



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 95 TO FACILITY OPERATING LICENSE NO. DPR-22
NORTHERN STATES POWER COMPANY
MONTICELLO NUCLEAR GENERATING PLANT
DOCKET NO. 50-263

1.0 INTRODUCTION

By letter dated August 15, 1995, as supplemented November 14, and December 20, 1995, the Northern States Power Company (the licensee) requested an amendment to the Technical Specifications (TS) appended to Facility Operating License No. DPR-22 for the Monticello Nuclear Generating Plant. The proposed amendment would modify the TS to: (1) revise the main steam isolation valve (MSIV) leak rate test acceptance criterion to be based upon the combined maximum flow path leakage for all four main steam lines of 46 standard cubic feet per hour (scfh) in lieu of the current limit of 11.5 scfh per valve; (2) revise the operability test interval for the drywell spray header and nozzles from 5 years to 10 years; and (3) revise TS 3/4.7.a.2, Primary Containment Integrity, to remove information specific to the primary containment leakage rate testing program and adopt the requirements of 10 CFR Part 50, Appendix J, Option B, for Type A integrated leakage rate testing, while remaining under Appendix J, Option A, for Type B and C (local leakage rate) testing.

2.0 BACKGROUND

Compliance with Appendix J provides assurance that the primary containment, including those systems and components that penetrate the primary containment, do not exceed the allowable leakage rate values specified in the TS and bases. The allowable leakage rate is determined so that the leakage assumed in the safety analyses is not exceeded.

On February 4, 1992, the NRC published a notice in the Federal Register (57 FR 4166) discussing a planned initiative to begin eliminating requirements marginal to safety that impose a significant regulatory burden. 10 CFR Part 50, Appendix J, "Primary Containment Leakage Testing for Water-Cooled Power Reactors," was considered for this initiative and the staff undertook a study of possible changes to this regulation. The study examined the previous performance history of domestic containments and examined the effect on risk of a revision to the requirements of Appendix J. The results of this study are reported in NUREG-1493, "Performance-Based Containment Leak-Test Program."

Based on the results of this study, the staff developed a performance-based approach to containment leakage rate testing. On September 12, 1995, the NRC approved issuance of this revision to 10 CFR Part 50, Appendix J, which was published in the Federal Register on September 26, 1995 (60 FR 49495), and became effective on October 26, 1995. The revision added Option B, "Performance-Based Requirements," to Appendix J to allow licensees to voluntarily replace the prescriptive testing requirements of Appendix J with testing requirements based on both overall and individual component leakage rate performance.

Regulatory Guide (RG) 1.163, "Performance-Based Containment Leak Test Program," September 1995, was developed as a method acceptable to the NRC staff for implementing Option B. This regulatory guide states that Nuclear Energy Institute (NEI) 94-01, "Industry Guideline for Implementing Performance-Based Option of 10 CFR Part 50, Appendix J," provides methods acceptable to the NRC staff for complying with Option B with four exceptions.

Option B requires that the RG or other implementation document used by a licensee to develop a performance-based leakage testing program must be included, by general reference, in the plant TS.

RG 1.163 specifies an extension in Type A test frequency to at least one test in 10 years based upon two consecutive successful tests. Type B tests may be extended up to a maximum of 10 years based upon completion of two consecutive successful tests and Type C tests may be extended up to 5 years based on two consecutive successful tests.

By letter dated October 20, 1995, NEI proposed TS for implementing Option B. After some discussion, the staff and NEI agreed on final TS that were transmitted to NEI in a letter dated November 2, 1995. These TS are to serve as a model for licensees to develop plant-specific TS in preparing amendments requested to implement Option B.

In order for a licensee to determine the performance of each component, an administrative leakage limit is established. The administrative limit is selected to be indicative of the potential onset of component degradation. Although these limits are subject to NRC inspection to assure that they are selected in a reasonable manner, they are not TS requirements. Failure to meet an administrative limit requires the licensee to return to the minimum value of the test interval.

Option B requires that the licensee maintain records to show that the criteria for Type A, B, and C tests have been met. In addition, the licensee must maintain comparisons of the performance of the overall containment system and the individual components to show that the test intervals are adequate. These records are subject to NRC inspection.

3.0 EVALUATION

3.1 Adoption of 10 CFR Part 50, Appendix J, Option B for Type A Testing

In a letter dated August 15, 1995, the licensee proposed changes to TS 3.7/4.7.A, Primary Containment, to remove prescriptive information concerning the primary containment leakage rate testing program and replace it with statements to abide by the requirements of 10 CFR Part 50, Appendix J. In a supplemental letter dated November 14, 1995, the licensee revised its original submittal to incorporate changes to the TS to adopt the newly approved 10 CFR Part 50, Appendix J, Option B, Section III.A for Type A testing (primary containment integrated leakage rate testing). The licensee's December 20, 1995, letter provided a new TS page 159 that incorporates wording to adopt 10 CFR Part 50, Appendix J, Option B, as modified by approved exemptions, for Type A testing and was within the scope of the January 22, 1996, Federal Register notice.

Option B permits a licensee to choose Type A; or Type B and C; or Type A, B, and C testing to be done on a performance basis. The licensee has elected to perform only Type A testing on a performance basis. Type B and C tests will be performed in accordance with 10 CFR Part 50, Appendix J, Option A.

The licensee has proposed changes to surveillance requirement TS 4.7.A.2.b. to delete information specific to Type A testing and replace it with the following:

"Perform required visual examinations and leakage rate testing for Type A containment integrated leakage rate tests in accordance with 10 CFR 50, Appendix J, Option B, as modified by approved exemptions, and Regulatory Guide 1.163 dated September 1995. Perform Type B and C tests in accordance with 10 CFR 50, Appendix J, Option A, as modified by approved exemptions."

The staff has reviewed these proposed changes and finds that, despite the different format of the licensee's current TS, all the important elements of the guidance regarding Type A testing provided in the NRC letter to NEI dated November 2, 1995, are included in the TS proposed by the licensee and that the proposed changes meet the requirements of 10 CFR Part 50, Appendix J, Option B and are consistent with the guidance of RG 1.163 dated September 1995. The staff therefore concludes that the licensee's request to implement 10 CFR Part 50, Appendix J, Option B, for Type A testing using the proposed TS is acceptable.

In addition, the licensee has proposed to delete TS 4.7.A.2.b.5., which contains specific surveillance requirements for Type B and C tests, and instead rely on the proposed TS 4.7.A.2.b., stated above (particularly the final sentence). Similarly, in TS 4.7.A.2.c., the licensee would also replace specific surveillance requirements for the containment airlock with a requirement to perform leakage rate testing in accordance with Appendix J, as modified by approved exemptions. Containment airlock testing is a Type B

test. Because the licensee is performing Type B and C tests in accordance with Option A, the containment airlock will be tested in accordance with Option A.

The existing TS 4.7.A.2.b.5. and 4.7.A.2.c. contain details which are also found in Appendix J, Option A, as modified by approved exemptions. The regulation requires licensee compliance, cannot be revised by the licensee, and is addressed by direct reference in the proposed TS. The TS need not duplicate the regulations. Direct reference to Appendix J eliminates the need for repetitious and unnecessary details in the TS. This is also consistent with the guidance in the Improved Standard Technical Specifications, NUREG-1433. Therefore, the staff finds the proposed deletion of TS 4.7.A.2.b.5. and revision of TS 4.7.A.2.c. to be acceptable.

Option B states that specific existing exemptions to Option A are still applicable unless specifically revoked by the NRC. Monticello currently has approved exemptions to 10 CFR Part 50, Appendix J, that were issued by the NRC on June 3, 1984. These exemptions do not involve Type A testing and therefore are not affected by this amendment.

3.2 MSIV Leak Rate Test Acceptance Criteria

The Monticello primary containment system consists of a drywell, which encloses the reactor vessel and recirculation pumps, a pressure suppression chamber which stores a large amount of water, a connecting vent system between the drywell and the suppression chamber, and isolation valves. The four main steam lines that penetrate the primary containment each have two 18-inch diameter isolation valves installed in series for a total of eight MSIVs. Type C leak rate testing of the MSIVs is performed in accordance with the requirements of 10 CFR Part 50, Appendix J (as modified by an approved exemption), to verify that leakage through these paths is within acceptable limits. Appendix J requires that the combined leakage of all penetrations and valves subject to Type B and C tests shall be less than $0.6 L_a$ (maximum allowable containment leak rate). For Monticello, L_a is 1.2% (by weight) of the containment air per day at the calculated peak containment internal pressure related to the design-basis loss-of-coolant accident, P_a , which is 42 psig. However, TS 3.7.2.b.2 excludes the contribution of MSIV leakage from the $0.6 L_a$ combined limit. Instead the TS limit each MSIV to a maximum leak rate of 11.5 scfh at 25 psig.

The licensee is proposing to change TS 3.7.2.b. to allow a combined maximum flow path leakage for all MSIVs of less than or equal to 46 scfh when tested at 25 psig, and a combined maximum flow path leakage rate of less than or equal to $0.6 L_a$ for all penetrations and valves subject to Type B and C tests when pressurized to P_a , 42 psig. This proposed change would allow one main steam line to have a leakage rate of up to 46 scfh if the other three lines have no leakage. The licensee has indicated in its August 15, 1995, submittal that frequent and repeated seat lapping performed to achieve unnecessarily low leak rates results in premature depletion of the available seat material, requiring major valve repair or replacement efforts. Since 1970, Monticello has reworked 39 MSIVs at an average rebuild cost of \$40,000 per valve. If the

proposed 46 scfh combined maximum flow path leakage criterion had been applied, nine of these repairs could have been avoided. In addition, repair of MSIVs involves increased radiation doses to workers. The licensee estimates that rework of a single valve represents approximately 1 person-Rem of exposure.

The Boiling Water Reactors Owners Group (BWROG) has evaluated the feasibility of increasing the TS limit for the MSIV leakage in NEDC-31858P Revision 2, September 1993 (BWROG Report for Increasing MSIV Leakage Rate Limits and Elimination of Leakage Control Systems, proprietary information - not publicly available). NEDC-31858P Revision 2 concludes, among other things, that MSIV leakage could be increased to 200 scfh per main steam line without inhibiting the safety function of the valve. The report also states that a leak rate of 200 scfh does not represent abnormal or excessive leakage for a valve of this size and type. The report further states that the BWROG found that disassembly and refurbishment of MSIVs to meet low leakage limits frequently contributes to repeated failures from maintenance-induced defects such as seat cracks, excessive pilot valve seat machining, and mechanical defects induced by assembly and disassembly.

The staff has reviewed the licensee's proposed TS change as well as the BWROG report and finds the changes to TS 3.7.2.b. to be acceptable. The combined maximum flow path leakage of 46 scfh is the same, technically, as allowing each main steam line a leakage rate of 11.5 scfh. Allowing an individual main steam line up to 46 scfh of leakage creates no new safety concern.

3.3 Drywell Spray Header and Nozzle Air Test Frequency

TS 4.5.C currently requires an operability test of the drywell spray header and nozzles with an air test during each 5-year period. The licensee is proposing to change the operability test interval from 5 to 10 years. The purpose of the operability test is to demonstrate that the spray header and nozzles are unobstructed. Operability testing experience at Monticello has been successful with no observed nozzle blockage during either periodic testing or specific inspections. Furthermore, Bases section SR 3.6.1.7.4 of NUREG-1434, "Standard Technical Specifications, General Electric (GE) BWR/6 Plants (Rev. 1, dated April 7, 1995)," states:

"This surveillance is performed every 10 years to verify that the spray nozzles are not obstructed and that flow will be provided when required. The 10 year frequency is adequate to detect degradation in performance due to the passive nozzle design and its normally dry state and has been shown to be acceptable through operating experience."

Based on the licensee's operating experience and industry experience with the drywell spray header and nozzles, the staff finds the licensee's proposed change to increase the operability test interval from 5 to 10 years to be acceptable.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Minnesota State official was notified of the proposed issuance of the amendment. The State official had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

The amendment changes a requirement with respect to the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and changes surveillance requirements. The staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendment involves no significant hazards consideration and there has been no public comment on such finding (61 FR 1632). Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

6.0 CONCLUSION

The staff has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: J. Kennedy
J. Pulsipher

Date: April 3, 1996