

Impressed Current Cathodic Protection of Internal Submerged Surfaces of Carbon Steel Water Storage Tanks

This NACE International standard represents a consensus of those individual members who have reviewed this document, its scope, and provisions. Its acceptance does not in any respect preclude anyone, whether he or she has adopted the standard or not, from manufacturing, marketing, purchasing, or using products, processes, or procedures not in conformance with this standard. Nothing contained in this NACE standard is to be construed as granting any right, by implication or otherwise, to manufacture, sell, or use in connection with any method, apparatus, or product covered by letters patent, or as indemnifying or protecting anyone against liability for infringement of letters patent. This standard represents minimum requirements and should in no way be interpreted as a restriction on the use of better procedures or materials. Neither is this standard intended to apply in all cases relating to the subject. Unpredictable circumstances may negate the usefulness of this standard in specific instances. NACE assumes no responsibility for the interpretation or use of this standard by other parties and accepts responsibility for only those official NACE interpretations issued by NACE in accordance with its governing procedures and policies which preclude the issuance of interpretations by individual volunteers.

Users of this NACE standard are responsible for reviewing appropriate health, safety, environmental, and regulatory documents and for determining their applicability in relation to this standard prior to its use. This NACE standard may not necessarily address all potential health and safety problems or environmental hazards associated with the use of materials, equipment, and/or operations detailed or referred to within this standard. Users of this NACE standard are also responsible for establishing appropriate health, safety, and environmental protection practices, in consultation with appropriate regulatory authorities if necessary, to achieve compliance with any existing applicable regulatory requirements prior to the use of this standard.

CAUTIONARY NOTICE: NACE standards are subject to periodic review, and may be revised or withdrawn at any time in accordance with NACE technical committee procedures. NACE requires that action be taken to reaffirm, revise, or withdraw this standard no later than five years from the date of initial publication and subsequently from the date of each reaffirmation or revision. The user is cautioned to obtain the latest edition. Purchasers of NACE standards may receive current information on all standards and other NACE publications by contacting the NACE *FirstService* Department, 15835 Park Ten Place, Houston, TX 77084-5145 (tel: +1 281-228-6200, email: firstservice@nace.org).

ABSTRACT

Presents procedures and practices used in providing impressed current cathodic protection to the normally submerged steel surfaces inside water storage tanks. Provides recommendations for the design and installation of cathodic protection systems and methods for determining the effectiveness of these systems.

KEYWORDS

anode, cathodic protection, impressed current cathodic protection, ICCP, coatings, reference electrode, storage tanks, water storage tanks, TG 167

Foreword

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.

The purpose of this NACE standard is to present the recommended practices for providing impressed current cathodic protection (ICCP) to the submerged steel surfaces inside water storage tanks. It contains recommendations for the design and installation of these cathodic protection (CP) systems and methods for determining the effectiveness of these systems. Recommendations for the operation and maintenance of both automatic and manual systems are provided. This standard is applicable to relatively large water storage tanks used in municipal water supply and fire protection, including elevated and on-grade tanks. Although the general principles outlined in this standard are applicable to all such tanks, the ICCP system described in this standard may not be practical for smaller tanks. It may be more economical to protect these tanks with galvanic anode cathodic protection. This standard is intended for use by engineers, water utilities, tank erectors and other contractors, and owner operators of steel water storage tanks.

This standard was originally prepared in 1988 by Task Group T-7L-1, a component of Unit Committee T-7L, “Cathodic Protection.” The task group was composed of corrosion engineers and others experienced in the design, installation, and maintenance of impressed current cathodic protection systems for water storage tanks. It was reaffirmed by T-7L in 1990 and 1995, revised in 2001 by Task Group (TG) 167 (formerly T-7L-14), then titled “Revision of NACE SP0388-1995,” reaffirmed by Specific Technology Group (STG) 05 “Cathodic/Anodic Protection” in 2007 and 2014, and revised by TG 167, “ICCP of Internal Submerged Surfaces of Steel Water Storage Tanks,” in 2018. TG 167 is administered by STG 05. This standard is issued by NACE International under the auspices of STG 05.

Impressed Current Cathodic Protection of Internal Submerged Surfaces of Carbon Steel Water Storage Tanks

1.	General	4
2.	Definitions	5
3.	Determination of the Need for Cathodic Protection.....	6
4.	Design of Impressed Current Cathodic Protection Systems	8
5.	Installation of Impressed Current Cathodic Protection Systems	12
6.	Criteria for Cathodic Protection and Measurement Procedures.....	13
7.	Constant Potential Impressed Current Systems	15
8.	Operation and Maintenance.....	16
	References.....	19
	Appendix A: Tanks and Vessels Containing Other Type Waters (Nonmandatory) .	19