



REGULATORY GUIDE

OFFICE OF NUCLEAR REGULATORY RESEARCH

REGULATORY GUIDE 1.156 (Task EE 404-4)

ENVIRONMENTAL QUALIFICATION OF CONNECTION ASSEMBLIES FOR NUCLEAR POWER PLANTS

A. INTRODUCTION

Criterion III, "Design Control," of Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," to 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities," requires, among other things, that, where a test program is used to verify the adequacy of specific design features, it include suitable qualification testing of a prototype unit under the most adverse design conditions.

Section 50.49, "Environmental Qualification of Electric Equipment Important to Safety for Nuclear Power Plants," of 10 CFR Part 50 requires that certain electric equipment important to safety be qualified for its application and specified performance. Section 50.49 also states requirements for establishing environmental qualification methods and qualification parameters.

This regulatory guide describes a method acceptable to the NRC staff for complying with the Commission's regulations with regard to the environmental qualification of quick-disconnect connection assemblies and environmental seals in combination with cables or wires as assemblies for service in nuclear power plants. The environmental qualification is to ensure that connection assemblies can perform their safety functions during and after a design basis event.

The Advisory Committee on Reactor Safeguards has been consulted concerning this guide and has concurred in the regulatory position.

Any information collection activities mentioned in this regulatory guide are contained as requirements in 10 CFR Part 50, which provides the regulatory basis for this guide. The information collection requirements in 10 CFR Part 50 have been cleared under OMB Clearance No. 3150-0011.

B. DISCUSSION

IEEE Std 572-1985, "Qualification of Class 1E Connection Assemblies for Nuclear Power Generating Stations,"* published in September 1985, was prepared by Subcommittee 2, "Qualification," of the Nuclear Power Engineering Committee of the Institute of Electrical and Electronics Engineers (IEEE) and was approved by the IEEE Standards Board on December 13, 1984 (and amended on September 25, 1987). This standard describes basic procedures for qualifying connection assemblies (for example, quick-disconnect connection assemblies and environmental seals in combination with cables as assemblies).

Guidance on seismic qualification for this equipment is suggested in Regulatory Guide 1.100, "Seismic Qualification of Electric and Mechanical Equipment for Nuclear Power Plants" (Proposed Revision 2, Task EE 108-5).

Section 50.49 of 10 CFR Part 50 defines three categories of electric equipment that are required to be environmentally qualified: (1) safety-related equipment, (2) nonsafety-related equipment whose failure could adversely affect safety-related equipment, and (3) certain post-accident monitoring equipment. This regulatory guide provides an acceptable method of qualifying quick-disconnect connection assemblies and environmental seals in combination with cables or wires as assemblies for all three categories of equipment.

IEEE Std 572-1985 contains references to other national standards. Those standards that are referenced but not endorsed by NRC are expected to be used in a manner consistent with regulatory practice.

*Copies may be purchased from the Institute of Electrical and Electronics Engineers Service Center, 445 Hoes Lane, P.O. Box 1331, Piscataway, NJ 08855.

USNRC REGULATORY GUIDES

Regulatory Guides are issued to describe and make available to the public methods acceptable to the NRC staff of implementing specific parts of the Commission's regulations, to delineate techniques used by the staff in evaluating specific problems or postulated accidents, or to provide guidance to applicants. Regulatory Guides are not substitutes for regulations, and compliance with them is not required. Methods and solutions different from those set out in the guides will be acceptable if they provide a basis for the findings requisite to the issuance or continuance of a permit or license by the Commission.

This guide was issued after consideration of comments received from the public. Comments and suggestions for improvements in these guides are encouraged at all times, and guides will be revised, as appropriate, to accommodate comments and to reflect new information or experience.

Written comments may be submitted to the Rules and Procedures Branch, DRR, ADM, U.S. Nuclear Regulatory Commission, Washington, DC 20555.

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C. REGULATORY POSITION

When used in conjunction with Regulatory Guide 1.89, "Environmental Qualification of Certain Electric Equipment Important to Safety for Nuclear Power Plants," the procedures described by IEEE Std 572-1985 are acceptable to the NRC staff for satisfying the Commission's regulations pertaining to the environmental qualification of quick-disconnect connection assemblies and environmental seals in combination with cables or wires as assemblies for service in nuclear power plants to ensure that the connection assemblies can perform their safety functions.

D. IMPLEMENTATION

The purpose of this section is to provide information to applicants and licensees regarding the NRC staff's plans for using this regulatory guide.

Except in those cases in which the applicant or licensee proposes an acceptable alternative method for complying with specified portions of the Commission's regulations, the methods described herein will be used in the evaluation of the qualification of connection assemblies, within the scope of this guide, for nuclear power plants as follows:

1. Plants for which the construction permit is issued after November 30, 1987,
2. Plants for which the operating license application is docketed 6 months or more after November 30, 1987,
3. Plants for which the applicant or licensee voluntarily commits to the provisions of this guide.

VALUE/IMPACT STATEMENT

BACKGROUND

Heretofore, no guidance specific to the qualification of connection assemblies has been published by NRC.* In September 1985, IEEE issued IEEE Std 572-1985, "Qualification of Class 1E Connection Assemblies for Nuclear Power Generating Stations," which provides specific guidance for the qualification of connection assemblies for use in nuclear power plants. This regulatory guide endorses IEEE Std 572-1985 without exceptions.

This regulatory guide was issued for public comment in May 1987 as Task EE 404-4. No comments were received from the public, therefore, the guide is being issued with no changes as Regulatory Guide 1.156.

*Regulatory Guide 1.131, "Qualification Tests of Electric Cables, Field Splices, and Connections for Light-Water-Cooled Nuclear Power Plants," was issued for public comment in August 1977 but not published following public comment.

VALUE/IMPACT ASSESSMENT

Value

The standard endorsed by this regulatory guide represents a national consensus on qualification methods to ensure the reliability and function of connection assemblies used in nuclear power plants. It provides a standardized approach so that industry and the NRC staff may have common understanding on connection assembly qualification and testing procedures, thus minimizing related engineering costs by the applicant and review costs for the staff.

Impact

This regulatory guide does not impose any new costs or obligations on licensees or applicants. Thus, no adverse impact will result from the issuance of this guide. The guidance was developed through the national consensus standards process and reflects current NRC and industry practice.

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