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QUALIFICATION OF CONTINUOUS DUTY SAFETY-RELATED MOTORS FOR NUCLEAR POWER PLANTS

A. INTRODUCTION

The U.S. Nuclear Regulatory Commission's (NRC's) regulations in Title 10, of the *Code of Federal Regulations*, Part 50, "Domestic Licensing of Production and Utilization Facilities" (10 CFR Part 50) (Ref. 1), require that structures, systems, and components in a nuclear power plant that are important to safety be designed to accommodate the effects of environmental conditions (i.e., they must remain functional under postulated design-basis events (DBEs)). General Design Criteria (GDC) 1, "Quality Standards and Records," 2, "Design Bases for Protection against Natural Phenomena," GDC 4, "Environmental and Dynamic Effects Design Bases," and GDC 23, "Protection System Failure Modes," of Appendix A, "General Design Criteria for Nuclear Power Plants," to 10 CFR Part 50, contain the general requirements for meeting those conditions. The specific requirements in 10 CFR 50.49, "Environmental Qualification of Electric Equipment Important to Safety for Nuclear Power Plants," for the qualification of certain electrical equipment important to safety in addition to, the general requirements of GDC 1, 2, 4, and 23. In addition, Criterion III, "Design Control," of Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," to 10 CFR Part 50, requires that test programs, when used to verify the adequacy of a specific design feature, should include the suitable qualification testing of prototype units under the most adverse design conditions.

This guide describes a method that the NRC staff considers acceptable for complying with the Commission's regulations for the qualification of continuous duty safety-related motors for nuclear power plants.

The NRC issues regulatory guides to describe and make available to the public methods that the NRC staff considers acceptable for use in implementing specific parts of the agency's regulations, techniques that the staff uses in evaluating specific problems or postulated accidents, and data that the staff needs in reviewing applications for permits and licenses. Regulatory guides are not substitutes for regulations, and compliance with them is not required. Methods and solutions that differ from those set forth in regulatory guides will be deemed acceptable if they provide a basis for the findings required for the issuance or continuance of a permit or license by the Commission.

This guide was issued after consideration of comments received from the public.

Regulatory guides are issued in 10 broad divisions: 1, Power Reactors; 2, Research and Test Reactors; 3, Fuels and Materials Facilities; 4, Environmental and Siting; 5, Materials and Plant Protection; 6, Products; 7, Transportation; 8, Occupational Health; 9, Antitrust and Financial Review; and 10, General.

Electronic copies of this guide and other recently issued guides are available through the NRC's public Web site under the Regulatory Guides document collection of the NRC's Electronic Reading Room at http://www.nrc.gov/reading-rm/doc-collections/ and through the NRC's Agencywide Documents Access and Management System (ADAMS) at http://www.nrc.gov/reading-rm/adams.html, under Accession No. ML093080087.

The NRC issues regulatory guides to describe methods that the staff considers acceptable for use in implementing specific parts of the agency's regulations, to explain techniques that the staff uses in evaluating specific problems or postulated accidents, and to provide guidance to applicants. Regulatory guides are not substitutes for regulations and compliance with them is not required.

This regulatory guide contains information collection requirements covered by 10 CFR Part 50 that the Office of Management and Budget (OMB) approved under OMB control number 3150-0011. The NRC may neither conduct nor sponsor, and a person is not required to respond to, an information collection request or requirement unless the requesting document displays a currently valid OMB control number.

B. DISCUSSION

The Working Group on Qualification of Motors (Subcommittee (SC 2.2) of the Nuclear Power Engineering Committee of the Institute of Electrical and Electronics Engineers, Inc. (IEEE) developed Standard 334-2006, "IEEE Standard for Qualifying Continuous Duty Class 1E Motors for Nuclear Power Generating Stations." The IEEE Standards Board approved this standard on September 15, 2006, and it was published on January 31, 2007 (Ref. 2). This standard establishes criteria for qualification of continuous duty Class 1E motors, located in mild and harsh environments in nuclear power plants, to demonstrate their ability to perform their intended safety functions. The standard also provides guidance for qualification of refurbished motors and insulation systems for motor rewinds.

The purpose of qualification is to provide reasonable assurance that safety-related motors perform their specified safety functions and that no failure mechanisms exist that can lead to a common-cause failure under the postulated service conditions. The standard provides the methods for qualifying safety-related motors.

Applicants and licensees should accomplish qualification by using these methods; type testing, operating experience, analysis as a supplement to type testing and operating experience, ongoing qualification, or any combination thereof. However, the preferred method of qualification is type testing.

C. REGULATORY POSITION

The NRC staff considers conformance with IEEE Standard 334-2006 an acceptable method for use in satisfying the Commission's regulations with respect to qualification of continuous duty safety-related motors.

IEEE Standard 334-2006 references several industry codes and standards. If the NRC's regulations separately incorporate a referenced standard, licensees and applicants must comply with the standard as set forth in the regulations. By contrast, if the NRC staff has endorsed a referenced standard in a regulatory guide, that standard constitutes an acceptable method of meeting a regulatory requirement as described in the regulatory guide.

D. IMPLEMENTATION

The purpose of this section is to provide information to applicants and licensees regarding the NRC's plans for using this regulatory guide. The NRC does not intend or approve any imposition or backfit in connection with its issuance.

In some cases, applicants or licensees may propose or use a previously established acceptable alternative method for complying with specified portions of the NRC's regulations. Otherwise, the methods described in this guide will be used in evaluating compliance with the applicable regulations for license applications, license amendment applications, and amendment requests. It will also be used to evaluate submittals for operating reactor licensees who voluntarily propose to initiate system modifications.

REFERENCES[1]

1. 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities," U.S. Nuclear Regulatory Commission, Washington, DC.

2. IEEE Std. 334-2006, "IEEE Standard for Qualifying Continuous Duty Class 1E Motors for Nuclear Power Generating Stations," Institute of Electrical and Electronics Engineers, Inc., Piscataway, NJ, January 31, 2007. [2]

1 Publicly available NRC published documents such as Regulations, Regulatory Guides, NUREGs, and Generic Letters listed herein are available electronically through the Electronic Reading room on the NRC's public Web site at: http://www.nrc.gov/reading-rm/doc-collections/. Copies are also available for inspection or copying for a fee from the NRC's Public Document Room (PDR) at 11555 Rockville Pike, Rockville, MD; the mailing address is USNRC PDR, Washington, DC 20555; telephone 301-415-4737 or (800) 397-4209; fax (301) 415-3548; and e-mail PDR.Resource@nrc.gov.

2 Copies of the non-NRC documents included in these references may be obtained directly from the publishing organization.