

GENERAL SPECIFICATION

ROTATING MACHINERY

GS EP MEC 903

Technical Information Analysis Form: Packaged Reciprocating Compressor

00	10/2012	First issue
Rev.	Date	Purpose of the revision

Owning entity: DEV/TEC	Managing entity: DEV/TEC/MTH
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1. Scope

This General Specification defines Company practices and tools to use to perform technical assessment of Packaged Reciprocating Compressor Suppliers.

2. Reference documents

The reference documents listed below form an integral part of this General Specification.

External Documents

Unless otherwise stipulated, the applicable version of these documents, including relevant appendices and supplements, is the latest revision published at the effective date of this document.

Reference	Title
API Std 618	Petroleum and natural gas industries - Packaged reciprocating gas compressors (4 th and 5 th editions)
API Std 670	Machinery Protection Systems
API Std 671	Special Purpose Couplings for Petroleum, Chemical and Gas Industry Services
ISO 13631	Petroleum and natural gas industries - Packaged reciprocating gas compressors

Total General Specifications

Unless otherwise stipulated, the applicable version of these documents, including relevant appendices and supplements, is the latest revision published in the applicable yearly collection.

Reference	Title
GS EP MEC 032	Rotating Machine Package Specification - Gas Engine or Electrical Motor driven Reciprocating Compressor
GS EP MEC 261	Packaged Reciprocating Compressors for Oil and Gas Production Services According to ISO 13631

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3. Technical assessment process of Packaged Reciprocating Compressor Suppliers

The technical assessment process of a Packaged Reciprocating Compressor Supplier is part of the global assessment process of a Supplier, lead by the E&P Purchasing Division.

3.1 Step 1: Gathering of information

To start the technical assessment process, Appendix 1 of this document (Technical Information Analysis Form) shall be sent to the Packaged Reciprocating Compressor Supplier, by the Company.

The Packaged Reciprocating Compressor Supplier shall fill and send back this Form, to the Company, with all the others necessary documents requested.

3.2 Step 2: Data Analysis of Appendix 1 and following actions

After data analysis of Appendix 1, the MTH discipline of E&P Technology Division, shall take a decision to proceed or not to the next step of the Supplier technical assessment process.

3.2.1 Case 1: Negative result given by the data analysis of Appendix 1

In case of negative result given by the data analysis of Appendix 1, the technical assessment process shall stop at this step. The technical assessment result of the Supplier is negative.

3.2.2 Case 2: Positive result given by the data Analysis of Appendix 1 - Audit of Supplier production site mandatory

Following positive result of Appendix 1 data analysis, an audit of the Supplier production site is deemed mandatory by the MTH discipline of E&P Technology Division.

This audit shall be performed by the MTH discipline of E&P Technology Division, or by its representative, and will give final result of the Supplier technical assessment.

3.2.3 Case 3: Positive result given by the data Analysis of Appendix 1 - Audit of Supplier production site not necessary

Following positive result of Appendix 1 data analysis, an audit of the Supplier production site, is not deemed necessary, by the MTH discipline of E&P Technology Division, to complete the technical assessment process. The technical assessment result of the Supplier is positive.

3.3 Step 3: Assessment notification to the Supplier

The outcome of step 2 analysis (negative, positive...) is consolidated by the authorized Company entity, together with others parameters (financial, contractual and social responsibility, quality, HSE...) for final decision.

Then, the authorized Company entity will notify the Supplier of the outcome of global.



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Appendix 1

Appendix 1 Technical Information Analysis Form: Packaged Reciprocating Compressor Supplier - EXCEL spreadsheet



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Quick guidelines to use this document : the objective of the following indications, are to the help user to fill the **Technical Information Analysis Form**.

This document has to be sent to the manufacturer to start technical assessment process before any survey at manufacturer location.
The manufacturer has to fill all information requested in all tables.

1) "Production Range" card :

On this card, the manufacturer has to indicate all its production ranges submitted for approval.

After technical assessment, Total or its representative, is able to indicate for which production ranges the manufacturer is finally approved.

2) "Theme I to Theme IV" cards :

The manufacturer has to fill all tables of each cards, in order to have a better understanding of its production capacities.

After analysis of manufacturer answers, Total or its representative, can make comments, in blue column, for each manufacturer answers.

3) "Global Synthesis" cards :

On this card all general information (name, address, contact of manufacturer, date of audit, assessment report n°, Total specifications linked,...) written will be automatically pasted in all the others cards.

First section of this card has to be filled by the manufacturer by indicating general information : name, address, contact, process concerned,...

The three others sections have to be filled by Total of its representative to summarize result and decision after analysis of the **Technical Information Analysis Form**.

In the last section, the signature of Total or its representative will be done, in order to validate the analysis result of this Form.

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MANUFACTURER

Vendor / Packager Name xxx	Activity and Process Concerned xxx	Audit Date xxx
Office Address xxx	Name and Function of Auditees	
Audited Workshop Address xxx		

TOTAL OR REPRESENTATIVE COMPANY TEAM

TOTAL COMPANY Project Concerned	Name, Function, Service / Company of Auditor
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Objectives of the Technical Information Analysis

TECHNICAL INFORMATION ANALYSIS / TECHNICAL ASSESSMENT RESULT (FOR THE PRODUCTION RANGE CONSIDERED) - TO BE FILLED BY TOTAL OR REPRESENTATIVE

Result of Information Analysis of GS EP MEC 903 - Appendix 1, filled by the Manufacturer		
	Yes / No	Comments
Level of information is appropriate		
On site Audit Requested		

Result of Technical Assessment of Manufacturer (to be filled if on site audit is not deemed necessary)		
	Decision *	Comments
Satisfactory		
Reserves to close to be satisfactory		
Not satisfactory		

Notes : * : Tip when appropriate

CONCLUSIONS OF TECHNICAL INFORMATION ANALYSIS / GENERAL COMMENTS

SIGNATURE OF TOTAL OR REPRESENTATIVE TEAM			
NAME	DATE	NAME	DATE

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ACTUAL PRODUCTION RANGE / APPROVED PRODUCTION RANGE OF VENDOR
To list all the actual production ranges of the vendor and select and comment the approved ones.

			To be completed by the vendor							To be completed by Total or representative Company	
Type	Code	Designation	Designation	Number of Throws	Stroke (mm)	RPM	kW/Throw	Total Rod Load (kN)		Approved	Comments
Reciprocating Compressor Package	3461	Compressors units									

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THEME I - GENERAL ORGANIZATION

All facilities described herein are meant to be permanent in-house facilities only. Any sub-contracted activity must be clearly indicated showing the names and addresses of related Subcontractors. The number, type and status of all listed equipment are subject to thorough checks by the COMPANY representative in charge of the Plant Survey during his visit of the facilities.

Table 1.1.a - General Organization - Surface area (Plot plan to be joined if available)

Zone	Surface area (m ²)	Description	Comments <i>To be filled by TOTAL or Company representative</i>
Overall			
Covered areas			
Yard areas			
Offices			
Manufacturing workshops			
Laboratory			
Material and extrusion equipment			
Testing workshops			
Warehouses			
Covered storage areas			

Table 1.1.b - General Organization - Manufacturer Management : organization chart to join

Position	Names	Comments <i>To be filled by TOTAL or Company representative</i>
Managing Director		
Sales Manager		
Plant / Yard Manager		
Production Manager		
Quality Assurance Manager		
Design/Engineering Manager		
Quality Control / Inspection Manager		
Head of Welding department		
HSE Manager		
Logistic Manager		
Others		

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THEME I - GENERAL ORGANIZATION
Table 1.1.c - General Organization - Personnel

Quality of Employees	Staff Quantity (vendor's personnel)	Contracted Personnel Quantity (personnel from external company which are working at the vendor facilities)	Average years of service (staff)	Comments <i>To be filled by TOTAL or Company representative</i>
Commercial department				
Administration				
Project Management				
Engineering / R&D				
Laboratory				
Procurement				
Expediting / Shipment				
Production methodes office				
Fabrication : qualified welders				
Fabrication : machining				
Fabrication : assembling				
Fabrication : testing				
Quality Inspector (for testing : NDT, DT,...)				
Quality Inspector (on line)				
Quality assurance				
Quality for outsourced material				
Supervisory Personnel				
Management				
HSE employees				
Number of persons dedicated to customer site intervention				
Others				
Total number of Employees				

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THEME I - GENERAL ORGANIZATION
Table 1.1.d - General Organization - Specific certification / habilitation of employees

Name of employees	Quality of employees (engineers, technicians, supervisors, operators...)	Type of certification	Level of certification	Comments <i>To be filled by TOTAL or Company representative</i>

Table 1.1.e - General Organization - Communication With Customer / Working Documents Language

	Language used with customer : YES / NO ?	Which department team (engineering, commercial, production,...) and how many people are able to discuss in other language than mother tongue ?	Documents (testing procedures, drawing, control procedures,...) available in which language ?	Comments <i>To be filled by TOTAL or Company representative</i>
English				
French				
Others				

Table 1.1.f - General Organization - Work Load Status

Items to check	Description	Comments <i>To be filled by TOTAL or Company representative</i>
Ownership		
Annual turnover in M\$ or M€ (3 previous year)		
Men hour capacity		
Work shift : normal, 2x8, 3x8		
Present and future work load (%)		
Future investment (tools, building, human ressources,...)		
Number of international subsidiaries		
Location of international and/or other subsidiaries		

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xxx	xxx	xxx

THEME I - GENERAL ORGANIZATION
Table 1.1.g - General Organization - List of documents to send by the vendor, to Total, in English (or French, if available) languages, with all Tables filled, before on site technical review

List of documents	Documents received : YES / NO ?	Documents available in English (or French) language : YES / NO ?	Comments <i>To be filled by TOTAL or Company representative</i>
Layout of the plant			
General Organization chart			
Vendor Quality Organization			
Vendor Quality Control Organization			
Vendor Technical authority Organization			
Interfaces between "New Products" Department and "Customer Support Services" Department			
Interfaces between workers in Factory and Field Engineers			
Products catalogue			
Process flow chart			
Performance & mechanical test procedure			
Control procedures : NDT, dye penetrant, Xray, magnetic particles procedures			
Equipment and/or package assembly procedures			
No load full speed test procedure			
Functional test procedure			
Full load, full speed, fully assembly test procedure			
Non-conformities management procedures			
Feedback management procedures			
Outsourced material inspection procedures			
Sub-Supplier evaluation, follow-up and audit procedures			
Quality manual			
ISO, API, PED certificates, others,....			
HSE policy			
Example of vendor's documents retranscribing the client's requirements			
Example of audit report : audit made by customer or audit made by vendor on its sub- suppliers			

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THEME I - GENERAL ORGANIZATION

Table 1.1.h - General Organization - References on similar jobs / Experience of vendor

[illegible]

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THEME II - ENGINEERING & DESIGN

All facilities described herein are meant to be permanent in-house facilities only. Any sub-contracted activity must be clearly indicated showing the names and addresses of related Subcontractors. The number, type and status of all listed equipment are subject to thorough checks by the COMPANY representative in charge of the Plant Survey during his visit of the facilities.

Table 2.1.a - Engineering & Design Capacity - Facilities Description				
Type of Equipment	Number of Equipment	Computer Program Names used	Comments / Description	Comments <i>To be filled by TOTAL or Company representative</i>
CAD Workstation				
Drawing Board				
Other				

Table 2.1.b - Engineering & Design Capacity - Description of Activities and Staff Qualification				
Number of Permanent Staff	Description of Engineering, Design and R&D activities	Staff Qualifications (Fitters, technicians, engineers...)	Sub-contracted (if any)	Comments <i>To be filled by TOTAL or Company representative</i>

Table 2.1.c - Engineering & Design Capacity - Calculation Facilities (Softwares for design calculation : finite element, thermal, stress, hydraulic, seismic calculations/analysis,...)					
Type of Design	Codes	Computer Programs	Subcontracted (if any)	Comments / Description	Comments <i>To be filled by TOTAL or Company representative</i>
Fabricated piping					
Structural steel members					
Performances					
Other					



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Vendor / Packager Name	Activity and Process Concerned	Audit Date
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THEME II - ENGINEERING & DESIGN						
Table 2.2.a - International Design Codes Application Deviation to International Recognized codes and standards						
Code or Standard	Date of Revision	Issue of Document used by vendor	Title	Deviation List available for Purchaser Review : Yes / No	Submitted to COMPANY : Yes/No	Comments <i>To be filled by TOTAL or Company representative</i>
ISO 13631	latest		Petroleum and natural gas industries - Packaged reciprocating gas compressors			
API Std 618	4th and 5th edition		Reciprocating Compressors for Petroleum, Chemical, and Gas Industry Services			
API Std 670	latest		Machinery Protection Systems			
API Std 671	latest		Special Purpose Couplings for Petroleum, Chemical, and Gas Industry Services			
Other						

Table 2.2.b - TOTAL General Specifications Application Deviation to TOTAL General Specifications						
GS EP	Date of Revision	Issue of Document used by vendor	Title	Deviation List available for Purchaser Review : Yes / No	Submitted to COMPANY : Yes/No	Comments <i>To be filled by TOTAL or Company representative</i>
GS EP MEC 032	01/2013		Rotating Machine Package Specification Gas Engine or Electrical Motor driven Reciprocating Compressor			
GS EP MEC 261	01/2013		Packaged Reciprocating Compressors for Oil and Gas Production Services According to ISO 13631			

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XXX	XXX	XXX

THEME III - MANUFACTURING

All facilities described herein are meant to be permanent in-house facilities only. Any sub-contracted activity must be clearly indicated showing the names and addresses of related Subcontractors. The number, type and status of all listed equipment are subject to thorough checks by the COMPANY representative in charge of the Plant Survey during his visit of the facilities.

Table 3.1.a - Workshop General Organization - Building Bay and Cranes Data of Covered Area / Handling and Transport facilities

Bay n°	Bay Dimensions (m x m)	Type of Crane / Handling tools / Transport	Number of Equipment	Max Capacity (tons)	Height under Hook (m)	Description (certification date, maintenance condition...)	Comments <i>To be filled by TOTAL or Company representative</i>
1							
2							
3							
4							
5							
6							
7							
8							

Table 3.1.b - Workshop General Organization - Cranes Data of Open Air Area / Handling and Transport facilities

Type of Crane / Handling tools / Transport	Number of Equipment	Max Capacity (tons)	Height under Hook (m)	Description (certification date, maintenance condition...)	Comments <i>To be filled by TOTAL or Company representative</i>

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THEME III - MANUFACTURING
Table 3.2.a - Machining - Description of Equipment in Place

Type of Equipment	Description	Quantity	Max. Capacity (m)	General maintenance condition	Comments <i>To be filled by TOTAL or Company representative</i>

Table 3.3.a - Control & Testing : Vibration - Description of Equipment in Place

Type of Equipment	Description	Quantity	Sensitivity / Range	General maintenance condition	Comments <i>To be filled by TOTAL or Company representative</i>

Table 3.3.b- Control & Testing : Hydrotest - Description of Equipment in Place

Type of Equipment	Description	Quantity	Max. Capacity (Barg)	General maintenance condition	Comments <i>To be filled by TOTAL or Company representative</i>

Table 3.3.c - Control & Testing - Performance test bench : Description of Equipment in Place

Type of Equipment	Description	Quantity	Max. Power (Kw)	General maintenance condition	Comments <i>To be filled by TOTAL or Company representative</i>

Table 3.3.d - Control & Testing - Mechanical test bench : Description of Equipment in Place

Type of Equipment	Description	Quantity	Max. Power (Kw)	General maintenance condition	Comments <i>To be filled by TOTAL or Company representative</i>

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THEME III - MANUFACTURING

Table 3.4.a - Welding - Description of Equipment in Place (permanent equipment only)

Equipment	Number	Max Capacity (tons)	Comments / Description (Maintenance condition,...)	Comments <i>To be filled by TOTAL or Company representative</i>
Manual Welding Positioners				
Automatic Welding Positioners				
Others				

Table 3.4.b - Welding and Heating - Description of Welding Staff : number and qualifications (to be joined)

	Number	Type of Qualification	Comments / Description	Comments <i>To be filled by TOTAL or Company representative</i>
Welding Engineer				
Welding Technician				
Welding Supervisor				
Arc-air gouging skillful operators				

Table 3.5.a - Mechanical Assembling - Description of Equipment in Place

Type of Equipment	Description	Quantity	Surfaces (m2)	General maintenance condition	Comments <i>To be filled by TOTAL or Company representative</i>

Table 3.5.b - Cleanliness of components and piping after assembly - Description of Equipment in Place

Type of Equipment	Description	Quantity	Capacity (turbulent flow)	General maintenance condition	Comments <i>To be filled by TOTAL or Company representative</i>

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THEME III - MANUFACTURING**Table 3.7.a - Painting , Dust removal & Preservation - Description of Equipment in Place**

Type of Equipment	Description	Quantity	Max. Capacity	General maintenance condition	Comments <i>To be filled by TOTAL or Company representative</i>

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Vendor / Packager Name	Activity and Process Concerned	Audit Date
xxx	xxx	xxx

THEME IV - PRODUCTS MANAGEMENT (Control, Testing, Inspection, Storage)

All facilities described herein are meant to be permanent in-house facilities only. Any sub-contracted activity must be clearly indicated showing the names and addresses of related Subcontractors. The number, type and status of all listed equipment are subject to thorough checks by the COMPANY representative in charge of the Plant Survey during his visit of the facilities.

Table 4.1.a - Outsourced Material Management - Material Storage			
Type of Storage	Dimension	Material Stored	Comments <i>To be filled by TOTAL or Company representative</i>
Covered storage yard			
Open storage yard			
Non controlled temperature warehouse			
Cold controlled temperature warehouse			
Hot controlled temperature warehouse			

Table 4.1.b - Outsourced Material Management - Storage Conditions - Identification		
Storage Conditions for :	Description / Comments	Comments <i>To be filled by TOTAL or Company representative</i>
Raw casings		
Raw forgings		
Raw welded sub-assembly (base plate, piping, supports)		
Pre-machined casing and forging		
Pre- machined & welded sub-assembly (base plate, piping, supports)		
External source components		
External source equipments (delivered as full assembly)		
Seals and gaskets		
Bearings		
Instruments, tubing, fittings, trays		
Electricals, cables, trays		
Non conform raw material		
Non conform pre-machined components		
Non conform external source components		
External source components		
External source equipments (delivered as full assembly)		
Flexibles & Hoses		
Welding products		
Preservation against corrosion and/or injuries of raw material machined components seal & gaskets external source components external source equipments		
Others		

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THEME IV - PRODUCTS MANAGEMENT (Control, Testing, Inspection, Storage)
Table 4.1.c - Outsourced Material Management - Outsourced Inspection : Non Destructive Testing Equipment

Type of test / control	Equipment type	Range capability	Quantity of Equipment	Calibration of Equipment updated ?	Testing procedures and international standards used (availability, issuance, updating)	Recording and traceability	Comments <i>To be filled by TOTAL or Company representative</i>
Raw casings and forgings (dimensions, weight, NDT, material certificates, identification)							
Pre-machined casings and forgings (dimensions, weight, NDT, material certificates, identification)							
Welded sub-assembly (dimensions, NDT, material certificates, identification)							
Machined components (dimensions, NDT, material certificates, identification)							
External source components							
External source equipments							
Seals and gaskets							
Bearings							
Instruments, tubing, fittings, trays							
Electricals, cables, trays							
Flexibles & Hoses							
Welding products							
Cleanliness and packing							

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THEME IV - PRODUCTS MANAGEMENT (Control, Testing, Inspection, Storage)
Table 4.2.a - Inspection, Testing and Quality Control - In house : Non Destructive Testing Equipment

Type of test / control	Equipment type	Range capability	Quantity of Equipment	Calibration of Equipment updated ?	Testing procedures and international standards used (availability, issuance, updating)	Recording and traceability	Comments <i>To be filled by TOTAL or Company representative</i>
Conventional dimensions & weight							
3 axis dimensions							
Homogeneity of material or coatings							
NDT dye penetrant							
NDT Xray							
NDT magnetic particles							
Resonance							
Lab tests							
Metrologic							
Profile							
Thickness of coating							
Welded assembly							
Leak							
Pressure							
Product assembly							
Performances							
Mechanical							
De bugging							
Functional							
Others							

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THEME IV - PRODUCTS MANAGEMENT (Control, Testing, Inspection, Storage)
Table 4.2.b - Inspection, Testing and Quality Control - Destructive Testing Equipment

Type of test / control	Equipment type	Range capability	Number of Equipment	Calibration of Equipment updated ?	Testing procedures and international standards used (availability, issuance, updating)	Testing sub-contracted ? If yes, indicate the name of sub-contractor in annex	Recording and traceability	Comments <i>To be filled by TOTAL or Company representative</i>
Impact test								
Hardness								
Rupture test								
Coating homogeneity								
Elongation test								
Corrosion test								
Erosion test								
Wear test								
Stress failure								
Ageing test								
Prototype								

Table 4.2.c - Inspection, Testing and Quality Control - Raw Material Chemical Analysis Equipment

Type of test / control	Equipment type	Range capability	Number of Equipment	Calibration of Equipment updated ?	Testing procedures and international standards used (availability, issuance, updating)	Testing sub-contracted ? If yes, indicate the name of sub-contractor in Annex	Recording and traceability	Comments <i>To be filled by TOTAL or Company representative</i>
Chemical analysis								
Mechanical performance								
Others								

Table 4.3.a - Finished Goods Management - Goods Storage

Type of Storage	Dimension	Material Stored	Comments <i>To be filled by TOTAL or Company representative</i>
Covered storage yard			
Open storage yard			
Warehouse			

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THEME IV - PRODUCTS MANAGEMENT (Control, Testing, Inspection, Storage)
Table 4.3.b - Finished Goods Management - Storage Conditions

Storage Conditions for :	Description / Comments	Comments <i>To be filled by TOTAL or Company representative</i>
Small Goods		
Fragile goods		
X-Ray films		
Others		

Table 4.3.c - Finished Goods Management - Shipping Facilities

Type	Maximum Dimension (m)	Maximum Capacity (weight in tons)	Comments <i>To be filled by TOTAL or Company representative</i>
Railroad siding with spur in yard			
Road / Trucking			
Air shipment			
Water			

Table 4.4.a - Procurement Practices - Raw Material Supplier List / Source of Materials

Raw Material	Suppliers	Number of audits / year	Comments (follow-up procedures, approval,...)	Comments <i>To be filled by TOTAL or Company representative</i>
Casing				
Forgings				
Base-plate				
Welding products				

Table 4.4.b - Procurement Practices - Pre-machined Component Supplier List / Source of Materials

Pre-machined Components	Suppliers	Number of audits / year	Comments (follow-up procedures, approval,...)	Comments <i>To be filled by TOTAL or Company representative</i>
Casing				
Forgings				
Base-plate				

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THEME IV - PRODUCTS MANAGEMENT (Control, Testing, Inspection, Storage)
Table 4.4.c - Procurement Practices - Component Supplier List / Source of Materials

Components	Suppliers	Number of audits / year	Comments (follow-up procedures, approval,...)	Comments <i>To be filled by TOTAL or Company representative</i>
Machined components				
Flexibles				
Hoses				
Tubbings & Fittings				
Cable trays				
PLC (Process logic)				
F&G PLC (Safety logic)				
Gas detectors				
Fire detectors				
Pressure transmitters				
Temperature transmitters				
RTD probes				
Thermocouples probes				
Level transmitters				
Level control valve				
Temperature control valve				
Pressure control valve				
Vortex flow meter				
Coriolis flow meter				
Turbine flow meter				
Orifice plates meter				
Multi-core instrument cables				
High temperature resistant instrument cables				
Compensation cables				
Valves (block)				
Valves (instrument manifold)				
Pressure Safety Valves				
Vibration monitor (PLC) & zener barrier				
Vibration, non contact probes and proximitors				
Vibration, accelerometer				
Vibration, velocimeter				
Ducting				
Enclosure				
Expansion joints				
Air filtration				
Silencers				
Heaters				

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Gaskets			
Seals (Rings, O rings)			
Seals (Mechanical seals)			
Bearings			
Couplings			
Piping			
Flanges			
Particles filters			
Coalescing filters			
Other			

Table 4.4.d - Procurement Practices - Equipment Supplier List / Source of Materials

Equipment	Suppliers	Number of audits / year	Comments (follow-up procedures, approval,...)	Comments <i>To be filled by TOTAL or Company representative</i>
Compressor				
Gas Engine				
Gears				
Electrical motors (Main)				
Electrical motors (auxiliary)				
Pumps, centrifugal				
Pumps, screws				
Pumps, gears				
Fans				
Scrubbers				
Coolers				
Fire extinguishing system				
Other				

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THEME IV - PRODUCTS MANAGEMENT (Control, Testing, Inspection, Storage)
Annex - Subcontractor list
Table 4.5.a - Subcontractor List for Non Destructive Tests

Material	Subcontractor	Number of audits / year	Comments (follow-up procedures, approval,...)	Comments <i>To be filled by TOTAL or Company representative</i>

Table 4.5.b - Subcontractor List for Destructive Tests

Material	Subcontractor	Number of audits / year	Comments (follow-up procedures, approval,...)	Comments <i>To be filled by TOTAL or Company representative</i>