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Corrosion Prevention and Control Planning

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ABSTRACT

This standard on corrosion prevention and control (CPC) planning is intended to support future CPC improvements to national acquisition and sustainment of products and facilities at an acceptable cost. It provides a standardized framework for a supplier's plan to control corrosion of supplied products and facilities. The standard is intended for use by public and private facility owners/acquisition agencies that require their suppliers to provide corrosion prevention and control procedures as a deliverable provided with the purchased products and facilities. The standard includes:

- *Attributes of the supplied product or facility that require planning for CPC;*
- *Considerations for material selection and design of a product or facility to minimize corrosion;*
- *Items or topics that should be addressed in a CPC plan;*
- *Items or topics that should be addressed in CPC planning which affect CPC in design, fabrication and construction, operation and use, and maintenance and sustainability;*
- *Characteristics of the key elements of CPC planning;*
- *New in this revision—Approaches to CPC assessment.*

KEYWORDS

Corrosion prevention and control, CPC, planning, design, material selection, Developed by JTG 527

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Foreword

Corrosion costs the United States of America an estimated $451B annually.[1] While guidance existed for corrosion prevention and control (CPC) planning, there wasn't a published standard that defined the key elements/composition of CPC planning for all public and private sector users as well as the suppliers of products (all equipment, systems, platforms, vehicles, support equipment and items necessary to perform a specific function or mission including all components of such items) and facilities (all buildings, structures, airfields, port facilities, surface and subterranean utility systems, heating and cooling systems, fuel tanks, pavements and bridges). This standard on CPC planning is needed to support future CPC improvements to procurement/contracting and sustainability of products and facilities at an acceptable cost. Inclusion of the appropriate levels of CPC requirements in individual statements of work (SOW), contracts and agreements is inconsistent across the enormous number of products and facilities projects acquired and sustained in both the public and private sectors. Referencing an approved standard that defines deterioration of materials, CPC planning characteristics and the appropriate application of CPC technologies and practices provides uniformity; is a more practical and reliable method to influence acquisition and sustainability programs; and is of benefit to all stakeholders.

SSPC and NACE have developed this joint standard for CPC planning. This document provides a standardized framework for a supplier's plan to prevent and control corrosion on products and facilities. The standard is intended for use by public and private owners and purchasing agencies that require their suppliers or facility owners to address CPC as an aspect of their purchased product or facility deliverable. The standard includes such items as:

- Attributes that impact planning for CPC
- Considerations for material selection and design to minimize corrosion
- Items or topics that should be addressed in corrosion prevention and control planning which affect CPC in design, fabrication and construction, operation and use, and maintenance and sustainability
- Characteristics of the key elements of CPC planning
- Approaches to CPC assessment

This standard was prepared in 2016 and revised in 2020 by Joint Task Group (JTG) 527, Corrosion Prevention and Control Planning Standard, a task group composed of representatives from SSPC and NACE. Within NACE, JTG 527 is administered by Specific Technology Group (STG) 08 on Corrosion Management and sponsored by STG 40 on Military and Aerospace Systems and Facilities. Within SSPC, JTG 527 is administered as a task group within the SSPC C.4.11 committee on Corrosion Prevention and Control Planning. This standard is published by SSPC under Committee C.4.11 and by NACE under the auspices of STG 08.

In SSPC/NACE standards, the terms ***shall, must, should,*** and ***may*** in accordance with Paragraph 2.2.1.8 of the Agreement between NACE International and SSPC: The Society for Protective Coatings. 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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Tables

Section 1: General

1.1 Background

Corrosion costs the United States an estimated $451B annually;[1] and specifically for the Department of Defense (DoD), this cost exceeds $20B annually.[2] For the purpose of this standard, the Congressional definition of corrosion cited in Title 10 United States Code (USC) §2228 will be used, which states that "Corrosion is the deterioration of a material or its properties due to a reaction of that material with its chemical environment."[3]

The most efficient method to address this staggering impact is to execute corrosion prevention and control (CPC) planning as a fundamental management tool for effectively addressing and reducing the impact of corrosion at every succeeding stage throughout the product's or facility's life. Program and Project Managers should tailor their CPC approach to fit the needs of their specific program or project across its life cycle. CPC planning requires the participation of all stakeholders including the end user. Cost effective material sustainability is best accomplished through inclusion of CPC during requirements development and initial design, rather than re-engineering or retro-fitting fielded products and constructed facilities, so it is especially important to ensure that CPC is addressed as early in the cycle as possible.

This joint standard for CPC planning provides a uniform, efficient and cost-effective application of CPC principles, technologies and best practices over the lifespan of a product or facility and leads to lower life cycle costs.

1.2 Scope and Limitations

This standard was developed at the request of the U.S. Department of Defense to define the key elements/composition of what CPC planning encompasses for design, manufacturing, construction, operation and sustainability of products and facilities. While products and facilities follow different processes and requirements, this standard attempts to provide both areas with assistance in determining the best approach for CPC planning with the desired outcome of realizing the useable service life consistent with the investment and expectations.

1.3 Overview of Topics Covered by this Standard

- CPC Planning Checklists
- Elements of CPC Planning and their characteristics
- Attributes that contribute to or affect CPC Planning considerations for material selection and design
- Miscellaneous issues that affect CPC in the design, fabrication and construction, operation and use, and maintenance and sustainability
- Definitions relevant to this standard
- Approaches to CPC assessment

Section 2: Checklists for Corrosion Prevention and Control (CPC) Planning

CPC planning consists of the application of various elements and aspects that can be used to establish a standardized approach towards managing CPC for products and facilities across their life cycle. CPC planning should include program management, engineering (including systems engineering), logistics, test and evaluation, budget/funding, end users and procurement/contracting. The following checklists (Tables 1 and 2) provide a listing of the basic elements of CPC planning which should be considered during the program/project and should be tailored to meet the requirements of the specific need. The user may select some or all of the elements for the specific program/project using this standard. For example, if warranties are not part of the subject program/project, don't include that as part of the checklist. These checklist tables include a hot link for each element to its corresponding requirement statement. Each requirement statement is subsequently hot linked to details and guidance specific to that element contained in Appendix A (nonmandatory).