Inspection of Pressure-Relieving Devices

API RECOMMENDED PRACTICE 576
SECOND EDITION, DECEMBER 2000

American Petroleum Institute

Helping You Get The Job Done Right.SM

Inspection of Pressure-Relieving Devices

Downstream Segment

API RECOMMENDED PRACTICE 576
SECOND EDITION, DECEMBER 2000

American Petroleum Institute

Helping You Get The Job Done Right.SM

SPECIAL NOTES

API publications necessarily address problems of a general nature. With respect to particular circumstances, local, state, and federal laws and regulations should be reviewed.

API is not undertaking to meet the duties of employers, manufacturers, or suppliers to warn and properly train and equip their employees, and others exposed, concerning health and safety risks and precautions, nor undertaking their obligations under local, state, or federal laws.

Information concerning safety and health risks and proper precautions with respect to particular materials and conditions should be obtained from the employer, the manufacturer or supplier of that material, or the material safety data sheet.

Nothing contained in any API publication is to be construed as granting any right, by implication or otherwise, for the manufacture, sale, or use of any method, apparatus, or product covered by letters patent. Neither should anything contained in the publication be construed as insuring anyone against liability for infringement of letters patent.

Generally, API standards are reviewed and revised, reaffirmed, or withdrawn at least every five years. Sometimes a one-time extension of up to two years will be added to this review cycle. This publication will no longer be in effect five years after its publication date as an operative API standard or, where an extension has been granted, upon republication. Status of the publication can be ascertained from the API Standards Department [telephone (202) 682-8000]. A catalog of API publications and materials is published annually and updated quarterly by API, 1220 L Street, N.W., Washington, D.C. 20005.

This document was produced under API standardization procedures that ensure appropriate notification and participation in the developmental process and is designated as an API standard. Questions concerning the interpretation of the content of this standard or comments and questions concerning the procedures under which this standard was developed should be directed in writing to the general manager of the Standards Department, American Petroleum Institute, 1220 L Street, N.W., Washington, D.C. 20005. Requests for permission to reproduce or translate all or any part of the material published herein should also be addressed to the general manager.

API standards are published to facilitate the broad availability of proven, sound engineering and operating practices. These standards are not intended to obviate the need for applying sound engineering judgment regarding when and where these standards should be utilized. The formulation and publication of API standards is not intended in any way to inhibit anyone from using any other practices.

Any manufacturer marking equipment or materials in conformance with the marking requirements of an API standard is solely responsible for complying with all the applicable requirements of that standard. API does not represent, warrant, or guarantee that such products do in fact conform to the applicable API standard.

FOREWORD

API publications may be used by anyone desiring to do so. Every effort has been made by the Institute to assure the accuracy and reliability of the data contained in them; however, the Institute makes no representation, warranty, or guarantee in connection with this publication and hereby expressly disclaims any liability or responsibility for loss or damage resulting from its use or for the violation of any federal, state, or municipal regulation with which this publication may conflict.

Suggested revisions are invited and should be submitted to the manager of the Standards Department, American Petroleum Institute, 1220 L Street, N.W., Washington, D.C. 20005.

CONTENTS

Figures

Inspection of Pressure-Relieving Devices

1 Scope

This recommended practice 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 recommended practice 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 References

This following standards and specifications are cited in this recommended practice:

API

510	*Pressure Vessel Inspection Code: Inspection, Rating, Repair, and Alteration*
RP 520	*Sizing, Selection, and Installation of Pressure-Relieving Devices in Refineries*, Part I, "Sizing and Selection," and Part II, "Installation"
RP 521	*Guide for Pressure-Relieving and Depressuring Systems*
Std 526	*Flanged Steel Pressure Relief Valves*
Std 527	*Seat Tightness of Pressure Relief Valves*
Std 620	*Design and Construction of Large, Welded, Low-Pressure Storage Tanks*
Std 650	*Welded Steel Tanks for Oil Storage*
Std 2000	*Venting Atmospheric and Low-Pressure Storage Tanks (Nonrefrigerated and Refrigerated)*
Bull 2521	*Use of Pressure-Vacuum Vent Valves for Atmospheric Pressure Tanks to Reduce Evaporation Loss*

ASME[1]

PTC 25	*Pressure Relief Devices*
Boiler and Pressure Vessel Code,	
Section I	"Power Boilers"
Section IV	"Heating Boilers"
Section VI	"Recommended Rules for Care and Operation of Heating Boilers"
Section VII	"Recommended Guidelines for Care of Power Boilers"
Section VIII	"Pressure Vessels," Division 1

NACE[2]

Std MR0175	*Sulfide Stress Cracking Resistant-Metallic Materials for Oil Field Equipment*

NB[3]

NB-18	*Pressure Relief Device Certifications*
NB-23	*National Board Inspection Code*

3 Definitions

3.1 GENERAL

3.1.1 car seal: A self-locking seal that when placed in position and closed, locks and must be cut with wire cutters or physically broken to be removed. Local jurisdictional requirements may specify the acceptable method(s) of sealing or locking block valves.

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

3.1.3 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.

3.2 DIMENSIONAL CHARACTERISTICS OF PRESSURE RELIEF VALVES

3.2.1 effective discharge area: A nominal or computed area used with an effective discharge coefficient to calculate

[1] ASME International, Three Park Avenue New York, New York 10016-5990, www.asme.org.
[2] NACE International, 440 South Creek Drive, Houston, Texas, 77084, www.nace.org.
[3] National Board of Boiler and Pressure Vessel Inspectors, 1055 Crupper Avenue, Columbus, Ohio 43229, www.nationalboard.com.