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NACE SP0297-2012
(formerly RP0297)
Item No. 21081

Standard Practice

Maintenance Painting of Electrical Substation Apparatus Including Flow Coating of Transformer Radiators

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Revised 2012-06-23
Reaffirmed 2004-03-31
Approved 1997-06-27
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ISBN 1-57590-042-4
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Foreword

Aspects of normal industrial maintenance painting such as surface preparation, coating selection, application methods, and safety considerations are subject to entirely different rules when placed within the confines of an energized, high-voltage substation. With utilities and industries attempting to obtain maximum use of their systems, transmission and distribution apparatus are being pushed to the limits of their designed service life. Properly engineered and implemented maintenance painting programs protect equipment from the detrimental effects of corrosion and help it perform to the fullest extent of its operating life.

Maintenance personnel for utilities and large industrial concerns who are responsible for maintenance painting of electrical equipment are primarily electrical engineers or have their background in electrical work. These individuals often have little, if any, practical knowledge of corrosion and its control. Consequently, many specifications that are poorly written, incomplete, and technically inaccurate are being used. This standard has been prepared to assist maintenance personnel responsible for painting electrical equipment.

A sample specification is included in Appendix A (Nonmandatory). This specification provides an example of one of the many types of specifications currently used by the industry. NACE neither endorses nor recommends the use of this sample specification. It is provided for information only.

This standard was originally prepared in 1997 by NACE Task Group (TG) T-6H-50, a component of former Unit Committee T-6H on Coating Materials for Atmospheric Service. It was reaffirmed in 2004 by Specific Technology Group (STG) 02 on Protective Coatings and Linings—Atmospheric. It was revised in 2012 by TG 457, "Review of NACE Standard RP0297-2004." TG 457 is administered by STG 02, "Coatings and Linings, Protective—Atmospheric." This standard is issued by NACE under the auspices of STG 02.

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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Contents

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Section 1: General

1.1 This standard practice provides standards for preparing specifications and procedures for coating electrical substation apparatus.

1.2 This standard is designed to introduce owners, engineers, maintenance personnel, and contractors to the four aspects unique to substation coating:

(a) Safety considerations
(b) Surface preparation for radiators
(c) Coating selection
(d) Application (flow coating)

1.3 This standard:

1.3.1 Informs the reader of the factors that make electrical substation coating unique among all other forms of industrial maintenance painting and highlights special factors such as worker safety and coating of radiators.

1.3.2 Provides owners, engineers, and maintenance personnel with a sample specification they may modify to meet their specific requirements.

1.4 This standard deals only with substation apparatus, which includes:

(a) Transformers
(b) Circuit breakers (all types)
(c) Switchgear enclosures
(d) Regulators
(e) Potential transformers
(f) Current transformers
(g) Coupling capacitor potential devices (CCPDs)

1.5 This standard does not include the painting of structural steel, fencing, buildings, or other miscellaneous items within the substations.

Section 2: Purpose of Coating Electrical Substation Apparatus

2.1 Electrical substation apparatus is coated for one or more of the following reasons:

2.1.1 To protect the metal portions of the apparatus from corrosion.

2.1.2 To help a substation blend in with the surrounding environment.

2.1.3 To improve the cosmetic appearance of the apparatus.

2.1.4 To improve or maintain the efficiency of transformer radiators.

2.1.5 To draw attention to important indicators (e.g., circuit breakers or switch open/close indicators that tell operators whether a breaker is open [meaning the circuit is cut out] or closed [meaning the circuit is in service]) or dangerous high-voltage areas (e.g., breaker closure switches, bushing caps).