

Prioritization of External Corrosion on Piping Within Metallic Casings using In-Line Inspection Data

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ABSTRACT

This NACE International standard provides the most current technology and industry practices for prioritization of cased piping using In-Line Inspection (ILI) data.

Metallic casings are used to install and protect the carrier pipe at pipeline crossings such as those at road and railroad rights of way. This standard provides an overview of prioritization strategies for management of external corrosion of piping in metallic cased crossings using ILI data integrated with construction, operating, maintenance and inspection information.

KEYWORDS

ILI, casings, external corrosion management

Foreword

This NACE International standard provides the most current technology and industry practices for prioritization of cased piping using In-Line Inspection (ILI) data.

This standard is intended for use by corrosion control personnel, design engineers, project managers, purchasers, and construction engineers, and managers. It is applicable to underground steel pipelines in the oil and gas gathering, distribution, and transmission industries.

This standard was prepared in 2020 by NACE Task Group (TG) 567, "Mitigation and Prioritization Strategies for Casings." The Task Group is administered by Specific Technology Group (STG) 35, "Pipelines, Tanks, and Well Casings." This standard is published under the auspices of Standards Committee (SC) 15, "Pipelines and Tanks."

In NACE standards, the terms **shall**, **must**, **should**, and **may** are used in accordance with the definitions of these terms in the NACE Publications Style Manual. The terms **shall** and **must** are used to state a requirement, and are considered mandatory. The term **should** is used to state something good and is recommended, but is not considered mandatory. The term **may** is used to state something considered optional.

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Section 1: General

- 1.1 Metallic casings are used to install and protect the carrier pipe at pipeline crossings such as those at road and railroad rights of way. This standard provides an overview of prioritization strategies for management of external corrosion of piping in metallic cased crossings using ILI data integrated with construction, operating, maintenance and inspection information.
- 1.2 Some regulatory guidance and industry practices for onshore buried pipelines include requirements that they must be electrically isolated from other underground metallic structures, including metallic casings. If isolation fails or is not achieved, operators are expected to attempt remedial measures to restore the electrical isolation. If the attempted remedial measures are unsuccessful in isolating the carrier pipe from the casing pipe, the operator should take additional action to minimize the potential for external corrosion to occur on the carrier pipe inside the casing pipe.
- 1.3 Loss of electrical isolation can result in an electrolytic couple, with ionic contact between the structures through an electrolyte, or a metallic short, having direct metallic contact between the casing and carrier pipe. Refer to SP0169¹ for additional information about how these conditions affect cathodic protection.
- 1.4 Advances in technology and industry experience provide pipeline operators useful information for prioritization of response to external metal loss anomalies in cased pipeline crossings. By integrating inspection, construction and historical information, reaction to the threat of external corrosion in cased crossings can be more effective. Prioritization and mitigation activities should be applied using a structured and consistent approach to cased pipeline crossings.²
- 1.5 This standard does not imply that utilization of casings is mandatory or necessary.
- 1.6 The existing standard practices that should be used to support this standard are:
- NACE SP0169³
 - NACE SP0200⁴
 - ISO 16440⁵
 - NACE SP0102⁶
 - API 1163⁷

Section 2: Definitions

The definitions of many of the corrosion-related terms used in this standard can be found in NACE/ASTM⁽¹⁾ G193.⁸ Other terms not included therein that have been used in this report are defined as follows:

Anomaly: An unexamined deviation from the norm in pipe material, coatings or welds. See *imperfection* and *defect*.

Carrier Pipe: A pipe inside a casing, which carries a product, such as a gas and/or a liquid.

Casing: A metallic pipe used to protect the carrier pipe.

Defect: A physically examined anomaly with dimensions and characteristics that exceed acceptable limits. See "Imperfection".

Electrolyte: A chemical substrate containing ions that migrate in an electric field.

Electrolytic Contact: Ionic contact between two metallic structures via an electrolyte.

Imperfection: A physically examined anomaly with dimensions and characteristics that do not exceed acceptable limits. See "Defect".

In-Line Inspection (ILI): An inspection of a pipeline from the interior of the carrier pipe using an ILI tool. Also called *intelligent* or *smart pigging*.

In-Line Inspection (ILI) Tool: The device or vehicle that uses a nondestructive testing (NDT) technique used to inspect the carrier pipeline from the inside.

Metallic Short: Direct or indirect metallic contact between two metallic structures.

Maximum Allowable Operating Pressure (MAOP): The maximum internal pressure permitted during the operation of a pipeline.

⁽¹⁾ ASTM International (ASTM), 100 Barr Harbor Dr., West Conshohocken, PA 19428-2959.