Pressure Testing of Steel Pipelines for the Transportation of Gas, Petroleum Gas, Hazardous Liquids, Highly Volatile Liquids, or Carbon Dioxide

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Introduction

This Recommended Practice (RP) provides guidelines for pressure testing steel pipelines for the transportation of gas, petroleum gas, hazardous liquids, highly volatile liquids, or carbon dioxide. The RP provides guidance so that:

a) Pipeline operators can select a pressure test suitable for the conditions under which the test will be conducted—this includes, but is not limited to, pipeline material characteristics, pipeline operating conditions, and various types of anomalies or other risk factors that may be present;

b) Pressure tests are planned to meet the overall objectives of the pressure test;

c) Site-specific procedures are developed and followed during all phases of the pressure testing process;

d) Pressure tests consider personnel safety, public safety, and environmental impacts;

e) Pressure tests are implemented by qualified personnel;

f) Pressure tests are conducted to meet stated acceptance criteria and pressure test objectives;

g) Pressure test records are developed, completed, and retained for the useful life of the facility.

Users of this RP should be aware that further or differing requirements may be necessary for some applications. Nothing in this RP is intended to inhibit the use of engineering solutions that are not covered by the RP. This may be particularly applicable where there is innovative developing technology. Where an alternative is offered, the RP may be used, provided all variations from the RP are identified and documented.

The guiding principles of this RP are as follows:

a) This RP provides a consistent means of preparing, assessing, using, and verifying pressure test results to help ensure that the objectives of the pressure test are met.

b) Provide guidance for meeting the requirements of Integrity Management as stated in API Recommended Practice 1160 and ASME B31.8S. Further information on using hydrostatic testing as an integrity management tool can be found in API Technical Report 1179, *Hydrostatic Testing as an Integrity Management Tool*.

c) This RP is not technology specific. It accommodates present and future technologies used for pressure testing steel pipelines.

d) This RP is performance-based and provides guidelines for the qualification of the pressure testing processes. It does not define how to meet those guidelines.

e) This RP provides guidelines for documenting important information during each phase of the pressure testing process.

f) Wherever possible, this RP utilizes existing terms and definitions from other applicable industry documents. Definitions of terms used in this RP are listed in Section 3.

g) The use of a pressure testing process to manage the integrity of pipelines requires an appropriate amount of interaction between the inspection service, if one is used, and the operator. This RP provides guidelines that will enable inspectors and operators to clearly define the areas of cooperation required and thus facilitate the satisfactory outcome of the pressure testing process.

Although many operators use vendors during various phases of the pressure testing process, the operator is ultimately responsible for:

a) Identifying specific risks and threats to be assessed as part of the pressure testing process,

b) Choosing the proper pressure test to assess identified risks and threats, and

c) Confirming and verifying pressure test results.

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1 Scope

This RP applies to all parts of a pipeline or pipeline facility including line pipe, pump station piping, terminal piping, compressor station piping, metering station piping, delivery station piping, regulator station piping, appurtenances connected to line pipe, appurtenances connected to facility piping, fabricated assemblies, valves, tees, elbows, reducers, flanges, and any other pipeline equipment or appurtenances.

This RP does not apply to pumping units, compressor units, breakout tanks, pressure vessels, control piping, sample piping, instrument piping/tubing, or any component or piping system for which other codes specify pressure testing requirements (i.e. ASME *Boiler and Pressure Vessel Code* or piping systems covered by building codes).

Although this RP contains guidelines that are based on sound engineering judgment, it is important to note that certain governmental requirements may differ from the guidelines presented in this document.

This RP does not address pipeline systems that are pressure tested with natural gas, nitrogen, or air.

2 Normative References

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any addenda) applies.

API Recommended Practice 1160, *Managing System Integrity for Hazardous Liquid Pipelines*

ASME B31.4 [1], *Pipeline Transportation Systems for Liquid Hydrocarbons and Other Liquids*

ASME B31.8, *Gas Transmission and Distribution Piping Systems*

ASME B31.8S, *Managing System Integrity of Gas Pipelines*

3 Terms, Definitions, and Abbreviations

3.1 Terms and Definitions

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

3.1.1
anomaly
Possible unexplained deviations from the norm in sound pipe material, coatings, or welds.

3.1.2
appurtenance
A component attached to the pipeline (e.g. valve, tee, instrument connection, supports, or anchors).

3.1.3
bend
A physical pipe configuration that changes pipeline direction.

[1] ASME International, 3 Park Avenue, New York, NY 10016-5990, www.asme.org.