



REGULATORY GUIDE

DIRECTORATE OF REGULATORY STANDARDS

Revised June 1984

REGULATORY GUIDE 1.89

QUALIFICATION OF CLASS IE EQUIPMENT 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, "Licensing of Production and Utilization Facilities," requires that design control measures provide for verifying the adequacy of a specific design feature by design reviews, by calculational methods, or by suitable qualification testing of a prototype unit under the most adverse conditions. This regulatory guide describes a method acceptable to the Regulatory staff for complying with the Commission's regulations with regard to design verification of Class IE equipment for service in light-water-cooled and gas-cooled nuclear power plants.

B. DISCUSSION

IEEE Std 323-1974, "IEEE Standard for Qualifying Class IE Equipment for Nuclear Power Generating Stations,"¹ dated February 28, 1974, was prepared by Subcommittee 2, Equipment Qualification, of the Nuclear Power Engineering Committee of the Institute of Electrical and Electronics Engineers, Inc., (IEEE) and subsequently was approved by the IEEE Standards Board on December 13, 1973. The standard describes basic procedures for qualifying Class IE equipment and interfaces that are to be used in nuclear power plants and components or equipment of any interface whose failure could adversely affect any class IE equipment.

The requirements delineated include principles, procedures, and methods of qualification which, when satisfied, will confirm the adequacy of the equipment design for the performance of Class IE functions under normal, abnormal, design-basis-event, post-design-basis-event, and containment-test conditions.

C. REGULATORY POSITION

The procedures described in IEEE Std 323-1974, "IEEE Standard for Qualifying Class IE Equipment for Nuclear Power Generating Stations,"¹ dated February 28, 1974, for qualifying Class IE equipment for service in light-water-cooled and gas-cooled nuclear power plants are generally acceptable and provide an adequate basis for complying with design verification requirements of Criterion III of Appendix B to 10 CFR Part 50 to verify adequacy of design under the most adverse design conditions subject to the following:

1. Reference is made in IEEE Std 323-1974, Sections 2, 6.3.2(5), and 6.3.5, to IEEE Std 344-1971, "Guide for Seismic Qualification of Class I Electric Equipment for Nuclear Power Generating Stations." The specific applicability or acceptability of IEEE Std 344 will be covered separately in other regulatory guides, where appropriate.
2. The radiological source term for qualification tests in a nuclear radiation environment should be based on the same source term as that used in Regulatory Guide 1.7 (Safety Guide 7, 3/10/71) for BWRs and PWRs. An equivalent source term (i.e., 100% of the noble gases, 50% of the halogens, and 1% of the remaining solids developed from maximum full-power operation of the core) should be used for HTGRs. The containment size should be taken into account in each case. For exposed organic materials, calculations should take into account both beta and gamma radiation.

¹ Copies may be obtained from the Institute of Electrical and Electronics Engineers, Inc., United Engineering Center, 345 East 47th Street, New York, New York 10017.

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Regulatory Guides are issued to describe and make available to the public methods acceptable to the AEC Regulatory 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 a guide will be acceptable if they provide a basis for the findings requisite to an issuance or continuance of a permit or license by the Commission.

Published guides will be revised periodically, as appropriate, to accommodate comments and to reflect new information or experience.

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: Docketing and Service Section.

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D. IMPLEMENTATION

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

This guide reflects current regulatory practice. Therefore, except in those cases in which the applicant proposes an acceptable alternative method for complying with specified portions of the Commission's regulations, this guide will be used by the Regulatory staff in evaluating all construction permit applications

for which the issue date of the Safety Evaluation Report (SER) is July 1, 1974, or after.

For those construction permit applications for which an SER was issued prior to July 1, 1974, the Regulatory staff may, subsequent to issuance of the construction permit (or operating license), reevaluate the Safety Analysis Report on a case-by-case basis to assure that acceptable methods for qualification of Class IE equipment have been specified in purchase orders executed for such equipment on or after November 15, 1974.