



Standard Practice

Aboveground Survey Techniques for the Evaluation of Underground Pipeline Coating Condition

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Foreword

This standard test method presents various techniques for aboveground evaluation of the coating condition of buried metallic pipelines. It is specifically intended to address buried onshore metallic pipelines and is based on available technology and methods that have successfully demonstrated evaluation of the coating condition of buried pipelines.

If new technology is applicable and is not included in this standard, the manufacturer is encouraged to submit verifiable data to NACE Specific Technology Group (STG) 35, "Pipelines, Tanks, and Well Casings," for review and possible inclusion in the next revision of this standard.

The provisions of this standard shall be applied by personnel who have acquired by education and related practical experience the principles of cathodic protection (CP) of buried metallic piping and the proper use of the survey techniques in this standard. Codes, laws, and regulations in a local geographic area may require supplement to or deviation from this standard.

This standard provides testing procedures to comply with the requirements specified on the indirect inspection step of the NACE external corrosion direct assessment¹ (EDCA) process.

The data gathered using these testing procedures may be submitted to the end user using the joint NACE/PODS SP0507.²

This standard is intended for use by individuals and teams planning and implementing aboveground evaluation of the coating condition of underground metallic pipelines. These individuals include engineers, operations and maintenance personnel, technicians, specialists, and inspectors. Users of this standard must be familiar with applicable pipeline safety regulations for the jurisdiction in which the pipeline operates. This includes all regulations requiring specific pipeline integrity assessment practices and programs.

This standard was prepared by Task Group (TG) 294, "Pipeline Coating: Aboveground Survey Techniques for the Evaluation of Underground Pipeline Coating Condition." TG 294 is administered by STG 35 and is sponsored by STG 03, "Coatings and Linings, Protective: Immersion and Buried Service" and STG 05, "Cathodic/Anodic Protection." This standard is issued by NACE under the auspices of STG 35.

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 Aboveground Survey Techniques

1.1.1 This standard presents acknowledged procedures for the application of aboveground techniques to evaluate the coating condition of underground metallic pipelines.

1.1.2 This standard does not designate practices for specific situations; the complexity of some underground pipeline and environmental conditions preclude standardizing the application of some of the coating evaluation techniques. Deviation from this standard may be warranted in specific situations, provided those responsible can demonstrate that the objectives expressed in this standard have been achieved.

1.1.3 This standard does not include procedures for close-interval pipe-to-soil potential surveys (CIS). CIS procedures are covered in NACE SP0207.³

1.1.4 Alternating current (AC) attenuation surveys are used to provide an assessment of the overall quality of the pipe coating section by section; however, this technique is not typically effective in identifying individual holidays.

1.1.5 Direct current (DC) and AC-voltage gradient surveys are used to evaluate in detail the coating condition on buried pipelines and identify and classify coating holidays.

1.1.6 The Pearson survey, named after J.M. Pearson (the individual who developed the technique), is used to locate coating holidays.

1.1.7 The pipeline operator must determine which survey techniques are suitable for providing required coating condition assessment information for each pipeline or pipeline section.

1.2 Pre-Survey Considerations

1.2.1 None of the aboveground coating evaluation techniques included in this standard are capable of detecting pipeline steel that is electrically shielded from the bulk electrolyte by disbonded coatings with no electrically continuous path to the electrolyte.

1.2.2 The indirect inspection tools covered in this standard are less sensitive when pipe burials exceed normal depth ranges. Field conditions and terrain may affect depth and detection sensitivity.

1.2.3 The following information should be gathered and analyzed to establish applicability of the aboveground coating condition survey techniques for any given pipeline or pipeline section. The items in the list are not intended to address all possible variables that may affect applicability of a technique to a specific pipe section:

1.2.3.1 Pipeline diameter and pipe-wall thickness, fluid transmitted, temperature, direction of flow, and operating pressure;

1.2.3.2 Pipeline coating type, age, and whether pipeline/sections are under concrete;

1.2.3.3 Route maps and cathodic protection records, when available;

1.2.3.4 Whether or not in-line inspection (ILI) correlation point locations are used together with global positioning system (GPS) information to compare known aboveground and underground survey data;

1.2.3.5 Pipeline depth-of-cover and soil type;