Inspection of Pressure-relieving Devices

Downstream Segment

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1 Scope

This recommended practice (RP) describes the inspection and repair practices for automatic pressure-relieving devices commonly used in the oil and petrochemical industries. As a guide to the inspection and repair of these devices in the user's plant, it is intended to ensure their proper performance. This publication covers such automatic devices as pressure-relief valves, pilot-operated pressure-relief valves, rupture disks, and weight-loaded pressure-vacuum vents.

The scope of this RP includes the inspection and repair of automatic pressure-relieving devices commonly used in the oil and petrochemical industry.

The recommendations in this publication are not intended to supersede requirements established by regulatory bodies. This publication does not cover weak seams or sections in tanks, explosion doors, fusible plugs, control valves, and other devices that either depend on an external source of power for operation or are manually operated. Inspections and tests made at manufacturers' plants, which are usually covered by codes or purchase specifications, are not covered by this publication.

This publication does not cover training requirements for mechanics involved in the inspection and repair of pressure-relieving devices. Those seeking these requirements should see API 510, which gives the requirements for a quality control system and specifies that the repair organization maintain and document a training program ensuring that personnel are qualified.

2 Normative References

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

API 510, *Pressure Vessel Inspection Code: In-service Inspection, Rating, Repair, and Alteration*

API Standard 520 (All Parts), *Sizing, Selection, and Installation of Pressure-relieving Devices in Refineries*

API Standard 521, *Pressure-relieving and Depressuring Systems*

API Standard 526, *Flanged Steel Pressure-relief Valves*

API Standard 527, *Seat Tightness of Pressure Relief Valves*

API Recommended Practice 580, *Risk-Based Inspection*

API Recommended Practice 581, *Risk-Based Inspection Technology*

API Standard 620, *Design and Construction of Large, Welded, Low-pressure Storage Tanks*

API Standard 2000, *Venting Atmospheric and Low-pressure Storage Tanks (Nonrefrigerated and Refrigerated)*

ASME PTC 25 [1], *Pressure Relief Devices*

ASME *Boiler and Pressure Vessel Code* (*BPVC*), *Section I: Power Boilers*

[1] ASME International, Three Park Avenue, New York, New York, 10016-5990, www.asme.org.

ASME *Boiler and Pressure Vessel Code* (*BPVC*), *Section IV: Heating Boilers*

ASME *Boiler and Pressure Vessel Code* (*BPVC*), *Section VI: Recommended Rules for the Care and Operation of Heating Boilers*

ASME *Boiler and Pressure Vessel Code* (*BPVC*), *Section VII: Recommended Guidelines for the Care of Power Boilers*

ASME Boiler and Pressure Vessel Code (*BPVC*), *Section VIII: Pressure Vessels; Division 1, Division 2 and Division 3*

ISO 4126-6 [2], *Safety devices for protection against excessive pressure—Part 6: Application, selection and installation of bursting disc safety devices*

NACE MR 0175 [3], *Petroleum and Natural Gas Industries—Materials for Use in H_2S-Containing Environments in Oil and Gas Production*

NACE MR 0103, *Materials Resistant to Sulfide Stress Cracking in Corrosive Petroleum Refining Environments*

NB-18 [4], *Pressure-relief Device Certifications*

NB-23:2004, *National Board Inspection Code*

3 Terms and Definitions

3.1 General

For the purposes of this document, the following terms and definitions apply.

3.1.1
car seal
A locking seal that when placed in position and closed locks and must be cut or physically broken to be removed.

3.1.2
galling
A condition whereby excessive friction between high spots results in localized welding with subsequent splitting and a further roughening of rubbing surfaces of one or both of two mating parts.

3.1.3
non-reclosing pressure-relief device
A pressure-relief device which remains open after operation. A manual resetting means may be provided.

3.1.4
pin-actuated device
A non-reclosing pressure-relief device actuated by static pressure and designed to function by buckling or breaking a pin which holds a piston or a plug in place. Upon buckling or breaking of the pin, the piston or plug instantly moves to the full open position.

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[2] International Organization for Standardization, 1, ch. de la Voie-Cruese, Case postale 56, CH-1211, Geneva, Switzerland, www.iso.org.

[3] NACE International, (formerly the National Association of Corrosion Engineers), 1440 South Creek Drive, Houston, Texas 77218-8340, www.nace.org.

[4] The National Board of Boiler and Pressure Vessel Inspectors, 1055 Crupper Avenue, Columbus, Ohio 43229, www.nationalboard.org.