

July 13, 2000

Mr. T. F. Plunkett
President - Nuclear Division
Florida Power and Light Company
Juno Beach, Florida 33408-0420

SUBJECT: EVALUATION OF RELIEF REQUEST NOS. IWE-01 AND IWE-02 ON
IMPLEMENTATION OF ASME SECTION XI FOR CONTAINMENT
INSPECTION FOR ST. LUCIE NUCLEAR PLANT (TAC NOS. MA8836 AND
MA8837)

Dear Mr. Plunkett:

By letter dated April 24, 2000, the Florida Power and Light Company (FPL, the licensee) requested relief from the requirements of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code) Section XI for the St. Lucie Nuclear Plant, Units 1 and 2. The U.S. Nuclear Regulatory Commission staff has reviewed the relief requests IWE-01 and IWE-02. Based on the information provided by FPL, the staff concludes that compliance with the ASME Code requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety, and that the licensee's proposed alternatives will provide reasonable assurance of containment pressure integrity. Therefore, the proposed alternatives are authorized pursuant to Title 10 of the *Code of Federal Regulations*, Section 50.55a(a)(3)(ii).

The enclosure contains the staff's Safety Evaluation.

Sincerely,

/RA/

Richard P. Correia, Chief, Section 2
Project Directorate II
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos.: 50-335 and 50-389

Enclosure: As stated

cc w/encl: See next page

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
OF RELIEF REQUESTS FROM ASME SECTION XI REQUIREMENTS
FOR CONTAINMENT INSPECTION
FLORIDA POWER AND LIGHT COMPANY'S
ST. LUCIE NUCLEAR PLANT, UNITS 1 AND 2
DOCKET NOS. 50-335 AND 50-389

1.0 INTRODUCTION

In the *Federal Register* dated August 8, 1996 (61 FR 41303), the Nuclear Regulatory Commission (NRC) amended its regulations to incorporate by reference the 1992 edition with 1992 addenda of Subsections IWE and IWL of Section XI of the ASME Boiler and Pressure Vessel Code (Code). Subsections IWE and IWL provide the requirements for inservice inspection (ISI) of Class CC (concrete containment), and Class MC (metallic containment) of light-water cooled power plants. The effective date for the amended rule was September 9, 1996, and it requires the licensees to incorporate the new requirements into their ISI plans and to complete the first containment inspection by September 9, 2001. However, a licensee may propose alternatives to or submit a request for relief from the requirements of the regulation pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Sections 50.55a(a)(3) and (g)(5).

By letter dated April 24, 2000, Florida Power and Light Company (FPL, the licensee) proposed two alternatives to the requirements of Subsection IWE of Section XI of the ASME Code for its St. Lucie Nuclear Plant (St. Lucie). The NRC's findings with respect to authorizing the alternative or denying the proposed request are discussed in this evaluation.

2.0 EVALUATION

2.1 Relief Request IWE-01:

2.1.1 Code Requirements:

ASME Code, Section XI, 1992 Edition with 1992 Addenda, Table IWE-2500-1, Examination Category E-D, Items 5.10 and E5.20, require visual examination (VT-3) of containment seals and gaskets.

2.1.2 Specific Relief Requested:

Pursuant to 10 CFR 50.55a(a)(3)(ii), relief is requested from the required visual examination (VT-3) of the seals and gaskets as specified in Table IWE-2500-1, Category E-D, Items 5.10 and 5.20, of the 1992 Edition, with 1992 Addenda of ASME Section XI.

2.1.3 Basis for Relief:

Seals and gaskets are tested by 10 CFR 50 Appendix J tests. As noted in 10 CFR Part 50 Appendix J, the purpose is to measure leakage of containment or penetrations whose design incorporates resilient seals, gaskets, and sealant compounds, and electrical penetrations fitted with flexible metal seal assemblies. Examinations of seals and gaskets require the joints, which are proven adequate through Appendix J testing, to be disassembled. For electrical penetrations, this would involve a pre-maintenance Appendix J test, de-termination of cables at electrical penetrations if enough slack is not available, disassembly of the joint, removal and examination of the seals and gaskets, re-assembly of the joint, re-termination of the cables if necessary, post maintenance testing of the cables, and a post maintenance Appendix J test of the penetration. The work required for the containment hatches would be similar except for the de-termination, re-termination, and testing of cables. This imposes a risk that equipment could be damaged. The 1992 Edition, 1993 Addenda, of Section XI recognizes that disassembly of joints to perform these examinations is not warranted. Examination Category E-D was modified to state that sealed or gasket connections need not be disassembled solely for performance of examinations. However, without disassembly, most of the surface of the seals and gaskets would be inaccessible.

For those penetrations that are routinely disassembled, a Type B test is required upon final assembly and prior to start-up. Since the Type B test will assure the leak tight integrity of primary containment, the performance of the visual examination would not increase the level of safety or quality.

This examination requirement was deleted from the 1998 edition of ASME Section XI.

Compliance with the specified requirements of this section would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

2.1.4 Proposed Alternative Examinations:

The leak tightness of seals and gaskets will be tested in accordance with 10 CFR 50 Appendix J. No additional alternatives to the visual examination, VT-3, of the seals and gaskets will be performed.

2.1.5 Staff Evaluation of IWE-01:

The licensee proposes to use, in lieu of performing the VT-3 examinations for containment penetration seals and gaskets, the existing primary containment leakage testing program for leakage testing containment penetrations in accordance with 10 CFR Part 50, Appendix J.

In its request, the licensee stated that because the seals and gaskets associated with these penetrations are not accessible for examination when the penetration is assembled, containment penetrations seals and gaskets must be disassembled and re-assembled for the purpose of performing the VT-3 visual examination. These activities (a pre-maintenance Appendix J test, de-termination of cables at electrical penetrations if enough cable slack is not available, disassembly of the joints, removal and examination of the seals and gaskets, re-assembly of the joints, re-termination of the cables if necessary, post-maintenance testing of cables, and post-maintenance Appendix J testing of the penetration) associated with a VT-3 visual examination would introduce the possibility of component damage that would not otherwise occur. The periodic test in accordance with 10 CFR Part 50, Appendix J will detect and measure local leakage of containment or penetrations whose design incorporates resilient

seals, gaskets, sealant compounds, and electrical penetrations fitted with flexible metal seal assemblies. If unacceptable leakage is identified during the test, corrective measures would be taken and components would be re-tested.

Also, the staff finds that ASME Section XI, 1992 Edition, 1993 Addenda recognizes that disassembly of joints for the sole purpose of performing visual examination is unwarranted. Requiring the licensee to disassemble components for the sole purpose of inspecting seals and gaskets would place a significant hardship on the licensee without a compensating increase in the level of quality and safety.

On the basis discussed above, the staff concludes that the alternative proposed by the licensee will provide reasonable assurance of the functionality and integrity of the containment penetration seals and gaskets during the testing required by 10 CFR Part 50, Appendix J. The proposed alternative is authorized pursuant to 10 CFR 50.55a(a)(3)(ii) on the basis that compliance with the specific requirements of the Code would result in hardship without a compensating increase in the level of quality and safety.

2.2 Relief Request IWE-02:

2.2.1 Code Requirements:

ASME Code, Section XI, 1992 Edition with 1992 Addenda, Table IWE-2500-1, Examination Category E-G, Item E8.20, requires torque or tension testing on bolted connections that have not been disassembled and reassembled during the inspection interval.

2.2.2 Specific Relief Requested:

Pursuant to 10 CFR 50.55a(a)(3)(ii), relief is requested from the required bolt torque or tension test of the bolted connections as specified in Table IWE-2500-1, Category E-G, Item 8.20, of the 1992 Edition, with 1992 Addenda of ASME Section XI.

2.2.3 Basis for Relief:

Bolt torque or tension testing is required on all bolted connections that have not been disassembled and reassembled during the inspection interval. Determination of the torque or tension values would require that the bolting be un-torqued and then re-torqued or re-tensioned. The performance of the 10 CFR 50 Appendix J, Type B test itself proves that the bolt torque or tension remains adequate to provide a leak rate that is within acceptable limits. The torque or tension value of bolting only becomes an issue if the leak rate becomes excessive. Once a bolt is torqued or tensioned, it is not subject to dynamic loading that could cause it to experience significant change. Verification of torque or tension values on bolted joints that are proven adequate through Appendix J testing and visual inspection is adequate to demonstrate that design function is met. Torque or tension testing is not required on any other ASME Section XI, Class 1, 2, or 3 bolted connections or their supports as a part of the inservice inspection program.

This examination requirement was deleted from the 1998 Edition of ASME Section XI.

Compliance with the specified requirements of IWE-2500-1, Examination Category E-G, Item 8.20 would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

2.2.4 Proposed Alternative Examinations:

The following examinations and tests are required by Subsection IWE to ensure the structural integrity and the leak tightness of Class MC pressure retaining bolted connections, therefore, no additional alternative examinations are proposed.

- 1) Exposed surfaces of bolted connections shall be visually examined in accordance with the requirements [of] Table IWE-2500-1, Examination Category E-G, Pressure Retaining Bolting, Item No. E8.10.
- 2) Bolted connections shall meet the pressure test requirements of Table IWE-2500-1, Examination Category E-P, All Pressure Retaining Components, Item E9.40.
- 3) A general visual examination of the entire containment once each inspection period shall be conducted in accordance with 10 CFR 50.55a(b)(2)(x)(E).

2.2.5 Staff Evaluation of IWE-02:

ASME Section XI, 1992 Edition with the 1992 Addenda, Table IWE-2500-1, Examination Category E-G, Pressure Retaining Bolting, Item E8.20, requires bolt torque or tension testing on bolted connections that have not been disassembled and reassembled during the inspection interval. This examination is used to aid in the determination that leaktight seals exist and that the structural integrity of the subject bolted connections is maintained. The licensee proposes to use the 10 CFR Part 50, Appendix J, Type B test together with visual examinations in accordance with the requirements of Table IWE-2500-1, Examination Category E-G, Item E8.10, as an alternative to the Code requirement to verify the integrity of penetrations with bolted connections.

The staff finds that bolt torque or tension testing on bolted connections that have not been disassembled and reassembled during the inspection interval would require the bolting be un-torqued and then re-torqued or re-tensioned, whereas the leak testing as required by 10 CFR Part 50, Appendix J would adequately verify the leaktight integrity of the containment. The staff also finds that compliance with ASME Code requirements will cause a hardship or a usual difficulty because un-torquing and subsequent re-torquing bolted connections involve unnecessary radiation exposure and costs to perform the work without a compensating increase in the level of quality and safety. In addition, the staff finds that the alternative approach proposed by the licensee (the test required by 10 CFR Part 50, Appendix J to verify the leaktight integrity of bolted connections for containment vessel leaktight integrity together with visual examinations) will provide reasonable assurance of the containment pressure boundary integrity. On this basis, the staff concludes that the alternative proposed by the licensee is authorized pursuant to 10 CFR 50.55a(a)(3)(ii).

3.0 CONCLUSION

Based on our review of the information provided in the requests for relief IWE-01 and IWE-02, the staff concludes that compliance with the Code requirements would result in a burden without a compensating increase in the level of quality and safety, and that licensee's proposed alternatives will provide reasonable assurance of containment pressure integrity. Therefore, these proposed alternatives are authorized pursuant to 10 CFR 50.55a(a)(3)(ii).

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Date: July 13, 2000

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