Pipeline Inspection Documents for Material Traceability and Electronic Test Reports

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Suggested revisions are invited and should be submitted to the Standards Department, API, 200 Massachusetts Avenue, Suite 1100, Washington, DC 20001, standards@api.org.

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Introduction

The API committee membership that developed this standard included participation from the American Gas Association (AGA); pipe manufacturers; fitting, flange, and valve manufacturers; and individuals associated with related industries, as well as representatives of the U.S. Department of Transportation (DOT), Pipeline and Hazardous Materials Safety Administration (PHMSA).

The purpose of this standard is to provide a method for the standardized and electronic exchange of material test report (MTR) inspection documents from manufacturer to purchaser to support enhanced material traceability and records.

Natural gas transmission pipeline operators are required to maintain material property records that are traceable, verifiable, and complete (TVC). The U.S. Code of Federal Regulations (CFR) in Title 49 CFR §192.67 requires operators of transmission pipelines to collect or make, and retain for the life of the pipeline, records that document the physical characteristics of the pipeline, including diameter, yield strength, ultimate tensile strength, wall thickness, seam-type, and chemical composition of materials in accordance with §§192.53 and 192.55. Records are to include tests, inspections, and attributes required by the manufacturing specifications applicable at the time the material was manufactured or installed.

Operators would benefit from a standardized and electronic MTR inspection document to comply with 49 CFR §192.67. Note that the CFR references are according to the date of this publication.

API 5L (46th Edition), 10.1.1.2 states: “Inspection documents shall be in printed form or in electronic form as an electronic data interchange (EDI) transmission that conforms to any EDI agreement between the purchaser and the manufacturer.”

As such, manufacturers primarily deliver MTR inspection documents to customers in a paper or PDF format. MTR inspection documents are commonly scanned one or more times throughout the chain of custody, which may result in blurry or illegible text.

Operators would benefit from a supplementary electronic package that collates all the data provided within the MTRs and that is easily accessible and consumed by operators' existing IT systems. This electronic package does not replace the need to supply formal certified MTRs. The format of the electronic package is to be agreed upon between the manufacturer and the purchaser, and may be among the interchange options defined in Section 4 of this standard.

API 5L (46th Edition), 10.1.3.2 provides data requirements for the inspection documents provided by the manufacturer to the purchaser for PSL 2 pipe. However, the format of the data may not be consistent, and data elements may be reported differently.

Further, electronic MTR inspection document data would support the following industry standards, programs, and traceable, verifiable, and complete processes:

— API 578, *Guidelines for a Material Verification Program (MVP) for New and Existing Assets*;

— API 1173, *Pipeline Safety Management*;

— API 1177, *Steel Pipeline Construction Quality Management Systems*;

— performing off-load inspections to ensure the delivered materials meet the purchasing specifications;

— accessing and confirming mechanical and chemical properties to ensure that the correct materials and weld procedures are used;

— integrating material property data into the asset’s system of record without manual data entry.

Manufacturers would benefit from a standardized requirement (as much as is practicable for each manufacturer to implement) for the content and format of MTR inspection documents to ease the burden of complying with new industry requirements. A standardized model published in an API standard would ensure manufacturers have a single reference to comply with for multiple purchasers. Current practices may require manufacturers to supply MTR inspection documents and material traceability data in various formats specified by different purchasers.

As stated in API 5L (46th Edition), 10.1.1.2, MTR inspection documents can be provided in an electronic form through an electronic data interchange (EDI) that conforms to any EDI agreement between the purchaser and the manufacturer. An EDI agreement could include the use of a published EDI standard, such as ASC X12. Data transferred through EDI in accordance with a published standard, such as ASC X12, is considered to be a legal and authenticated document that could eliminate the need for a complementary paper MTR inspection document.

Purchasers and manufactures may also agree to the use of other electronic data interchange methods, but the legality, security, and authentication of the data interchange method should be considered. For example, complementary MTRs commonly include a quality statement and the signature of a manufacturer's representative. Quality statements and signatures are not required in API 5L (46th Edition), 10.1.3.2, but may be required by the manufacturer and/or purchaser. Specialized software may be required to provide a signature or similar authentication functionality for an MTR inspection document if the electronic record is not accompanied by a paper document.

API 5L (46th Edition), 10.1.3.2.l, which provides the minimum MTR inspection document data elements, also includes a line item for "the results of any supplementary testing specified in the purchase order." This standard provides format and content recommendations for commonly requested supplementary tests.

This standard also provides a supplementary and optional method for complying with API 5L (46th Edition) 11.2, which requires pipe to be marked with "an identification number (Z), which permits the correlation of the product or delivery unit (e.g. bundled pipe) with the related inspection document, if applicable." Pipe is commonly marked with a heat number. However, a heat number may not be adequate to link a product or delivery unit to its related inspection document. Pipe manufactured with a single heat may undergo different processing techniques that change the mechanical properties resulting in different inspection documents. To comply with API 5L (46th Edition), 11.2, pipe should be marked with an identification number that can be correlated with a specific MTR inspection document, such as an inspection certificate number. Further, heat numbers are not unique and may be duplicated between manufacturers and can potentially be duplicated after five years within the same manufacturer. This document provides a supplementary and optional method to correlate the product with its inspection document using a unique inspection certificate number and date.

The use of this standard also comes with awareness concerning the potential use of any supplied data to generate fraudulent MTRs. While this risk exists with traditional paper-based MTRs, the availability of the supplied data in electronic format may be considered easier to use in a fraudulent manner. This standard contains no recommendations to guard against this, but simply points out this risk; it is for the purchasers of material covered by this standard to assure themselves of the veracity of any supplied data.

Pipeline Inspection Documents for Material Traceability and Electronic Test Reports

1 Scope

This standard is for carbon and low-alloy steel pipe and components used in the compression, pumping, and transmission of crude petroleum, petroleum products, fuel gases, carbon dioxide, nitrogen, and, where applicable, covers distribution systems. This standard applies to new assets and does not retroactively apply to in-service assets.

This standard provides a method for the electronic exchange of MTR inspection documents from manufacturer to purchaser to support enhanced material traceability and records for steel line pipe, and could be applied to related steel assets. Data models for each asset type/product are provided in separate annexes; annexes for new asset types will be incrementally added to this standard as necessary.

The users of this standard are purchasers (operators and distributors) and manufacturers, and it is intended that all work performed in accordance with this standard either meets or exceeds its requirements.

The values stated in either U.S. Customary Units (USC) or metric units (SI) are to be regarded separately as standard. Each system is intended to be used independently of the other, without combining values in any way.

While this standard is comprehensive, it may not address all issues that may arise. The absence of guidance or requirements is not to be considered prohibitive to a particular activity or approach that is based upon sound engineering judgment. For example, other industry standards, reliable engineering tests and analyses, or other established industry practices may serve as useful references to establish sound engineering judgment.

2 Normative References

The following referenced documents are indispensable for the application of this standard. For dated references, only the edition cited applies. For undated references, the latest edition (including any addenda or errata) applies.

API Specification 5L, *Line Pipe (46th Edition)*

For a list of other documents referenced by or related to this standard, refer to the Bibliography.

3 Terms, Definitions, and Abbreviations

For the purpose of this standard, the following terms, definitions, and abbreviations apply.

3.1 Terms and Definitions

3.1.1
distributor/stockist
An entity that purchases pipe from the manufacturer and distributes it to the operator.

NOTE The distributor may or may not take physical possession of the pipe and may or may not be responsible for transferring material inspection and traceability documentation from the manufacturer to the operator.

3.1.2
electronic form
An electronic file in a database or spreadsheet format.