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PERFORMANCE-BASED CONTAINMENT LEAK-TEST PROGRAM

A. INTRODUCTION

The Nuclear Regulatory Commission has amended its regulations (60 FR 49495) to provide a performance-based option, Option B, for leakage-rate testing of containments of light-water-cooled nuclear power plants. Licensees may voluntarily comply with this Option B as an alternative to compliance with the current requirements in Appendix J, "Primary Reactor Containment Leakage Testing for Water-Cooled Power Reactors," to 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities." The amendment is aimed at improving the focus of the body of regulations by eliminating prescriptive requirements that are marginal to safety and by providing licensees greater flexibility for cost-effective implementation methods for regulatory safety objectives. This regulatory guide provides guidance on an acceptable performance-based leak-test program, leakage-rate test methods, procedures, and analyses that may be used to comply with the performance-based Option B in Appendix J to 10 CFR Part 50.

The information collections contained in this regulatory guide are covered by the requirements in Appendix J to 10 CFR Part 50, which have been approved by the Office of Management and Budget Approval number 3150-0011.

B. DISCUSSION

The Commission has stated that future regulatory initiatives should use a performance-oriented and risk-based regulatory approach in which safety standards are established based upon risk, regulatory requirements are expressed in terms of meeting a performance standard, and regulated entities are provided flexibility to adopt cost-effective methods for complying with the performance-based safety standard. See Staff Requirements Memorandum dated May 18, 1994, on SECY-94-090, "Institutionalization of Continuing Program for Regulatory Improvement."[1] In accordance with the policy that regulated entities should be allowed flexibility to adopt cost-effective methods for complying with regulatory requirements, detailed technical methods for compliance with the performance standard would not be incorporated into the regulatory requirement. Instead, the detailed methods would be described either in NRC regulatory guides or in industry standards and guidance documents that are reviewed and approved by the NRC

[1]Copies are available for inspection or copying for a fee from the NRC Public Document Room at 2120 L Street NW., Washington, DC; the PDR's mailing address is Mail Stop LL-6, Washington, DC 20555; telephone (202)634-3273; fax (202)634-3343.

staff as an acceptable means for demonstrating compliance with the regulatory requirement.

Consistent with this approach, the revision to Appendix J of 10 CFR Part 50 is less prescriptive, utilizes risk-based insights, and allows the licensee the flexibility to adopt cost-effective methods, including setting test intervals, for implementing the safety objectives underlying the requirements of Appendix J. This regulatory guide approves an industry guideline that describes in detail a performance-based leak-test program, leakage-rate test methods, procedures, and analyses; the NRC staff has determined this industry guideline to be an acceptable means of demonstrating compliance with the requirements of the amendment of Appendix J to 10 CFR Part 50.

C. REGULATORY POSITION

NEI 94–01, Revision 0, dated July 26, 1995, "Industry Guideline for Implementing Performance-Based Option of 10 CFR 50 Appendix J,"[1] prepared by the Nuclear Energy Institute, provides methods acceptable to the NRC staff for complying with the provisions of Option B in Appendix J to 10 CFR Part 50, subject to the following:

1. NEI 94–01 references ANSI/ANS–56.8–1994, "Containment System Leakage Testing Requirements,"[2] for detailed descriptions of the technical methods and techniques for performing Types A, B, and C tests under the amendment of Appendix J to 10 CFR Part 50. However, as stated in NEI 94–01, the test intervals in ANSI/ANS 56.8–1994 are not performance-based. Therefore, licensees intending to comply with Option B in the amendment to Appendix J should establish test intervals based upon the criteria in Section 11.0 of NEI 94–01, rather than using the test intervals specified in ANSI/ANS–56.8–1994. All other technical methods and techniques for performing Types A, B, and C tests contained in ANSI/ANS–56.8–1994 are acceptable to the NRC staff.
2. Section 11.3.2, "Programmatic Controls," of NEI 94–01 provides guidance for licensee selection of an extended interval greater than 60 months or 3 refueling cycles for a Type B or Type C tested component. Because of uncertainties (particularly unquantified leakage rates for test failures, repetitive/common mode failures, and aging effects) in historical Type C component performance data, and because of the indeterminate time period of three refueling cycles and insufficient precision of programmatic controls described in Section 11.3.2 to address these uncertainties, the guidance provided in Section 11.3.2 for selecting extended test intervals greater than 60 months for Type C tested components is not presently endorsed by the NRC staff. Further, the interval for Type C tests for main steam and feedwater isolation valves in BWRs, and containment purge and vent valves in PWRs and BWRs, should be limited to 30 months as specified in Section 3.3.4 of ANSI/ANS–56.8–1994, with consideration given to operating experience and safety significance.
3. Section 9.2.1, "Pretest Inspection and Test Methodology," of NEI 94–01 provides guidance for the visual examination of accessible interior and exterior surfaces of the containment system for structural problems. These examinations should be conducted prior to initiating a Type A test, and during two other refueling outages before the next Type A test if the interval for the Type A test has been extended to 10 years, in order to allow for early uncovering of evidence of structural deterioration.
4. Section 10.2.3.3 states that an as-found Type C test or an alternative test or analysis is to be performed prior to any maintenance, repair, modification, or adjustment activity if it could affect a valve's leak-tightness. "Alternative test or analysis" is not endorsed as an appropriate substitute for an as-found test, because the as-found test provides clear and objective evidence of performance of isolation components.

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 an applicant or licensee proposes an acceptable alternative method for complying with specified portions of the Commission's regulations, the methods described in this guide reflecting public comments will be used in the evaluation of submittals for construction permits and operating licenses (as appropriate) and will be used to evaluate the implementation of Option B of Appendix J to 10 CFR Part 50.

[2] Copies may be obtained from the American Nuclear Society, 555 North Kensington Avenue, La Grange Park, Illinois 60525.

REGULATORY ANALYSIS

A regulatory impact analysis has been prepared for the revision to Appendix J of 10 CFR Part 50 and this regulatory guide. The analysis is available for inspection or copying for a fee in the Commission's Public Document Room, 2120 L Street NW., Washington, DC; the PDR's mailing address is Mail Stop LL–6, Washington, DC 20555; phone (202)634–3273; fax (202)634–3343.

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