	TECHNICAL SPECIFICATION	Nº: I-ET-3010.2D-1233-320-P4X-101	
	CLIENT:	AGUP	SHEET: 1 of 24
	JOB:	HIGH CAPACITY FPSO - GAS EXPORTATION ALL ELECTRIC	
	AREA:	ATAPU 2 AND SÉPIA 2	
SRGE	TITLE:	MOLECULAR SIEVE REGENERATION GAS COMPRESSION UNIT (UC-1233001A/B) PACKAGE SPECIFICATION	INTERNAL ESUP

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INDEX OF REVISIONS

REV.	DESCRIPTION AND/OR REVISED SHEETS
0	ORIGINAL ISSUE
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	REV. 0	REV. A	REV. B	REV. C	REV. D	REV. E	REV. F	REV. G	REV. H
DATE	MAR/24/22	AGO/23/22	DEC/09/22						
DESIGN	EEA	EEA	EEA						
EXECUTION	CFQ2	CFQ2	CFQ2						
CHECK	UP4Y	UP4Y	UP4Y						
APPROVAL	CXM6	CXM6	CXM6						

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 FORM OWNED TO PETROBRAS N-0381 REV. L



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1. INTRODUCTION

- 1.1 This document objective is to detail information related to integrally geared compressor packages of HIGH CAPACITY FPSO - GAS EXPORTATION ALL ELECTRIC project.
- 1.2 Design shall comply with rules and regulations stated by Brazilian Authorities, Classification Society, International Standards. PURCHASER and PACKAGER shall also comply with local codes / regulations and shall be responsible for their legal translations.
- 1.3 PURCHASER and PACKAGER shall comply with Contract exhibits. Requirements for capital spare, spare parts, field proven experience, training, commissioning support and Classification society, among other contractual requirements, shall be according to Contract exhibits.
- 1.4 This document will cover the compression package of the following systems: UC-1233001A/B - MOLECULAR SIEVE REGENERATION GAS COMPRESSION UNIT

2. DEFINITIONS

PETROBRAS	FPSO contracting and operating company.
PACKAGER	Company responsible for project, assembly, construction, fabrication, test of compressor and project, assembly, tests, integration and furnishing of all other main equipment in the skid, including the auxiliary systems.
PURCHASER	EPC company responsible for project, assembly, erection, construction, fabrication, test and furnishing, lift, hook up, installation and integration of all Modules of FPSO, with complete and fully operative systems in accordance with the requirements of this specification, codes and standards referenced therein.
VENDOR	Company hired by the purchaser or packager to supply equipment, components of equipment, instruments, control systems, etc. that will be part of the main system to be supplied.

3. GENERAL DESIGN REQUIREMENTS

- 3.1 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 FPSO. Prime importance is given to approve high degree of reliability, durability and maintainability.
- 3.2 PACKAGER shall be the compressor OEM (Original Equipment Manufacturer) and shall assume unit responsibility and shall assure that all subvendors comply with the requirements stated herein.
- 3.3 All points shown in the data sheet, as well as operating points not shown with lower intermediate molecular weight, have equal probability of occurrence. There is no predominant operating point. The certified point does not represent the most frequent operating point.



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3.4 Equipment and piping served by cooling water shall also be design with protections/detections against scenario of lack of supply and/or overpressure and/or high cooling water temperature.

4. UC-1233001A/B – MOLECULAR SIEVE REGENERATION GAS COMPRESSION UNIT– SPECIFIC REQUIREMENTS

4.1 Each molecular sieve regeneration gas compression unit consist of an electrical driven integrally geared compressor, single stage, with gearbox, suction throttle valve control and auxiliaries equipment integrated for perfect functioning of the required service (accessories, control panel, machinery protection system, oil system, seal gas system, etc.). A total of 2 units shall be delivered. Each unit shall be designed according I-ET-3010.00-1200-321-P4X-001 - TECHNICAL SPECIFICATION FOR CENTRIFUGAL COMPRESSOR DRIVEN BY ELECTRIC MOTOR taking into account the modification listed in this document. Units shall not share auxiliaries systems. Although compression units are 2x100% configuration, package shall be designed to run all compressor units simultaneously.

4.2 Process design cases shall be as per I-FD-3010.2D-1233-321-P4X-001 - MOLECULAR SIEVE REGENERATION GAS COMPRESSION UNIT (UC-1233001A/B).

5. I-ET-3010.00-1200-321-P4X-001 SPECIFIC PROJECT TERMS

5.1 Considering this specific project, the following terms shall be replaced at the I-ET-3010.00-1200-321-P4X-001 - TECHNICAL SPECIFICATION FOR CENTRIFUGAL COMPRESSOR DRIVEN BY ELECTRIC MOTOR:

FROM:	TO:
SPECIFIC PROJECT TOPSIDES UPS AND DC SYSTEMS ONE-LINE DIAGRAM	I-DE-3010.2D-5265-946-P4X-001 - TOPSIDES UPS AND DC SYSTEMS ONE-LINE DIAGRAM
SPECIFIC PROJECT AUTOMATION AND CONTROL ARCHITECTURE	I-DE-3010.2D-5520-800-P4X-002 - AUTOMATION AND CONTROL ARCHITECTURE
SPECIFIC PROJECT PIPING SPECIFICATION FOR TOPSIDE	I-ET-3010.2D-1200-200-P4X-001 - PIPING SPECIFICATION FOR TOPSIDES
SPECIFIC PROJECT INSTRUMENTATION ADDITIONAL TECHNICAL REQUIREMENTS	I-ET-3010.2D-1200-800-P4X-001 - INSTRUMENTATION ADDITIONAL TECHNICAL REQUIREMENTS
SPECIFIC PROJECT FIELD INSTRUMENTATION	I-ET-3010.2D-1200-800-P4X-005 - FIELD INSTRUMENTATION
SPECIFIC PROJECT AUTOMATION INTERFACE OF PACKAGED UNITS	I-ET-3010.2D-1200-800-P4X-014 - AUTOMATION INTERFACE OF PACKAGE UNITS
SPECIFIC PROJECT TOPSIDE'S MECHANICAL HANDLING PROCEDURES	I-ET-3010.2D-5266-630-P4X-001 - TOPSIDE'S MECHANICAL HANDLING PROCEDURES
SPECIFIC PROJECT EQUIPMENT LIST	I-LI-3010.2D-1200-940-P4X-002 - EQUIPMENT LIST

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SPECIFIC PROJECT AUTOMATION AND CONTROL SYSTEM FUNCTIONS	I-MD-3010.2D-5520-800-P4X-001 - AUTOMATION AND CONTROL SYSTEM FUNCTIONS
SPECIFIC PROJECT AUTOMATION NET WORK DESCRIPTION	I-MD-3010.2D-5520-800-P4X-003 - AUTOMATION NET WORK DESCRIPTION
PETROBRAS TOPSIDE'S MECHANICAL HANDLING PROCEDURES	I-ET-3010.2D-5266-630-P4X-001 - TOPSIDE'S MECHANICAL HANDLING PROCEDURES
SPECIFIC PROJECT DESCRIPTIVE MEMORANDUM – PROCESS	I-MD-3010.2D-1200-940-P4X-005 - DESCRIPTIVE MEMORANDUM - PROCESS
SPECIFIC PROJECT DESCRIPTIVE MEMORANDUM – AUTOMATION AND CONTROL SYSTEM - SCOPE DEFINITION	I-MD-3010.2D-1200-940-P4X-011 - DESCRIPTIVE MEMORANDUM - AUTOMATION & CONTROL

5.2 The adjustment of the I-ET-3010.00-1200-321-P4X-001 - TECHNICAL SPECIFICATION FOR CENTRIFUGAL COMPRESSOR DRIVEN BY ELECTRIC MOTOR shall also take place according ANNEX B.

6. PETROBRAS GENERAL DELIVERY REQUIREMENTS

- 6.1 Besides the documentation listed in Annex "B" of API 617, which shall be considered as required, VENDOR shall submit the documents described at Annex A of this technical specification. Different schedule may be proposed by VENDOR and submitted to PETROBRAS approval.
- 6.2 Proposal drawings and data shall not be certified or as-built.
- 6.3 PETROBRAS drawings approval shall not be considered as relieving the PURCHASER and PACKAGER from any responsibility for detailed design, dimensioning and construction of equipment or deviations from specifications.
- 6.4 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.
- 6.5 PURCHASER and PACKAGER shall provide weights, dimensions and center of gravity for all equipment, including auxiliaries in different skids or shipped loose, with accuracy of $\pm 10\%$ in proposal phase and $\pm 3\%$ after order. PURCHASER and PACKAGER shall also furnish required data for dry, operation, test and maintenance cases.
- 6.6 PURCHASER and PACKAGER are required to note on respective data sheets of main equipment the moments of inertia (kg.m^2) of each rotor.

7. MINIMUM SCOPE OF SUPPLY

- 7.1 PURCHASER and 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:

Centrifugal compressor Gearbox Electric motor Auxiliary equipment



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- Couplings and guards: Main equipment Auxiliary equipment
- Baseplate (skid): Main equipment Auxiliary equipment
- Inlet system: Heat exchanger Silencer Knock-out drum
- Temporary strainer Permanent Filter
- Interstage system: Heat exchanger Silencer Knock-out drum
- Discharge system: Heat exchanger Silencer Knock-out drum
- Instrumentation, automation and control: Unit control panel
- Machinery protection system
- Load sharing control: Design & supply Design data
- Capacity control: Design & supply Design data
- Suc. Throttle valve: Design & supply Design data
- Hot by-pass: Design & supply Design data
- VFD: Design & supply Design data
- Anti-surge system: For each stage Common for all stages
- Monitoring / controls: Design & supply Design data
- Control valve: Design & supply Design data
- Instrumentation: Design & supply Design data
- By-pass line: Design & supply Design data
- By-pass cooler: ** Design & supply ** Design data **
- Relief valves: Design & supply Design data
- Non-return valves : Design & supply Design data
- Operational depressurizing valve, with restriction orifice: Design & supply Design data
- Oil system: Lube Control Seal
- Sealing system: Main equipment Auxiliary equipment
- Cooling system: Main equipment Auxiliary equipment
- Deluge system
- Piping and accessories for all utility system within skid limits
- MCC Transformers Uninterruptible power supply
- Grounding
- All safety equipment and systems such as emergency shutdown valves, pressure safety valves, etc. within skid limits

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- Cables, cables trays, junction boxes and accessories within skid limits
- Lateral analysis of the whole train, with model & report: Typical Dedicated
- Torsional analysis of the whole train, with model & report: Typical Dedicated
- Transient torsional analysis of the whole train, with model & report: Typical Dedicated
- Forced unbalance rotor response analysis of all units, with model & report: Typical Dedicated
- Special tools for main & auxiliary equipment maintenance (field maintenance)
- Capital spare (all required parts included in main quotation with list of itemized prices and its container dimensions)
- Spare parts for tests, commissioning, start-up and assisted operation
- Design and coordination of complete arrangement within package limits
- Painting and procedures
- Preparation for shipment, including a single spreader bar for each FPSO for compressor skid
- Packing, coating, anticorrosive protection and preservation
- Hydrostatic test (HT), Performance Test (PT), Mechanical Running Test (MRT), Sound Level Test (SLT), Factory Integrated Test (FIT), Site Acceptance Test (SAT).
- Supply & application of thermal insulation
- Supply & application of support system, where applicable
- Supply & application of heat tracing devices
- Supply & application of noise attenuation devices
- All consumables (oils, greases, fluids, products, etc.) for installation, commissioning and start-up
- Nameplates
- Full package documentation
- Full compliance to local codes & regulations
- Certification by Classification Society
- Quality assurance program
- Technical assistance of the following services: engineering during Detailed Engineering Design, erection, installation, onshore / offshore commissioning and start-up of main and auxiliary equipment, Site Acceptance Test, assisted operation before Offshore Acceptance Test and during Offshore Acceptance Test, included in main quotation, with itemized prices.
- Training..

**** PACKAGER shall evaluate if a recycle cooler is required. And, if so, PACKAGER shall include cooler and associated accessories as part of scope of supply. This cooler shall comply with I-ET-3010.00-1200-540-P4X-001 - REQUIREMENTS FOR PRESSURE VESSELS DESIGN AND FABRICATION. If a tubular type heat exchanger is selected, it shall comply with I-ET-3010.00-1200-451-P4X-001 -**



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REQUIREMENTS FOR SHELL AND TUBE HEAT EXCHANGER DESIGN AND FABRICATION

- 7.2 For details about equipment and systems, see complete PETROBRAS specification I-ET-3010.00-1200-321-P4X-001 - TECHNICAL SPECIFICATION FOR CENTRIFUGAL COMPRESSOR DRIVEN BY ELECTRIC MOTOR.
- 7.3 PURCHASER and PACKAGER are responsible for the complete package. Even if some sub-item is not described (for instance bolts, gaskets, expansion joints, thermowells etc.) PURCHASER and PACKAGER shall take it into account and include it in the scope of supply.

8. APPLICABLE DOCUMENTS (STANDARDS, REGULATIONS, ETC.):

Document Nº	Description
NR-1	Brazilian Ministry of Economy - Regulation Standard 1: “ <i>Disposições Gerais</i> ”
NR-10	Brazilian Ministry of Economy - Regulation Standard 10: “ <i>Instalações e Serviços em Eletricidade</i> ”
NR-11	Brazilian Ministry of Economy - Regulation Standard 11: “ <i>Transporte, Movimentação, Armazenagem e Manuseio de Materiais</i> ”
NR-12	Brazilian Ministry of Economy - Regulation Standard 12: “ <i>Máquinas e Equipamentos</i> ”
NR-13	Brazilian Ministry of Economy - Regulation Standard 13: “ <i>Caldeiras e Vasos de Pressão</i> ”
NR-15	Brazilian Ministry of Economy - Regulation Standard 15: “ <i>Atividades e Operações Insalubres</i> ”
NR-17	Brazilian Ministry of Economy - Regulation Standard 17: “ <i>Ergonomia</i> ”
NR-20	Brazilian Ministry of Economy - Regulation Standard 20: “ <i>Líquidos Combustíveis e Inflamáveis</i> ”
NR-23	Brazilian Ministry of Economy - Regulation Standard 23: “ <i>Proteção Contra Incêndio</i> ”
NR-26	Brazilian Ministry of Economy - Regulation Standard 26: “ <i>Sinalização de Segurança</i> ”
NR-37	Brazilian Ministry of Economy - Regulation Standard 37: “ <i>Segurança e Saúde em Plataformas de Petróleo</i> ”
API Std 521	Pressure-relieving and Depressuring Systems
API Std 541	Form-Wound Squirrel-Cage Induction Motors - 500 Horsepower and Larger
API Std 610	Centrifugal Pumps for Petroleum, Petrochemical and Natural Gas Industries
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 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 682	Pumps - Shaft Sealing Systems for Centrifugal and Rotary Pumps



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Document Nº	Description
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 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 ₂ S-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.
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
IEC60034	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)

9. ATTACHED AND REFERENCED DOCUMENTS

- 9.1 The documents listed below form an integral part of this project. Any deviation from the specifications mentioned in these documents shall be clearly stated by the PURCHASER and PACKAGER and submitted to PURCHASER for approval.
- 9.2 PURCHASER and 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.
- 9.3 Attached documents (data sheets, drawings, technical specifications, etc.):

Document Nº	Discipline	Title	
I-DE-3010.2D-1200-942-P4X-002	ARR	GENERAL ARRANGEMENT	(1)



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Document Nº	Discipline	Title	
I-DE-3010.2D-1414-942-P4X-001	ARR	M-04 - CO2 REMOVAL - EQUIPMENT LAYOUT PLAN	(1)
I-ET-3000.00-0000-940-P4X-002	COO	SYMBOLS FOR PRODUCTION UNITS DESIGN	(1)
I-ET-3A26.00-1000-941-PPC-001	COO	METOCEAN DATA	(1)
I-ET-3A36.00-1000-941-PPC-001	COO	METOCEAN DATA	(1)
I-DE-3010.00-5140-700-P4X-003	ELE	GROUNDING INSTALLATION TYPICAL DETAILS	(1)
I-DE-3010.00-5140-797-P4X-001	ELE	ELECTRICAL SYSTEM AUTOMATION ARCHITECTURE DIAGRAM	(1)
I-DE-3010.00-5140-797-P4X-002	ELE	ELECTRICAL SYSTEM AUTOMATION TYPICAL ACTUATION DIAGRAMS	(1)
I-LI-3010.00-5140-797-P4X-001	ELE	ELECTRICAL SYSTEM AUTOMATION INTERFACE SIGNALS LIST	(1)
I-ET-3010.00-5140-700-P4X-002	ELE	SPECIFICATION FOR ELECTRICAL MATERIAL FOR OFFSHORE UNITS	(1)
I-ET-3010.00-5140-700-P4X-003	ELE	ELECTRICAL REQUIREMENTS FOR PACKAGES FOR OFFSHORE UNITS	(1)
I-ET-3010.00-5140-700-P4X-005	ELE	REQUIREMENTS FOR HUMAN ENGINEERING DESIGN FOR ELECTRICAL SYSTEMS OF OFFSHORE UNITS	(1)
I-ET-3010.00-5140-700-P4X-007	ELE	SPECIFICATION FOR GENERIC ELECTRICAL EQUIPMENT FOR OFFSHORE UNIT	(1)
I-ET-3010.00-5140-700-P4X-009	ELE	GENERAL REQUIREMENTS FOR ELECTRICAL MATERIAL AND EQUIPMENT FOR OFFSHORE UNITS	(1)
I-ET-3010.00-5140-712-P4X-001	ELE	LOW-VOLTAGE INDUCTION MOTORS FOR OFFSHORE UNITS	(1)
I-ET-3010.00-5140-712-P4X-002	ELE	MEDIUM-VOLTAGE INDUCTION MOTORS FOR OFFSHORE UNITS	(1)
I-ET-3010.00-5140-797-P4X-001	ELE	ELECTRICAL SYSTEM AUTOMATION ARCHITECTURE	(1)
I-ET-3010.00-5140-741-P4X-004	ELE	SPECIFICATION FOR LOW-VOLTAGE GENERIC ELECTRICAL PANELS FOR OFFSHORE UNITS	(1)
I-DE-3010.2D-5265-946-P4X-001	ELE	TOPSIDES UPS AND DC SYSTEMS ONE-LINE DIAGRAM	(1)
I-ET-3010.00-1200-800-P4X-002	INS	AUTOMATION, CONTROL AND INSTRUMENTATION ON PACKAGE UNITS	(1)
I-ET-3010.00-5500-854-P4X-001	INS	MACHINERY MONITORING SYSTEM (MMS)	(1)
I-ET-3010.2D-1200-800-P4X-014	INS	AUTOMATION INTERFACE OF PACKAGE UNITS	(1)
I-ET-3010.00-1200-956-P4X-001	MEC	QUALIFICATION TESTS FOR PAINT SYSTEMS	(1)
I-ET-3010.00-1200-956-P4X-002	MEC	GENERAL PAINTING	(1)
I-ET-3010.00-1200-540-P4X-001	MEC	REQUIREMENTS FOR PRESSURE VESSELS DESIGN	(1)
I-ET-3010.00-1200-540-P4X-001	MEC	REQUIREMENTS FOR SHELL AND TUBE HEAT EXCHANGER DESIGN AND FABRICATION	(1)
I-ET-3010.00-1200-321-P4X-001	MEC	TECHNICAL SPECIFICATION FOR CENTRIFUGAL COMPRESSOR DRIVEN BY ELECTRIC MOTOR	(1)



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I-FD-3010.2D-1233-320-P4X-101	MEC	MOLECULAR SIEVE REGENERATION GAS COMPRESSION UNIT (UC-1233001A/B)	(1)
I-FD-3010.2D-1200-854-P4X-001	MEC	MACHINERY PROTECTION SYSTEM FOR MOTOR DRIVEN CENTRIFUGAL COMPRESSOR	(1)
I-RL-3010.2D-1350-960-P4X-002	NAV	MOTION ANALISYS	(1)
I-FD-3010.2D-1233-321-P4X-001	PRO	MOLECULAR SIEVE REGENERATION GAS COMPRESSION UNIT (UC-1233001A/B)	(1)
I-RL-3010.2D-1200-940-P4X-001	PRO	GENERAL SPECIFICATION FOR AVAILABLE UTILITIES	(1)
I-DE-3010.2D-1233-944-P4X-001	PRO	GAS DEHYDRATION SYSTEM	(1)
I-DE-3010.2D-1233-944-P4X-002	PRO	REGENERATION PRE TREATMENT	(1)
I-DE-3010.2D-1233-944-P4X-003	PRO	REGENERATION COOLING	(1)
I-DE-3010.2D-1200-94A-P4X-001	SAF	AREA CLASSIFICATION - GENERAL	(1)

(1) The requirements of these documents are mandatory and refer to this package and other packages or equipment on the unit.

Note: Electrical datasheets shall be included during detailed design.

10. ANNEX

10.1 ANNEX A

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	2W	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, Data Sheet and Sizing Calculations		X	6W	X	2D	X
A05	Journal-Bearing Assembly Drawings, Bill of Materials, Data Sheet 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	X	6W	X	2D	X



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REV. B

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INTERNAL

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Item	Description	With Proposal	For Approval		Certified		Final
		Document	Document	Schedule	Document	Schedule	
A15	Electrical and Instrumentation Schematics and Bill of Materials	X	X	6W	X	2D	X
A16	Electrical and Instrumentation Arrangement Drawing and List of Connections		X	4W	X	2D	X
A17	Data Sheets (Proposal / As-Built)	X	X	6W	X	2D	X
A18	Noise Sound Level (datasheet and report)	X	X	6W	X	2D	X
A19	Metallurgy of Major Components	X	X	6W	X	2D	X
A20	Lateral Analysis Report		X	6W	X	2D	X
A21	Torsional Analysis Report		X	6W	X	2D	X
A22	Vibration Analysis Report (with Sommerfeld Number Versus Stiffness and Dampening Bearing curves)	X	X	6W	X	2D	X
A23	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. Operation limits (envelope) shall be clearly indicated.	X	X	6W	X	2D	X
A24	Impeller Overspeed Test Report				X	1T	1D
A25	Mechanical Running Test Report				X	1T	1D
A26	Coupling Selection and Rating	X	X	6W	X	2D	X
A27	Spare Parts Recommendations Lists with Itemized Prices for Two (2) Years of Operation)	X	X	10W	X	2D	X
A28	List of Special Tools Furnished for Maintenance		X	10W	X	2D	X
A29	Preparation for Storage at Job Site before Installation		X	6W	X	4D	1D
A30	Weather Protection, Insulation and Tropicalization		X	6W	X	4D	1D
A31	Tabulation of All Utilities	X	X	6W	X	2D	X
A32	Reference List of Similar Equipment Installed and Operating Under Analogous Conditions	X					
A33	Operating Restrictions to protect Equipment During Start-Up, Operation and Shutdown	X	X	6W	X	2D	X
A34	List of Components Requiring PETROBRAS's Approval	X	X	6W	X	2D	X
A35	Summary of Materials and Hardness of Materials exposed to H ₂ S	X	X	6W	X	2D	X
A36	Interstage Cooler System Data						
A37	Drawings, Details and Description of Instrumentation and Controls	X	X	6W	X	2D	X
A38	Minimum Length of Straight Pipe Required at Machine Inlet or Side Inlets	X	X	6W	X	2D	X



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Item	Description	With Proposal	For Approval		Certified		Final
		Document	Document	Schedule	Document	Schedule	
A39	Maximum and Minimum Allowable Seal Pressure for each Compressor	X	X	6W	X	2D	X
A40	Statement of Manufacturer's Testing Capabilities	X	X	6W	X	2D	X
A41	Performance Test Data and Curves				X	1T	1D
A42	Back-to-Back Impeller Machine Vendor to provide Thrust Bearing Loads Versus Differential Pressure Curve		X	6W	X	2D	X
A43	Balance Piston Leakage Rates (Test and Field Values)	X	X	6W	X	2D	X
A44	Balance Piston Line Differential Pressure Versus Thrust Load Curves		X	6W	X	2D	X
A45	Testing Procedures		X	6W	X	2D	X
A46	PACKAGER and PURCHASER Progress Reports		X	2W			
A47	Installation Manual		X	10W	X	2D	X
A48	Operating and Maintenance Manual		X	10W	X	2D	X
A49	Technical Data Manual		X	10W	X	2D	X
A50	Fulton and Kirk-Donald Plot	X	X	6W	X	2D	X
A51	Aerodynamics Cross Coupling Stiffness and Log Decrement Analysis	X	X	6W	X	2D	X
A52	As-Built Dimensions and Data (Including Assemblies Clearances)						X
A53	Certified Hydrostatic Test Logs				X	1T	1D
A54	Rotor Balancing Logs				X	1T	1D
A55	Rotor Combined Mechanical and Electrical Runout Report				X	1T	1D
A56	Weld Procedures and Welders Qualification Certificates		X	6W	X	2D	X
A57	List of Drawings and Documents Index (Status and Delivery Schedule)		X	2W	X	2D	X
A58	Preservation, Packaging and Shipping Procedures, including vendors.		X	6W	X	2D	X
A59	Shipping List		X	6W	X	2D	X
A60	Material Safety Data Sheets	X	X	10W	X	2D	X
A61	Liquid Injection System Drawings, Data and List of Components						
A62	Technical Requirements, Data and Drawings for Anti-Surge System	X	X	6W	X	2D	X
A63	Piping and Support Drawings, Arrangement and Details	X	X	4W	X	2D	X
A64	Pressure Vessels, Coolers Pumps and Auxiliary Equipment Data Sheets and Drawings	X	X	6W	X	2D	X
A65	Structure (Walkaways, Handrails, Grating, etc.) Drawings and List of Components		X	4W	X	2D	X



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Item	Description	With Proposal	For Approval		Certified		Final
		Document	Document	Schedule	Document	Schedule	
A66	Baseplate Drawings and List of Components	X	X	6W	X	2D	X
A67	Foundation Plan (With Anchor Bolts and Supports Location)		X	6W	X	2D	X
A68	Dimensions, Weights, Static / Dynamic Loads, Moments and Centers of Gravity	X	X	6W	X	2D	X
A69	Equipment General Description and Catalogs	X					
A70	Painting Specification	X	X	6W	X	2D	X
A71	List of VENDORS	X	X	6W	X	2D	X
A72	Nameplate Drawings for Each Piece of Equipment or Part, Including Applicable Code Stamp		X	6W	X	2D	X
A73	Vent Study Report		X	6W	X	2D	X
A74	List of Exceptions to the Specifications and Applicable Standards	X					
B	Gearbox						
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, Data Sheet and Sizing Calculations		X	6W	X	2D	X
B05	Journal Bearing Assembly Drawing, Parts List, Bill of Materials and Data Sheet and Sizing Calculations	X	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 Data Sheets		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



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Item	Description	With Proposal	For Approval		Certified		Final
		Document	Document	Schedule	Document	Schedule	
B16	Input and Output Shaft Position Diagram	X	X	6W	X	2D	X
B17	Welding Procedures and Welders Qualification Certificates		X	6W	X	2D	X
B18	Hydrostatic Test Logs				X	1T	2D
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 Data Sheets	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 Recommendations Lists 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	6W	X	2D	X
B36	List of VENDORS	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 Data Sheets	X	X	6W	X	2D	X



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Item	Description	With Proposal	For Approval		Certified		Final
		Document	Document	Schedule	Document	Schedule	
C05	Electrical and Instrumentation Wiring Diagrams and Bill of Materials	X	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	Data Sheets (Proposal / As-Built)	X	X	6W	X	2D	X
C12	Installation, Operation and Maintenance Manuals		X	10W	X	2D	X
C13	Spare Parts Recommendations Lists 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
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	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	Cross-Sectional Drawing, 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	Data Sheets (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



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Item	Description	With Proposal	For Approval		Certified		Final
		Document	Document	Schedule	Document	Schedule	
D13	Spare Parts Recommendations Lists 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	deleted						
D18	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
D19	Material Safety Data Sheets	X	X	6W	X	2D	X
D20	Cause x Effect Matrix, Ladder Block, Control Narratives, Logic (including Start-Up, Alarm and Shutdown) and Loop Diagrams		X	6W	X	2D	X
D21	P&ID Drawings and Schematics including, as a minimum: Steam, Seal Gas, Electrical Power, Fuel, Water, Lubrication and Process Fluid System	X	X	6W	X	2D	X
D22	EMI and RFI Test Logs				X	1T	2D
D23	Fire Fighting System List of Components, Drawings, Data Sheets and Bill of Materials		X	6W	X	2D	X
D24	Gas Detection System List of Components, Drawings, Data Sheets and Bill of Materials		X	6W	X	2D	X
D25	Preservation, Packing and Shipping Procedures, including vendors.		X	6W	X	2D	X
D26	Dimensions, Weights, Static / Dynamic Loads, Moments and Centers of Gravity	X	X	6W	X	2D	X
D27	Equipment General Description and Catalogs	X					
D28	Reference List of Similar Equipment Installed and Operating Under Analogous Conditions	X					
D29	Painting Specification	X	X	6W	X	2D	X
D30	List of VENDORS	X	X	6W	X	2D	X
D31	Nameplate Drawings for Each Piece or Part, Including Applicable Code Stamp		X	6W	X	2D	X
D32	List of Exceptions to the Specifications and Applicable Standards	X					



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Item	Description	With Proposal	For Approval		Certified		Final
		Document	Document	Schedule	Document	Schedule	
D33	Package Control System Architecture Diagram	X	X	6W	X	2D	X
D34	List of Data / Tags for Remote Monitoring from HMI Unit A&C System / Memory Map		X	6W	X	2D	X
D35	Control Panel I/O List		X	6W	X	2D	X
D36	Field Acceptance Test and Site Acceptance Test Procedures		X	6W	X	2D	X
D37	Instrument Index	X	X	4W	X	2D	X
D38	Factory Acceptance Test, Site Acceptance Test and Site Integration Test Procedures		X	6W	X	2D	X
D39	Instrument List		X	10W	X	2D	X
D40	Alarm & Events List		X	10W	X	2D	X
D41	Cable List		X	10W	X	2D	X
D42	PLC Technical Specification		X	10W	X	2D	X
D43	Instrument/Instrumented Valve Datasheets (one per type of instrument/instrumented valve)		X	10W	X	2D	X
D44	Instrument/Instrumented Valve Calculations (Control Valves, PSVs, Orifice Plates/Restriction Orifices and Thermowells)		X	10W	X	2D	X
D45	UCP and RIO Panels General Arrangement		X	10W	X	2D	X
D46	UCP and RIO Panels Internal Interconnections Diagram		X	10W	X	2D	X
D47	Wiring Diagram		X	10W	X	2D	X
D48	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	Main Motor & Electrical Equipment						
E01	Dimensional Drawings, Including Weights	X	X	6W	X	2D	X
E02	Dimensional Drawing and Technical Information for Air-Water Coolers		X	6W	X	2D	X
E03	Dimensional Drawing and Technical Information for Bearings		X	6W	X	2D	X
E04	Dimensional Drawing and Technical Information for Pressurisation System		X	6W	X	2D	X
E05	Required Data-Sheets	X	X	6W	X	2D	X



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Item	Description	With Proposal	For Approval		Certified		Final
		Document	Document	Schedule	Document	Schedule	
E06	Starting Time Calculation Report Including Calculation of the Relation T_a/T_r , Current-Speed Curves and Torque-Speed Curves for Motor and Driven Machine, Printed on the Same Chart (100% and 85% of Rated Voltage)	X	X	6W	X	2D	X
E07	Temperature Rise Test Report for Motors Installed in Hazardous Area		X	6W	X	2D	X
E08	Electrical and Mechanical Parameter List in P.U., Including Locked-Rotor, Pull-Up and Breakdown Torques; Rotor Inertia Moment; Rotor Time Constants; Power Factor at Locked-Rotor and at Rated Conditions; Motor Electrical Model with Reactances, Resistances, Slip Dependence, Current Dependence	X	X	6W	X	2D	X
E09	Painting Method	X	X	6W	X	2D	X
E10	Complete Tests List	X	X	6W	X	2D	X
E11	Spare Parts Recommendations Lists with Itemized Prices (Start-Up, Commissioning, Compulsory Set per Classification Society, One (1) and Two (2) Years of Operation)	X	X	10W	X	2D	X
E12	Wiring Diagram(s) for Motor, Instruments, Panels, Sensors, Lubrication and Pressurisation Equipment		X	6W	X	2D	X
E13	Saturation Curves for Current Transformers		X	6W	X	2D	X
E14	Details of Power and Control Terminal Boxes	X	X	6W	X	2D	X
E15	Nameplate Drawings for Each Piece of Equipment or Part, Including Applicable Code Stamp		X	6W	X	2D	X
E16	Speed-Torque and Speed-Current Curves At 100% And 85% Rated Voltage	X	X	6W	X	2D	X
E17	Protection Study Including the Compatibility of Protection Devices with Permissible Thermal Times at Ambient (Cold Start) and Running (Hot Start) Temperatures						
E18	Heating and Cooling Time Constants		X	6W	X	2D	X



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		Document	Document	Schedule	Document	Schedule	
E19	Time-Current Curves Showing the Allowable Starting Condition and Continuous Operation at Rated Voltage and Ambient Temperature		X	6W	X	2D	X
E20	Temperature-Time Curves Showing the Required Stator and Rotor Limits and the Cool-Down Time After All Possible Operational Conditions, Including and Indicating the Worst One		X	6W	X	2D	X
E21	Assembly, Installation, Operation and Maintenance Manuals		X	10W	X	2D	X
E22	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	6W	X
E23	Dimension, weight and functional diagrams for all electrical panels	X	X	6W	X	1T	2D
E24	Electrical load list of auxiliaries	X	X	6W	X	1T	2D
E25	Hazardous area certificates for all electrical equipment	X	X	6W	X	2D	X
E26	Electrical interconnection diagrams		X	6W	X	1T	2D
E27	Technical Reports for All Tests				X	1T	2D
E28	Motor datasheets fulfilled	X	X	6W	X	2D	X
G	General documents						
G1	Inspection and Test Plan	X	X	2W	X	4W	1D
G2	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
G3	Factory Acceptance Test, Site Acceptance Test and Site Integration Test Reports.		X	2T	X	3T	1D
G4	Handling drawing for installation		X	4W	X	2D	1D
G5	Instrument and instrumented valve list		X	4W	X	2D	1D
G6	Instrument and instrumented valve data sheets		X	4W	X	2D	1D
G7	Calibration certificates of instruments, control valves and PSVs						1D
G8	Packing list		X	4D	X	2D	1D
G9	Details drawing of pressure vessels, including internal parts.		X	6W	X	2D	1D
G10	Fabrication procedures of pressure vessels classified in NR-13		X	6W	X	2D	1D
G11	NDT procedures of pressure vessels classified in NR-13		X	6W	X	2D	1D



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Item	Description	With Proposal	For Approval		Certified		Final
		Document	Document	Schedule	Document	Schedule	
G12	Calculation reports of pressure vessels		X	4W	X	2D	1D
G13	Welding, heat treatment and NDT reports, especially for pressure vessels						1D
G14	Material certificates of all pressurized components, specially for pressure vessels						1D
G15	Painting and insulation inspection report						1D
G16	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	2D	1D
G17	Databook index		X	6W	X	2D	1D
G18	Dispatch Dossier						1D
G19	Piping isometrics		X	6W	X	2D	1D
G20	Piping class (piping specification data sheet) - which shall contain at least information about: material, sizes, standard and codes of piping, valve and piping fittings		X	6W	X	2D	1D
G21	Calculation report from pipe thickness dimensioning and any other element on piping class		X	6W	X	2D	1D
G22	Piping support catalog – 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	2D	1D
G23	Expansion joint calculation report and draws (if existent on project)		X	6W	X	2D	1D
G24	Piping code compliance (ASME B31.3) in a calculation report attending the flexibility analysis requirements from code		X	6W	X	2D	1D
G25	General arrangement		X	6W	X	2D	1D
G26	Piping plant		X	6W	X	2D	1D

Remarks:

Indicated schedule is the required time for PURCHASER and 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.

	TECHNICAL SPECIFICATION	Nº I-ET-3010.2D-1233-320-P4X-101	REV. B
	AREA:	ATAPU 2 AND SÉPIA 2	SHEET 22 of 24
	TITLE:	MOLECULAR SIEVE REGENERATION GAS COMPRESSION UNIT (UC-1233001A/B) PACKAGE SPECIFICATION	INTERNAL ESUP

10.2 ANNEX B – Additions and Modifications of I-ET-3010.00-1200-321-P4X-001 - TECHNICAL SPECIFICATION FOR CENTRIFUGAL COMPRESSOR DRIVEN BY ELECTRIC MOTOR

10.2.1 Besides of already modified at chapter 5, the compressors and auxiliary equipment of UC-1233001A/B - MOLECULAR SIEVE REGENERATION GAS COMPRESSION UNIT shall be in accordance with I-ET-3010.00-1200-321-P4X-001, plus the following changes, as noted in parenthesis for each clause, according to the definitions stated below. The information of each clause shall be read as follows, whenever starting with:

- Addition: Continuation of that particular Specification paragraph
- Modification: Replacement of part of that affected Specification paragraph
- Substitution: Replacement of that Specification paragraph in its entirety
- New: Insertion of a requirement not found in Specification
- Deletion: Removal of that particular Specification paragraph
- Comment: Clarification or interpretation on that Specification paragraph

10.2.2 Note - From this point onwards the numbering of the items refer to the corresponding item of the I-ET-3010.00-1200-321-P4X-001.

3.1(Substitution)

Centrifugal compressors shall be in accordance with API std 617, last edition.

3.4 (Deletion)

4.3.1 (Deletion)

4.6.1 (Substitution)

The mineral lube oil system shall be designed per API 614 for special purpose applications (last edition). Special considerations shall be given to the FPSO motion in order to guarantee bearing lube and its oil drainage during normal operation and post-lube:

- for gearbox, the MLO system shall be integrated, if possible, and provided for lubricating driver, gearbox, and driven equipment. When MLO system is not possible to be integrated, an independent mineral oil (lube) package system shall be provided for lubricating driver, gearbox and driven equipment, installed nearest main equipment baseplate.

4.6.12 (Deletion)

4.7.1 (Deletion)

4.7.1.1 (Deletion)

4.7.1.2 (Deletion)

4.7.1.3 (Deletion)

**5.1.15 (Deletion)****5.2.1 (Addition)**

- Emergency shutdown retentive push-button (to be installed in the field near machine);

5.2.2 (Deletion)**5.2.3 (Substitution)**

Compressor Governor System (CGS), located inside the UCP Panel, shall include, at least:

- Capacity control;
- Load-sharing control;
- Anti-surge controls;

5.2.4 (Deletion)**5.2.5 (Deletion)****5.2.6 (Deletion)****5.5.10 (Deletion)****5.8.1.2 (Deletion)****5.8.1.4 (Deletion)****5.8.1.6 (Deletion)****5.8.2.2 (Substitution)**

Capacity control shall maintain the constant flow and limit minimum suction pressure, maximum discharge pressure and maximum electric motor current. The control shall operate in automatic and manual modes. These variables shall be monitored and controlled by Unit Control Panel (UCP). All limits set points shall be defined and monitored from UCP_HMI. The flow set point shall be defined from HMI of PN-UT-1233001-01 MOLECULAR SIEVE UNIT CONTROL PANEL.

5.8.2.3 (Substitution)

The Throttle Valve shall be included in capacity control loop.

5.8.2.4 (Substitution)

If compression trains operating in parallel, capacity control shall provide appropriate distribution of loads between compression units, so that they keep their Operating Point (OP) proportionally equidistant from their respective Surge Control Line. Special attention shall be given to compression units operating closer to the surge line.



TECHNICAL SPECIFICATION

Nº I-ET-3010.2D-1233-320-P4X-101

REV. B

AREA: ATAPU 2 AND SÉPIA 2

SHEET 24 of 24

TITLE: MOLECULAR SIEVE REGENERATION GAS
COMPRESSION UNIT (UC-1233001A/B) PACKAGE
SPECIFICATION

INTERNAL

ESUP

- 5.8.3 (Deletion)
- 5.8.3.1 (Deletion)
- 5.8.3.2 (Deletion)
- 5.8.3.3 (Deletion)
- 5.8.3.4 (Deletion)
- 5.8.3.5 (Deletion)
- 5.8.3.6 (Deletion)

- 5.8.4.14 (Deletion)

- 5.8.5 (Deletion)
- 5.8.5.1 (Deletion)
- 5.8.5.2 (Deletion)
- 5.8.5.3 (Deletion)
- 5.8.5.4 (Deletion)
- 5.8.5.5 (Deletion)
- 5.8.5.6 (Deletion)

- 5.8.6 (Deletion)
- 5.8.6.1 (Deletion)
- 5.8.6.2 (Deletion)
- 5.8.6.3 (Deletion)
- 5.8.6.4 (Deletion)
- 5.8.6.5 (Deletion)
- 5.8.6.6 (Deletion)

- 7.9 (Deletion)

- 8.5 (Deletion)
- 8.5.1 (Deletion)
- 8.5.2 (Deletion)
- 8.5.3 (Deletion)

- 8.6 (Deletion)
- 8.6.1 (Deletion)
- 8.6.2 (Deletion)

- 8.9 (Deletion)
- 8.9.1 (Deletion)
- 8.9.2 (Deletion)
- 8.9.3 (Deletion)
- 8.9.4 (Deletion)
- 8.9.5 (Deletion)

- 9.3 (Deletion)