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FUNCTIONAL SPECIFICATION FOR SAFETY RELIEF VALVE

(PROJECT STANDARDS AND SPECIFICATIONS)

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SCOPE OF THIS DOCUMENT:

1 This specification describes the essential considerations in the selection, calibration, testing, installation and commissioning of safety relief valve.

2 The Contractor shall be responsible for the selection of Safety Relief Valve suitable for its intended application, its procurement, packing, calibration, testing, and shipment to site, installation and commissioning at site.

CODES & STANDARDS:

1 **Project Specifications:**

a) Instrumentation Design Criteria

b) Scope of Work

2 **Other Specifications to be followed:**

a) API RP 520: Recommended Practice for the Design and of Pressure Relieving Systems in Refineries

b) API RP 527: Testing for tightness

SCOPE OF SUPPLY:

1 The number of Safety Relief Valves to be supplied and installed shall be as per the requirements indicated in the Scope of Work and the P & IDs.

2 The scope of supply shall also include commissioning spares and two years' spares as required, and as suggested by the Manufacturer.

SAFETY RELIEF VALVES:

1 **Basis of selection:**

1.1 All relief valves of size 1" and above shall be full nozzle full lift type. Relief valves with size less than 1" shall be base or modified nozzle type.

1.2 Flanged relief valves for process piping, excluding steam and air pressure piping, shall be either the enclosed spring type or pilot-operated type.

1.3 Balanced relief valves shall be used if the variable backpressure is more than 10% of valve set pressure or where the service is corrosive. Balanced relief valves suitable for variable backpressure may also be used where appreciable savings in the discharge disposal system piping can be affected by virtue of the increased allowable backpressure. Balanced bellow materials shall be the same as the valve trim.

1.4 Rupture disc type pressure relief devices shall not be used as primary relief devices.

1.5 Relief valves 1" and larger shall be of the type having a nozzle bushing which extends through and beyond the base of the inlet-bolting flange, and which forms the gasket-bearing surface for the inlet flange.

1.6 ¾ " and 1" relief valves may have screwed ends. All process Relief valve 1" size and larger shall have flanged inlet and outlet connections.

1.7 Thermal relief valves shall have a minimum orifice area of 38.7 mm^2.

1.8 Venting and breathing equipment for low pressure above ground storage tanks shall be in accordance with the API Std 2000 "Guide for Tank and venting atmospheric and low pressure storage tanks".

1.9 Lifting levers may be provided on air service only. Closed bonnet construction shall be used.

1.10 All castings and welding shall be 100% radiographed.

2 **Sizing:**

2.1 The contractor shall size safety relief valve according to requirements of the project relief and blow down requirement.

2.2 The selected orifice shall be the next standard orifice size available above the calculated area.

2.3 For two-phase liquid/vapour relief application, the total orifice area shall be the sum of the orifice areas calculated individually for liquid and vapour.

2.4 Where the fail open state of a control valve is used in relief valve sizing calculations, then any bypass valve shall have a Cv equal to or less than that of the control valve. The bypass valve Cv shall be clearly indicated on the valve body.

3 Set Pressure

3.1 Relief valves shall be set at no higher than the design pressure of the system being protected by the valve except as permitted by the relevant ASME Codes.

3.2 The allowing tolerance in set pressure are as below:

a) ±0.14 Kg/cm2g for set pressure and up to and including 5 Kg/cm2g set pressure.

b) ±3% for set pressure above 5 Kg/cm2g.

4 Material:

4.1 The material requirements for safety relief valve shall in general be according to Instrumentation Design Criteria and the material selection chart provided in Annexure –1 of this specification.

5 Valve Springs:

5.1 Relief valves for set pressures of 17.5kg/cm^2 (250 psig) or less shall have springs suitable for a range of adjustment of plus or minus 10% of the set pressure.

5.2 Relief valves set at pressures higher than 17.5 kg/cm^2 (250 psig) shall have springs suitable for a range of adjustment of plus or minus 5% of the set pressure. Range identification shall be provided on the spring.

EQUIPMENT PROTECTION:

1 Relief valve shall have tamperproof sealing, by wiring of screw cap and body, and lead sealing.