numbers	X	X	6W	X	2D	X
A04	Thrust-Bearing Assembly Drawings, Part Numbers, Datasheet and Sizing Calculations		X	6W	X	2D	X
A05	Journal-Bearing Assembly Drawings, Bill of Materials, Datasheet and Sizing Calculations		X	6W	X	2D	X
A06	Shaft-Coupling Assembly Drawing and Bill of Materials	X	X	6W	X	2D	X
A07	Lube-Oil Schematics and Bills of Materials	X	X	6W	X	2D	X
A08	Lube-Oil Arrangement Drawings and List of Connections		X	4W	X	2D	X
A09	Lube-Oil Component Drawings and Data		X	6W	X	2D	X
A10	Seal Gas System Schematic and Bill of Materials	X	X	6W	X	2D	X
A11	Seal Gas System Arrangement Drawing and List of Connections		X	4W	X	2D	X
A12	Seal Gas System Component Drawings and Data		X	6W	X	2D	X
A13	Seal Gas System Assembly Drawing and Part Numbers		X	6W	X	2D	X
A14	Seal Gas System Leakage Rates		X	6W	X	2D	X
A15	Electrical and Instrumentation Schematics and Bill of Materials	X	X	6W	X	2D	X
A16	List of Major Components with respective MTBF	X	X	6W	X	2D	X
A17	Electrical and Instrumentation Arrangement Drawing and List of Connections		X	4W	X	2D	X
A18	Datasheets (Proposal / As Built)	X	X	6W	X	2D	X
A19	Noise Sound Level (datasheet and report)	X	X	6W	X	2D	X
A20	Metallurgy of Major Components	X	X	6W	X	2D	X
A21	Lateral Analysis Report		X	6W	X	2D	X
A22	Torsional Analysis Report		X	6W	X	2D	X
A23	Vibration Analysis Report (with Sommerfeld Number Versus Stiffness and Dampening Bearing curves)		X	6W	X	2D	X
A24	Performance Curves for each Compressor Section and for each Operating Case (Polytropic Head, Discharge Pressure, Discharge Temperature, Polytropic Efficiency and Power versus Inlet Volumetric and Mass Flow) SI units.	X	X	6W	X	2D	X
A25	Impeller Overspeed Test Report				X	1T	1D
A26	Mechanical Running Test Report				X	1T	1D
A27	Coupling Selection and Rating	X	X	6W	X	2D	X

Item	Description	With Proposal	For Approval		Certified		Final
		Document	Document	Schedule	Document	Schedule	
A28	Spare Parts Recommendation List with Itemized Prices for Two (2) Years of Operation	X	X	10W	X	2D	X
A29	List of Special Tools Furnished for Maintenance		X	10W	X	2D	X
A30	Preparation for Storage at Job Site before Installation		X	6W	X	4D	1D
A31	Weather Protection, Insulation and Tropicalization		X	6W	X	4D	1D
A32	Tabulation of All Utilities	X	X	6W	X	2D	X
A33	Reference List of Similar Equipment Installed and Operating Under Analogous Conditions	X					
A34	Operating Restrictions to protect Equipment During Start-Up, Operation and Shutdown	X	X	6W	X	2D	X
A35	List of Components Requiring PETROBRAS's Approval	X	X	6W	X	2D	X
A36	Summary of Materials and Hardness of Materials exposed to H_2S	X	X	6W	X	2D	X
A37	List of Exceptions to the Specifications and Applicable Standards	X					
A38	Interstage Cooler System Data						
A39	Drawings, Details and Description of Instrumentation and Controls	X	X	6W	X	2D	X
A40	Minimum Length of Straight Pipe Required at Machine Inlet or Side Inlets	X	X	6W	X	2D	X
A41	Maximum and Minimum Allowable Seal Pressure for ~~each~~ Compressor	X	X	6W	X	2D	X
A42	Statement of Manufacturer's Testing Capabilities	X	X	6W	X	2D	X
A43	Performance Test Data and Curves				X	1T	1D
A44	Thrust Bearing Loads Versus Differential Pressure Curve		X	6W	X	2D	X
A45	Balance Piston Leakage Rates (Test Values)	X	X	6W	X	2D	X
A46	Balance Piston Line Differential Pressure Versus Thrust Load Curves		X	6W	X	2D	X
A47	Testing Procedures		X	6W	X	2D	X
A48	PACKAGER Progress Reports		X	2W			
A49	Installation Manual		X	10W	X	2D	X
A50	Operating and Maintenance Manual		X	10W	X	2D	X
A51	Technical Data Manual		X	10W	X	2D	X
A52	Fulton and Kirk-Donald Plot	X	X	6W	X	2D	X
A53	Aerodynamics Cross Coupling Stiffness and Log Decrement Analysis	X	X	6W	X	2D	X
A54	As-Built Dimensions and Data (Including Assemblies Clearances)						X
A55	Certified Hydrostatic Test Logs				X	1T	1D
A56	Rotor Balancing Logs				X	1T	1D
A57	Rotor Combined Mechanical and Electrical Runout Report				X	1T	1D
A58	Weld Procedures and Welders Qualification Certificates		X	6W	X	2D	X
A59	List of Drawings and Documents Index (Status and Delivery Schedule)		X	2W	X	2D	X
A60	Preservation, Packaging and Shipping Procedures, including vendors.		X	6W	X	2D	X
A61	Shipping List		X	6W	X	2D	X
A62	Material Safety Datasheets	X	X	10W	X	2D	X

Item	Description	With Proposal	For Approval		Certified		Final
		Document	Document	Schedule	Document	Schedule	
A63	Liquid Injection System Drawings, Data and List of Components						
A64	Technical Requirements, Data and Drawings for Anti-Surge System	X	X	6W	X	2D	X
A65	Piping and Support Drawings, Arrangement and Details	X	X	4W	X	2D	X
A66	Pressure Vessels, Coolers, Pumps and Auxiliary Equipment Datasheets and Drawings	X	X	6W	X	2D	X
A67	Structure (Walkaways, Handrails, Grating, etc.) Drawings and List of Components		X	4W	X	2D	X
A68	Baseplate Drawings and List of Components	X	X	6W	X	2D	X
A69	Foundation Plan (With Anchor Bolts and Supports Location)		X	6W	X	2D	X
A70	Dimensions, Weights, Static / Dynamic Loads, Moments and Centers of Gravity	X	X	6W	X	2D	X
A71	Equipment General Description and Catalogs	X					
A72	Painting Specification	X	X	6W	X	2D	X
A73	List of VENDORs (sub-suppliers)	X	X	6W	X	2D	X
A74	Nameplate Drawings for Each Piece of Equipment or Part, Including Applicable Code Stamp		X	6W	X	2D	X
A75	Failure Modes and Effect Analysis (FMEA) Report	X					
B	**Gearbox & Auxiliaries**						
B01	Certified Dimensional Outline Drawing and List of Connections	X	X	4W	X	2D	X
B02	Cross-Sectional Drawing, Parts List and Bill of Materials	X	X	6W	X	2D	X
B03	Rotor Assembly Drawing, Parts List and Bill of Materials	X	X	6W	X	2D	X
B04	Thrust Bearing Assembly Drawing, Parts List, Bill of Materials, Datasheet and Sizing Calculations		X	6W	X	2D	X
B05	Journal Bearing Assembly Drawing, Parts List, Bill of Materials and Datasheet and Sizing Calculations		X	6W	X	2D	X
B06	Coupling Assembly Drawing, Parts List and Bill of Materials	X	X	6W	X	2D	X
B07	Lube-Oil Schematic and Bill of Materials	X	X	6W	X	2D	X
B08	Lube-Oil Component Drawings and Datasheets		X	6W	X	2D	X
B09	Electrical and Instrumentation Schematics, Wiring Diagrams and Bill of Materials	X	X	6W	X	2D	X
B10	Electrical and Instrumentation Arrangement Drawing and List of Connections		X	4W	X	2D	X
B11	Anticipated Tooth Contact Drawing and Specifications		X	6W	X	2D	X
B12	Record of Deviations from Manufacturing Process Control System		X	6W	X	2D	X
B13	Mass Elastic Data		X	6W	X	2D	X
B14	Lateral Critical Speed Analysis Report		X	6W	X	2D	X
B15	Torsional Critical Speed Analysis Report		X	6W	X	2D	X
B16	Input and Output Shaft Position Diagram		X	6W	X	2D	X
B17	Welding Procedures and Welders Qualification Certificates		X	6W	X	2D	X
B18	Hydrostatic Test Logs				X	1T	2D

Item	Description	With Proposal	For Approval		Certified		Final
		Document	Document	Schedule	Document	Schedule	
B19	Mechanical Running Test Logs				X	1T	2D
B20	Rotor Balancing Logs				X	1T	2D
B21	Rotor Mechanical and Electrical Runout				X	1T	2D
B22	Proposals, Purchase and As-Built Datasheets	X	X	6W	X	2D	X
B23	As-Built Dimensions or Data (Including Assembly Clearances)				X	2D	X
B24	Installation Manual		X	10W	X	2D	X
B25	Operating and Maintenance Manual		X	10W	X	2D	X
B26	Technical Manual		X	10W	X	2D	X
B27	Spare Parts Recommendation List with Itemized Prices for Two (2) Years of Operation	X	X	10W	X	2D	X
B28	Preservation, Packaging and Shipping Procedures, including vendors.		X	6W	X	2D	X
B29	List of Special Tools Furnished For Maintenance		X	10W	X	2D	X
B30	Nondestructive Test Procedures and Acceptance Criteria		X	6W	X	2D	X
B31	Book With All Quality Assurance Documents		X	10W	X	2D	X
B32	Dimensions, Weights, Static / Dynamic Loads, Moments and Centers of Gravity	X	X	10W	X	2D	X
B33	Equipment General Description and Catalogs	X					
B34	Reference List of Similar Equipment Installed and Operating under Analogous Conditions	X					
B35	Painting Specification	X	X	6W	X	2D	X
B36	List of VENDORS (sub-suppliers)	X	X	6W			X
B37	Nameplate Drawings for each Piece or Part, Including Applicable Code Stamp		X	6W	X	2D	X
B38	List of Exceptions to the Specifications and Applicable Standards	X					
C	**Oil system**						
C01	Certified Dimensional Outline Drawing and List of Connection	X	X	4W	X	2D	X
C02	Components Drawings and Bill of Materials	X	X	6W	X	2D	X
C03	System Schematics, Bill of Materials and Components Sizing Criteria	X	X	6W	X	2D	X
C04	Component Datasheets	X	X	6W	X	2D	X
C05	Electrical and Instrumentation Wiring Diagrams and Bill of Materials		X	6W	X	2D	X
C06	Electrical and Instrumentation Terminal Box Layout and List of Connections		X	6W	X	2D	X
C07	Test Procedures		X	6W	X	2D	X
C08	Welding Procedures		X	6W	X	2D	X
C09	Hydrostatic Test Logs				X	1T	2D
C10	Operational Test Logs				X	1T	2D
C11	Datasheets (Proposal / As-Built)	X	X	6W	X	2D	X
C12	Installation, Operation and Maintenance Manuals		X	10W	X	2D	X
C13	Spare Parts Recommendation List with Itemized Prices for Two (2) Years of Operation	X	X	10W	X	2D	X
C14	Pressure Vessel Certification Data		X	6W	X	2D	X
C15	Preservation, Packing and Shipping Procedures, including vendors.		X	6W	X	2D	X
C16	Dimensions, Weights, Static / Dynamic Loads, Moments and Centers of Gravity	X	X	6W	X	2D	X

Item	Description	With Proposal	For Approval		Certified		Final
		Document	Document	Schedule	Document	Schedule	
C17	Equipment General Description and Catalogs	X					
C18	Reference List of Similar Equip. Installed and Operating Under Analogous Conditions	X					
C19	Painting Specification	X	X	6W	X	2D	X
C20	List of VENDORS (sub-suppliers)	X	X	6W	X	2D	X
C21	Nameplate Drawings for Each Piece or Part, Including Applicable Code Stamp		X	6W	X	2D	X
C22	List of Exceptions to the Specifications and Applicable Standards	X					
D	**Automation & Machinery Protection System**						
D01	Certified Dimensional Outline Drawing and List of Connections	X	X	4W	X	2D	X
D02	Part List and Bill of Materials	X	X	6W	X	2D	X
D03	Control and Electrical System Schematics and Bill of Materials	X	X	6W	X	2D	X
D04	Electrical and Instrumentation System Arrangement Plans	X	X	6W	X	2D	X
D05	Grounding Plan		X	6W	X	2D	X
D06	Calibration Curves (Certified)		X	6W	X	2D	X
D07	Rotor Nodal Point Analysis Data		X	6W	X	2D	X
D08	Recommended Alarm (Alert) and Shutdown (Danger) Set-Points	X	X	6W	X	2D	X
D09	Datasheets (ISA)	X	X	6W	X	2D	X
D10	Dimensions and Data	X	X	6W	X	2D	X
D11	Installation Manual		X	10W	X	2D	X
D12	Operation and Maintenance Manuals		X	10W	X	2D	X
D13	Spare Parts Recommendation List with Itemized Prices for Two (2) Years of Operation	X	X	10W	X	2D	X
D14	List of Drawings and Documents Index (Status and Delivery Schedule)	X	X	6W	X	2D	X
D15	Shipping List		X	6W	X	2D	X
D16	Special Weather Protection and Tropicalization Requirements		X	6W	X	2D	X
D17	Technical Data Manual: Hardware and Software Manuals, Application Program, Communication Drivers, Drawings); Instrumentation Cable List with Complete Specification; Electronic Cards Schematic Drawings with Connections)		X	10W	X	2D	X
D18	Material Safety Datasheets	X	X	6W	X	2D	X
D19	Cause x Effect Matrix, Ladder Block, Control Narratives, Logic (including Start-Up, Alarm and Shutdown) and Loop Diagrams		X	6W	X	2D	X
D20	P&ID Drawings and Schematics including, as a minimum: Seal Gas, Electrical Power, Fuel, Water, Lubrication and Process Fluid System	X	X	6W	X	2D	X
D21	EMI and RFI Test Logs				X	1T	2D
D22	Fire Fighting System List of Components, Drawings, Datasheets and Bill of Materials	**X**	X	6W	X	2D	X
D23	Gas Detection System List of Components, Drawings, Datasheets and Bill of Materials	**X**	X	6W	X	2D	X
D24	Preservation, Packing and Shipping Procedures, including vendors.		X	6W	X	2D	X
D25	Dimensions, Weights, Static / Dynamic Loads, Moments and Centers of Gravity	X	X	6W	X	2D	X

Item	Description	With Proposal	For Approval		Certified		Final
		Document	Document	Schedule	Document	Schedule	
D26	Equipment General Description and Catalogs	X					
D27	Reference List of Similar Equipment Installed and Operating Under Analogous Conditions	X					
D28	Painting Specification	X	X	6W	X	2D	X
D29	List of VENDORS (sub-suppliers)	X	X	6W	X	2D	X
D30	Nameplate Drawings for Each Piece or Part, Including Applicable Code Stamp		X	6W	X	2D	X
D31	List of Exceptions to the Specifications and Applicable Standards	X					
D32	Package Control System Architecture Diagram	X	X	6W	X	2D	X
D33	List of Data / Tags for Remote Monitoring from HMI Unit A&C System / Memory Map		X	6W	X	2D	X
D34	Control Panel I/O List		X	6W	X	2D	X
D35	Field Acceptance Test and Site Acceptance Test Procedures		X	6W	X	2D	X
D36	Instrument Index	X	X	4W	X	2D	X
D37	Factory Acceptance Test, Site Acceptance Test and Site Integration Test Procedures		X	6W	X	2D	X
D38	Instrument List		X	10W	X	2D	X
D39	Alarm & Events List		X	10W	X	2D	X
D40	Cable List		X	10W	X	2D	X
D41	PLC Technical Specification	X	X	10W	X	2D	X
D42	Instrument / Instrumented Valve Datasheets (one per type of instrument/instrumented valve)		X	10W	X	2D	X
D43	Instrument/Instrumented Valve Calculations (Control Valves, PSVs, Orifice Plates/Restriction Orifices and Thermowells)		X	10W	X	2D	X
D44	UCP and RIO Panels General Arrangement		X	10W	X	2D	X
D45	UCP and RIO Panels Internal Interconnections Diagram		X	10W	X	2D	X
D46	Wiring Diagram		X	10W	X	2D	X
D47	Instrumentation certificates, such as, but not limited to calibration certificates, hazardous areas certificates and IP degree certificates in accordance with INMETRO		X	10W	X	2D	X
E	**Gas Turbine & Auxiliaries**						
E01	Certified Dimensional Outline Drawing and List of Connections	X	X	4W	X	2D	X
E02	Cross-Sectional Drawing, Part List and Bill of Materials	X	X	6W	X	2D	X
E03	Rotor Assembly Drawing, Part List and Bill of Materials	X	X	6W	X	2D	X
E04	Thrust-Bearing Assembly Drawing, Part List and Bill of Materials, Datasheet and Sizing Calculations		X	6W	X	2D	X
E05	Journal-Bearing Assembly Drawing, Part List and Bill of Materials, Datasheet and Sizing Calculations		X	6W	X	2D	X
E06	Shaft-Coupling Assembly Drawing and Bill of Materials	X	X	6W	X	2D	X
E07	Bleed-Air / Cooling-Air, Sealing and Leak-off Schematics and Bill of Materials	X	X	6W	X	2D	X

Item	Description	With Proposal	For Approval		Certified		Final
		Document	Document	Schedule	Document	Schedule	
E08	Fuel-System Schematics and Bill of Materials	X	X	6W	X	2D	X
E09	Fuel-System Component Assembly Drawings and List of Connections		X	6W	X	2D	X
E10	Lube-Oil / Control-Oil Schematics and Bill of Materials	X	X	6W	X	2D	X
E11	Lube-Oil System Assembly, Arrangement Drawing and List of Connections		X	6W	X	2D	X
E12	Electrical and Instrumentation Schematics and Bill of Materials	X	X	6W	X	2D	X
E13	Electrical and Instrumentation Arrangement Drawings and List of Connections		X	4W	X	2D	X
E14	Governor, Control and Trip System Data and Bill of Materials	X	X	6W	X	2D	X
E15	Injection System Schematics and Bill of Materials						
E16	Injection-System Arrangement Drawing						
E17	Tabulation of Utility Requirement	X	X	6W	X	2D	X
E18	Curves Showing Certified Shaft Speed Versus Power at Site Rated Conditions and De-rating Factor Versus Equivalent Hours	X	X	6W	X	2D	X
E19	Curve Showing Ambient Temperature Versus Rated Power Output	X	X	6W	X	2D	X
E20	Curve Showing Output-Power Shaft Speed Versus torque	X	X	6W	X	2D	X
E21	Curves Showing Incremental Power Output x Water or Steam System Injection Rate						
E22	Heat-Rate and Output Power Correction Factors (Pressure, Relative Humidity etc.)	X	X	6W	X	2D	X
E23	Thrust-Bearing Performance Data		X	6W	X	2D	X
E24	Blading Vibration Analysis Data (including Campbell & Goodman Diagram)		X	6W	X	2D	X
E25	Lateral Critical Analysis Report		X	6W	X	2D	X
E26	Torsional Critical Analysis Report		X	6W	X	2D	X
E27	Transient Torsional Analysis Report		X	6W	X	2D	X
E28	Allowable Flange Loadings		X	6W	X	2D	X
E29	Coupling Alignment Diagram		X	6W	X	2D	X
E30	Weld Procedures and Welders Qualification Certificates		X	6W	X	2D	X
E31	Certified Hydrostatic Test Logs				X	1T	2D
E32	Mechanical Running Test Logs				X	1T	2D
E33	Performance Test Logs				X	1T	2D
E34	Nondestructive Test Procedures		X	6W	X	2D	X
E35	Procedures for Special and Optional Tests	X	X	6W	X	2D	X
E36	Certified Mill Test Reports				X	1T	2D
E37	Rotor Balancing Logs				X	1T	2D

Item	Description	With Proposal	For Approval		Certified		Final
		Document	Document	Schedule	Document	Schedule	
E38	Rotor Combined Mechanical and Electrical Runout				X	1T	2D
E39	Datasheets (Proposal / As Built)	X	X	6W	X	2D	X
E40	As-Built Dimensions and Data (Including Assembly Clearances)				X	2D	X
E41	Installation Manual		X	10W	X	2D	X
E42	Operating and Maintenance Manuals		X	10W	X	2D	X
E43	Spare Parts Recommendation List with Itemized Prices for Two (2) Years of Operation	X	X	10W	X	2D	X
E44	List of Drawings and Documents Index (Status and Delivery Schedule)		X	2W	X	2D	X
E45	Shipping Lists		X	6W	X	2D	X
E46	List of Special Tools Furnished for Maintenance		X	10W	X	2D	X
E47	Technical Data Manual		X	10W	X	2D	X
E48	Material Safety Datasheets	X	X	10W	X	2D	X
E49	Preservation, Packing and Shipping Procedures.		X	6W	X	2D	X
E50	Bearing Babbit Strength Versus Temperature Curves	X	X	6W	X	2D	X
E51	Inlet Air Filtration System Datasheets, Drawings and Bill of Materials	X	X	6W	X	2D	X
E52	Noise Sound Level	X	X	6W	X	2D	X
E53	Acoustic Enclosure Datasheets, Drawings and Bill of Materials	X	X	6W	X	2D	X
E54	Ventilation System Calculation, Datasheet, Arrangement and Bill of Materials	X	X	6W	X	2D	X
E55	Water Washing System Drawings, Data and List of Components	X	X	6W	X	2D	X
E56	Starting System Drawings, Description, Requirements and List of Components	X	X	6W	X	2D	X
E57	Lift / Maintenance Devices Drawings and List of Components	X	X	6W	X	2D	X
E58	List of Major Components with respective MTBF	X	X	6W	X	2D	X
E59	Metallurgy of Major Components	X	X	6W	X	2D	X
E60	Piping and Support Drawings, Arrangement and Details		X	4W	X	2D	X
E61	Pressure Vessels, Coolers, Pumps and Auxiliaries Equipment Datasheets and Drawings	X	X	6W	X	2D	X
E62	Structure (Walkways, Handrails, Grating, etc.) Drawings and List of Components		X	4W	X	2D	X
E63	Baseplate Drawings and List of Components	X	X	6W	X	2D	X
E64	Foundation Plan (With Anchor Bolts Location)		X	6W	X	2D	X
E65	Dimensions, Weights, Static / Dynamic Loads, Moments and Centers of Gravity	X	X	6W	X	2D	X

Item	Description	With Proposal	For Approval		Certified		Final
		Document	Document	Schedule	Document	Schedule	
E66	Equipment General Description and Catalogs	X					
E67	Reference List of Similar Equipment Installed and Operating Under Analogous Conditions	X					
E68	Painting Specification	X	X	6W	X	2D	X
E69	List of VENDORS (sub-suppliers)	X	X	6W	X	2D	X
E70	Detailed List of Consumables (Oils, Greases, Fluids, Products, etc.) for Installation, Commissioning and Start-Up, Including Quantities, Vendors, etc.		X	6W	X	2D	X
E71	Nameplate Drawings for Each Piece or Part, Including Applicable Code Stamp		X	6W	X	2D	X
E72	List of Exceptions to the Specifications and Applicable Standards	X					
E73	Preparation for Storage at Job Site Before Installation		X	6W	X	4D	1D
E74	Weather Protection, Insulation and Tropicalization		X	6W	X	4D	1D
E75	PACKAGER Progress Report		X	2W			
E76	Auxiliary MCCs dimensions and weight						
E77	Auxiliary MCCs schematic diagrams						
E78	Electrical load list of auxiliaries	X	X	6W	X	2D	1D
E79	List of electrical cables	X	X	6W	X	2D	1D
E80	Electrical interconnection diagrams	X	X	6W	X	2D	1D
E81	Auxiliary MCCs logical block diagrams						
E82	Heating Panel dimensions and weight	X	X	6W	X	2D	1D
E83	Heating Panel schematic diagrams	X	X	6W	X	2D	1D
E84	Heating Panel logical block diagrams	X	X	6W	X	2D	1D
E85	Hazardous area certificates for all electrical equipment	X	X	6W	X	2D	X
E86	Temperature Rise Test Report for Motors Installed in Hazardous Area		X	6W	X	2D	X
E87	Wiring Diagram(s) for Motor, Instruments, Panels, Sensors, Lubrication and Pressurisation Equipment		X	6W	X	2D	X
E88	Design of all power and control cable routes and sub routes within the machine skid, including trays, supports, grounding connections and other similar structures, giving identification, quotes, elevations, rated sizes, orientation of design.		X	6W	X	6D	X
E89	Motor, datasheets fulfilled	X	X	6W	X	2D	X
E90	Dispatch Dossier						1D
E91	Failure Modes and Effect Analysis (FMEA) Report	X					
F	**General documents**						
F1	Inspection and Test Plan		X	4W	X	2W	1D
F2	Engineering, Fabrication, Inspection, Test Plan and Delivery Schedule of the PACKAGE (including details of each major equipment and components)	X	X	2W	X	2D	1D
F2	Factory Acceptance Test, Factory Integrated Test, Site Acceptance Test and Site Integration Test Reports.		X	2T	X	4W	1D
F3	Handling drawing for installation		X	4W	X	2W	1D
F4	Instrument and instrumented valve list		X	4W	X	2W	1D

Item	Description	With Proposal	For Approval		Certified		Final
		Document	Document	Schedule	Document	Schedule	
F5	Instrument and instrumented valve datasheet		X	4W	X	2W	1D
F7	Calibration certificates of instruments, control valves and PSVs						1D
F8	Packing list		X	4D	X	2W	1D
F9	Details drawing of pressure vessels, including internal parts.		X	6W	X	2W	1D
F10	Fabrication procedures of pressure vessels classified in NR-13		X	6W	X	2W	1D
F11	NDT procedures of pressure vessels classified in NR-13		X	6W	X	2W	1D
F12	Calculation reports of pressure vessels		X	4W	X	2W	1D
F13	Welding, heat treatment and NDT reports, especially for pressure vessels						1D
F14	Material certificates of all pressurized components, especially for pressure vessels						1D
F15	Painting and insulation inspection report						1D
F16	Hydrotest procedures and reports of piping and pressure vessels. For pressure vessels classified in NR-13, Hydrotest reports shall contain the Qualified Professional signature, as per NR-13 requirement		X	6W	X	2W	1D
F17	Databook index		X	6W	X	2W	1D
F18	Dispatch Dossier						1D
F19	Piping isometrics		X	6W	X	2W	1D
F20	Piping class (piping specification datasheet) - which shall contain at least information about material, sizes, standard and codes of piping, valve and piping fittings		X	6W	X	2W	1D
F21	Calculation report from pipe thickness dimensioning and any other element on piping class		X	6W	X	2W	1D
F22	Piping support catalogue – which shall contain at least support code (tag), detailed draw, material table with base material, quantity and size of each support element		X	6W	X	2W	1D
F23	Expansion joint calculation report and draws (if existent on project)		X	6W	X	2W	1D
F24	Piping code compliance (ASME B31.3) in a calculation report attending the flexibility analysis requirements from code		X	6W	X	2W	1D
F25	General arrangement		X	6W	X	2W	1D
F26	Piping plant		X	6W	X	2W	1D

Remarks:
Indicated schedule is the required time for PACKAGER submits documents after order, return of reviewed documents or test execution, with the following legend:

- W: Weeks after order (e.g.: 2 weeks = 2W);
- D: Weeks prior to dispatch;
- T: Weeks after testing, completion or inspection.

5.2 PACKAGER shall include in the document list, for each document, the respective item number or numbers of the above list.

5.3 Proposal drawings and data shall not be certified or as-built.

5.4 PETROBRAS drawings approval shall not be considered as relieving the PACKAGER from any responsibility for detailed design, dimensioning and construction of equipment or deviations from specifications.

5.5 All data, drawings and equipment supplied according to this specification shall use the SI measurement system, except for ordinary piping, flanges, accessories and appurtenances, which shall be in inches.

5.6 All drawings and documents (including those provided by VENDORs) shall be identified, at least, with PETROBRAS name, job, area, location, requisition number, order number, tag and service following CODING OF TECHNICAL ENGINEERING DOCUMENTS NI-1710.

5.7 Documents, drawings, instruction books and other commercial or engineering data shall be in English or Brazilian Portuguese language. All manuals and instruction books shall be in Brazilian Portuguese language.

5.8 PACKAGER shall provide weights, dimensions and center of gravity for all equipment, including auxiliaries in different skids or shipped loose, with accuracy of ± 10% in proposal phase and ± 3% after order. PACKAGER shall also furnish required data for dry, operation, test and maintenance cases.

5.9 PACKAGER is required to note on respective datasheets of main equipment the moments of inertia (kg.m²) of each rotor.

5.10 Design Engineering Automation

5.10.1 This item defines the minimum technical requirements for the effective use of Design Engineering Automation for the equipment being supplied. Requirements are applicable to the whole package supplied.

5.10.2 Digital Delivery Requirement

All documents and drawings shall be delivered in digital files to PETROBRAS.

Digital deliverables can generally be classified as native editable formats (e.g. MS Word [.doc], MS Excel [.xls], MicroStation [.dgn] and AutoCAD [.dwg]), neutral viewing formats (e.g. Adobe Portable Document Format [.pdf]) and image raster formats. Native format shall be required for documentation that will be subject to updating in the operational phase. Neutral viewing formats are acceptable for documents and drawings not requiring change, standard equipment documentation and certain drawings extracted from the 3D model.

As a rule, files shall not consist of multiple documents (i.e. several documents with different numbers in the same file). Each uniquely numbered document shall be delivered as a separate file.

PACKAGER shall implement quality routines to ensure that the digital information, documentation and data bases delivered reflects the final “as built” version that has been through the PURCHASER approval / verification process.

When files with pdf extension are used, the following requirements shall still be followed:

- Files shall have the greatest extent possible be created by generating them from the original file. Digitalizing is not acceptable for drawings and diagrams;

- Document front sheet shall be included in the source file and the total number of pages, including annexes, appear on the front sheet prior to converting from original format. The document front page shall always be numbered as page 1;
- In all cases, indexing using the bookmark function shall be considered. As a minimum (depending on the size of the document) bookmarking shall be used for the first three heading levels;
- Different page orientation within a single file shall be avoided;
- Files shall be delivered without any security restrictions enabled.

5.10.3 CAD/CAE Detailed Requirements

- A single complete 3D model for each facility or equipment shall be submitted to PETROBRAS;
- The 3D models shall not be dependent on additional applications not commercially available. If this cannot be achieved, all proprietary software, user's manual and macros shall be documented and included at scope of supply, free of charge, both as executables and as source code;
- For continued use and updating of the 3D model at detailing phase, PETROBRAS shall have the right to use and modify the proprietary software;
- 3D models shall be delivered fully compatible with the version of the application to be agreed between PETROBRAS and PACKAGER. Normally, this shall be the latest available version. It is highly recommended that during the project execution the applications versions are not updated;
- Objects in models shall be identified with tag numbers. This syntax shall be followed in the project engineering databases and spreadsheets in order to facilitate linking and consistency with engineering information and documentation;
- All 3D equipment models shall have at least the following information: equipment identification (with tag); service and type; suction and discharge pressure; suction and discharge temperature; flow rate; empty and operating weight; isolation thickness and type; class of equipment, according to NR-13; center of gravity (C.G.) coordinates; nozzle identification, service, diameter, class, material, face type and length according documentation (datasheets, P&ID, etc.); supplier drawing number, with review and status of the reference document used in the equipment modeling.

6 DATABOOK

6.1 PACKAGER shall include in the scope of supply a comprehensive databook regarding to design, specifications, datasheets, etc. approved "as built".

6.2 The turbocompressor package databook shall be issued with drawings, documents and catalogues index, completely filled in and updated, at least, 30 calendar days prior to the equipment delivery and shall be divided in three sections, at least as follows:

6.2.1 Section I:

- Certified and illustrated part list (exploded views of internal parts);

- All certified drawings;
- Catalogues;
- Technical specifications;
- Certified performance curves;
- Certified calculation sheets;
- Datasheets of equipment, motors and instruments, duly filled in, updated and certified.

6.2.2 Section II:

- Description of operation of instrumentation, controls, panels, and auxiliary equipment;
- Instructions for storage and transportation;
- Commissioning procedures;
- Instructions for installation and operation (including all system description);
- Instruction for installation of main equipment and auxiliaries;
- Overhaul procedures: including disassembly, cleaning, inspection (including acceptance criteria), repair and modification standards, assembly and testing of main equipment and auxiliaries (including photographic catalogs) for all maintenance levels;
- Standard practices and technical specifications for maintenance;
- Special tools catalogues.

6.2.3 Section III:

- EX electrical equipment certificates;
- Material certificates;
- Inspection Reports and Test certificates;
- Welding procedures.

6.2.4 Section IV:

- Certificates and documentation issued related to regulatory standards NR-10 and NR-13 (when applicable).

7 ATTACHED AND REFERENCED DOCUMENTS

7.1 The documents listed in the tables below form an integral part of this project. Any deviation from the specifications mentioned in these documents shall be clearly stated by the PACKAGER and submitted to PURCHASER for approval, during clarification phase.

7.2 PACKAGER shall also consider deviations or comments from paragraphs marked with a bullet in API standards, even if a decision is required or further information will be provided.

7.3 All standards shall be used in their respective last revisions.

Document Nº	Discipline	Title		Rev
NI-1710	COO	CODING OF TECHNICAL ENGINEERING DOCUMENTS		
I-ET-3926.01-1000-941-PPC-001	COO	METOCEAN DATA	(1)	
I-RL-3A17.01-1200-940-1J5-001	COO	GENERAL SPECIFICATION FOR AVAILABLE UTILITIES	(1)	
I-DE-3926.01-5140-700-MJU-004	ELE	TYPICAL DETAIL OF INSTALLATION – GROUNDING	(1)	
I-ET-3010.00-5143-700-P4X-001	ELE	ELECTRICAL SYSTEM PROTECTION CRITERIA	(1)	
I-ET-3926.01-5140-700-PPC-002	ELE	GENERAL SPECIFICATION FOR ELECTRICAL MATERIAL AND EQUIPMENT FOR OFFSHORE UNITS	(1)	
I-ET-3926.01-5140-700-PPC-003	ELE	GENERAL ELECTRICAL REQUIREMENTS FOR PACKAGES FOR OFFSHORE UNITS	(1)	
I-ET-3926.01-5140-700-PPC-005	ELE	GENERAL REQUIREMENTS FOR HUMAN ENGINEERING DESIGN FOR ELECTRICAL SYSTEM OF OFFSHORE UNITS	(1)	
I-ET-3010.00-5140-700-P4X-002	ELE	SPECIFICATION OR ELECTRICAL MATERIAL AND EQUIPMENT FOR OFFSHORE UNITS	(1)	
I-ET-3926.01-5140-700-PPC-004	ELE	GENERAL SPECIFICATION FOR ELECTRICAL SYSTEM	(1)	
I-DE-3926.01-5265-946-MJU-001	ELE	ELECTRICAL ONE LINE DIAGRAM 220V EMERGENCY LOADS UPS	(1)	
I-ET-3926.01-1200-800-PPC-002	INS	AUTOMATION, CONTROL AND INSTRUMENTATION ON PACKAGE UNITS	(1)	
I-ET-3A17.01-1231-327-1J5-001	MEC	TURBOCOMPRESSOR UC-1231002	(1)	
I-FD-3A17.01-1231-321-1J5-001	MEC	CENTRIFUGAL COMPRESSOR FOR NATURAL GAS TURBOCOMPRESSOR	(1)	
I-FD-3A17.01-1231-341-1J5-001	MEC	GEARBOX FOR NATURAL GAS TURBOCOMPRESSOR	(1)	
I-FD-3017.01-1231-332-1J5-001	MEC	GAS TURBINE FOR NATURAL GAS TURBOCOMPRESSOR	(1)	
I-FD-3A17.01-1231-392-1J5-001	MEC	OIL SYSTEM FOR NATURAL GAS TURBOCOMPRESSOR	(1)	
I-FD-3A17.01-1231-854-1J5-001	MEC	MACHINERY PROTECTION SYSTEM FOR NATURAL GAS TURBOCOMPRESSOR	(1)	
DE-3A17.01-5400-94A-1J5-001	SAF	PLANTA DE CLASSIFICAÇÃO DE ÁREAS	(1)	
I-ET-3010.00-5420-300-P4X-001	SAF	FIRE PROTECTION FOR MACHINERY HOODS	(1)	
I-ET-3010.00-1200-300-P4X-001	SAF	NOISE AND VIBRATION CONTROL REQUIREMENTS	(1)	

(1) The requirements of these documents are mandatory and refer to this package and other packages or equipment on the unit.
(2) These documents shall only be used by PACKAGER for reference.
Note: Electrical datasheets shall be included during detailed design.

7.4 Applicable documents (standards, regulations, etc.):

Document Nº	Description
NR-1	Brazilian Regulation Standard 1: "*General Provisions"*
NR-09	Brazilian Regulation Standard 9: "*Assessment and Control of Occupational Exposure to Physical, Chemical, and Biological Agents*"
NR-10	Brazilian Regulation Standard 10: "*Safety in Electrical Installations and Services"*

Document Nº	Description
NR-11	Brazilian Regulation Standard 11: "*Transport, Moving, Storage and Handling of Materials"*
NR-12	Brazilian Regulation Standard 12: "*Machinery and Work Equipment Safety"*
NR-13	Brazilian Regulation Standard 13: "*Boilers and Pressure Vessels"*
NR-15	Brazilian Regulation Standard 15: "*Unhealthy Activities and Operations"*
NR-17	Brazilian Regulation Standard 17: "*Ergonomics"*
NR-20	Brazilian Regulation Standard 20: "*Safety and Health at Work with Flammable and Combustible Liquids"*
NR-23	Brazilian Regulation Standard 23: "*Fire Protection"*
NR-26	Brazilian Regulation Standard 26: "*Safety Signs"*
NR-37	Brazilian Regulation Standard 37: "*Health and Safety on Oil Platforms*"
API Std 521	Pressure-relieving and Depressuring Systems
API Std 613	Special Purpose Gear Units for Petroleum, Chemical and Gas Industry Services
API Std 614	Lubrication, Shaft-Sealing and Control-Oil Systems and Auxiliaries
API Std 616	Gas Turbines for Petroleum, Chemical and Gas Industry Services
API Std 617	Axial and Centrifugal Compressors and Expander-compressors
API Std 662	Plate Heat Exchangers for General Refinery Services
API Std 670	Machinery Protection System
API Std 671	Special-Purpose Couplings for Petroleum, Chemical and Gas Industry Services
API Std 676	Positive Displacement Pumps - Rotary
API Std 692	Dry Gas Sealing Systems for Axial, Centrifugal, Rotary Screw Compressors and Expanders
API RP 14E	Recommended Practice for Design and Installation of Offshore Production Platform Piping Systems
API RP 520	Sizing, Selection and Installation of Pressure-Relieving Devices
API RP 582	Welding Guidelines for the Chemical, Oil and Gas Industries.
API RP 684	API Standard Paragraphs Rotordynamic Tutorial: Lateral Critical Speeds, Unbalance Response, Stability, Train Torsionals and Rotor Balancing
API RP 686	Recommended Practice for Machinery Installation and Installation Design
ASME B 16.5	Pipe Flanges and Flanged Fittings
ASME B 16.34	Valves - Flanged, Threaded and Welding End
ASME B 31.3	Process Piping
ASME PTC 10	Performance Test Code on Compressors and Exhausters
ASME PTC 22	Gas Turbines - Performance Test Code
ASME S.VIII	Rules for Construction of Pressure Vessels
ASME S. IX	Qualification Standard for Welding, Brazing and Fusing Procedures, Welders, Brazers and Welding, Brazing and Fusing Operators
ISO 15156	Petroleum and Natural Gas Industries: Materials for use in H_2S Containing Environments in Oil and Gas Production
ISO 12944-9	Paints and Varnishes – Corrosion Protection of Steel Structures by Protective Paint Systems – Part 9: Protective Paint Systems and Laboratory Performance Test Methods for Offshore and Related Structures.

Document Nº	Description
ISO 21940-11	Mechanical vibration – Rotor balancing – Part 11: Procedures and tolerances for rotors with rigid behavior
ISO 23936.2	Petroleum, petrochemical and natural gas industries — Non-metallic materials in contact with media related to oil and gas production – Part 2: Elastomers
IEC 61260	Octave Band and Fractional-Octave-Band Filters
IEC 61672	Electroacoustics - Sound Level Meters
IEC 60034	Rotating Electrical Machines
IEC 61892	Mobile and Fixed Offshore Units – Electrical installations
IEC 60079	Explosive Atmosphere Standards
IEC 60092	Electrical Installations in Ships
IEC 62381	Automation systems in the process industry – Factory acceptance test (FAT), site acceptance test (SAT), and site integration test (SIT)
IMO-SOLAS	Regulations for Water Mist
NFPA 37	Standard for the Installation and use of Stationary Combustion Engines and Gas Turbines
NFPA 750	Standard on Water Mist Fire Protection Systems
IOGP Report 454	Human Factors Engineering in Projects

8 GENERAL REQUIREMENTS

8.1 The technical proposal shall present the complete and detailed scope of supply and meet the requirements of all items of the respective Material Requisition and its annexes, complemented by the Technical Clarification Circular Letters Any exclusion and/or alternative to what is specified in the Material Requisition and its annexes, including the use of the bidders' standard and exclusive technology, shall be presented in a Deviation List, which only will be accepted by PETROBRAS during the clarification phase, preceding the proposal presentation. PETROBRAS's acceptance of each item of the Deviation List will be through Technical Clarification Circular Letters, that will be issued to all bidders. The Deviation List shall contain, at least, for each requirement that the bidder intends to change:

- The document's description, code and section that contain the requirement;
- The reason for deviation, always indicating the requirements that are different to bidder's standard and the costs, schedule and technical benefits/impacts of the change;
- The bidder proposal.

8.2 PACKAGER shall take unit responsibility. Unit responsibility refers to the technical responsibility for design, fabricate, coordinate, test and supply the whole package according to PETROBRAS specifications.

8.3 PACKAGER shall obtain the approval of local or national authorities on any specific requirements stated on this Material Requisition or PETROBRAS order.

8.4 PACKAGER shall fill in PETROBRAS equipment datasheets. When specific datasheets for auxiliary equipment are not included in Material Requisition,

PACKAGER and VENDORS shall attach applicable API standard or other international standard datasheets.

8.5 PACKAGER shall include manual of auxiliary equipment and components on section II of Databook.

8.6 All inspections, NDTs and tests predicted by PACKAGER in the Inspection and Test Plan shall have a report included in the Databook.

8.7 Progress reports shall be issued periodically, in accordance with total duration of the fabrication time (e.g., every two weeks or every month).

8.8 PACKAGER operation and maintenance manual shall contain the specification of lubricant fluids and periodicity to replace it.

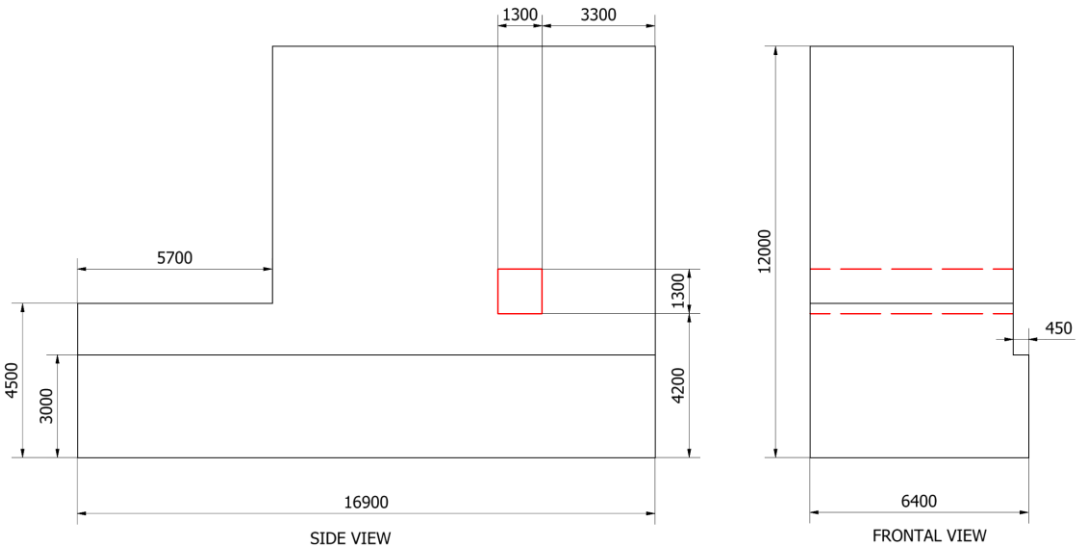
8.9 Installation manual shall contain all recommendations for preservation during erection stage and long-term storage. If PACKAGER fails to provide this information on the installation manual, any damages due to the lack of preservation will be PACKAGER's responsibility.

8.10 General arrangement drawings shall contain the connection list, i.e., a list with all connection tie in/out points of the skids, including the following minimum information: Connection identification number (represented in the drawing), connection description, connection specification (design code), rating, flange face type, connection nominal diameter and fluid.

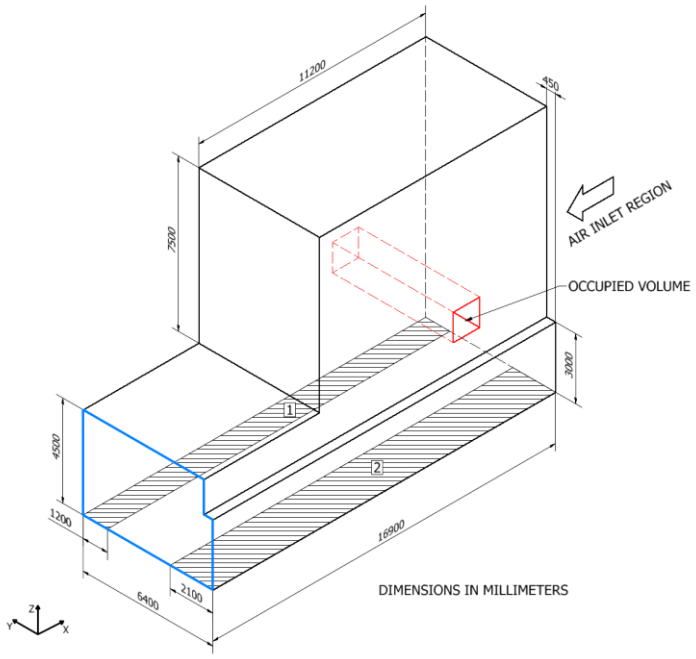
8.11 Dry seal drawings shall contain a list with all connections on the seal, including identification code (represented on the mechanical seal drawing), connection description and fluid. Dry gas seal drawings shall also contain a part list with identification number of the part, description of the part and material of each part.

8.12 Each material certificate and NDT report shall be issued with a PACKAGER cover sheet, informing to which part of the equipment the document refers to.

8.13 The turbocompressor skid, including its designated maintenance area, shall comply with the main dimensional constraints of the available free space defined in Figure 1. Areas highlighted in red are excluded from the free space envelope due to the presence of essential structural elements. Any deviation or non-conformance from these dimensional parameters shall be formally submitted to Petrobras for review and approval.



(a)



(b)

Figure 1 – Free space for turbocompressor installation: (a) Main dimensions - side and frontal view and (b) Isometric view

8.14 The hatched areas 1 and 2 shown in Figure 1 shall remain clear from floor level up to a vertical height of 2.1 m. These zones, however, may be temporarily occupied for maintenance operations or other short-term service activities.

8.15 Certain boundaries of the represented envelope cannot be crossed for operation and maintenance purposes due to the presence of safety barriers (to be built after

commissioning) and other minor constructed areas, as indicated in red in Figure 2 and Figure 3.

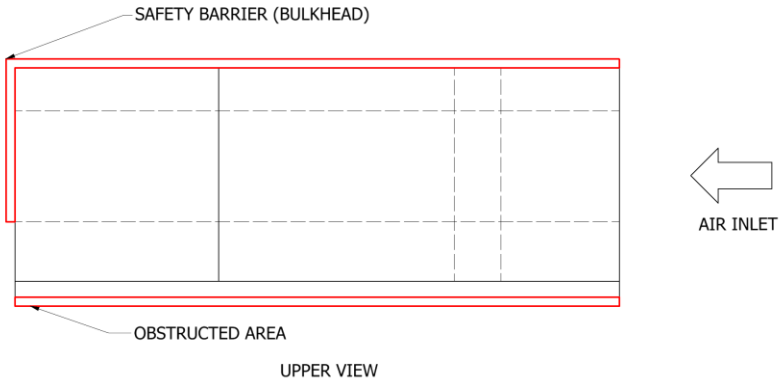


Figure 2 – Representation of safety barriers and obstructed areas, top view

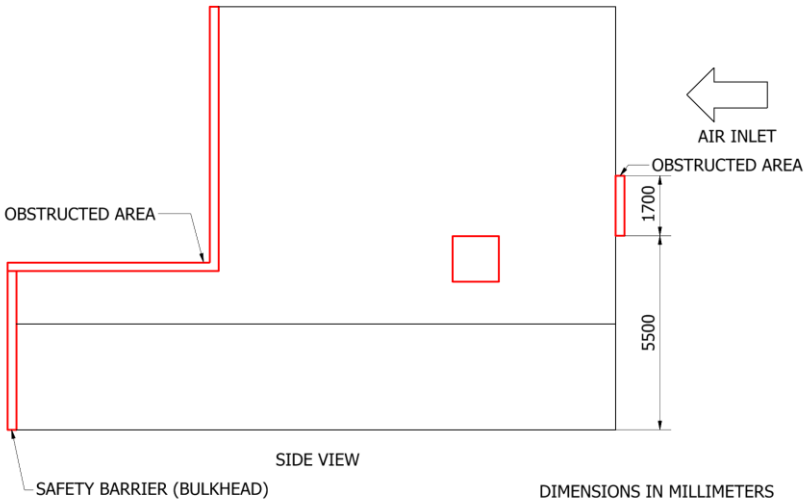


Figure 3 – Representation of safety barriers and obstructed areas, side view

8.16 Due to site restrictions, installation to the final location shall be carried out through the aperture highlighted in blue in Figure 1 (b), with horizontal movement along the X axis. The equipment baseplate and enclosure shall have dimensions that permit this passage. The air inlet and exhaust systems may be lowered along the Z axis via the upper access of the free space. Components to be lifted by the crane shall not exceed 26,800 kg (PMXL-1 crane lifting limit).

9 PREVIOUS EXPERIENCE

9.1 In order to demonstrate successful experience, PACKAGER shall provide a specific reference list (highlighting similar duties), for every quoted equipment model. List shall comprise supplied equipment operating data, service, customer, end-user, location, year of start-up, contact person, e-mail address and telephone number. Equipment which successful experience of continuous and satisfactory

operation under similar conditions (at least as severe as those specified on the datasheets) cannot be demonstrated is not acceptable.

9.2 Undersized equipment, unproven designs or prototypes (including parts) with no previous service on offshore installations is not acceptable.

9.3 Unless otherwise specified, a minimum of 25.000 hours continuous operation under similar operating conditions shall be demonstrated for at least 4 machines of the same model and same size to meet datasheet operating conditions required.

9.4 “Prototype” and / or “unproven” refer to new or altered designs, which prior experience of operation under similar conditions cannot be demonstrated.

9.5 “Undersized” refers to equipment or components that, to comply with specified transient service conditions might be close to design limitations.

9.6 PACKAGER shall guarantee the implementation of all improvements required by Service Bulletin (SB) or other engineering recommendations issued during the design and construction phase up to PETROBRAS final acceptance of equipment, without any additional cost to PETROBRAS.

10 SPARE PARTS

10.1 PACKAGER shall include in scope of supply all spares required for complete cold/hot field testing, start-up, commissioning and assisted operation.

10.2 A Spare Parts List including all other recommended spares required to cover two years of operation shall be provided as part of the technical documentation. This list shall include the price of each part, delivery time, and layout and sectional drawings indicating the location of the parts with tag/reference identifications.

10.3 Part number of each spare part shall be informed. PACKAGER shall provide interchangeability list for all identical / common parts among several quoted equipment. Special attention shall be given to general-purpose equipment (pumps, gears, etc.) and parts (seals, couplings, bearings, etc.), where there should be fully identical (same size and materials) or similar (same size, different materials) parts. Whenever feasible, materials shall be upgraded to a common, top specification, to reduce spare parts inventory. In this case, such changes shall be noted on the datasheets. Upon receiving upgraded materials parts list, PETROBRAS will decide which material specification should be used as upgraded reference.

10.4 All items shall be individually priced and included in main quotation.

10.5 PACKAGER shall guarantee the availability of spare parts for the entire package for a minimum period of 30 (thirty) years from the equipment start-up date.

10.6 All spares shall be packed separately with clear identification and delivered with the main equipment in packing suitable for long-term storage. Identification shall match with identification number on packing list.

10.7 As Capital Spares, PACKAGER shall consider at least one gas turbine (gas generator and power turbine), one compressor bundle (i.e. 'inner barrel assembly' as per API STD 617) with one spare rotor or, when applicable, one complete cartridge, and a set of gear rotors. For these spares, PACKAGER shall provide the container for each item.

10.8 During commissioning, start up, assisted operation and warranty periods PACKAGER shall be responsible for providing and replacing all faulty parts. Additional spare parts for commissioning, start-up and assisted operation shall be defined and recommended by PACKAGER and shall also be supplied with the equipment.

11 GUARANTEE AND WARRANTY

11.1 PURCHASER and PACKAGER agreement and compliance with the project specifications and inquiry documents shall not excused PACKAGER from the responsibility of supplying equipment and components suitable for the specified operating conditions.

11.2 PURCHASER, PACKAGER and VENDORS shall guarantee and agree upon the following clauses:

- Equipment performance according to operating conditions as stated on Material Requisition and PACKAGER information.
- All equipment and materials shall be new. Refurbished equipment or parts thereof are not acceptable.
- All equipment and component parts shall be guaranteed by the PACKAGER against fault in design, defective or improper materials, poor workmanship and failure from normal usage for a period stated in the contract. If any defects or low performance occur during such contract period, PACKAGER shall make all necessary or desirable alterations (repairs and replacements) following Contract guidelines.

11.3 Unless otherwise stated / defined on the contract between PETROBRAS and PACKAGER, the warranty period shall comprise one (1) year of operation start or three (3) years after delivery, whatever comes first.

12 TECHNICAL ASSISTANCE

12.1 PACKAGER shall provide all necessary support and supervision, including assistance with Detailed Engineering Design assistance, for the erection and installation, commissioning, start-up, and Site Acceptance Test (including assisted operation prior to and during the test) of the main and auxiliary equipment.

12.2 PACKAGER shall provide offshore field service supervision (erection and installation, commissioning, start-up and Site Acceptance Test) for all equipment including, at least, the following activities:

- Receiving the equipment at jobsite (M);
- Inspection of baseplate foundations (M);
- Leveling, pre-alignment and grouting (M);
- Energizing of the system – electric and control panels (E/I/A);
- Supervision of final mechanical assembly (M);
- Full simulation of control loops (E/I/A);

- Establishing adequate communication between the systems and the supervisory system (E/I/A);
- Preparation for flushing (M);
- Flushing approval, mechanical and chemical cleaning of main pipes (M);
- Turbine train interlocks and functional tests (E/I/A);
- Site Acceptance Test (M/E/I/A);
- Start up (M/E/I/A).

Remarks: M (Mechanical); E (Electrical); I (Instrumentation); A (Automation)

12.3 PACKAGER shall be capable of providing specialists from different areas such as mechanical, electrical, instrumentation and automation (including sub vendor technicians).

12.4 PACKAGER shall be responsible for all offshore technicians' costs (including transportation and accommodation).

12.5 The procedure to perform the Site Acceptance Test at site shall be submitted for PETROBRAS comments and approval, at least, three (3) months before the test. PACKAGER is required to comment field installations.

12.6 The services will take place at PMXL-1 and will be scheduled with the PACKAGER through formal communication issued by PETROBRAS at least 15 calendar days in advance.

12.7 The services will be paid based on a daily rate for work performed per offshore technician.

12.7.1 Services shall be planned and executed considering a daily offshore work shift of 11 (eleven) hours, with an additional 1 (one) hour for meals, preferably during daytime hours (5:00 AM to 10:00 PM).

12.7.2 Services beyond this schedule or during nighttime are not planned. However, if required due to production losses or safety-related issues, service planning must undergo prior approval by PETROBRAS.

12.7.3 There will be no differentiated billing for services performed at nighttime or exceeding the 11-hour daily work limit.

13 TRAINING

13.1 Training shall include a standardized program for PETROBRAS operation and maintenance personnel, aimed at familiarizing participants with the equipment supplied by vendor and enabling them to competently operate and perform routine maintenance on the entire package. The training shall cover, at a minimum, the following topics:

- Complete System description;
- Technical and operational characteristics;
- Operating principles;
- Operating and Maintenance procedures and routines;

- Identification and troubleshooting of operational problems and possible causes;
- Signaling and warning devices;
- Presentation and interpretation of drawings and diagrams.

13.2 PACKAGER shall prepare and submit a detailed training program to PETROBRAS for review and approval at least three (3) months prior to equipment start-up.

13.3 Training program shall commence two (2) months prior to equipment start-up, with a duration of five (5) working days, eight (8) hours per day. The training shall be conducted in Brazil, at a site to de be defined by PETROBRAS.

13.4 The training shall be conducted in Brazilian Portuguese. Consecutive translation services are acceptable and shall be provided by PACKAGER. Training manuals shall be supplied in Brazilian Portuguese. All training materials shall be specifically based on the equipment supplied.

13.5 PACKAGER shall provide two (2) complete sets of training material, in both printed and electronic formats, covering all topics addressed during training.

13.6 A total of twelve (12) operation personnel and twelve (12) maintenance personnel shall be considered for participation in the training program. The training sessions shall permit synchronous transmission (live streaming), remote participation, and recording.

13.7 Training videos shall be provided either in Brazilian Portuguese or in English with Brazilian Portuguese subtitles.

13.8 PACKAGER shall be responsible for all costs related to technicians, including transportation, accommodation, mobilization/demobilization, and travel expenses. Additionally, PACKAGER shall provide all required documentation and training manuals.

13.9 Attendance certificates shall be issued to all participants upon completion of the training courses.

14 WORKING GROUP

REV. 0		
KEY	**DEPARTMENT**	**ROLE**
CL2R	BS/ATP-IMI/MIED	EXECUTION
DHG1	BS/PCM/PROJDP	EXECUTION
FBJW	BS/PCM/PROJDP	EXECUTION
FEU5	BS/PCM/PROJDP	EXECUTION
FZ35	BS/PCM/PROJDP	EXECUTION
RZA7	BS/PCM/PROJDP	EXECUTION
SGPL	SRGE/ESUP/PIES/PPP	EXECUTION
URS8	BS/PCM/PROJDP	EXECUTION
U32A	BS/PCM/PROJDP	CHECK
BEGS	BS/PCM/PROJDP	APPROVAL

REV. A / REV. B		
KEY	**DEPARTMENT**	**ROLE**
DHG1	BS/PCM/PROJDP	EXECUTION
FBJW	BS/PCM/PROJDP	EXECUTION
FEU5	BS/PCM/PROJDP	EXECUTION
FZ35	BS/PCM/PROJDP	EXECUTION
RZA7	BS/PCM/PROJDP	EXECUTION
SGPL	SRGE/ESUP/PIES/PPP	EXECUTION
U32A	BS/PCM/PROJDP	EXECUTION
URS8	BS/PCM/PROJDP	EXECUTION
CTFQ	BS/ENGP/EEDSE	CHECK
BEGS	BS/PCM/PROJDP	APPROVAL

REV. C / REV. D		
KEY	**DEPARTMENT**	**ROLE**
FBJW	BS/PCM/PROJDP	EXECUTION
FEU5	BS/PCM/PROJDP	EXECUTION
CTFQ	BS/ENGP/EEDSE	CHECK
BEGS	BS/PCM/PROJDP	APPROVAL