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April 20, 1994

Docket No. 50-245
B14577

Re: 10CFR50, Appendix J

U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555

Millstone Nuclear Power Station, Unit No. 1
Integrated Safety Assessment Program
Topic No. 1.14 - Appendix J Modifications

This letter provides Northeast Nuclear Energy Company's (NNECO's) resolution of the remaining issues pertaining to 10CFR50, Appendix J testing requirements for containment isolation valves.

Summary

NNECO has finalized its position regarding Appendix J testing of twelve containment penetrations. This letter provides status of all twelve penetrations and includes exemption requests for valves associated with four of the penetrations. The exemption requests are provided in Attachment 1.

Two penetrations have been modified and are no longer within the scope of 10CFR50, Appendix J. A third penetration will be modified during the Cycle 15 refueling outage. Descriptions of the modifications are provided in Attachment 2.

Five of the penetrations have been determined to be outside the scope of 10CFR50, Appendix J. Detailed information is provided in Attachment 3.

Two penetrations remain under evaluation by NNECO and will be addressed in a separate submittal.

Background/Discussion

On November 14, 1975, NNECO submitted a letter(1) which described the extent of conformance with 10CFR50, Appendix J

(1) D. C. Switzer letter to K. R. Goller, dated November 14, 1975.

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which could be achieved based upon the Millstone Unit No. 1 design. Since that time, NNECO and the Staff have been working toward establishing a program at Millstone Unit No. 1 which conforms to the extent practical with the requirements of 10CFR50, Appendix J. For those areas where strict adherence to the rule is not possible, NNECO has strived to demonstrate that the level of safety assured by Appendix J is met by the design of Millstone Unit No. 1. To that end, NNECO has implemented design changes, performed risk analyses, and when necessary, prepared exemption requests.

The last exemption request was submitted on April 29, 1988.[2] That letter, as supplemented by letters dated May 19, 1989,[3] and November 8, 1990,[4] requested exemptions from Appendix J for fifteen penetrations. The Staff issued their safety evaluation on June 5, 1991.[5] Within the safety evaluation, five of the fifteen exemption requests were granted. Subsequently, the remaining penetrations and associated valves were addressed in the Integrated Safety Assessment Program (ISAP) Update Report dated October 23, 1992,[6] under Topic 1.14. In addition to the original ten, two other penetrations (X-211A and X-211B) were addressed in the ISAP Update Report dated June 18, 1993.[7] Finally, during a review of systems for resolution of inservice testing issues, it was determined that the inboard check valves

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(2) E. J. Mroczka letter to U.S. Nuclear Regulatory Commission, "Integrated Safety Assessment Program -- Topic Nos. 1.14, 'Appendix J Modifications,' and -- 2.33, 'RBCCW Leak Rate Testing,'" dated April 29, 1988.

(3) E. J. Mroczka letter to U.S. Nuclear Regulatory Commission, "Withdrawal of Exemption Request," dated May 19, 1989.

(4) E. J. Mroczka letter to U.S. Nuclear Regulatory Commission, "Request for Exemption from Appendix J Requirements -- Additional Information," dated November 8, 1990.

(5) M. L. Boyle letter to E. J. Mroczka, "Exemptions to Appendix J - Type C Leak Rate Testing -- (TAC No. 68292)," dated June 5, 1991.

(6) J. F. Opeka letter to U.S. Nuclear Regulatory Commission, "Integrated Safety Assessment Program -- Update Report," dated October 23, 1992.

(7) J. F. Opeka letter to U.S. Nuclear Regulatory Commission, "Integrated Safety Assessment Program -- Update Report," dated June 18, 1993.

for penetrations X-30f and X-34f should also be considered isolation valves. These penetrations are included in this letter.

Penetration X-15 is located on the reactor water cleanup return line. As discussed in ISAP Topic 1.14.2, a test connection will be added downstream of CU-29 during the Cycle 15 refueling outage to permit Appendix J, Type C testing of the valve. This penetration is discussed in Attachment 2.

ISAP Topics 1.14.3 and 1.14.4 addressed penetration X-20 and X-21, respectively. Modifications to these penetrations have been performed during the Cycle 14 refueling outage. These penetrations are discussed in Attachment 2.

The nitrogen supply line to the safety relief valve and main steam isolation valve accumulators enters containment through penetration X-22. Neither the inboard nor outboard valve is currently testable. However, NNECO has determined that the valves upstream of the current outboard isolation valve are testable, and will be designated as the isolation valves. This was proposed in ISAP Topic 1.14.5. An exemption request for the inboard valve is presented in Attachment 1.

Penetrations X-30f and X-34f are on the reactor recirculation pump seal purge lines. The valves inside containment cannot be Type C tested without a modification. The penetrations are not exposed to containment air during a Type A test and require an exemption from Type A testing. These exemptions are discussed in Attachment 1.

Penetration X-42 is located in the standby liquid control system injection line. The inboard isolation valve is not currently testable. As described in ISAP Topic 1.14.6, an exemption for this valve is justified. The exemption request is provided in Attachment 1.

Penetrations X-204A, X-204B, and X-204C were discussed in ISAP Topics 1.14.7 and 1.14.8. Penetrations X-210A and X-210B were discussed in ISAP Topic 1.14.9. These penetrations are all for emergency core cooling systems. The lines through penetration X-204A, X-204B, and X-204C draw water from the torus during a postulated accident. X-210A and X-210B are on return lines to the torus. NNECO has determined that the valves associated with these penetrations fall outside the scope of 10CFR50, Appendix J. This position is discussed in Attachment 3.

Penetrations X-211A and X-211B are on the low pressure coolant injection torus spray lines. These penetrations are discussed in

ISAP Topic 1.14.1. NNECO has not finalized a position on these penetrations. Therefore, these penetrations will be addressed in a separate submittal.

Conclusion

Five penetrations and the associated valves have been determined to be outside the scope of Appendix J. NNECO will remove these valves from further consideration in the Appendix J program.

Three penetrations are being modified to be in compliance with the requirements of 10CFR50, Appendix J. Modifications associated with two of the penetrations have been completed. The modification for penetration X-15 will be completed during the Cycle 15 refueling outage.

NNECO is seeking exemptions from Appendix J, Type C testing requirements for valves on four different penetrations and an exemption from the requirement of Appendix J, Type A testing for two of the penetrations.

This submittal is considered a Cost Beneficial Licensing Action by NNECO. Completing modifications to the valves associated with penetrations X-22, X-30f, X-34f, X-42, X-204A, X-204B, X-204C, X-210A, and X-210B would cost several million dollars without a commensurate safety benefit. The attachments provide the basis for this conclusion.

A submittal regarding penetrations X-211A and X-211B will be provided to the Staff in the near term.

If you have any questions, please contact Mr. Thomas B. Silko at (203) 665-5241.

FOR: J. F. Opeka
Executive Vice President

BY: S. E. Scace
S. E. Scace
Vice President

cc: T. T. Martin, Region I Administrator
J. W. Andersen, NRC Acting Project Manager, Millstone Unit No. 1
P. D. Swetland, Senior Resident Inspector, Millstone Unit Nos. 1, 2, and 3

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Attachment 1

Millstone Nuclear Power Station, Unit No. 1

Integrated Safety Assessment Program
Topic No. 1.14 - Appendix J Modifications

EXEMPTION REQUESTS

April 1994

TITLE: EXEMPTION FROM 10CFR50, APPENDIX J, SECTION III.C FOR PENETRATION X-22

NNECO requests an exemption from Appendix J, Section III.C for valve AC-162 in accordance with 10CFR50.12(a)(2)(ii).

DESCRIPTION

The nitrogen supply to the safety relief valve (SRV) and inboard main steam isolation valve (MSIV) accumulators enters containment through penetration X-22. This line has two containment isolation valves (CIVs) identified in Updated Final Safety Analysis Report (UFSAR) Table 6.2-4. Motor-operated gate valve AC-50 is outside containment and is normally open. Check valve AC-162 is inside containment. Neither valve is Appendix J, Type C tested, but penetration X-22 is exposed to expected postaccident differential pressure during Type A tests.

During normal operation one drywell compressor supplies nitrogen to the containment header based on system demand. If both compressors are unavailable, secondary nitrogen bottles will automatically maintain containment supply pressure. The secondary nitrogen supply system ties into the drywell compressor line upstream of AC-50. AC-50 does not receive an auto-close signal at any time, nor does any off-normal or emergency operating procedure direct operators to close the valve. Rather, NNECO prefers to leave this valve open at all times to ensure a ready supply of nitrogen is available to the SRVs and MSIVs.

AC-50 is no longer considered a CIV. Type C testing of check valves AC-48, AC-49 and AC-51 was conducted during the Cycle 14 refueling outage and demonstrated a containment barrier outside penetration X-22, in place of AC-50. All three valves are located upstream of AC-50 (within 15 feet) in the reactor building. Valves AC-48 and AC-49 are in series on the nitrogen drywell compressor supply line (there are no provisions to test AC-48 and AC-49 separately). Valve AC-51 is on the supply line from the secondary nitrogen bottles.

This change to the designated CIVs was presented in the Integrated Safety Assessment Program (ISAP) Update Report dated June 18, 1993[1] under ISAP Topic 1.14.5. and will be effective starting with the Cycle 14 refueling outage.

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(1) J. F. Opeka letter to U.S. Nuclear Regulatory Commission, "Integrated Safety Assessment Program -- Update Report," dated June 18, 1993.

The previous exemption request[2] was for both valves on this penetration and identified a potential gas seal from the drywell compressor system as the method to provide isolation for penetration X-22. The exemption was denied. With the redesignation of AC-48, AC-49, and AC-51 as the containment isolation boundary, an exemption is only required for AC-162.

JUSTIFICATION

AC-162 is located inside containment and cannot be Type C tested without a modification to the system. Exemption from the requirements of 10CFR50, Appendix J is justified pursuant to 10CFR50.12(a)(2)(ii) in that:

- Application of the regulation in the particular circumstances is not necessary to achieve the underlying purpose of the rule.

  Although not Type C tested, reasonable assurance exists that AC-162 will function. No impurities or moisture which could contribute to valve degradation are present in this line since the nitrogen is maintained clean and dry via filters, moisture separators, and dryers. Finally, per SECY-77-439, check valves are considered passive components and are not assumed to fail.

  The piping configuration inside containment constitutes a closed system which is seismic and QA Category I. Normally with this configuration, only one containment isolation valve is required and AC-162 would not be subject to Appendix J. However, this piping has not been analyzed for a consequential failure during a loss-of-coolant-accident (LOCA) and is conservatively assumed to fail. Based on this assumption, the containment header is vented during Type A tests.

  Millstone Unit No. 1 has been subjected to eight Type A tests. This penetration has not been the cause of a failure of any previous Type A test.

  Additionally, a probabilistic risk assessment (PRA) determined that eliminating leakage through penetration X-22

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(2) E. J. Mroczka letter to U.S. Nuclear Regulatory Commission, "Integrated Safety Assessment Program -- Topic Nos. 1.14, 'Appendix J Modifications,' and -- 2.33, 'RBCCW Leak Rate Testing,'" dated April 29, 1988.

would result in a negligible reduction in public exposure risk.

CONCLUSION

NNECO has concluded that "special circumstances" exist and an exemption from Appendix J, Section III.C for valve AC-162 is warranted under 10CFR50.12. The Type C testing of the outboard CIVs, as described above, in conjunction with the conservative position to directly expose penetration X-22 to accident pressure during Type A tests provides assurance of leak tight integrity of penetration X-22 and meets the underlying intent of 10CFR50, Appendix J.

This exemption will not present an undue risk to the public health and safety. Based on the justification provided above, Appendix J, Type C testing of AC-162 is not necessary to ensure that containment leakage will remain within the allowable leakage rate as defined in the Millstone Unit No. 1 Technical Specifications.

TITLE: EXEMPTION FROM 10CFR50, APPENDIX J, SECTION III.A AND III.C FOR PENETRATIONS X-30f and X-34f

NNECO requests an exemption from Appendix J, Section III.A for penetrations X-30f and 34f and Section III.C for valves RR-111A and 111B in accordance with 10CFR50.12(a)(2)(ii).

DESCRIPTION

The reactor recirculation (RR) pump seal purge lines enter containment through penetrations X-30f and X-34f. These penetrations each have only one CIV (RR-25A and 25B) identified in UFSAR Table 6.2-4. Check valves RR-25A and 25B are outside containment and check valves RR-111A and 111B are inside. RR-25A and 25B were successfully Type C tested during the current refueling outage. Penetrations X-30f and X-34f are exposed to postaccident differential pressure (but not containment air test pressure) by venting the reactor vessel during Type A tests.

The RR pump seal purge system was designed to keep the pump seals clean from debris (specifically during start up), to avoid mechanical damage, and to provide seal cooling. During normal operation, approximately 6 gpm of water is injected into the pump lower seal at approximately 1200 psig by the control rod drive (CRD) pumps. Most of this sealing flow is injected into the RR flow through a thermal barrier between the lower seal and the pump volute. The remainder of sealing flow passes through the upper seals and is collected in the containment drain sumps.

A concurrent loss-of-normal-power (LNP) is postulated with a LOCA. Due to the LNP, the CRD pumps would lose power. This would result in a depressurization of the RR pump seal purge lines, although the lines would remain water filled. However, restarting one CRD pump is an immediate action in the LNP procedure. This will repressurize the lines.

NNECO informed the NRC about this penetration and test method in correspondence dated November 6, 1980[3], November 19, 1986,[4]

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(3) W. G. Counsil Letter to D. M. Crutchfield, "10CFR50, Appendix J Modification Schedule," dated November 6, 1980.

(4) J. F. Opeka letter to C. I. Grimes, "Supplement to Integrated Safety Assessment Program -- Topic No. 1.14, 'Appendix J Modifications,'" dated November 19, 1986.

and July 29, 1988.[5] RR-111A and 111B were not considered CIVs until a system review was conducted of the inservice test (IST) program in 1992.

JUSTIFICATION

RR-111A and 111B are located inside containment and cannot be tested without a modification to the system. Exemption from the requirements of 10CFR50, Appendix J, Section III.C for these valves is justified pursuant to 10CFR50.12(a)(2)(ii) in that:

- Application of the regulation in the particular circumstances is not necessary to achieve the underlying purpose of the rule.

  Although the RR pump seal purge piping outside penetrations X-30f and X-34f is not seismic, the licensing basis does not require postulation of a seismic event coincident with a LOCA, thus the piping is assumed to remain intact. This system is considered an extremely low probability leak path due to the resistance from CRD water in the piping and the reduction in head of a containment air leak as it passes through the system.

  Additional resistance to a leak is provided by a water-filled tortuous path consisting of a thermal barrier with a clearance of 0.05 inches, a network of small diameter piping, and three check valves in series which eventually lead to the condensate storage tank (CST) or hotwell. In addition, restarting one CRD pump is an immediate action in the LNP procedure. This will repressurize the lines.

  Millstone Unit No. 1 has been subjected to eight Type A tests. These penetrations have not been the cause of a failure of any previous Type A test.

  Valves RR-111A and RR-111B are also subjected to a standing water reverse flow leak test each refueling outage by the IST program.

  Off-gassing of reactor coolant can be assumed to occur during a postulated accident. If the check valves fail to seal against containment pressure, the off-gas would collect in high points in the system. Any off-gas that could possibly reach the CST or hotwell will be so greatly diluted

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(5) E. J. Mroczka letter to U.S. Nuclear Regulatory Commission, "Containment Isolation Boundaries," dated July 29, 1988.

by the volume of water in the system that no noticeable increase in offsite dose would exist.

Penetrations X-30f and X-34f are not exposed to containment atmosphere during Type A tests. Exemption from the requirements of 10CFR50, Appendix J, Section III.A is justified pursuant to 10CFR50.12(a)(2)(iv) in that:

- The exemption would result in a benefit to the public health and safety that compensates for any decrease in safety that may result from the grant of the exemption.

  During each Type A test, the reactor vessel is vented to equalize containment and reactor vessel pressure. Penetrations X-30f and X-34f are exposed to accident pressure plus the head of water in the reactor vessel. Exposure to containment atmosphere during the Type A test would require draining the reactor recirculation piping and relying on the pump maintenance valves to maintain reactor level. Maintenance valves are not designed to be leak tight. Draining of the reactor recirculation piping to expose both penetrations to containment atmosphere and relying on the maintenance valves to maintain reactor water level during the Type A test would impose unusual difficulties without a compensating increase in the level of safety.

CONCLUSION

NNECO has concluded that "special circumstances" are present and that an exemption from Appendix J, Section III.A for penetrations X-30f and 34f and Section III.C for check valves RR-111A and 111B is warranted under 10CFR50.12. Based on the Appendix J, Type C testing of the isolation valves outside containment and the extremely low probability of containment leakage from this system, penetrations X-30f and X-34f demonstrate their leak tightness and, as such, meet the underlying intent of 10CFR50, Appendix J.

These exemptions will not present an undue risk to the public health and safety. Based on the above justification, Appendix J, Type C testing for RR-111A and 111B is not necessary to ensure that containment leakage remains within the allowable leakage rate as defined in the Millstone Unit No. 1 Technical Specifications.

NNECO has also concluded that the increased risk to public health and safety from draining the reactor recirculation lines and

relying on the pump maintenance valves to maintain reactor level is not compensated by any increase in the level of safety provided by venting these lines during the Type A test.

TITLE: EXEMPTION FROM 10CFR50, APPENDIX J, SECTION III.C FOR PENETRATION X-42

NNECO requests an exemption from Appendix J, Section III.C for valve SL-8 in accordance with 10CFR50.12(a)(2)(ii).

DESCRIPTION

The standby liquid control (SLC) system injection line to the reactor vessel enters containment through penetration X-42. This system has two parallel, positive displacement pumps in series with two explosively-actuated (squib) valves (SL-5A and 5B), and two check valves, SL-7 and SL-8. Valves SL-5A, 5B, and SL-7 are located outside containment while valve SL-8 is located inside containment. Valve SL-7 is Appendix J, Type C tested and is identified in UFSAR Table 6.2-4 as a CIV. Valve SL-8 is not currently Appendix J, Type C tested and is not identified as a CIV. Penetration X-42 is exposed to postaccident differential pressure during Type A tests. This penetration was evaluated in the ISAP Update Report dated October 23, 1992[6] under ISAP Topic 1.14.6.

The SLC system is a safeguard system that is not normally used to shutdown the reactor. It is actuated only upon the failure of the control rods to scram during an anticipated transient without scram (ATWS) event. An SLC injection requires manual initiation by inserting a key and turning a switch. During all design basis accidents analyzed in the Millstone Unit No. 1 UFSAR, all control rods except one are assumed to be fully inserted and no credit is taken for the SLC system to shutdown the reactor.

During normal operation, the two squib valves, (SL-5A and 5B) and check valves SL-7 provide redundant containment isolation capability. Squib valves SL-5A and 5B cannot be Type C tested. However, these valves require an explosive device to shear off the squib valve end cap inlet fitting, thus allowing flow to pass through the valve. This design provides a zero leakage seal.

A previous exemption request for SL-8 was denied, based on redundant isolation not being available after an SLC injection.

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(6) J. F. Opeka letter to U.S. Nuclear Regulatory Commission, "Integrated Safety Assessment Program -- Update Report," dated October 23, 1992.

JUSTIFICATION

Check valve SL-8 cannot be tested. Exemption from the requirements of 10CFR50, Appendix J is justified pursuant to 10CFR50.12(a)(2)(ii) in that:

- Application of the regulation in the particular circumstances is not necessary to achieve the underlying purpose of the rule.

  After any design basis accident, the squib valves and check valve SL-7 provide redundant capability to accommodate a single failure and provide containment isolation.

  In the event of SLC system initiation during an ATWS event, containment isolation is not required because a LOCA is not postulated to occur simultaneously.

  Although not Type C tested, reasonable assurance exists that SL-8 will function. Check valves are considered passive components per SECY-77-439 and are not assumed to fail.

  Furthermore, any leakage through penetration X-42 after an ATWS event would have to overcome a 36 ft column of water to the penetration and another 12½ ft to the squib valves.

  A PRA determined that eliminating leakage through penetration X-42, even without taking credit for the squib valves providing positive isolation, would result in a negligible reduction in public exposure risk.

CONCLUSION

NNECO has concluded that "special circumstances" are present and that an exemption from Appendix J, Section III.C for check valve SL-8 is warranted under 10CFR50.12. Containment integrity of penetration X-42 is assured after all design basis accidents by SL-7 and SL-5A and 5B. This configuration meets the underlying intent of 10CFR50, Appendix J.

This exemption will not present an undue risk to the public health and safety. Based on the above justification, Appendix J, Type C testing of SL-8 is not necessary to ensure that containment leakage will not exceed the allowable leakage defined in the Millstone Unit No. 1 Technical Specifications.

Attachment 2

Millstone Nuclear Power Station, Unit No. 1

Integrated Safety Assessment Program
Topic No. 1.14 - Appendix J Modifications

STATUS OF CIV MODIFICATIONS

April 1994

PENETRATION X-15

Penetration X-15 is located in the reactor water cleanup (RWCU) return line to the reactor vessel. The RWCU system provides a means of removing contaminants from the reactor water by filtration and ion exchange. The return line of the RWCU system discharges through three regenerative heat exchangers and two containment isolation valves (CIVs), CU-28 and CU-29, into the reactor vessel. Valve CU-28 is a motor operated gate valve that provides the outboard isolation and is Appendix J, Type C tested. Valve CU-29 is a check valve that provides the inboard isolation but is not currently Appendix J, Type C tested. Both valves are identified as CIVs in the Millstone Unit No. 1 Updated Final Safety Analysis Report (UFSAR), Table 6.2-4.

A previous exemption request for testing of CU-29 was denied after it was determined that the cost of modification to support Type C testing would be much smaller than the original estimate.

Currently, CU-29 is water tested at a differential pressure of approximately 20 psi on a refueling outage frequency. This test verifies CU-29 closes upon changes in system flow/pressure and has less than 1.5 gpm water leakage.

A modification to permit Type C testing of CU-29 is scheduled in accordance with the Integrated Safety Assessment Program (ISAP) under Topic 1.14.2 for the Cycle 15 refueling outage.

PENETRATION X-20

Penetration X-20 is located in the demineralized water (DW) supply to primary containment. The DW system provides a supply of water for cleaning and controlling contaminates inside containment. Valve DW-64 is the outboard isolation valve and DW-66 and 67 are the inboard isolation valves. All three valves are manually operated gate valves that are locked closed during normal operation. None of these valves were Appendix J, Type C tested although identified as CIVs in Table 6.2-4 of the Millstone Unit No. 1 UFSAR. Penetration X-20 was exposed to postaccident differential pressure during previous Appendix J, Type A tests.

A previous exemption request for testing these valves was denied.

As described in ISAP Topic 1.14.3, penetration X-20 was cut and capped both inside and outside containment during the Cycle 14 refueling outage. This eliminates DW-64, DW-66, and DW-67 as CIVs.

PENETRATION X-21

Penetration X-21 is located in the station air (SA) supply line to the station air header inside primary containment. Motor operated gate valve SA-344 is the outboard isolation valve and check valve SA-345 is the inboard isolation valve. Both valves are identified as CIVs in the Millstone Unit No. 1 UFSAR, Table 6.2-4. Valve SA-344 is closed during normal operation. Neither valve was Appendix J, Type C tested and this penetration has not been exposed to differential pressure during Appendix J, Type A tests.

A previous exemption request for testing these valves was denied.

ISAP Topic 1.14.4 stated that NNECO planned to insert a testable blank flange inside containment. Instead, during the Cycle 14 refueling outage, penetration X-21 was cut and capped both inside and outside containment. This eliminates SA-344 and SA-345 as CIVs.

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Attachment 3

Millstone Nuclear Power Station, Unit No. 1

Integrated Safety Assessment Program
Topic No. 1.14 - Appendix J Modifications

PENETRATIONS OUTSIDE OF APPENDIX J

April 1994

PENETRATIONS X-204A, B, C

Penetrations X-204A, X-204B, and X-204C are being removed from the Appendix J program.

Discussion

Core spray (CS) and low pressure coolant injection (LPCI) system valves CS-2A, 2B and LP-2A, through 2D are identified as containment isolation valves (CIVs) in the Millstone Unit No. 1 Updated Final Safety Analysis Report (UFSAR), Table 6.2-4, for penetrations X-204A, B, C. These valves are located outside the torus on the suction side of the corresponding pumps. None of these valves are currently Appendix J, Type C tested.

The isolation function and testing requirements of the valves in these systems has been under discussion since the original Appendix J letter in November 1975[1]. The previous exemption request[2] was denied. The denial was not based on technical grounds, but rather on the fact that a commitment to perform modifications had been previously made and accepted. As stated in the Integrated Safety Assessment Program (ISAP) Update Reports for Topics 1.14.7 and 1.14.8, modifications to make these valves testable will cost several million dollars and will not provide a commensurate increase in safety.

Valves CS-2A and 2B are motor-operated gate valves and are open during all modes of operation. Close-to-arm switches are included in the control circuits of these valves preventing closure with an emergency core cooling system (ECCS) signal present. Valves LP-2A through 2D are motor-operated gate valves which are key locked in the open position. The CS system takes suction on the torus and injects into the reactor. The LPCI system also takes suction on the torus and can inject into the recirculation header, drywell spray or back to the torus.

CS and LPCI piping outside penetrations X-204A, B, C is part of an engineered safety feature and is an extension of the containment boundary. The Category I design and construction provides assurance that these lines will remain intact during and

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(1) D. C. Switzer letter to K. R. Goller, dated November 14, 1975.

(2) E. J. Mroczka letter to U.S. Nuclear Regulatory Commission, "Integrated Safety Assessment Program -- Topic Nos. 1.14, 'Appendix J Modifications,' and -- 2.33, 'RBCCW Leak Rate Testing,'" dated April 29, 1988.

after a design basis accident (DBA). Since these valves will not be closed during a DBA, they do not perform any containment isolation function.

Valves CS-2A and 2B and LP-2A through 2D have overlapping safety functions. They were designed to go open or stay open in a DBA. They are also required to perform a containment isolation function. In cases where there are overlapping safety functions (e.g., containment integrity and ECCS availability), the function that provides greater safety takes precedence. Although Millstone Unit No. 1 is not governed by the NRC Standard Review Plan (SRP), Section 6.2.4 of the SRP is supportive of designing a valve to fail in such a manner as to provide the greater safety. Specifically, paragraph II.6.j states, in part:

> For engineered safety features or engineered feature-related systems, isolation valves in the lines may remain open or be opened. The position of an isolation valve in the event of power failure to the valve operator should be the "safe" position. Normally this position would be the postaccident valve position.

Since these valves are not relied on to provide containment isolation during a DBA, testing these valves according to the requirements of 10CFR50, Appendix J, is inconsistent.

These penetrations and valves are not exposed to containment atmosphere. In a March 3, 1977 letter,[3] the Staff stated:

> Appendix J, Section III.C.2.a requires that valves, unless pressurized with a seal system, shall be pressurized with air or nitrogen at the calculated accident pressure, P_a. The intent of this requirement is to simulate the condition of the system following a postulated loss-of-coolant accident (LOCA), where the leakage barriers (e.g., valves, gaskets, and seals) may be exposed to the containment atmosphere. There are a number of liquid-filled systems, however, that are designed to remain operable following a LOCA. These liquid-filled systems include the emergency core cooling system and the containment heat removal systems. For those systems that are designed to engineered safety feature criteria and for which there is assurance that they will remain filled with liquid following a LOCA, the liquid leakage rates should be distinguished from containment atmosphere leakage rates. Therefore, these systems can be hydrostatically tested to demonstrate that the fluid

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(3) G. Lear letter to D. C. Switzer, dated March 3, 1977.

inventory is sufficient to maintain a water seal during and following the accident. A liquid leakage limit can then be assigned for these systems. This criterion is similar in concept to a valve seal-water system criterion and will provide equivalent isolation protection. For this type of testing, radiological analyses should be performed to demonstrate that the liquid leakage limits do not result in significant doses, and that the resultant total dose would not be greater than the 10CFR Part 100 guidelines.

In subsequent correspondence dated July 29, 1977,(4) NNECO committed to leak-rate test the valves with water at a pressure of 1.1 P_a ± hydrostatic head. This commitment requires extensive modification to the lines.

These penetrations take water from near the bottom of the torus approximately eight feet below minimum torus water level. Torus water level is controlled by Technical Specification 3.7.A.1 and is monitored at least once per shift in accordance with Technical Specification 4.7.A.1. Because of this water seal, during a postulated accident none of these valves would be exposed to containment atmosphere, even if that particular line was not in use.

For the CS and LPCI systems, assurance of minimal system leakage (not valve seat leakage) under postaccident conditions is required to verify torus inventory would be maintained. An operational leak test of the CS and LPCI systems is performed on a quarterly basis. A system walkdown is performed with the pump seals exposed to at least 200 psig and the suction line valve packings exposed to approximately 5 psig. This walkdown is to verify zero leakage.

An additional verification of system leak tightness is performed during the Type A test where the entire CS and LPCI suction piping is exposed to 43 psig plus the hydrostatic head of the water with an acceptance criteria of zero leakage.

This design, combined with the surveillances, demonstrates that an undepletable inventory of water exists which will provide a continuous water seal for all affected penetrations.

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(4) D. C. Switzer letter to G. Lear, "10CFR50, Appendix J Compliance and Proposed Technical Specification Changes," dated July 29, 1977.

In the June 5, 1991 response to NNECO's exemption request[5], the Staff stated that a similiar penetration, X-212, falls outside of the scope of Appendix J, Type C tests due to the undepletable water seal. The configuration of the CS and LPCI valves are the same as the valves on penetration X-212, in that a continuous, undepletable water seal is available.

Conclusion

Valves CS-2A, 2B, and LP-2A through 2D do not close during a DBA. Therefore, the CS and LPCI valves fall outside the scope of 10CFR50, Appendix J. In addition, sufficient water inventory to maintain an undepleteable water seal is available. Finally, system integrity is verified by walkdown during Type A tests. As discussed in ISAP Topics 1.14.7 and 1.14.8, modifications to make these valves testable would cost several million dollars and provide no commensurate safety benefit. Therefore, no modification will be made to allow hydraulic testing of the valves and the valves will be removed from the Appendix J program.

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(5) M. L. Boyle letter to E. J. Mroczka, "Exemptions to Appendix J - Type C Leak Rate Testing (TAC No. 68292)," dated June 5, 1991.

PENETRATION X-210A and 210B

Penetrations X-210A and X-210B are being removed from the Appendix J program.

Discussion

Valves CS-14A, 14B, and LP-24 through D are located on the CS and LPCI pump minimum flow return lines to the torus. Valves LP-43A and 43B are located on the LPCI return line to the torus. Valves CS-14A, 14B, and LP-24A through D are all check valves. Valves LP-43A and 43B are motor operated gate valves that are closed during normal operation and may be opened during and after a DBA to provide torus cooling. All of these valves are identified as CIVs in the Millstone Unit No. 1 UFSAR, Table 6.2-4, for penetration X-210A and X-210B.

Modifications to penetration X-210A and X-210B extended the torus return line piping below torus water level to elevation -17 feet 11 inches, providing an 8 ft. water seal.

The leak tightness of the torus (and this water seal) is demonstrated on a continuous basis since the torus water is monitored at least once per shift. The containment boundaries are also subjected to leakage checking during Type A tests.

Since these penetrations will remain covered with an undepletable water seal during and after a design basis accident, the above valves will not perform a containment isolation function covered under Appendix J.

In the June 5, 1991 response to NNECO's exemption request, the Staff stated that a similiar penetration, X-212, falls outside of the scope of Appendix J, Type C due to the undepletable water seal. The configuration of penetrations X-210A and X-210B and the associated valves is no different than penetration X-212, in that a continuous, undepletable water seal is available.

Conclusion

Penetrations X-210A and X-210B remain covered with an undepletable water seal. As such, the associated valves fall outside the scope of 10CFR50, Appendix J. As discussed in ISAP Topic 1.14.9, modifications to make these valves testable would cost several million dollars without a commensurate safety benefit. Therefore, no modification will be made to allow hydraulic testing of the valves and the valves will be removed from the Appendix J program.