

In-line Inspection Systems Qualification

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Contents

1	Scope.....	1
2	Normative References	1
3	Terms, Definitions, Acronyms, and Abbreviations	1
3.1	Terms and Definitions	1
3.2	Acronyms and Abbreviations	11
4	Systems Qualification Process	11
4.1	General	11
4.2	Personnel Qualification	13
4.3	Operator and Service Provider Responsibilities	13
5	ILI System Selection	13
5.1	General	13
5.2	Inspection Goals and Objectives	13
5.3	Physical and Operational Characteristics and Constraints	14
5.4	Selection of an ILI System	15
5.5	Performance Specification.....	16
6	Qualification of Performance Specifications	16
6.1	General	16
6.2	Performance Specifications.....	16
6.3	Qualification Requirements	24
6.4	Documentation and Other Requirements.....	26
7	System Operational Verification.....	27
7.1	General.....	27
7.2	Project Requirements	27
7.3	Pre-inspection Requirements	29
7.4	Inspection Requirements	31
7.5	Post-inspection Requirements	32
7.6	ILI Data Quality Assurance and Data Analysis	33
7.7	ILI System Verification Cumulative Assessment.....	38
7.8	RCA for Failed Runs	38
8	System Results Validation	39
8.1	Introduction	39
8.2	Evaluation of Inspection System Results.....	41
9	Reporting Requirements	59
9.1	General.....	59
9.2	DQA	60
9.3	Report Content	60
9.4	Reporting Format	62
9.5	Data Deliverable	63
9.6	Quality Control of Data Delivered.....	63
9.7	Discussion of Results.....	65
9.8	Integrity Data Management Integration	65
9.9	Example Spreadsheet for Data Delivery	65
10	Quality Management System	66
10.1	System Scope.....	66
10.2	Quality System Documentation	67
10.3	QC	69
10.4	Continual Improvement.....	69
10.5	Quality System Review.....	70

Annex A (informative) Performance Specification Example Template	71
Annex B (informative) Sample On-site Report for Caliper and MFL Inspection Tool Runs	76
Annex C (informative) Estimating the Performance Specifications from a Comparison of Individual Validation Measurements	79
Annex D (informative) Example Inspection Results Report	91
Annex E (informative) Example Validation Dig Documentation	95
Annex F (informative) Example: On-site Feature Location/Validation Activities	97
Annex G (informative) Supplementary Performance Criteria and Methodologies	100
Bibliography	104

Figures

1 Inspection Terminology	2
2 ILI Process Flow Diagram	12
3 Dimensional Classes for Metal Loss Indications	18
4 POD Function vs Metal Loss Depth	21
5 Comparison with Records	42
6 Level 1 Validation	44
7 ILI to ILI Comparison	45
8a Level 2 Validation Approach	47
8b Level 2 Validation Details	48
9 ILI to Field Comparison	52
10 Example Unity Plot of Two Independent Sets of Measurements	54
C.1 Unity Plot Showing the 80 % Statistical Tolerance Interval with 95 % Confidence and the Corresponding Range of Field Depths Expected for a 50 % WT Reported ILI Depth	85
C.2 Unity Plot Showing a Sample of 50 Plausible Regression Lines, the 80 % Credible Interval Bounds, and the Corresponding Range of Field Depths Expected for a 2.5 mm Reported ILI Depth	86
E.1 Metal Loss Profile for Interaction Criteria	96
F.1 Feature Location Example	98
F.2 “Gap” Interpolation Example	98
G.1 Example ILI System Demonstrating Relationship of POD, POI, and Sizing Accuracy with POR	100

Tables

1 Suggested Operator and Service Provider Accountabilities	13
2 Characterizing Metal Loss PODs—Example Depth Detection Thresholds	21
3 Characterizing Cracking PODs—Example Depth Detection Thresholds	21
4 Example of Characterizing Cracking POIs	22
5 Classification of Anomaly Matches	49
6 POI Example	50
7 Example Agreement Test of Two Independent Sets of Measurements	54
A.1 Features and POIs	71
A.2 Location Accuracy of Features	73
A.3 Detection and Sizing Accuracy in 90° Bends	73
A.4 Detection and Sizing Accuracies for Dents and Ovalities	73
A.5 Horizontal and Vertical Accuracy of Pipeline Location as a Function of Marker Distance and Certainty	73
A.6 Example PODs and Sizing Tolerances for Metal Loss (at a Specified Confidence Level) ...	74
A.7 Example of Crack Detection Capabilities	74
A.8 Example of Sizing Accuracy for Crack or Crack-like Anomalies	75
A.9 Example of Impact to Performance for Crack or Crack-like Anomalies	75
C.1 Tool Selection Check	80
G.1 Expanded Identification Table	102

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. Where 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 Cracks in Pipelines*

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

ASNT ILI-PQ¹, *In-line Inspection Personnel Qualification and Certification*

NACE SP0102², *In-line Inspection of Pipelines*

CEPA³, *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>.