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U.S. ATOMIC ENERGY COMMISSION

# REGULATORY GUIDE

DIRECTORATE OF REGULATORY STANDARDS

## REGULATORY GUIDE 1.54

### QUALITY ASSURANCE REQUIREMENTS FOR PROTECTIVE COATINGS APPLIED TO WATER-COOLED NUCLEAR POWER PLANTS

#### A. INTRODUCTION

Appendix B to 10 CFR Part 50, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," establishes overall quality assurance program requirements for the design, fabrication, construction, and operation of safety-related nuclear power plant structures, systems, and components. This guide describes an acceptable method of complying with the Commission's quality assurance requirements with regard to protective coatings applied to ferritic steels, aluminum, stainless steel, zinc-coated (galvanized) steel, concrete, or masonry surfaces of water-cooled nuclear power plants. The Advisory Committee on Reactor Safeguards has been consulted concerning this guide and has concurred in the regulatory position.

#### B. DISCUSSION

Subcommittee N101.5.7 of the American National Standards Institute (ANSI) Standards Committee N101, Atomic Industry Facility Design, Construction, and Operation Criteria, under the sponsorship of the American Institute of Chemical Engineers, has developed a standard which includes quality assurance requirements for protective coatings applied to ferritic steels, aluminum, stainless steel, zinc-coated (galvanized) steel, concrete, or masonry surfaces of nuclear facilities. This standard was approved by the American National Standards Committee N101 and its Secretariat. It was subsequently approved and designated N101.4-1972 by the American National Standards Institute on November 28, 1972.

#### C. REGULATORY POSITION

The requirements and guidelines included in ANSI N101.4-1972, "Quality Assurance for Protective

Coatings Applied to Nuclear Facilities,"<sup>1</sup> for protective coatings applied to ferritic steels, aluminum, stainless steel, zinc-coated (galvanized) steel, concrete, or masonry surfaces of water-cooled nuclear power plants are generally acceptable and provide an adequate basis for complying with the pertinent quality assurance requirements of Appendix B to 10 CFR Part 50 subject to the following:

1. ANSI N101.4-1972 should be used in conjunction with ANSI N45.2-1971, "Quality Assurance Program Requirements for Nuclear Power Plants."<sup>2</sup>
2. Subdivision 2.7 of ANSI N101.4-1972 states that when references are made to other standards, these references shall imply the most recent or current editions of the referenced standards. The specific applicability or acceptability of referenced standards will be covered separately in other regulatory guides, where appropriate.
3. Subdivision 1.1.2 of ANSI N101.4-1972 states that quality assurance, as covered by this standard, comprises all those planned and systematic actions necessary to provide specified documentation and adequate confidence that shop or field coating work for nuclear facilities will perform satisfactorily in service. This statement should not be interpreted as implying that the end product of quality assurance actions is the production of specified documentation. The term

<sup>1</sup>Copies may be obtained from the American Institute of Chemical Engineers, 345 East 47th Street, New York, N.Y. 10017.

<sup>2</sup>Copies may be obtained from the American Society of Mechanical Engineers, United Engineering Center, 345 East 47th Street, New York, N.Y. 10017.

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Copies of published guides may be obtained by request indicating the divisions desired to the U.S. Atomic Energy Commission, Washington, D.C. 20545, Attention: Director of Regulatory Standards. Comments and suggestions for improvements in these guides are encouraged and should be sent to the Secretary of the Commission, U.S. Atomic Energy Commission, Washington, D.C. 20545, Attention: Chief, Public Proceedings Staff.

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"quality assurance" as used in ANSI N101.4-1972 should be considered to comprise all those planned and systematic actions necessary to provide adequate confidence that shop or field coating work for nuclear facilities will perform satisfactorily in service. In this connection it is emphasized that records and documents listed in Subdivisions 7.4 through 7.8, and included in the standard, are suggested forms only. Alternate documentation consistent with the requirements of Appendix B to 10 CFR Part 50 is also considered acceptable.

4. Sections 3 and 4 of ANSI N101.4-1972 delineate quality assurance requirements for coating materials and surface preparation of substrates. Coatings and cleaning

materials used with stainless steel should not be compounded from or treated with chemical compounds containing elements that could contribute to corrosion, intergranular cracking, or stress corrosion cracking. Examples of such chemical compounds are those containing chlorides, fluorides, lead, zinc, copper, sulfur, or mercury where such elements are leachable or where they could be released by breakdown of the chemical compounds under expected environmental conditions (e.g., by radiation). This limitation is not intended to prohibit the use of trichlorotrifluoroethane which meets the requirements of Military Specification MIL-C-81302b for cleaning or degreasing of austenitic stainless steel provided adequate removal is assured prior to painting.