



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO THE INSERVICE TESTING PROGRAM

AND REQUESTS FOR RELIEF

UNION ELECTRIC COMPANY

CALLAWAY NUCLEAR PLANT, UNIT 1

DOCKET NO. STN 50-483

1.0 INTRODUCTION

The Callaway first 10-year program, Revision 10, NRC review is contained in a staff SE dated May 17, 1988. Subsequently, Union Electric Company (UE), by letter dated April 30, 1990, submitted Revision 11 of the first 10-year IST program and additional information related to requests for relief from certain code requirements which were determined to be impractical to perform at the Callaway Plant. Revision 11 of UE's IST Program contains three additional relief requests. The program for the first 10-year interval is based on the requirements of the 1980 Edition through the Winter of 1981 Addenda of Section XI of the ASME code.

2.0 EVALUATION

The IST Program Revision 11 requests for relief from the requirements of Section XI, that have been determined to be impractical to perform, or provide acceptable alternatives to code requirements, have been reviewed by the staff and are evaluated below.

2.1 Relief Request V04:

The licensee has requested relief from ASME Code Section XI, IWV-3421 through 3425 and IWV-3427(b), requirements for Valve Leak Rate Test, which address verification of containment integrity. The valves covered by this request are all Category A, Class 2 containment isolation valves.

2.1.1 Basis for Relief

10 CFR Part 50, Appendix J, Primary Reactor Containment Leakage Testing for Water-Cooled Power Reactors, provides leakage test requirements for containment isolation valves. Technical Specifications provide ACTION statements to be adhered to in the event of test failure. Valve leak rate for containment isolation valves will be performed to the leak test requirements of 10 CFR Part 50, Appendix J, and Technical Specifications. This includes requirements for test frequency, differential test pressure, seal leakage measurement and test medium.

2.1.2 Evaluation

The staff has determined that the leak test procedures and requirements for containment isolation valves specified in 10 CFR Part 50, Appendix J, are equivalent to the requirements of IWV-3421 through IWV-3425. The 10 CFR Part 50, Appendix J, leak rate testing does not require establishing corrective actions based on individual valve leakage rates, therefore, the licensee must also comply with the Analysis of Leakage Rates and Corrective Action requirements IWV-3426 and IWV-3427(a). The licensee has committed to comply with the Analysis of Leakage Rates and Corrective Action requirements of Paragraph IWV-3426 and 3427(a) as recommended in Attachment 1, Item 10, to Generic Letter 89-04. Based on the level of safety provided by the Appendix J leak rate testing and the licensee's commitment to comply with the requirements of IWV-3426 and 3427(a), the staff concludes the proposed alternative to the requirements of IWV-3421 through 3425 would provide an acceptable level of quality and safety. Therefore, relief is granted pursuant to 10 CFR 50.55a(a)(3)(i).

IWV-3427(b) specifies additional requirements on increased test frequencies for valve sizes of six inches and larger and repairs or replacement over the requirements of IWV-3427(a). The staff, in reviewing the test data at a number of nuclear plants, has determined that the usefulness of IWV-3427(b) does not justify the burden of complying with this requirement given that valve reliability is adequate in the absence of complying with IWV-3427(b). Because the burden of increased testing upon the licensee would result in hardship without a compensatory increase in the level of quality and safety, relief is granted pursuant to 10 CFR 50.55a(a)(3)(ii).

2.2 Relief Request V07

The licensee has requested relief from ASME Code Section XI, IWV-3522, requirements for Check Valve Exercising which is utilized as confirmation of check valve disk movement. Relief is requested for the Emergency Core Cooling System Valves BB-V-001, BB-V-0022, BB-V-0040, BB-V-0059, BB-8949A, BB-8949B, BB-8949C, BB-8949D, EJ-8941A, EJ-8941B, EJ-8841A, EJ-8841B, EM-V-0001, EM-V-0002, EM-V-0003, EM-V-0004, EP-V-0010, EP-V-0020, EP-V-0030, EP-V-0040, EP-8818A, EP-8818B, EP-8818C, and EP-8818D.

2.2.1 Basis for Relief

ASME Section XI, IWV-3522, indicates that confirmation of check valve disk movement may be by a number of methods including "other positive means." Full flow measurement through individual check valves is recognized as a valid full open test. Non-intrusive methods of determining check valve position, however, have progressed sufficiently to warrant use in surveillance activities. In particular, acoustic monitoring as demonstrated by the Nuclear Industry Check Valve Group (NIC) at Utah State University has proven to work successfully.

The licensee proposes to use acoustic monitoring equipment to verify the check valve moves to the full open position by determining that the valve strikes its backseat.

2.2.2 Evaluation

Tests for check valves contained in IWV-3522 require valves be exercised to the positions required to fulfill their safety function. Confirmation that the valve is exercised to the correct positions is required. Confirmation is allowed by visual observation of the disk, by electric signal initiated by a position indicating device, by full flow through the valve and by other positive means. The staff believes that other positive means could include confirmation of disk position by qualified methods including non-intrusive methods. Item 1 of Attachment 1 to Generic Letter 89-04 provides guidance on qualifying alternative techniques for meeting the ASME Code requirements. The licensee has committed to comply with the Generic Letter 89-04 recommendations by addressing and documenting Items 1 through 6 in Item 1 as described above concerning acceptability of any alternative technique chosen, including acoustic monitoring. This will be included in Revision 12 to the Callaway Plant first 10-year IST program. Therefore, the Code requirements for disk exercising will be met and relief from the Code requirements is not necessary.

2.3 Relief Request BB-11

The licensee has requested relief from ASME Code Section XI, IWV-3521, requirements for Test Frequency which requires quarterly testing for the subject valves. The check valves covered by this request are BB-V-122, BB-V-152, BB-V-182 and BB-V-212.

2.3.1 Basis for Relief

Testing these check valves in the safety-related closed direction dictates isolating cooling water to the Reactor Coolant Pumps (RCP) Thermal Barrier Cooling Coils and Motor Coolers. This function is required when the RCPs are operating. Loss of RCP seal injection without Thermal Barrier Cooling would cause catastrophic RCP seal failure and subsequent Small Break Loss of Coolant Accident. Loss of RCP motor cooling would result in catastrophic motor failure causing a loss of forced RCS flow. The cooling water to the RCPs is provided by a common header, therefore, testing cannot be performed until all four RCPs are off, which does not occur except during reactor refueling outages.

The licensee proposes to perform the testing during refueling outages.

2.3.2 valuation

Exercising these valves would isolate cooling water flow to RCP Thermal Barrier Cooling Coils and Motor Coolers which could damage pump seals and consequently the pumps causing a premature failure. Pump failure during power operations would result in a plant trip and a seal failure could result in a Small Break Loss of Coolant Accident. The cooling water supply is provided by a common header requiring isolation of all cooling water to the pump bearings and motor for this test. Therefore, testing should be limited to reactor refueling outages when all four RCPs are down.

Based on the impracticality of exercising these valves quarterly or during cold shutdowns when one or more reactor coolant pumps are operating and the increased burden, additional plant shutdowns, upon the licensee that could result if the requirements were imposed on the facility, the proposed alternative is acceptable and relief is granted pursuant to 10 CFR 50.55a(g)(6)(i).

3.0 CONCLUSIONS

The staff has reviewed the licensee's requests for relief, V04, V07, and BB-11 and has concluded the proposed alternatives are either acceptable or relief from Code requirements are not necessary. The request for relief from ASME Code Section XI, IWV-3421 through 3425 and IWV 3427(b) requirements for Valve Leak Rate Test, V04, is acceptable pursuant to 10 CFR 50.55a(b)(3)(i) and 10 CFR 50.55a(a)(3)(ii). Request for relief from ASME Code Section XI, IWV-3522 requirements for Check Valve Exercising, V07, is not necessary. Relief request BB-11 concerning relief from ASME Code Section XI, IWV-3521, requirements for Test Frequency, is acceptable pursuant to 10 CFR 50.55a(g)(6)(i).

The staff concludes, pursuant to 10 CFR 50.55a(a)(3)(i) and (ii) and 50.55a(a)(6)(i) that the Code requirements are impractical, the alternatives proposed provide an acceptable level of quality and safety, or compliance with the code would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety; and therefore relief is granted and the alternatives imposed. This relief is authorized by law and will not endanger life or property or the common defense and security and are otherwise in the public interest, given due consideration to the burden upon the licensee and facility.

4.0 ACKNOWLEDGEMENT

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