Refinery Valves and Accessories for Control and Safety Instrumented Systems

API RECOMMENDED PRACTICE 553
SECOND EDITION, OCTOBER 2012

AMERICAN PETROLEUM INSTITUTE

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Downstream Segment

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Refinery Valves and Accessories for Control and Safety Instrumented Systems

1 Scope

1.1 This recommended practice (RP) addresses the special needs of automated valves in refinery services. The knowledge and experience of the industry has been captured to provide proven solutions to well-known problems.

1.2 This document provides recommended criteria for the selection, specification, and application of piston (i.e. double-acting and spring-return) and diaphragm-actuated (spring-return) control valves. Control valve design considerations are outlined such as valve selection, material selection, flow characteristic evaluation, and valve accessories. It also discusses control valve sizing, fugitive emissions, and consideration of the effects of flashing, cavitation, and noise.

1.3 Recommendations for emergency block and vent valves, on/off valves intended for safety instrumented systems, and special design valves for refinery services, such as Fluid Catalytic Cracking Unit (FCCU) slide valves and vapor depressurizing systems, are also included in this recommended practice.

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 Publication 2218, *Fireproofing Practices in Petroleum and Petrochemical Processing Plants*

API Recommended Practice 521, *Guide for Pressure-Relieving and Depressurizing Systems*

API Recommended Practice 556, *Instrumentation, Control and Protective Systems for Gas Fired Heaters*

API Standard 598, *Valve Inspection and Testing*

API Specification 6FA, *Specification for Fire Test for Valves*

API Standard 607, *Fire Test for Soft-Seated Quarter-Turn Valves*

API Standard 608, *Metal Ball Valves – Flanged, Threaded and Butt Welding Ends*

API Standard 609, *Butterfly Valves: Double Flanged, Lug-and Wafer-Type*

ANSI, B16.34 [1], *Valves—Flanges, Threaded, and Welded End*

ANSI 70, *National Electrical Code*

ANSI/FCI70-2 [2], *Quality Control Standard for Control Valve Seat Leakage*

ASME *Boiler and Pressure Vessel Code* [3], *Section VIII, Div. 1, International Society for Measurement and Control Standard S75 Series of Control Valve Standard*s

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1 American National Standards Institute, 25 West 43rd Street, 4th Floor, New York, New York 10036, www.ansi.org.
2 ANSI/Fluid Controls Institute, Inc., 1300 Sumner Avenue, Cleveland, Ohio, 44115, www.fluidcontrolsinstitute.org.
3 ASME International, 3 Park Avenue, New York, New York 10016-5990, www.asme.org.