U.S. ATOMIC ENERGY COMMISSION

3/16/73

REGULATORY GUIDE

DIRECTORATE OF REGULATORY STANDARDS

REGULATORY GUIDE 1.40

QUALIFICATION TESTS OF CONTINUOUS-DUTY MOTORS INSTALLED INSIDE THE CONTAINMENT OF WATER-COOLED NUCLEAR POWER PLANTS

A. INTRODUCTION

Criterion III, "Design Control," of Appendix B to 10 CFR Part 50, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," requires that, where a test program is used to verify the adequacy of a specific design feature, it include suitable qualification testing of a prototype unit under the most adverse design conditions. This guide describes an acceptable method of complying with the Commission's regulations with regard to the qualification testing of prototype continuous-duty Class I motors installed inside the containment 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

IEEE Std 334-1971, "IEEE Trial-Use Guide for Type[1] Tests of Continuous-Duty Class I Motors Installed Inside the Containment of Nuclear Power Generating Stations," was prepared by Subcommittee 2 of the Joint Committee on Nuclear Power Standards of the Institute of Electrical and Electronics Engineers, Inc. (IEEE), and was subsequently approved by the IEEE Standards Committee on September 16, 1971. The standard delineates specific procedures for the qualification testing of Class I motors to demonstrate adequacy of design for service within the containments of nuclear power plants. These procedures provide for testing under conditions simulating those imposed during normal operation in addition to those resulting from a design basis loss-of-coolant accident.

The standard specifies procedures for accomplishing accelerated aging of components to simulate the effects of long-term operation, including radiation effects, and for subjecting a prototype aged motor to combined (steam) pressure, temperature, and chemical environments approximating those of the design basis loss-of-coolant accident.

C. REGULATORY POSITION

The procedures for conducting qualification tests of continuous-duty motors installed inside the containment of water-cooled nuclear power plants which are specified by IEEE Std 334-1971, "IEEE Trial-Use Guide for Type Tests of Continuous-Duty Class I Motors Installed Inside the Containment of Nuclear Power Generating Stations,"[2] are generally acceptable and provide an adequate basis for complying with the qualification testing requirements of Criterion III of Appendix B to 10 CFR Part 50, to verify adequacy of design for service under the most adverse design conditions, subject to the following:

1. To the extent practicable, auxiliary equipment that will be part of the installed motor assembly should also be qualified in accordance with IEEE Std 334-1971.
2. The qualification tests should simulate as closely as practicable all design basis events which affect operation of the motor's auxiliary equipment. For example, the delayed starting of a water-cooled motor in accordance with Section 4.3.3.3.3(6) of the standard should be accompanied by the delayed initiation of the motor's cooling system simulating the design basis temporary loss of a-c power.
3. Section 6, "References," of IEEE Std 334-1971 lists additional applicable IEEE Standards. The specific applicability or acceptability of these referenced standards will be covered separately in other regulatory guides, where appropriate.

[1] As used in this regulatory guide, the terms "qualification test" and "type test" are synonymous.

[2] Copies may be obtained from the Institute of Electrical and Electronics Engineers, United Engineering Center, 345 East 47th Street, New York, N.Y. 10017.