



U.S. ATOMIC ENERGY COMMISSION

REGULATORY GUIDE

DIRECTORATE OF REGULATORY STANDARDS

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REGULATORY GUIDE 3.21

QUALITY ASSURANCE REQUIREMENTS FOR PROTECTIVE COATINGS APPLIED TO FUEL REPROCESSING AND TO PLUTONIUM PROCESSING AND FUEL FABRICATION PLANTS

A. INTRODUCTION

Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," to 10 CFR Part 50, "Licensing of Production and Utilization Facilities," establishes quality assurance requirements for the design, construction, and operation of nuclear power plant and fuel reprocessing plant structures, systems, and components. Paragraph 70.22(f) of 10 CFR Part 70, "Special Nuclear Material," requires that each application for a license to possess and use special nuclear material in a plutonium processing and fuel fabrication plant contain a description of the quality assurance program to be applied to the design, fabrication, construction, testing, and operation of the structures, systems, and components of the plant. It further provides that the description include a discussion of how the criteria of Appendix B of Part 50 will be met. Paragraph 70.23(b) of 10 CFR Part 70 provides that the Commission will approve construction of a plutonium processing and fuel fabrication plant when it has determined that the design bases and the quality assurance program provide reasonable assurance of protection against natural phenomena and the consequences of potential accidents, noting also that the criteria in Appendix B of 10 CFR Part 50 will be used in determining the adequacy of the quality assurance program. This Regulatory Guide describes a method acceptable to the Regulatory staff of complying with the Commission's regulations with regard to protective coatings applied to ferritic steels, aluminum, stainless steel, zinc-coated (galvanized) steel, concrete, or masonry surfaces of fuel reprocessing or plutonium processing and fuel fabrication plants.

B. DISCUSSION

Subcommittee N101.5.7 of American National

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,"¹ for protective coatings applied to ferritic steels, aluminum, stainless steel, zinc-coated (galvanized) steel, concrete, or masonry surfaces of fuel reprocessing and of plutonium processing and fuel fabrication 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 Regulatory Guide 3.3 which refers to N45.2-1971, "Quality Assurance Program Requirements for Nuclear Power Plants."²

¹ Copies may be obtained from the American Institute of Chemical Engineers, 345 East 47th Street, New York, New York, 10017

² Copies may be obtained from the American Society of Mechanical Engineers, United Engineering Center, 345 East 47th Street, New York, New York 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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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 references standards. The specific applicability or acceptability of referenced standards will be covered separately in other regulatory guides or regulations, where appropriate.

3. Subdivision 1.1.2 of ANSI N101.4-1972 states that quality assurance, as covered by this standard, comprises all of 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 "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.