

Impressed Current Cathodic Protection of Reinforcing Steel in Atmospherically Exposed Concrete Structures

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 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 International 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 to all cases relating to the subject. Unpredictable circumstances may negate the usefulness of this standard in specific instances. NACE International assumes no responsibility for the interpretation or use of this standard by other parties and accepts responsibility for only those official NACE International interpretations issued by NACE International in accordance with its governing procedures and policies which preclude the issuance of interpretations by individual volunteers.

Users of this NACE International 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 International 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 International 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CAUTIONARY NOTICE: NACE International standards are subject to periodic review and may be revised or withdrawn at any time without prior notice. NACE International requires that action be taken to reaffirm, revise, or withdraw this standard no later than five years from the date of initial publication. The user is cautioned to obtain the latest edition. Purchasers of NACE International standards may receive current information on all standards and other NACE International publications by contacting the NACE International FirstService Department, 15835 Park Ten Place, Houston, Texas 77084, telephone +1 (281) 228-6223.

ABSTRACT

Presenting guidelines for cathodic protection of reinforcing steel in concrete structures. The guidelines are limited to impressed current cathodic protection systems for new or existing atmospherically exposed reinforced concrete and are not intended for application to prestressed concrete. Criteria described include 100 mV polarization development/decay, statistical distribution analysis, and E-log I analysis. This standard includes sections that address criteria for achieving cathodic protection, design of ICCP systems, installation practices, energizing and system adjustment, operation and maintenance of ICCP systems, and records.

KEYWORDS

Impressed current cathodic protection, ICCP, reinforced concrete, reinforcing steel, 100 mV polarization criterion, TG 044

Foreword

The purpose of this NACE standard practice is to present guidelines for impressed current cathodic protection of reinforcing steel in atmospherically exposed concrete structures. This standard is aimed at owners, engineers, architects, contractors, and all those concerned with rehabilitation of corrosion-damaged reinforced concrete structures.

For more information on design, maintenance, and rehabilitation of reinforcing steel in concrete, refer to NACE SP0187¹ and NACE SP0390.² For a state-of-the-art overview regarding the use of reference electrodes for atmospherically exposed reinforced concrete structures, refer to NACE Publication 11100.³ For a state-of-the-art overview on criteria for cathodic protection of prestressed concrete structures, refer to NACE Publication 01102.⁴

This standard was originally prepared in 1990 by NACE Task Group (TG) T-3K-2, a component of Unit Committee T-3K on Corrosion and Other Deterioration Phenomena Associated with Concrete. It was revised by Work Group T-11-1a in 2000 and reaffirmed by Specific Technology Group (STG) 01, "Reinforced Concrete," in 2007. It was revised in 2019 by TG 044, "ICCP of Reinforcing Steel in Atmospherically Exposed Concrete Structures." TG 044 is administered by STG 01 and sponsored by STG 05 on "Cathodic/Anodic Protection." This standard is published by NACE under the auspices of STG 01.

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.

Impressed Current Cathodic Protection of Reinforcing Steel in Atmospherically Exposed Concrete Structures

1.	General	4
2.	Definitions	4
3.	Criteria.....	5
4.	Design of Impressed Current Cathodic Protection Systems	7
5.	Installation Practices	9
6.	Energizing and System Adjustment	9
7.	Operation and Maintenance of Impressed Current Cathodic Protection Systems.....	11
8.	Records.....	12
	References.....	13
	Bibliography	13
	Appendix A: Additional Information Useful for Design (Nonmandatory).....	14
	Appendix B: Test Equipment (Nonmandatory).....	15