

April 13, 2004

Mr. J. A. Stall
Senior Vice President, Nuclear and
Chief Nuclear Officer
Florida Power and Light Company
P.O. Box 14000
Juno Beach, Florida 33408-0420

SUBJECT: ST. LUCIE UNITS 1 AND 2 - RELIEF REQUESTS REGARDING INSERVICE
INSPECTION OF REACTOR VESSEL BOTTOM AREA AND PIPING IN
COVERED TRENCHES (TAC NOS. MC1086 AND MC1087)

Dear Mr. Stall:

By a letter dated October 15, 2003, as supplemented by letters dated January 30, 2004, and March 22, 2004, Florida Power and Light Company (the licensee) submitted Relief Request No. 25 (RR- 25) for St. Lucie Unit 1 and RR-4 for St. Lucie Unit 2, requesting relief from certain Inservice Inspection (ISI) requirements of the American Society of Mechanical Engineers (ASME) Code relating to visual inspection of the reactor vessel bottom area and Reactor Coolant System (RCS) support piping that passes through covered trenches. Pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.55a(a)(3)(ii), the licensee proposes to perform the inspections under different plant conditions than those required by the ASME Code, as compliance with the Code would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

The U.S. Nuclear Regulatory Commission (NRC) staff has reviewed the licensee's proposed alternative and has concluded that performance of the inspections during the hydrostatic and system leakage tests when the containment is at normal operating pressure and temperature conditions would result in hardship or unusual difficulty to the licensee without a compensating increase in the level of quality and safety. Therefore, pursuant to 10 CFR 50.55a(a)(3)(ii), the alternative examinations in RR-25 are authorized for the third 10-year ISI interval for St. Lucie Unit 1, which began February 11, 1998, and ends February 10, 2008, and the alternative examinations in RR-4 are authorized for the third 10-year ISI interval at St. Lucie Unit 2, which began on August 8, 2003, and ends August 7, 2013.

Further details on the bases for the NRC staff's conclusions are contained in the enclosed safety evaluation. If you have any questions regarding this issue, please contact Brendan Moroney at (301) 415-3974.

Sincerely,

/RA by M. L Marshall for/
William F. Burton, Acting Chief, Section 2
Project Directorate II
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos. 50-335 and 50-389

Enclosure: Safety Evaluation

cc: See next page

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

INSERVICE INSPECTION PROGRAM

RELIEF REQUEST NOS. 25 AND 4

FLORIDA POWER AND LIGHT COMPANY

ST. LUCIE NUCLEAR PLANT, UNITS 1 AND 2

DOCKET NOS. 50-335 AND 50-389

1.0 INTRODUCTION

By letter dated October 15, 2003, as supplemented by letters dated January 30, 2004, and March 22, 2004, Florida Power and Light Company (FPL, the licensee) submitted Relief Request No. 25 (RR-25) for St. Lucie Unit 1 and RR-4 for St. Lucie Unit 2, requesting relief from certain Inservice Inspection (ISI) requirements of the American Society of Mechanical Engineers (ASME) Code relating to visual inspection of the reactor vessel bottom area and Reactor Coolant System (RCS) support piping that passes through covered trenches. Pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.55a(a)(3)(ii), the licensee proposes to perform the inspections under different plant conditions than those required by Section XI, Article IWA-5000, System Pressure Tests, paragraph IWA-5242, Insulated Components, of the ASME Code, as compliance with the Code would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

2.0 REGULATORY REQUIREMENTS

Inservice inspection of the ASME Code Class 1, 2 and 3 components is to be performed in accordance with Section XI of the ASME Boiler and Pressure Vessel Code (Code) and applicable addenda as required by 10 CFR 50.55a(g), except where specific relief has been granted by the Commission pursuant to 10 CFR 50.55a(g)(6)(i). In 10CFR 50.55a(a)(3), it states that alternatives to the requirements of paragraph (g) may be used, when authorized by the NRC, if the applicant demonstrates that (i) the proposed alternatives would provide an acceptable level of quality and safety or (ii) compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

Pursuant to 10 CFR 50.55a(g)(4), ASME Code Class 1, 2 and 3 components (including supports) shall meet the requirements, except the design and access provisions and the preservice examination requirements, set forth in the ASME Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," to the extent practical within the limitations of design, geometry, and materials of construction of the components. The

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regulations require that inservice examination of components and system pressure tests conducted during the first 10-year interval and subsequent intervals comply with the requirements in the latest edition and addenda of Section XI of the ASME Code incorporated by reference in 10 CFR 50.55a(b) 12 months prior to the start of the 120-month interval, subject to the limitations and modifications listed therein. The Code of record for the St. Lucie Unit 1 third 10-year ISI interval is the 1989 Edition, no Addenda; and the code of record for the St. Lucie Unit 2 third 10-year ISI interval is the 1998 Edition through 2000 Addenda of the ASME Boiler and Pressure Vessel Code.

3.0 TECHNICAL EVALUATION

Code Requirement:

ASME Code, Section XI, Article IWA-5000, System Pressure Tests, paragraph IWA-5242, Insulated Components, describes the requirements for conducting the visual examination VT-2 of insulated components for evidence of leakage at normal operating pressure and temperature.

System/Component(s) for Which Relief is Requested:

St. Lucie Unit 1:

Reactor Vessel - Pressure Retaining Boundary Bottom Head Area,
Piping - Pressure Retaining Boundary (covered trench portions only):
 Safety Injection (SI) Headers: 12-SI-148, 149, 150, 151,
 Charging: 2-CH-147,
 Letdown: 2-RC-142,
Piping - Pressure Retaining Components (covered trench portions only):
 Shutdown Cooling (SDC) Suction: 10-SI-420, 422

St. Lucie Unit 2:

Reactor Vessel - Pressure Retaining Boundary Bottom Head Area,
Piping - Pressure Retaining Boundary (covered portions only):
 SI Headers: 12-SI-148, 149, 150, 151,
 Charging: 2-CH-147,
 Letdown: 2-RC-142,
Piping - Pressure Retaining Components (covered portions only):
 SDC Suction: 10-SI-362, 363
 Hot Leg Injection: 3-SI-179, 181

Code Requirement from Which Relief is Requested:

Pursuant to the provisions of 10 CFR 50.55a(a)(3)(ii), the licensee requests approval for an alternative to perform the examination of the reactor vessel bottom head area and piping in covered trenches at different plant conditions than those required by the ASME Code, Section XI, paragraph IWA-5242.

Licensee's Proposed Alternative Examination:

FPL will continue to perform the required system pressure tests as prescribed by IWB-5000 each refueling outage and IWC-5000 each period, and will examine all accessible components in accordance with IWA-5242.

For those portions of components rendered inaccessible by Containment Building configuration, as an alternative to the requirements of IWA-5242, FPL will open the inaccessible areas each refueling outage and perform a VT-2 examination of the reactor vessel bottom and other associated piping following plant cooldown and depressurization. This inspection will check insulation surfaces and joints for signs of leakage or residue. Any evidence of leakage will be evaluated in accordance with IWA-5250, which may include additional inspections and insulation removal as deemed necessary.

Licensee's Basis for Requesting Relief:

St. Lucie Plant does not have access for a direct visual examination of the reactor vessel bottom area during the ASME Section XI System Leakage Test visual examination VT-2 walkdown. There are three possible pathways that lead to the area. Two are in the electrical tunnel at the bottom of the containment "keyway" and are blocked by the Reactor Cavity Relief Dampers (Blast Dampers). These dampers consist of horizontal louvers approximately 11 inches wide, and normally remain in the closed position. They are not intended for human passage. The third pathway is through the reactor cavity sump, a small tunnel from the cavity to the weir pit. A cooling duct runs through this tunnel, limiting the height to a crawl space approximately a foot high and six to eight feet long. Ambient conditions during VT-2 examinations at normal operating conditions create an extreme heat stress environment and, combined with a nearly impossible exit pathway, make examination of this area an excessively hazardous work situation. For these reasons, St. Lucie VT-2 inspectors have considered the reactor bottom area not accessible for examination. The increase in the level of quality and safety gained by performing a visual inspection at normal operating conditions does not compensate for the safety hazard to the inspector.

Some segments of Class 1 and Class 2 reactor support piping pass through trenches that are covered and secured during normal operation. These trenches are required to be covered and secured prior to entering Mode 4 following a shutdown to ensure containment sump recirculation flowpaths are maintained. This is outlined in the St. Lucie response to NRC Bulletin 2003-01 (FPL Letter L-2003-201 dated August 8, 2003). The trench covers prohibit direct examination of horizontal insulation joints and low points as directed by IWA-5242(a). However, due to gaps and handholes in the trench covers and the use of grating in some locations, surrounding areas can be observed for evidence of leakage. Areas to which leakage may be channeled are also open in many locations throughout the containment for observation during the System Leakage Test. This is in compliance with the requirements of IWA-5242(b).

The objective of the required visual examination at normal operating conditions is to detect evidence of leakage and thereby verify the integrity of the RCS pressure boundary. FPL believes the same evidence of leakage can be identified by visual examination following cooldown for refueling. The St. Lucie reactors have no bottom head penetrations, and have been volumetrically examined in accordance with the rules of Section XI with no relevant indications identified. There is no expectation of leakage due to the solid configuration of the

bottom. The reactor cavity is monitored for leakage continuously during operation, and inventory balance is performed daily throughout the operating cycle. Therefore, FPL concludes that the proposed alternative provides reasonable assurance of system integrity and an acceptable level of quality and safety comparable to an exam performed at normal operating conditions.

Staff Evaluation:

The staff has reviewed the information concerning the ISI program RR-25 for St. Lucie Unit 1 and RR-4 for St. Lucie Unit 2 for the third 10-year ISI intervals of each unit pertaining to VT-2 visual examinations of the bottom of the reactor vessel and piping in covered trenches at different plant conditions than required by the Code, which requires that these examinations be conducted during each hydrostatic and system leakage test of the RCS. The hydrostatic and system leakage tests are conducted at normal operating pressure and temperature. These conditions create an extreme heat stress environment which, when combined with a nearly impossible exit pathway, make examination of this area excessively hazardous. Thus, imposition of the examination requirements would cause a hardship or unusual difficulty on the licensee.

The licensee proposed, as an alternative, to perform the required VT-2 visual examination for evidence of leakage and boric acid corrosion during each refueling outage, following plant cooldown and depressurization, instead of at normal operating pressure and temperature. Any evidence of leakage and boric acid corrosion that occurred during the previous fuel cycle can be detected by visual examination of this area at the end of the cycle during the outage. In addition, the RCS temperatures will be substantially lower under the vessel area during the outage, which removes the hazardous temperature conditions. The staff agrees that the VT-2 visual examination for evidence of leakage and boric acid corrosion conducted during each refueling outage would provide reasonable assurance that leaks through the bottom of the vessel and associated Class 1 and Class 2 piping in covered trenches that occurred during the previous cycle would be detected. Additionally, leakage and boric acid corrosion of the vessel bottom head and piping would result in the formation of boric acid crystals which can be detected by the proposed VT-2 visual examination during each refueling cycle. This examination is sufficient to inspect the condition of the external surface of the vessel bottom head area and piping in covered trenches. The staff, therefore, has determined that the Code-required examinations of the reactor vessel bottom head and associated Class 1 and Class 2 piping in covered trenches during system leakage and hydrostatic tests at normal operating pressure and temperature would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

4.0 CONCLUSION

The staff has reviewed the licensee's submittal and concludes that performance of the Code-required VT-2 visual examination of the bottom of the reactor vessel and associated piping in covered trenches during the hydrostatic and system leakage tests when the containment is at normal operating pressure and temperature conditions would result in hardship or unusual difficulty to the licensee without a compensating increase in the level of quality and safety. The staff agrees that the VT-2 visual examination for evidence of leakage and boric acid corrosion conducted during each refueling outage, following plant cooldown and depressurization, would provide reasonable assurance that any leaks through the bottom of the

vessel and associated Class 1 and Class 2 piping in covered trenches that occurred during the previous cycle would be detected. Therefore, pursuant to 10 CFR 50.55a(a)(3)(ii), the alternative examinations in RR-25 are authorized for the third 10-year ISI interval for St. Lucie Unit 1, which began February 11, 1998, and ends February 10, 2008, and the alternative examinations in RR-4 are authorized for the third 10-year ISI interval at St. Lucie Unit 2, which began on August 8, 2003, and ends August 7, 2013.

All other requirements of the ASME Code, Section III and XI for which relief has not been specifically requested and approved remain applicable, including third party review by the Authorized Nuclear Inservice Inspector.

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Date: April 13, 2004

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