

September 28, 2001

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 PLANT, UNITS 3 AND 4 - THIRD 10-YEAR INTERVAL
INSERVICE INSPECTION PROGRAM PLAN, REQUEST FOR RELIEF NO. 23
FROM THE REQUIREMENTS OF THE AMERICAN SOCIETY OF
MECHANICAL ENGINEERS BOILER AND PRESSURE VESSEL CODE
(TAC NOS. MB2180 AND MB2181)

Dear Mr. Stall:

By letter dated June 11, 2001, Florida Power and Light Company (the licensee) submitted a request for relief (RR) No. 23 from the requirements of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code for Turkey Point Plant, Units 3 and 4, as part of its Third 10-Year Interval Inservice Inspection Program Plan.

Based on the discussion in the enclosed safety evaluation, the U.S. Nuclear Regulatory Commission staff finds the licensee's RR No. 23 acceptable. This completes the staff's action for TAC Nos. MB2180 and MB2181. If you have any comments regarding this matter, please contact Kahtan Jabbour at 301-415-1496.

Sincerely,

/RA/

Richard P. Correia, 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

THIRD 10-YEAR INTERVAL INSERVICE INSPECTION

REQUEST FOR RELIEF NO. 23

TURKEY POINT PLANT, UNITS 3 AND 4

FLORIDA POWER AND LIGHT COMPANY

DOCKET NUMBERS 50-250 AND 50-251

1.0 INTRODUCTION

Inservice inspection of the American Society of Mechanical Engineers (ASME) Code Class 1, 2, and 3 components is to be performed in accordance with Section XI of the ASME Boiler and Pressure Vessel (B&PV) Code and applicable addenda as required by Title 10, *Code of Federal Regulations* (10 CFR), Section 50.55a(g), except where specific written relief has been granted by the Commission pursuant to 10 CFR 50.55a(g)(6)(i). It states in 10 CFR 50.55a(a)(3) that alternatives to the requirements of paragraph (g) may be used, when authorized by the U.S. Nuclear Regulatory Commission (NRC), if the licensee 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 pre-service 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 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 Turkey Point, Units 3 and 4, third 10-year inservice inspection (ISI) interval is the 1989 Edition of the ASME Boiler and Pressure Vessel Code.

2.0 EVALUATION

The NRC staff has reviewed the information concerning the Third 10-year ISI program Request for Relief No. 23 from Code requirements for the Turkey Point Plant, Units 3 and 4, provided by Florida Power and Light Company (the licensee) in a letter dated June 11, 2001. The staff's evaluation and conclusions are provided below.

2.1 Request for Relief No. 23, Category B-D, Item B3.90 and B1.40 Reactor Pressure Vessel Nozzle-to-Vessle Weld

ENCLOSURE

Code Requirements:

1989 Code Edition, Section XI, Examination Category B-D Full Penetration Welds of Nozzles in Vessels, Code Item B3.90, Figure IWB-2500-7 (a) and (b).

ASME Section V, 1989 Code Edition, Article 4, Paragraphs T-441.3.2.5 Angle Beam Scanning, T-3.2.6 Scanning for Reflectors Oriented Parallel to the Weld, and T-441.3.2.7 Scanning for Reflectors Oriented Transverse to the Weld.

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

ASME Section XI, Class 1, Examination Category B-D, Item B3.90 Reactor Pressure Vessel Pressure retaining Nozzle-to-Vessel welds at Turkey Point Units 3 and 4.

Licensee's Code Relief Request (as stated):

"Pursuant to 10 CFR 50.55a(a)(3)(i), relief is requested to implement an alternative to the requirements of ASME Section XI Figures IWB-2500-7 (a) and IWB-2500-7 (b). These examinations will be performed during the third inspection interval. This relief request is applicable to Turkey Point Units 3 and 4."

Licensee's Basis for Requesting Relief (as stated):

"FPL is currently required to perform in-service examinations of selected welds in accordance with the requirements of 10 CFR 50.55a, plant technical specifications, and the 1989 Edition of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code, Section XI, Rules for Inservice Inspection of Nuclear Power Plant Components. This Code edition invokes the examination volume requirements of Figures IWB-2500-7 (a) and IWB-2500-7 (b). This Code edition also invokes the examination requirements of Appendix I, Article I- 2000 which reference ASME Section V, Article 4 that essentially prescribes twenty (20) year old examination methodology. The Ultrasonic examination techniques utilized for this examination will have been qualified by demonstration for Appendix VIII Supplement 7 of the 1995 Edition 1996 Addenda of ASME by the Performance Demonstration Initiative (PDI) as amended by the September 1999 revision of 10 CFR 50.55a. The use of these qualified techniques further assures that the reactor vessel welds have remained free of service related flaws thus enhancing quality and ensuring plant safety and reliability.

"The examination volume for the reactor pressure vessel nozzle-to-vessel welds extends far beyond the weld into the base metal, and is unnecessarily large. This extends the examination time significantly, and results in no net increase in safety, as the area being examined is a base metal region which is not prone to in-service cracking and has been extensively examined before the vessel was put into service and during the First and Second In-service examination.

"The attached figures reduce the examination volume next to the widest part of the weld from half of the vessel wall thickness to one-half (1/2) inch. This removes examination from the base metal that was extensively examined during construction and pre-service

inspection and is not in the high residual stress region associated with the weld. These high-stressed areas are contained in the volume that is defined by the attached figures and are subject to examination.

“The implementation of this alternative is also expected to reduce the on-vessel examination time by as much as 5 hours, which translates to a significant reduction in personnel radiation exposure.”

Licensee’s Proposed Alternative Examination (as stated):

1. “Perform examinations in accordance with the exam volume as defined in Figures 1 and 2.
2. “Conduct Mechanized Ultrasonic Examinations of essentially 100% of all welds using Performance Demonstration Initiative (PDI) ASME Section XI, Appendix VIII qualified procedures and personnel. This will be accomplished in accordance with ASME Code, Section XI, Division 1, 1995 Edition, 1996 Addenda, Appendix VIII, Supplement 7 as modified by 10 CFR 50.55a.
3. “Periodic System Pressure Tests per Category B-P, Table IWB-2500-1”

Evaluation:

The Code requires 100% ultrasonic examination of the weld length of the Reactor Vessel Nozzle-to-Vessel Welds. The licensee has proposed to perform mechanized ultrasonic examinations of essentially 100% of all welds using PDI ASME Section XI, Appendix VIII qualified procedures and personnel. The licensee will perform the subject exams in accordance with ASME Code, Section XI, Division 1, 1995 Edition, 1996 Addenda, Appendix VIII, Supplement 7.

The licensee’s proposed alternative addresses the area next to the weld that must be volumetrically examined. The licensee’s alternative reduces the examination volume adjacent to the widest part of the weld from half of the vessel wall thickness to ½ inch. The thickness of reactor wall near the nozzle is 9 inches and the Code required volume adjacent to the widest part of the weld from half of the vessel wall thickness would be 4½ inches. The acceptability of reduced volume examinations is based on prior examinations of the base metal and internal stress distribution near the weld. Although the alternative does not specifically impose prior examination results of the excluded volume area as a condition for allowing a reduced examination volume, the base metal was extensively examined during construction, preservice inspection, and inservice inspections. These examinations showed that the ASME Code volume was free of flaws.

The creation of flaws during plant service in the volume excluded from examination by the licensee’s proposed alternative is unlikely because of the low stress in the base metal away from the weld. The stresses caused by welding are concentrated at and near the weld. Cracks, should they initiate, will occur in the high-stressed areas of the weld. The high stressed areas are within the volume included in the licensee’s alternative for examination. The licensee has performed prior examinations of the

subject welds which supports this aspect of the licensee's alternative. In addition, periodic system pressure tests per Category B-P, Table IWB-2500-1 will be performed.

The licensee's proposal to use PDI's performance demonstration program for ASME, Section XI, Appendix VIII, Supplement 7, will provide enhanced volumetric examinations and reasonable assurance that a flaw would be found by these examinations. The coverage requirements emphasizes ultrasonic examination of the weld volume at the weld root for circumferential and radial flaws by scanning in four orthogonal directions and de-emphasize ultrasonic examination of the remaining weld. Appendix VIII, Supplement 7, requirements are specifically designed for nozzle-to-vessel weld configurations and the ASME Code, Section XI, Division 1, 1995 Edition, 1996 Addenda has been approved for use in 10 CFR 50.55a.

On this basis, the staff finds that the licensee's proposed alternative provides reasonable assurance of quality and safety.

3.0 CONCLUSION

The staff concludes that the licensee's proposed alternative provides reasonable assurance of quality and safety. Therefore, the licensee's proposed alternative is authorized pursuant to 10 CFR 50.55a(a)(3)(i) for the third 10-year inservice inspection interval.

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Date: September 28, 2001

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