

## GENERAL SPECIFICATION

### INSTRUMENTATION

#### GS EP INS 125

|                                               |
|-----------------------------------------------|
| <b>Safety Relief Valves and Rupture Discs</b> |
|-----------------------------------------------|

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## 1. Scope

This specification describes the minimum requirements for the design, sizing, selection and installation of:

- Pressure Relief Valves
- Thermal Relief Valves
- Rupture Discs
- Tank pressure / Vacuum systems
- Valves/Discs Maintenance Facilities.

This specification shall be applied in conjunction with:

- [GS EP PVV 112](#)
- [GS EP PVV 142](#).

The Piping Valves Vessels (PVV) General Specifications (GS) as referenced throughout this specification provide the mandatory requirements related to metallurgy, casting, welding, machining and material examinations. This specification provides additional requirements to the referenced PVV specifications.

## 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                                                                                                         |
|------------------------------------------|---------------------------------------------------------------------------------------------------------------|
| <a href="#">AISI</a>                     | American Iron and Steel Institute                                                                             |
| <a href="#">API 6D / ISO 14313</a>       | Specification for Pipeline Valves                                                                             |
| <a href="#">API RP 520</a>               | Recommended Practice for the Design and Installation of Pressure Relieving Systems                            |
| <a href="#">API Std 2000</a>             | Venting Atmospheric and Low-pressure Storage Tanks: Non refrigerated and Refrigerated                         |
| <a href="#">API Std 526</a>              | Flanged Steel Pressure Relief Valves                                                                          |
| <a href="#">ASME B16.34</a>              | Valves - Flanged, Threaded and Welded End                                                                     |
| <a href="#">ASME B16.5</a>               | Pipe Flanges and Flanged Fittings                                                                             |
| <a href="#">ASME Section VIII div. 1</a> | Pressure Vessels                                                                                              |
| <a href="#">ASTM A 352</a>               | Steel Castings, Ferritic and Martensitic, for Pressure-Containing Parts, Suitable for Low-Temperature Service |

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| Reference                                     | Title                                                                                                                                                                          |
|-----------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ASTM A 703                                    | Steel Castings, General Requirements for Pressure Containing Parts                                                                                                             |
| Class Society Rules                           | Particular design rules as per selected Class Society may be applicable for equipment installed on the hull of floating facilities and may require Class Society type approval |
| EN 10204                                      | Metallic Products - Type of Inspection Documents                                                                                                                               |
| European Directive 97/23/EC dated 29 May 1997 | Directive of the European Parliament and of the Council on the approximation of the Laws of Member States concerning pressure equipment (PED)                                  |
| ISO 15156                                     | Material for use in H <sub>2</sub> S containing environments in oil & gas production - Cracking-resistant CRAs (corrosion resistant alloys) and other alloys                   |
| MSS SP-54                                     | Quality Standard for Steel Castings – Radiographic inspection for Valves, Flanges and fittings and Other Piping Components                                                     |
| MSS SP-55                                     | Quality Standard for Steel Castings for Valves, Flanges and Fittings and Other Piping Components - Visual Method for Evaluation of Surface Irregularities                      |
| NACE MR0175/ISO 15156                         | International Standard NACE MR0175/ISO 15156 - Petroleum and Natural Gas Industries - Materials for use in H <sub>2</sub> S-containing Environments in Oil and Gas Production  |
| UNS                                           | Unified Numbering System code                                                                                                                                                  |

### 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 COR 350 | External protection of offshore and coastal structures and equipment by painting |
| GS EP COR 351 | External protection of structures and equipment by painting. Floating structures |
| GS EP COR 354 | External protection of onshore structures and equipment by painting              |
| GS EP ECP 103 | Process sizing criteria                                                          |
| GS EP EXP 203 | Maintenance and inspection documentation preparation during project phase        |
| GS EP EXP 217 | Requirements to Vendors, Suppliers and EPC's for spare parts                     |

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| Reference     | Title                                                                                              |
|---------------|----------------------------------------------------------------------------------------------------|
| GS EP INS 101 | Instrumentation engineering, supply and construction general requirements                          |
| GS EP INS 107 | Design and installation of instrumentation links                                                   |
| GS EP PVV 112 | Piping material classes                                                                            |
| GS EP PVV 142 | Valves                                                                                             |
| GS EP PVV 611 | Welding of pressure containing piping and equipment                                                |
| GS EP PVV 612 | Metallurgical and equipment subject to severe sour service. Metallurgical and welding requirements |
| GS EP PVV 613 | Valves materials requirements for use in sour service                                              |
| GS EP PVV 622 | Piping and equipment subject to intermediate sour service. Metallurgical and welding requirements  |
| GS EP SAF 262 | Pressure protection relief and hydrocarbon disposal systems                                        |

### 3. Definitions

The following terms and abbreviations will be used in the present document:

**Company:** TOTAL E&P or any TOTAL E&P subsidiary.

**Contractor:** Any party TOTAL E&P has signed a contract with, for the Engineering, Procurement, Construction and Installation of a part of a project or maintenance contract.

**Manufacturer:** The party having received a Purchase Order from Company, Contractor or Package Vendor for the manufacturing and supply of safety relief valves or rupture discs.

**Package or Package Unit:** Prefabricated process or utility self-contained unit, generally able to operate on its own, supplied fully tested and ready for immediate installation, being supplied by a designated Package Vendor.

|     |                                  |
|-----|----------------------------------|
| FAT | Factory Acceptance Test          |
| NDE | Non-Destructive Examination      |
| NPS | Nominal Pipe Section             |
| PID | Piping & Instrumentation Diagram |
| PSV | Pressure Safety Valve            |
| TSV | Thermal Safety Valve             |

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## 4. General Requirements

Safety relief valves and rupture discs design shall be based on the requirements of the process application, operating and design conditions, piping specification (material, class) and environmental conditions.

As mentioned in [GS EP INS 101](#), the final selection of the Manufacturer upon tender and bid evaluation shall be subject to standardization for each application type. Therefore, the Contractor shall ensure throughout the facility and subcontracted packages that the number of valve brands and models is reduced to the lowest minimum possible, i.e. preferably to one Manufacturer for each application only. The Contractor shall equally coordinate his selection of valve brand and model with all Package Vendors accordingly, in order to avoid a large diversity of valves, accessories, spare parts, etc.

## 5. Data Sheets

An approved dedicated engineering data sheet shall be the basis for procuring the relief valves or rupture discs. Standard sizing and product data sheets provided by the Manufacturer shall not be used as a substitute for the engineering data sheets.

Engineering data sheets are a collection of specific data provided by multiple disciplines (process, safety, instrumentation, piping, valves, mechanical, etc.).

Engineering data sheets shall be segregated documents for the following types:

- Conventional relief valve
- Pilot-Operated relief valve
- Thermal relief valve
- Rupture disk
- Other applications as may be the case.

Contractors and Package Vendors shall issue an as-built revision of all engineering data sheets upon installation & commissioning with all Vendor specific details completed, in the proper electronic format, as per Contract.

## 6. Safety Relief Valves Technical Requirements

Safety relief valves shall meet the requirements of [API 526](#).

Safety relief valves shall be of conventional direct-acting angle pattern, spring loaded, pilot operated and high-capacity type.

- Conventional spring-loaded safety valves shall be used in services where there is no back- pressure or where the constant back-pressure does not exceed 10% of the set pressure and also usually for steam service.
- Balanced bellows safety valves shall be used for variable back pressures or for back pressures ranging from 10% to 50% of the set pressure or when the fluid is corrosive, toxic or fouling.

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- Pilot operated valves shall be considered on services such as light gases at high set pressure, on clean gas in pulsating service, when the set point is less than 10% above the operating pressure or for very high capacities.

Refer to [GS EP ECP 103](#) for set point tolerances.

Safety relief valves, except for the thermal relief of liquids, shall be adjustable blow-down type, designed in accordance with [API RP 520](#) and [ASME Boiler and Pressure Vessel Code, section VIII](#) and where applicable, [section I](#).

Safety relief valves on cryogenic services shall be supplied with extended bonnet. Material for the extended bonnet and temperature transfer fins shall be suitable for the minimum design temperature of the PSV.

An atmospheric, open vented bonnet shall be provided for steam or air.

Use of diaphragm type pilot operated valve is not allowed.

Weight loaded relief valves shall be used only for low-pressure safety valves ([API Std 2000](#)).

The use of aluminum, instruments containing mercury (Hg), and instruments containing asbestos is strictly prohibited.

The use of [AISI 304](#) or [304L SS](#) is not allowed for any parts in contact with the atmosphere.

Lifting levers shall be provided on all safety valves used on steam and air service.

In case of dangerous gas (e.g.  $H_2S$ ), vents shall be collected and hooked up so as to lead a safe location.

Thermal safety valve shall be conventional spring loaded type, as per [GS EP SAF 262](#). The discharge of liquid expansion valves shall be hooked up so as to lead a safe location.

## 6.1 Origin of Materials and Manufacturing

The Manufacturer shall submit during tender a "Declaration of Materials and Manufacturing Origin", clearly listing:

- All casting companies for the supply of cast and forged components
- All companies for welding and examination of cast and forged components
- All companies for machining, assembling and testing

which may be used for the fabrication of any pressure or non pressure-containing or process-wetted valve component, including Manufacturer himself. This list shall be set up for each valve component, per valve model, size and pressure range.

The Manufacturer shall clearly list which of his own factory/factories (names and addresses) is/are proposed. In case the Manufacturer will use more than one of his own factories at different geographic locations, then the Manufacturer shall clearly list which factory will be used for each valve and/or each valve component.

It shall be noted that Company approval of a Manufacturer is related to a specific factory at a specific geographic location.

Casting companies are subject to Company approval. The fact that a Manufacturer is listed on Company's approved vendor list does not imply a general approval for any casting Company or