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Measurement Techniques Related to Criteria for Cathodic Protection on Underground or Submerged Metallic Piping Systems

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Document History

2022-01-14: Revised by AMPP Standards Committee (SC) 15, Pipelines & Tanks.

2018-09-21: Revised by Task Group (TG) 020, “Measurement Techniques Related to Criteria for Cathodic Protection on Underground or Submerged Metallic Piping Systems.”

2012-06-23: Revised by TG 020, “Measurement Techniques Related to Criteria for Cathodic Protection on Underground or Submerged Metallic Piping Systems.”

2002-04-11: Reaffirmed by TG 020, “Measurement Techniques Related to Criteria for Cathodic Protection on Underground or Submerged Metallic Piping Systems.”

1997-12-22: Approved as TM0497 by T-10A-3, “Test Methods and Measurement Techniques Related to Cathodic Protection Criteria.”

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Foreword

This standard contains instrumentation and general measurement guidelines. It includes methods for voltage drop considerations when structure-to-electrolyte potential measurements are made and provides guidance to minimize incorrect data from being collected and used.

The measurement techniques provided in this standard were compiled from information submitted by committee members and others with expertise on the subject. Variations or other techniques not included may be equally effective. The complexity and diversity of environmental conditions may require the use of other techniques.

Appendix A (mandatory) contains information on the common types, use, and maintenance of reference electrodes. Appendix B (nonmandatory) contains information for direct current (DC) Cell-to-Cell Surface Potential Gradient Surveys. Appendix C (nonmandatory) contains information regarding the use of coupons to evaluate cathodic protection (CP), Appendix D (nonmandatory) contains information regarding Dynamic Stray Current testing, Appendix E (nonmandatory) contains information regarding AC Corrosion testing and interrupted surveys on pipelines with DC Decouplers and Appendix F (nonmandatory) contains information regarding Evaluation of Potentials Considering Adequacy of Current Interruption. As there is ongoing research into the nonmandatory procedures, the tester is advised to keep abreast of any revisions or improvements.

Scope

This NACE International standard test method provides descriptions of the measurement techniques and cautionary measures most commonly used on underground and submerged piping other than offshore piping to determine whether one or more selected criterion has been met at a representative test site(s) with consideration for special conditions. These methods are also applicable to many other underground or submerged metallic structures. Descriptions of measurement techniques and cautionary measures used on offshore pipelines and structures can be found in NACE SP0115/ISO 15589-2 for offshore pipelines and SP0176 for offshore structures.[1,2] This standard includes only those measurement techniques that relate to the criteria or special conditions, such as a net protective current and alternating current (AC) corrosion testing.[3]

The measurement techniques described require that the measurements be made in the field. Because the measurements are obtained under widely varying circumstances of field conditions and pipeline design, this standard is not as prescriptive as those NACE standard test methods that use laboratory measurements. Instead, this standard gives the user latitude to make testing decisions in the field based on the technical facts available.

Rationale

This standard is intended for use by corrosion control personnel concerned with the corrosion of underground or submerged piping systems that transport oil, gas, water, or other fluids. This revision dated 2022-03-01 added definition and discussion of DC Decouplers primarily in Appendix E.

In AMPP standards, the terms *shall* and *must* are used to state requirements and are considered mandatory. The term *should* is used to state something that is recommended, but is not considered mandatory. The term *may* is used to state something considered optional.