



FPL

JUL 22 2004

L-2004-164
10 CFR 50.55a

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D. C. 20555

Re: Turkey Point Units 3 and 4
Docket Nos. 50-250 and 251
ASME Section XI Relief Requests Nos. 34 and 35
Alternative Through-Wall Sizing Requirements and
Alternative Ultrasonic Examination for Reactor Flange to Upper Shell Welds

Florida Power & Light Company (FPL) requests approval of Relief Requests No. 34, Attachment 1, and Relief Request No. 35, Attachment 2, pursuant to 10 CFR 50.55a (a)(3)(i).

As stated in FPL letters L-2002-125, dated June 26, 2002 and L-2003-158, dated June 20, 2003, FPL has extended the Third 10-Year inservice inspection interval to perform examinations for remaining Reactor Coolant System components. The ASME Code of record for Turkey Point Units 3 and 4 for the Fourth 10-year inservice inspection interval is the 1998 Edition with Addenda through 2000 of the American Society of Mechanical Engineers (ASME) Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components." FPL will be performing examinations, associated with Relief Requests 34 and 35 during the first refueling outage of the Fourth 10-year interval, Fall 2004 for Unit 3, and the Spring 2005 for Unit 4, and crediting the examinations to the Third 10-year inservice inspection interval utilizing the provision of ASME Section XI, paragraph IWA-2430.

For Relief Request 34, pursuant to 10CFR 50.55a (a)(3)(i), FPL requests approval to implement an alternative to the requirements within ASME Section XI, 1998 Edition with Addenda through 2000, Appendix VIII, Supplement 10, Qualification Requirements for Dissimilar Metal Piping Welds. FPL previously submitted Relief Request 33, "Alternative Requirements for Implementation of Appendix VIII, Supplement 10," and received approval (Safety Evaluation dated July 31, 2003 – TAC Nos. MB7973 & MB7974) to implement alternative requirements for the implementation of Appendix VIII, Supplement 10. Relief Request 34 is specifically for through wall sizing of flaws identified during examinations of dissimilar metal welds from the inside surface. For Relief Request 35, pursuant to 10CFR 50.55a (a)(3)(i), FPL requests approval to implement an alternative to the requirements within ASME Section XI, 1998 Edition with Addenda through 2000, Appendix I, Article I-2100(b), for examinations from the reactor vessel inside surface.

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NRC has previously approved similar relief requests for Virgil C. Summer Nuclear Station (TAC No. MC0108), in safety evaluations dated February 3, 2004 and March 19, 2004.

Relief Requests 34 and 35 are needed to support examinations during the Turkey Point Unit 3 Fall 2004 refueling outage. We request approval of these reliefs as soon as practical to support the upcoming outage scheduled to begin September 27, 2004.

Please contact Walter Parker at (305) 246-6632, if there are any questions.

Sincerely,

A handwritten signature in black ink that reads "Terry O. Jones". The signature is written in a cursive, flowing style.

Terry O. Jones
Vice President
Turkey Point Plant

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Attachments

NRC Regulatory Issue Summary 2001-05 waived the requirements that multiple copies of documents be submitted to the NRC.

**Turkey Point Units 3 and 4
Third Inservice Inspection Interval
Relief Request Number 34**

Proposed Alternative
In Accordance with 10 CFR 50.55a (a)(3)(i)

Alternative Provides Acceptable Level of Quality and Safety

**"ALTERNATIVE THROUGH-WALL SIZING REQUIREMENTS FOR IMPLEMENTATION OF
APPENDIX VIII, SUPPLEMENT 10"**

1. ASME Code Component(s) Affected

Class 1, Pressure Retaining Piping Welds subject to Ultrasonic (UT) examination using procedures, personnel, and equipment qualified to ASME Section XI, 1998 Edition with Addenda through 2000, Appendix VIII, Supplement 10.

UNIT 3				
Component Identification	Description	Inside Diameter	Wall Thickness	Base/ Weld Material
27.5"-RCS-1306-14 27.5"-RCS-1307-14 27.5"-RCS-1309-14	Cold Leg Elbow to Nozzle	27.5 inch	2.4 inch	Carbon Steel Nozzle buttered with Stainless Steel. Field welded to cast stainless steel elbow with stainless steel weld material
29"-RCS-1304-1 29"-RCS-1305-1 29"-RCS-1308-1	Hot Leg Nozzle to Pipe	29 inch	2.6 inch	Carbon Steel Nozzle buttered with Stainless Steel. Field welded to forged stainless steel pipe with stainless steel weld material

UNIT 4				
Component Identification	Description	Inside Diameter	Wall Thickness	Base/ Weld Material
27.5"-RCS-1406-14 27.5"-RCS-1407-14 27.5"-RCS-1409-14	Cold Leg Elbow to Nozzle	27.5 inch	2.4 inch	Carbon Steel Nozzle buttered with Stainless Steel. Field welded to cast stainless steel elbow with stainless steel weld material
29"-RCS-1404-1 29"-RCS-1405-1 29"-RCS-1408-1	Hot Leg Nozzle to Pipe	29 inch	2.6 inch	Carbon Steel Nozzle buttered with Stainless Steel. Field welded to forged stainless steel pipe with stainless steel weld material

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2. Applicable Code Edition and Addenda

The Code of Record for the Turkey Point Units 3 and 4 fourth 10-year inservice inspection interval is the 1998 Edition with Addenda through 2000 of the American Society of Mechanical Engineers (ASME) Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components."

FPL is performing the examinations during the first outage of the fourth 10-year interval, Fall 2004 (Unit 3) and the Spring 2005 (Unit 4), and crediting the examinations to the third 10-year inservice inspection interval utilizing the provision of ASME Section XI, paragraph IWA-2430.

3. Applicable Code Requirement

Pursuant to 10CFR 50.55a (a)(3)(i), Florida Power and Light Company (FPL) requests approval to implement an alternative to the requirements within ASME Section XI, 1998 Edition with Addenda through 2000, Appendix VIII, Supplement 10, Qualification Requirements for Dissimilar Metal Piping Welds. FPL previously submitted Relief Request 33, "Alternative Requirements for Implementation of Appendix VIII, Supplement 10," and received approval (SE dated July 31, 2003 – TAC Nos. MB7973 & MB7974) to implement alternative requirements for the implementation of Appendix VIII, Supplement 10. This request for relief is specifically for through wall sizing of flaws identified during examinations of dissimilar metal welds from the inside surface.

Paragraph 3.2(b) of ASME Section XI, Appendix VIII, Supplement 10, states that the examination procedures, equipment, and personnel are qualified for depth sizing when the root mean square error (RMSE) of the flaw depth measurements, as compared to the true flaw depths, is less than or equal to 0.125 inch.

Exam Cat.	Item No.	Examination Description
R-A	R1.11	Volumetric examination of essentially 100% of the weld length of selected welds during the interval.
Note: Turkey Point Unit 3 Relief Request 27 (SE dated November 30, 2000 - TAC No. MA8111) and Unit 4 Relief Request 32 (SE dated August 1, 2003- TAC No. MB5551) were approved to implement a Risk-Informed program as an alternative to Section XI for Code Categories B-F and B-J. Therefore, the Turkey Point Units 3 and 4 ASME Section XI Code Category B-F, Item No. B5.10 has been changed to Category R-A, Item No. R1.11.		

4. Reason for Request

FPL is required to perform the UT examination of the reactor vessel nozzle-to-safe end welds in accordance with the requirements of 10CFR50.55a, Technical Specifications, and the 1998 Edition with Addenda through 2000 of the ASME Section XI. This code edition invokes the examination requirements of Appendix VIII, Supplement 10. The examination is performed from the nozzle inside surface with remote tooling.

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FPL requests relief to use the following alternative requirements for implementation of Appendix VIII, Supplement 10. These alternatives will be implemented through the Performance Demonstration Initiative (PDI) Program.

5. Proposed Alternative and Basis for Use

Proposed Alternative:

Florida Power & Light requests an alternative to paragraph 3.2(b) of the ASME Section XI Code to evaluate the vendor's depth sizing performance of 0.224 inch RMSE against the ASME Code Section XI, Appendix VIII, Supplement 10 flaw depth sizing tolerance for dissimilar metal welds of 0.125 inch RMSE and determine the appropriate sizing error to consider during such flaw evaluation. FP&L proposes to add the difference between the vendor's achieved sizing error and the Code required value to the size of flaws measured during the examination for the purpose of flaw evaluation.

Basis for use:

Florida Power & Light has been informed that its inspection vendor, Framatome ANP/Areva, has been unsuccessful at achieving the 0.125 inch RMSE depth sizing criterion for the procedure and personnel qualifications. To date, there has not been a vendor who has met the RMSE Code requirement for examinations from the inside surface. Section XI, Appendix VIII, Supplement 10, "Qualification Requirements for Dissimilar Metal Piping Welds," performance demonstrations include both field and shop weld configurations. The ASME Section XI, Appendix VIII qualified procedure, 54-ISI-822-00, "ID Automated Ultrasonic Examination of Austenitic and Dissimilar Metal Piping Welds for Depth Sizing", which will be used for Florida Power & Light's hot and cold leg weld examinations achieved an RMSE depth sizing error of 0.224 inch when sizing from the inside surface for the wall thickness range in the demonstration test set.

Configuration	RMS (inches)
Shop Welds	.232
Field Welds	.215
Shop and Field Welds Combined	.224

Compliance with the proposed alternatives will provide an acceptable level of quality and safety for examination of the affected welds.

6. Duration of Proposed Alternative

The NRC is requested to approve this relief request for Turkey Point's Units 3 and 4 Third Inservice Inspection Interval.

7. Attachments to Relief Request No. 34

None.

**Turkey Point Units 3 and 4
Third Inservice Inspection Interval
Relief Request Number 35**

Proposed Alternative
In Accordance with 10 CFR 50.55a (a)(3)(i)

Alternative Provides Acceptable Level of Quality and Safety

"ALTERNATIVE ULTRASONIC EXAMINATION FOR THE REACTOR FLANGE-TO-UPPER SHELL WELDS USING PDI DEMONSTRATED TECHNIQUES"

1. ASME Code Component(s) Affected

Class 1 Reactor Vessel Flange-to-Upper Shell Welds (Welds Number 3-WR-18 and 4-WR-18) subject to Ultrasonic (UT) examination.

2. Applicable Code Edition and Addenda

The code of record for the Turkey Point Units 3 and 4 Fourth 10-year inservice inspection interval is the 1998 Edition with Addenda through 2000 of the American Society of Mechanical Engineers (ASME) Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components."

FPL is performing the examinations during the first refueling outage of the Fourth 10-year interval, Fall 2004 (Unit 3) and the Spring 2005 (Unit 4), and crediting the examinations to the Third 10-year inservice inspection interval utilizing the provision of ASME Section XI, paragraph IWA-2430.

3. Applicable Code Requirement

Pursuant to 10CFR 50.55a (a)(3)(i), Florida Power and Light Company (FPL) requests approval to implement an alternative to the requirements within ASME Section XI, 1998 Edition with Addenda through 2000, Appendix I, Article I-2100. Subparagraph I-2110(b) requires "ultrasonic examinations of reactor vessel-to-flange welds, closure-head-to-flange welds, and integral attachment welds be conducted in accordance with Article 4 of Section V except that alternative examination beam angles may be used. These examinations shall be further supplemented by Table I-2000-1."

Exam Cat.	Item No.	Examination Description
B-A	B1.30	Essentially 100% volumetric examination of the reactor vessel-to-flange weld in accordance with Appendix I, Article I-2000

4. Reason for Request

FPL is required to perform the UT examination of the reactor vessel-to-flange weld in accordance with the requirements of 10CFR50.55a, Technical Specifications, and the 1998 Edition with Addenda through 2000 of the ASME Section XI. This code edition invokes the

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examination requirements of Appendix I, Article I-2000 that essentially prescribes 20-year old examination methodology. The examination is performed from the reactor vessel inside surface and the flange surface. This examination methodology is typically "qualified" by calibration on side drilled holes in a calibration block fabricated from similar material.

In the 1989 Addenda of ASME Section XI, a qualification by performance demonstration, Appendix VIII, approach for UT examinations was introduced. In September 1999, 10CFR50.55a was issued and required an expedited implementation of Appendix VIII supplements in accordance with specific dates. ASME Section XI, Appendix I requires implementation of Appendix VIII for reactor vessel welds. However, Section XI, Appendix I, Subparagraph I-2110(b) specifically excludes the reactor vessel-to-flange weld from qualification by performance demonstration in accordance with Appendix VIII. FPL believes that supplementing the ASME Section XI Appendix I examination from the flange surface with the performance of the reactor vessel inside surface examination using procedures, equipment, and personnel qualified by demonstration in accordance with Appendix VIII, Supplement 4 (clad-base metal interface) and 6 (vessel welds other than clad-base metal interface) will provide an acceptable level of safety and surpass the quality of the generic examination techniques specified by the referenced code edition.

5. Proposed Alternative and Basis for Use

Proposed Alternative:

FPL requests an alternative to the ASME Section XI, Article I-2110(b) required examination from the reactor vessel inside surface. FPL proposes supplementing the ASME Section XI Appendix I examination from the flange surface with the examination from the reactor vessel inside surface using procedures, equipment, and personnel qualified by demonstration to perform remote mechanized examination of the reactor vessel flange-to-shell weld from the inside surface in accordance with ASME Code, Section XI, Appendix VIII, Supplements 4 and 6, in lieu of Section V, Article 4 requirements. The ASME Section XI, Appendix VIII qualified procedures, 54-ISI-801, "Automated UT of PWR Vessel Shell Welds," have been demonstrated to perform detection, length sizing and through-wall sizing of reactor vessel shell welds, including those of similar thickness and material composition as the flange-to-shell weld. The procedures, equipment, and personnel for the remote mechanized examination from the inside surface have been qualified by demonstration in accordance with the Performance Demonstration Initiative (PDI) Program.

Basis for Use:

The Appendix VIII procedure is technically superior to the standard ASME Code, Section V, Article 4 methodologies that are amplitude based. Enhanced performance is possible by (a) increased sensitivity to flaws, (b) demonstrated flaw measurement capability using amplitude independent sizing techniques, and (c) compatibility of the Appendix VIII examination technique with the flange-to-shell weld joint geometry resulting in good ultrasonic beam coverage.

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- (a) **Increased sensitivity to Flaws:** The Appendix VIII procedure is more sensitive to flaws because the exam sensitivity level compares to the ASME DAC (distance amplitude correction) level of 10 percent DAC. Previous examinations of the reactor vessel shell welds in accordance with ASME Section V were conducted at the less sensitive level of 50 percent DAC for flaws located in the outer 80 percent of the material thickness and 20 percent DAC for flaws located from the clad-base metal interface to a depth of about 20 percent thickness (i.e., near surface region).

The Appendix VIII procedure offers an additional level of assurance in the detection of flaws because the procedure requires that all signals interpreted by the analyst as flaws, regardless of amplitude response, shall be measured and assessed in accordance with the applicable criteria. The Appendix VIII procedure recognizes that some flaws can exhibit low amplitude response depending on orientation. This evidence has not been factored into the ASME Section V techniques that have traditionally had a flaw response cut-off point of 20 percent DAC.

- (b) **Demonstrated Flaw Measurement Capability using Amplitude Independent Sizing Techniques:** 54-ISI-801, "Automated UT of PWR Vessel Shell Welds" in accordance with ASME Section XI, Appendix VIII, Supplements 4 and 6 was demonstrated in 2004 to the Electric Power Research Institute (EPRI) Performance Demonstration Initiative (PDI). The reference number for the performance demonstration test is PDQS No. 449.

The procedure complies with ASME Code, Section XI 1998 Edition with Addenda through 2000 as modified by 10CFR50.55a. The procedure was qualified using tip diffraction sizing techniques, which are amplitude independent. The amplitude based flaw bounding criteria specified in ASME Section V procedures have been proven inaccurate because the size of the reflection is measured. This may or may not accurately reflect true flaw sizes.

- (c) **Compatibility of the Appendix VIII technique to the flange-to-shell weld joint and synergy with the previous examination:** The Appendix VIII shell weld examination procedure requires the use of 45°L, 45°S, and 70°L to examine the weld and heat affected zone. The procedure requires the exam volume to be examined with sound beams in four orthogonal directions although it has also been successfully demonstrated as a single sided examination technique. The increment size is 0.5 inch for dual side examinations and 0.2 inch for single side examinations. When examination coverage using Appendix VIII techniques are combined with the manual examination performed from the flange seal surface, the expected coverage is a minimum of 68 percent. It is not anticipated that greater coverage could be obtained scanning along the ID surface by using additional transducers and beam angles, due to the fact that the flange taper geometry will partially obstruct the path of all transducers. The Attachment to Relief Request No. 35 illustrates that the inner 15 percent is well interrogated, with the exception of the area directly beneath the curved surface above the weld. This is a common limitation for the flange-top-shell weld joint.

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The last remote mechanized exam of the flange-to-shell weld was conducted in 1990. At that time 45, 60, and 50/70 degree exam angles were used, and the results were acquired and analyzed using an automated ultrasonic exam system. No indications were found exceeding the allowable limits of Section XI. Scan limitations were reported due to the flange inside surface configuration.

Florida Power & Light will ensure that the flange-to-shell weld is examined from the inside surface with ultrasonic examination techniques qualified by demonstration in lieu of standard amplitude based ultrasonic examination techniques currently specified. The examination will be conducted to the maximum extent practical in four orthogonal directions. When these results are combined with the manual examination performed from the flange seal surface, the coverage is expected to be 68 percent. The examination sensitivity and flaw measurement capability of the proposed alternative are superior to the method prescribed and coverage will be acceptable, considering the difficult geometric presentation.

6. Duration of Proposed Alternative

The NRC is requested to approve this relief request for Turkey Point's Units 3 and 4 Third Inservice Inspection Interval.

7. Attachments to Relief Request 35

- 1) Description of 3-WR-18 Weld Coverage Calculations

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Attachment to Relief Request 35

