

March 3, 2005

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: TURKEY POINT UNITS 3 AND 4 - SAFETY EVALUATION FOR RELIEF  
REQUEST NO. 1 REGARDING THE FOURTH 10-YEAR INSERVICE  
INSPECTION INTERVAL (TAC NOS. MC2420 AND MC2421)

Dear Mr. Stall:

By a letter to the U.S. Nuclear Regulatory Commission (NRC), dated March 11, 2004, as supplemented by letter dated April 29, 2004, Florida Power and Light Company (FPL), submitted Relief Request (RR) No. 1 for Turkey Point, Units 3 and 4. FPL requested relief from the requirements specified in American Society of Mechanical Engineers *Boiler and Pressure Vessel Code* (Code), Section XI, in accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.55a paragraph (a)(3)(ii). Specifically, FPL requested relief from the Code required examinations on the Regenerative Heat Exchanger shell welds, support welds, and component supports and proposed to perform a VT-2 visual examination at the beginning of the outage for leakage and boric acid accumulation and a VT-2 visual examination at startup during the system leakage test.

Based on the review of your submittals, the NRC staff has concluded that compliance with the Code requirement in performing inservice examination of the welds in the regenerative heat exchanger would result in hardship to the licensee without a compensating increase in the level of quality and safety. The alternatives proposed provide reasonable assurance of structural integrity and, therefore, are authorized pursuant to 10 CFR 50.55a(a)(3)(ii). These reliefs are authorized for the extension period for the fourth 10-year inservice inspection interval for Turkey Point, Units 3 and 4.

Further details on the bases for the NRC staff conclusions are contained in the enclosed Safety Evaluation (SE). Please note that RR No. 2, which was submitted by FPL in the same

J. A. Stall

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March 3, 2005

correspondence as RR No. 1, was previously issued in a SE dated December 2, 2004 [ADAMS Accession ML043370063].

If you have any questions regarding this issue, please feel free to contact Ms. Eva Brown at 301-415-2315.

Sincerely,

***/RA/***

Michael L. Marshall, Jr., Chief, Section 2  
Project Directorate II  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

Docket Nos. 50-250 and 50-251

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. 1

FLORIDA POWER AND LIGHT

TURKEY POINT NUCLEAR PLANT, UNITS 3 AND 4

DOCKET NOS. 50-250 AND 50-251

1.0 INTRODUCTION

By a letter to the Nuclear Regulatory Commission (NRC), dated March 11, 2004, as supplemented by letter dated April 29, 2004, Florida Power and Light Company (FPL), submitted Relief Request (RR) No. 1 for Turkey Point Units 3 and 4. FPL requested relief from the requirements specified in American Society of Mechanical Engineers (ASME) *Boiler and Pressure Vessel Code* (Code), Section XI, in accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.55a paragraph (a)(3)(ii). Specifically, FPL requested relief from the Code required examinations on the Regenerative Heat Exchanger (RGX) shell welds, support welds, and component supports and proposed to perform a VT-2 visual examination at the beginning of the outage for leakage and boric acid accumulation and a VT-2 visual examination at startup during the system leakage test.

FPL's request applies to its Turkey Point Units 3 and 4 for its fourth 10-year inservice inspection (ISI) interval. The fourth 10-year ISI interval for Turkey Point Unit 3 began February 22, 2004, and ends on February 21, 2014; for Unit 4, it began April 15, 2004, and ends on April 14, 2014.

2.0 REGULATORY EVALUATION

Title 10, CFR, Section 50.55a(g) requires that ISI of ASME Code Class 1, 2, and 3 components be performed in accordance with Section XI of the ASME Code and applicable addenda, except where specific written relief has been granted by the NRC pursuant to 10 CFR 50.55a(g)(6)(i). According to 10 CFR 50.55a(a)(3), alternatives to the requirements of paragraph (g) may be used, when authorized by the NRC, if an applicant demonstrates that the proposed alternatives would provide an acceptable level of quality and safety or if the specified requirement would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

Enclosure

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 (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 ISI 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 ISI Code of record for the fourth 10-year inspection interval for Turkey Point Units 3 and 4 is the 1998 Edition with Addenda through 2000 of ASME Section XI.

### 3.0 TECHNICAL EVALUATION

#### 3.1 Components for Which Relief Is Requested

ASME Code Class 1 RGX at Turkey Point Nuclear Plant, Units 3 and 4.

<u>Weld Description/ No. of Welds/Each Unit</u>	<u>ID Number</u>	<u>Examination Category/Item Number</u>
a. Head to Shell/ 3 welds	1 of RGX I, II, & 3	B-B, B2.51
b. Shell to Tube Sheet - Primary/ 3 welds	2 of RGX I, II, & 3	B-B, B2.80
c. Tube Sheet to Shell - Secondary/ 3 welds	3 of RGX I, II, & 3	B-B, B2.80
d. Channel Head Weld - Secondary/ 3 welds	4 of RGX I, II, & 3	B-B, B2.51
e. Shell I, II, & III Nozzle Welds/ 12 welds	9, 10, 11, & 12	B-D, B3.150
f. Shell I, II, & III Nozzle IR/ 12 areas	Not Applicable	B-D, B3.160
g. Integrally Welded Supports/ 3 welds	Lugs	B-K, B10.10
h. Clamp Restraints/ 3	Not Applicable	B-K, B10.10
i. Supports/ 3	Not Applicable	F-A, F.140

#### 3.2 ASME Code Requirements

The ASME Code, Section XI, 1998 Edition with 2000 Addenda requires volumetric examination of welds in examination category B-B and B-D and surface examination of integrally welded attachments in examination category B-K. The Code further requires a VT-3 visual examination of welds in the supports, mechanical connections, clearances, sliding surfaces, and assembly of the supports.

### 3.3 Licensee's Proposed Alternatives

FPL proposes to perform a VT-2 visual examination at the beginning of the outage for leakage and boric acid accumulation and a VT-2 visual examination at startup during the system leakage test. FPL requests relief from the Code required examinations on the Regenerative Heat Exchanger shell welds, support welds, and component supports.

### 3.4 Licensee's Basis for Alternative

The RGXs are located in a locked high-radiation area. This area has a general field of 2 Rem/hr and is highly contaminated. Turkey Point Health Physics (HP) rules require the constant presence of a HP technician during entry to this area. Other conditions include limited accessibility to the examination areas due to the close proximity of the adjacent wall and floor, limited work area due to cubicle walls built to shield personnel in adjacent areas, and interference from other pipe lines and supports in the immediate area. During construction of Turkey Point Units 3 and 4, asbestos insulation was used extensively. Asbestos insulation is present in the area of the RGXs. Additional protection is required for personnel entering this area to avoid possible spreading and ingestion of this hazardous material (i.e., an extra layer of protective clothing, tenting, HEPA filters).

Performing ASME Code required examinations would require large expenditures of man-hours and accumulated man-Rem dose. The welds must be de-insulated for examination and temporary shielding and scaffold installed. Effective shielding reduces accessibility to the examination areas. Proper surface conditioning will add to inspectors' time and exposure required to perform valid surface and volumetric examinations. The area must be tented to avoid spreading of asbestos fibers found in the insulation. The design and arrangement of the Regenerative Heat Exchanger are not conducive to meaningful examinations.

FPL has performed examinations on the RGXs for both Turkey Point Units 3 and 4 during the first inspection interval (approximately early 1972 through late 1983) before the original RR was approved. This experience showed that the design arrangement and accessibility are not conducive to meaningful examinations. The configuration, limited accessibility, high-radiation levels, and interference from supports, walls, and the floor do not allow the Code required volumetric and/or surface examinations.

Since 1985, FPL has performed VT-2 and VT-3 examinations on the items listed in this RR. These examinations were performed in accordance with the previous approved RR, which required FPL to look for evidence of leakage around the Regenerative Heat Exchanger just after shutdown for a refueling outage and a second time during the system pressure test at plant startup.

During the 1991 outages of both units, the system hydrostatic tests were performed on the affected systems. No leakage was detected. No evidence of leakage from the Regenerative Heat Exchanger or its attached piping has been noted in either unit during any of the previous examinations.

Performing the alternative examinations will not increase the health and safety risk to the public.

### 3.5 Evaluation

The ASME Code, Section XI, 1998 Edition with 2000 Addenda requires volumetric examination of welds in examination category B-B and B-D and surface examination of integrally welded attachments in examination category B-K. The Code further requires a VT-3 visual examination of welds in the supports, mechanical connections, clearances, sliding surfaces, and assembly of the supports. The RGXs are located in a locked high-radiation area in a general field of 2 Rem/hr and is highly contaminated. Further, the examination areas have limited access due to their close proximity to the walls and the floor. The heat exchangers are also insulated using asbestos insulation, which in itself poses significant health risk to test crew, thus, requiring additional protection. Therefore, performance of Code required examination would require a significant man-hour effort and consequent high man-rem dose to personnel. The heat exchangers were volumetrically examined during the first 10-year ISI interval and no rejectable indication was found. Subsequently in the second and the third 10-year ISI intervals, the heat exchangers were visually inspected during system pressure tests and no leakage was ever detected. Therefore, the service history of the heat exchangers has been good. There is no known degradation mechanism other than fatigue that is believed to exist in the welds that are subject to volumetric or surface examination. The NRC staff's estimation has shown that the fatigue crack growth rate is extremely small even in highly stressed areas and, therefore, the fatigue will not cause a postulated flaw which may have been missed during fabrication inspection or the first 10-year ISI to leak during its service life. The heat exchanger material being austenitic stainless steel has high fracture toughness and under a normal service loading condition, a critical flaw in the heat exchanger weld is more likely to cause a leak than to cause a gross failure. Any inservice leakage from a heat exchanger can be detected either during operation or during a system leakage test.

On the basis of above evaluation and pursuant to 10 CFR 50.55a(a)(3)(ii), the NRC staff concludes that compliance with the Code requirement in performing inservice examination of the welds in the regenerative heat exchanger would result in hardship to the licensee without a compensating increase in the level of quality and safety and that the alternatives proposed provide reasonable assurance of structural integrity.

#### 4.0 CONCLUSION

The NRC staff has determined that the proposed alternative will provide an acceptable level of quality and safety. Therefore, pursuant to 10 CFR 50.55a(a)(3)(ii), the staff authorizes the proposed alternative, for RR No. 1, described in FPL's letter of March 11, 2004, as supplemented by letter dated April 29, 2004, for Turkey Point Units 3 and 4 for its fourth 10-year ISI interval. 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: March 3, 2005

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