UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

REQUEST FOR RELIEF FROM ASME CODE REPAIR REQUIREMENTS

FOR ASME CODE CLASS 3 COOLING COIL

FLORIDA POWER AND LIGHT COMPANY

ST. LUCIE PLANT, UNIT 1

DOCKET NO. 50-335

1.0 INTRODUCTION

10 CFR 50.55a(g) requires nuclear power facility piping and components to meet the applicable requirements of Section XI of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (hereafter referred as the Code). Section XI of the Code specifies Code-acceptable repair methods for flaws that exceed Code acceptance limits in piping that is in-service. A Code repair is required to restore the structural integrity of flawed Code piping, independent of the operational mode of the plant when the flaw is detected. Those repairs not in compliance with Section XI of the Code are non-Code repairs. However, the implementation of required Code (weld) repairs to ASME Code Class 1, 2 or 3 systems is often impractical for nuclear licensees since the repairs normally require an isolation of the system requiring the repair, and often a shutdown of the nuclear power plant.

Alternatives to Code requirements may be used by nuclear licensees when authorized by the Director of the Office of Nuclear Reactor Regulation if the proposed alternatives to the requirements are such that they are shown to provide an acceptable level of quality and safety in lieu of the Code requirements [10 CFR 50.55a(a)(3)(i)], or if compliance with the Code requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety [10 CFR 50.55a(a)(3)(ii)].

A licensee may also submit requests for relief from certain Code requirements when a licensee has determined that conformance with certain Code requirements is impractical for its facility [10 CFR 50.55a(g)(5)(iii)]. Pursuant to 10 CFR 50.55a(g)(6)(i), the Commission will evaluate determinations of impracticality and may grant relief and may impose alternative requirements as it determines is authorized by law.

Generic Letter (GL) 90-05, entitled "Guidance for Performing Temporary Non-Code Repair of ASME Code Class 1, 2, and 3 Piping," dated June 15, 1990, provides guidance for the staff in evaluating relief requests submitted by

ENCLOSURE

licensees for temporary non-Code repairs of Code Class 3 piping. Under GL 90-05, impracticality is defined to exist if the flaw detected during plant operation is in a section of Class 3 piping that cannot be isolated for completing a code repair within the time period permitted by the limiting condition of the affected system as specified in the plant TSs, and performance of the code repair necessitates a plant shutdown.

BACKGROUND

In August of 1996, Florida Power and Light Company (FPL, the licensee) identified a leak on a brazed joint on one of the six cooling coil banks for the 1B containment cooling unit (HVS-1B) at St. Lucie Plant, Unit 1. The leak is located in the brazed joint between the 3-inch carbon steel pipe stub and 3-inch copper coil header piping. The leak was characterized as being six to eight separate pin hole leaks in the joint brazing material. The pin hole leaks are in close proximity to one another. By letter dated October 4, 1996, the licensee requested relief from the ASME Code, Section XI repair or replacement requirements and proposed an alternative under the provisions of 10 CFR 50.55a(a)(3)(ii) because compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety. The licensee based its request for relief on the basis that a leak repair enclosure has been installed over the leaky area by the licensee pursuant to the guidance provided in GL 90-05. This leak repair enclosure is intended to function as a temporary non-Code repair until a Code repair is accomplished during the next scheduled Unit 1 outage exceeding 30 days or during the next scheduled refueling outage. By letter dated January 30, 1997, the licensee revised their request by changing the containment anomaly inspections from once every 2 weeks to, nominally, once per month.

3.0 LICENSEE'S RELIEF REQUEST

3.1 Components for Which Relief is Requested

ASME Code Class 3 containment cooling unit coil HVS-1B.

3.2 Section XI Edition for St. Lucie Plant, Unit 1

1983 Edition of the ASME Code, Section XI, inclusive of the 1983 Summer Addenda.

3.3 ASME Section XI Code Requirement

The ASME Code Section XI requires that repairs or replacements of ASME Code Class components be performed in accordance with rules found in Articles IWA-4000 or IWA-7000, respectively. 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.

3.4 Content of the Relief Request

Relief is sought from performing a repair or replacement of the brazed joint between the 3-inch carbon steel pipe stub and 3-inch copper coil header piping per the requirements of Article IWA-4000 or IWA-7000, respectively. Relief is being sought until the next St. Lucie-1 scheduled refueling outage (Refueling Outage 15) or scheduled outage greater than 30 days in length.

3.5 Basis for Relief

Request for relief has been submitted and an alternative has been proposed under the provisions of 10 CFR 50.55a(a)(3)(i). The licensee has stated that the leakage has been eliminated by the installation of an engineered leak repair enclosure. The enclosure has been designed for the maximum internal and external design pressure and temperature conditions. The enclosure is constructed of carbon steel plate material and alloy bolting. The enclosure is designed to encapsulate both copper header piping and carbon steel pipe stub. This design ensures that the entire brazed joint is contained within the enclosure. The leak repair enclosure has been evaluated for potential impact on the structural integrity of the affected components. The additional loads (dead weight and seismic) imposed by the leak repair enclosure are acceptable and the structural integrity of the existing components is unaffected. This evaluation demonstrated that the structural integrity of the affected components is ensured until permanent Code repair is performed. Code repair or replacement is currently scheduled to start during next refueling outage (SL1-15) which is currently scheduled for the fall of 1997. Further, the licensee has determined that a Code repair is not practical at this time. In order to perform the Code repair, one of the two containment cooling trains would have to be isolated and taken out of service. Containment cooling unit HVS-1B would have to be drained and the cooling coil removed to allow for joint disassembly. Complete disassembly, assembly and testing of the unit will most likely exceed the Technical Specification allowed outage time which will necessitate a plant shutdown. In addition, performance of a Code repair while the unit is at power will result in unnecessary personnel exposure. Dose rates in the area of the HVS-1B cooler have been measured at 50 Mr/hr.

3.6 Licensee's Alternative Program

1. The licensee has stopped the leak by performing a temporary non-Code repair of the leaking area using carbon steel plate material and alloy bolts. The temporary non-Code repair will remain in place until a Code repair or replacement is completed during the next refueling outage.

2. Monitoring of the degraded area by plant operators.

3. Code repair of the affected brazed joint during the next refueling outage (scheduled to begin in the fall of 1997).

4.0 STAFF EVALUATION AND CONCLUSIONS

4.1 Operability Determination, Root Cause Analysis and Structural Integrity Evaluation

The licensee determined that the leak is located in the brazed joint between the 3-inch carbon steel pipe stub and 3-inch copper coil header piping of the HVS-1B containment cooling unit. The leak was characterized as being six to eight separate pin hole leaks in the joint brazing material. The pin hole leaks are in close proximity to one another. St. Lucie-1 has four containment cooling units located inside containment. The cooling coils and the associated component cooling water system piping for the containment cooling units are classified as ASME Code Class 3. The piping is also classified as moderate energy (maximum operating temperature less than 200°F and maximum operating pressure less than 275 psig). After the leak was discovered the licensee performed an evaluation which concluded that the piping is operable. Continued monitoring and additional visual examinations were performed. The visual examination confirmed that the leak had not worsened and the leak was measured to be one gallon per hour. The licensee also determined that volumetric examination was not possible because of joint geometry of the copper pipe to carbon steel pipe stub brazed joint construction. The failure was attributed to the presence of subsurface defects in the brazed joint such as flux inclusions, lack of fusion or porosity.

4.2 Augmented Inspection

The leak was located in the brazed joint between the 3-inch carbon steel pipe stub and 3-inch copper coil header piping of the HVS-1B containment cooling unit. The leak was characterized as being six to eight separate pin hole leaks in the joint brazing material. The pin hole leaks are in close proximity to one another. The leak was measured to be one gallon per hour. After the leak was discovered 15 additional potentially susceptible locations were visually inspected for signs of leakage. No leakage was identified from these additional locations. Also, in accordance with the guidance of GL 90-05, the licensee has committed to periodically assess the structural integrity of the temporary repair during the containment anomaly inspections that are typically performed once per month.

4.3 Proposed Temporary Non-Code Repair and Monitoring Provisions

At this time, the licensee has performed a temporary non-Code repair of the leaking area using approved injection compound enclosed by carbon steel plate and alloy bolts. The temporary non-Code repair will remain in place until a Code repair or replacement is completed during the next refueling outage. The degraded area is monitored by plant operators. Code repair or replacement of the reducer will be completed during the next refueling outage (scheduled to begin in the fall of 1997).

4.4 Staff Conclusions

The staff has determined that the licensee's flaw evaluation has been consistent with the guidelines and acceptance criteria of GL 90-05. The staff

therefore finds the licensee's structural integrity and operability assessments to be acceptable. The licensee has performed a non-code repair of the leaking brazed joint using approved injection compound enclosed by carbon steel plate and alloy bolts. The temporary non-Code repair will remain in place until a Code repair or replacement is completed during the next refueling outage. The degraded area is monitored by plant operators. Code repair or replacement of the brazed joint will be completed during the next refueling outage (scheduled to begin in the fall of 1997).

Furthermore, the staff finds that performance of an immediate Code repair is impractical since it would require that one of the two containment cooling trains would have to be isolated and taken out of service; containment cooling unit HVS-1B would have to be drained and the cooling coil removed to allow for joint disassembly; and complete disassembly, assembly and testing of the unit will most likely exceed the Technical Specification allowed outage time which will necessitate a Unit shutdown. In addition, shutting the Unit down is not in the best interest of plant safety, given the small magnitude of the flaw and the licensee's alternative program. The staff therefore concludes that temporary relief may be granted, and that authorization of the licensee's alternative program 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 and facility that could result if the Code requirements were imposed on the facility. Pursuant to 10 CFR 50.55a(g)(6)(i), the alternative is authorized until the next scheduled outage exceeding 30 days, but no later than the next refueling outage. At that time Code requirements will be applicable.

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Dated: May 27, 1997