

April 22, 2003

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: SAINT LUCIE NUCLEAR PLANT, UNIT 2 - SAFETY EVALUATION FOR
RELIEF REQUEST NO. 34 REGARDING TEMPORARY NON-CODE REPAIRS
OF INTAKE COOLING WATER (ICW) CLASS 3 PIPING (TAC NO. MB6927)

Dear Mr. Stall:

By a letter dated December 10, 2002, Florida Power and Light Company (the licensee) submitted Interim Relief Request 34 for Saint Lucie Unit 2, requesting relief from the repair/replacement criteria specified in American Society of Mechanical Engineers (ASME) Code, Section XI, Article IWA-4000 for repair of ASME Class 3 ICW system piping lines I-30"-CW-11 & I-36"-CW-16. In accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.55a(g)(5)(iii), the request proposed an alternative non-Code repair method as prescribed within the guidelines of the U.S. Nuclear Regulatory Commission (NRC) Generic Letter 90-05, "Guidance for Performing Temporary Non-Code Repair of ASME Class 1, 2, and 3 Piping."

The NRC staff has reviewed the licensee's proposed alternative and has concluded that it is impractical for the licensee to comply with the requirements of ASME Code, Section XI, Article IWA-4000. Additionally, the NRC staff has concluded that the proposed actions provide reasonable assurance of the continued structural integrity of ICW system piping lines I-30"-CW-11 & I-36"-CW-16. Granting relief pursuant to 10 CFR 50.55a(g)(6)(i) is authorized by law and will not endanger life or property or the common defense and security, and is otherwise in the public interest giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility. Therefore, relief is granted until the next refueling outage (SL2-14), which is scheduled to begin April 21, 2003.

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Further details of 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 Eva Brown at (301) 415-2315 or Brendan Moroney at (301) 415-3974.

Sincerely,

/RA by B.Mozafari acting for/

Allen G. Howe, Chief, Section 2
Project Directorate II
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-389

Enclosure: Safety Evaluation

cc w/encl: See next page

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

INSERVICE INSPECTION PROGRAM

RELIEF REQUEST NO. 34

FLORIDA POWER AND LIGHT

SAINT LUCIE NUCLEAR PLANT, UNIT 2

DOCKET NO. 50-389

1.0 INTRODUCTION

By a letter dated December 10, 2002, Florida Power and Light Company (FPL, the licensee) submitted Interim Relief Request (RR)-34 for Saint Lucie Unit 2 (STL2). In RR 34, FPL requested a practical alternative to performing American Society of Mechanical Engineers (ASME) Code (Code), Section XI, Article IWA-4000 required repair/replacement for Class 3 intake cooling water (ICW) piping leaks. This request proposes an alternative non-Code repair method as prescribed within the guidelines of the U.S. Nuclear Regulatory Commission (NRC) Generic Letter (GL) 90-05, "Guidance for Performing Temporary Non-Code Repair of ASME Class 1, 2, and 3 Piping," that would temporarily repair the leaks within the 72-hour allowed outage time permitted in the Technical Specifications (TSs). Additionally, the licensee has proposed that the subject relief request remain in place until the next STL2 refueling outage, currently scheduled to begin April 21, 2003.

2.0 REGULATORY EVALUATION

Licensees may perform temporary non-Code repairs of Class 3 ICW system piping lines, I-30"-CW-11 & I-36"-CW-16, in accordance with guidance outlined in GL 90-05 entitled, "Guidance for Performing Temporary Non-Code Repair of ASME Class 1, 2, and 3 Piping." GL 90-05 dated June 15, 1990, provides criteria necessary to repair ASME Class 1, 2, and 3 piping within the 72-hour allowed outage time permitted in the TSs during applicable inservice inspection (ISI) intervals. Specifically, for ASME Class 1 and 2 piping, the licensee is required to perform Code repairs or request NRC to grant relief for temporary repairs on a case-by-case basis, regardless of pipe size; while for ASME Class 3 piping, the licensee is required to document the temporary non-Code repair by requesting the NRC to grant relief.

In accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.55a(g)(5)(iii), licensees may request relief from certain Code requirements if they determine that conformance is impractical. The licensee shall notify the Commission of this determination and submit information, in accordance with 10 CFR 50.4, to support the requested relief.

Enclosure

ISI of ASME Class 1, 2, and 3 components is to be performed in accordance with Section XI of the Code and the applicable addenda as required by 10 CFR 50.55a(g), except where written relief has been granted by the Commission pursuant to 10 CFR 50.55a(g)(6)(i), which deals with consideration of the impracticality of conforming with certain Code requirements. As stated in 10 CFR 50.55a(a)(3), alternatives to the requirements of (g) may be used, when authorized by the NRC, if (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 Class 1, 2, and 3 components (including supports) shall meet the requirements, except the design and access provisions and the pre-service examination requirements, set forth in the Code, Section XI, "Rules for ISI of Nuclear Power Plant Components," to the extent practical within the limitations of design, geometry, and materials of construction of the components. The 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 Code incorporated by reference in Section 50.55a(b) 12 months prior to the start of the 120 month interval, subject to the limitations and modifications listed therein. The applicable Code of record for the second 10-year ISI for STL2 is the 1989 Edition of the Code, Section XI, no addenda.

3.0 TECHNICAL EVALUATION

By a letter dated December 10, 2002, the licensee requested approval to use an alternative non-Code repair method, as prescribed within the guidelines of NRC GL 90-05, that would temporarily repair ASME Class 3 ICW piping leaks within the 72-hour allowed outage time permitted in the TSSs.

3.1 RELIEF REQUEST NO. 34, TEMPORARY NON-CODE REPAIRS OF ICW CLASS 3 PIPING

3.1.1 Component Identification

STL2, ASME ICW System Piping Lines I-30"-CW-11 & I-36"-CW-16

3.1.2 Code Requirements for which Relief is Requested

Rules for Inservice Inspection of Nuclear Power Plants Components, Section XI, 1989 Edition, no Addenda

The Code, Section XI, requires that repairs/replacements of ASME Class components be performed in accordance with the rules found in Article IWA-4000. The intent of these rules serves to provide an acceptable means of restoring the structural integrity of a degraded Code Class system back to the original design requirements.

3.1.3 Licensee's Proposed Alternative to Code

Pursuant to 10 CFR 50.55a(g)(5)(iii), FPL requested approval of RR-34 to perform an alternative temporary non-Code repair on an ICW piping leak in lieu of a Code repair. The affected section of the ICW piping has a maximum operating pressure of 90 pounds per square inch gauge (psig), a maximum operating temperature of 95 degrees Fahrenheit (°F), and was designed in accordance with the Class 3 requirements of ASME Section III. These pressure and temperature values are less than the 274 psig and 200°F values specified in GL 90-05 and, therefore, the subject system/components can be classified as ASME Class 3 moderate energy lines. Therefore, a temporary non-Code repair can be performed. FPL plans to perform the temporary non-Code repairs on the ICW piping leaks by following the guidelines in GL 90-05. The temporary repairs consist of passive devices installed for pressure boundary integrity only, using adequate and suitable material acceptable for the system temperature and pressure. An augmented examination was performed in five susceptible areas to identify additional flaws within 15 days of the initial discovery. The augmented examinations identified one additional through-wall flaw in the opposite train. In accordance with the requirements of GL 90-05, FPL expanded its inspections and examined an additional five areas in the most susceptible locations, based on the root cause analysis. No additional through-wall flaws were identified in the second expansion. The installation of the leak limiting devices consists of an epoxy sealant, covered by 16 gage stainless steel sheet metal with half (½) inch stainless steel banding. The temporary repairs are removable, and do not compromise the structural integrity of the piping system and its associated supports. The licensee will perform weekly plant walkdown inspections to assess degradation/structural integrity of the temporary repairs

3.1.4 Licensee's Basis for Relief

The licensee has evaluated the flaws in accordance with the guidelines provided in GL 90-05. Based upon the evaluation, it was determined that the discovered flaws satisfy the criteria for non-Code repairs as described in GL 90-05. The licensee determined that performing permanent repairs in accordance with the Code would be impractical because the TSs allowed outage time of 72-hours for the affected headers may be insufficient to accomplish a Code repair/replacement. A plant shutdown and cooldown with unnecessary cycling of facility systems and components would also be required to perform a Code repair/replacement of the piping. The licensee indicated that a Code repair/replacement will be accomplished during the upcoming Unit 2 refueling outage (SL2-14) which is scheduled for spring 2003.

3.1.5 Evaluation

The licensee's personnel, while conducting inspections of ICW pump 2A discharge line I-36"-CW-16 and ICW pump 2B discharge line I-30"-CW-11, discovered potential corrosive degradation and through-wall flaws. The through-wall flaws and the wall thinning detected were evaluated by FPL Engineering in accordance with the guidelines in NRC GL 90-05. The NRC staff reviewed the licensee's evaluations and requested that the licensee provide additional information concerning the effects of temporary repair on flooding and spraying water on equipment in close proximity to the leaks.

In response, the licensee stated that temporary repairs will be installed near the intake canal, inside a trench/pit, which would eliminate concerns with flooding and spraying of water on equipment. Any leakage would flow into the intake canal, locations of piping, and flaws on the piping such that water spray would not affect any equipment, including the ICW pumps.

The licensee calculated the potential ICW inventory losses based on a rupture of a 0.75 (3/4) inch instrument line concurrent with another opening from which 100 gallons per minute (gpm) is lost. The internal diameter of 3/4 inch pipe is approximately 0.824 inch and bounds the identified area in the relief. ICW inventory losses, should they occur, will be within the acceptable limits.

The structural integrity of the flawed piping was evaluated using the "Through-Wall Flaw" approach. Design loading for the line CW-11 was evaluated within Civil Engineering Calculation PSL-2FSC-02-026 and design loading for line CW-16 was evaluated within Civil Engineering Calculation PSL-2FSC-02-027. These calculations assume a through-wall flaw and evaluates the flaw stability by a linear elastic fracture mechanics methodology. These calculations included deadweight, pressure, thermal expansion, and seismic loads. Calculations for CW-11 determined a stress intensity factor (K) of 21.6 kilopounds per square inch, square root inches (ksi $\sqrt{\text{in.}}$) and a K of 12.13 ksi $\sqrt{\text{in.}}$. Both of these values are significantly below the K allowed for ferritic steel of 35 ksi $\sqrt{\text{in.}}$. Additionally, the requirements of GL 90-05 for flaw characterization, acceptable spacing for multiple flaws, flaw area, and linear fracture mechanics criteria were met. Therefore, temporary non-Code repairs are applicable until the next scheduled refueling outage.

The licensee also provided clarification that the proposed temporary leak mitigating devices are judged to be of minimal mass (less than 10 pounds total) which is considered insignificant compared to the overall mass of the piping system and components. The additional weight added by the devices result in no negative impact on the structural design of the piping; therefore, the temporary repair does not effect the design loading of the line.

In accordance with plant design specifications, the affected section of ICW piping has a maximum operating pressure of 90 psig, a maximum operating temperature of 95°F, and was designed in accordance with Class 3 requirements of ASME Section III. These pressure and temperature values are less than the 274 psig and 200°F values specified in GL 90-05, which provides the basis to classify the subject system/components as ASME Class 3 and moderate energy lines. Therefore, installation of a leak limiting device consisting of an epoxy sealant, covered by 16 gage stainless steel metal with ½ inch stainless steel banding has no structural significance beyond that necessary to resist the hydraulic pressure of the leak.

The licensee has committed to assess the structural integrity of the temporary leak device on a weekly basis. Operations personnel, during the performance of their daily rounds, will perform plant walkdown inspections. The operations personnel will assure that the leak mitigating device is structurally intact and there is no visual indication of operational leakage.

4.0 CONCLUSION

The NRC staff has determined that the proposed actions provide reasonable assurance of the continued structural integrity of ICW system piping lines I-30"-CW-11 & I-36"-CW-16, and has determined that the licensee's flaw evaluation was consistent with the guidelines and

acceptance criteria of GL 90-05. Additionally, the NRC staff has determined that it would be impractical for the licensee to perform a Code repair at this time. Therefore, granting relief pursuant to 10 CFR 50.55a(g)(6)(i) is authorized by law and will not endanger life or property or the common defense and security, and is otherwise in the public interest, giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility. This relief is granted until the next refueling outage (STL2-14), which is scheduled to begin April 21, 2003. All other ASME Code, Section XI, requirements for which relief was not specifically requested and approved in this relief request remain applicable, including third party review by the Authorized Nuclear Inservice Inspector.

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Date: April 22, 2003

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