In-line Inspection Systems Qualification

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Introduction

This standard provides requirements for qualification of in-line inspection systems used in gas and hazardous liquid pipelines. The standard facilitates the following.

a) Inspection service providers make clear, uniform, and verifiable statements describing in-line inspection system performance.

b) Pipeline operators select an inspection system suitable for the conditions under which the inspection will be conducted. This includes, but is not limited to, the pipeline material characteristics, pipeline operating conditions, and types of anomalies expected to be detected and characterized.

c) The in-line inspection system operates properly under the conditions specified.

d) Inspection procedures are followed before, during, and after the inspection.

e) Anomalies are described using a common nomenclature, as described in this standard and in referenced documents.

f) The reported data and inspection results provide the expected accuracy and quality in a consistent format.

Users of this standard should be aware that further or differing requirements may be needed for some applications. Nothing in this standard is intended to inhibit the use of inspection systems or engineering solutions that are not covered by the standard. This may be particularly applicable where there is innovative developing technology. For these technologies, this standard may be used, provided applicable variations from the standard are identified and documented.

Personnel and equipment used to perform in-line inspections and analyze the results shall be qualified according to this standard and its companions, ASNT ILI-PQ, *In-line Inspection Personnel Qualification and Certification* and NACE SP0102, *In-line Inspection of Pipelines*. This standard is an umbrella document covering all aspects of in-line inspection systems, incorporating the requirements of ASNT ILI-PQ and NACE SP0102 by reference.

This standard is not technology specific. It accommodates present and future technologies used for in-line inspection systems. This standard is performance based and provides requirements for qualification processes. It does not, however, define how to meet those requirements. This standard defines the documentation of processes for in-line inspection system qualifications. One objective of this standard is to foster continual improvement in the quality and accuracy of in-line inspections. Wherever possible, this standard utilizes existing terms and definitions from other applicable standards. Section 3 provides definitions of terms.

The use of an in-line inspection system to manage the integrity of pipelines requires close cooperation and interaction between the provider of the inspection service (service provider) and the beneficiary of the service (operator). This standard provides requirements that will enable service providers and operators to clearly define the areas of cooperation required and thus ensure the satisfactory outcome of the inspection process. Whereas service providers have the responsibility to identify in-line inspection system capabilities, their proper use, and application, operators bear the ultimate responsibility to:

a) identify specific risks (threats) to be investigated;

b) choose the proper inspection technology;

c) maintain operating conditions within performance specification limits;

d) confirm inspection results.

Following the standard provides a consistent means of assessing, using, and validating results from in-line inspection systems such that acceptable inspection results are obtained.

In-line Inspection Systems Qualification

1 Scope

This standard covers the qualification, selection, reporting, verification, validation, and use of in-line inspection (ILI) systems for onshore and offshore steel gas and hazardous liquid pipelines. This includes, but is not limited to, tethered, self-propelled, or free-flowing systems for detecting metal loss, cracks, mechanical damage, pipeline geometries, and pipeline location or mapping. The standard applies to both existing and developing technologies.

This standard is an umbrella document that provides performance-based requirements for ILI systems, including procedures, personnel, equipment, and associated software.

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 Recommended Practice 1176, *Assessment and Management of Cracking in Pipelines*

API Recommended Practice 1183, *Assessment and Management of Pipeline Dents*

ASNT ILI-PQ [1], *In-line Inspection Personnel Qualification and Certification*

NACE SP0102 [2], *In-line Inspection of Pipelines*

CEPA [3], *Metal Loss Inline Inspection Tool Validation Guidance Document,* First Edition

3 Terms, Definitions, Acronyms, and Abbreviations

3.1 Terms and Definitions

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

3.1.1
aboveground marker
AGM
A spatial reference point that is identifiable as a distinct feature in the ILI.

NOTE This may also include the ability to detect and record the passage of an ILI tool.

3.1.2
actionable anomaly
An anomaly that may exceed acceptable limits based on the operator's anomaly and pipeline data analysis (see Figure 1).

[1] American Society for Nondestructive Testing, 1711 Arlingate Lane, Columbus, Ohio 43228, https://www.asnt.org.

[2] NACE International (now Association for Materials Protection and Performance), 15835 Park Ten Place, Houston, Texas 77084, https://ampp.org.

[3] Canadian Energy Pipeline Association, 1110, 505 – 3rd Street SW, Calgary, Alberta T2P 3E6, Canada, https://cepa.com/en.