



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
OF THE THIRD TEN YEAR INTERVAL INSERVICE INSPECTION PROGRAM PLAN

REQUEST FOR RELIEF NO. 16

FLORIDA POWER AND LIGHT COMPANY

TURKEY POINT, UNITS 3 AND 4

DOCKET NUMBERS: 50-250 AND 50-251

1.0 INTRODUCTION

The Technical Specifications for Turkey Point, Units 3 and 4 state that the inservice inspection of the American Society of Mechanical Engineers (ASME) Code Class 1, 2, and 3 components shall be performed in accordance with Section XI of the ASME Boiler and Pressure Vessel Code and applicable Addenda as required by Title 10 of the Code of Federal Regulations (10 CFR) 50.55a(g), except where specific written relief has been granted by the Commission pursuant to 10 CFR 50.55a(g)(6)(i). Section 50.55a(a)(3) states that alternatives to the requirements of paragraph (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 difficulties 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 preservice examination requirements, set forth in the ASME Code, Section XI, "Rules for Inservice Inspection 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 applicable edition of Section XI of the ASME Code for the Turkey Point, Units 3 and 4 third 10-year inservice inspection (ISI) interval is the 1989 Edition. The components (including supports) may meet the requirements set forth in subsequent editions and addenda of the ASME Code incorporated by reference in 10 CFR 50.55a(b) subject to the limitations and modifications listed therein and subject to Commission approval.

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Pursuant to 10 CFR 50.55a(g)(5), if the licensee determines that conformance with an examination requirement of Section XI of the ASME Code is not practical for its facility, information shall be submitted to the Commission in support of that determination and a request made for relief from the ASME Code requirement. After evaluation of the determination, pursuant to 10 CFR 50.55a(g)(6)(i), the Commission may grant relief and may impose alternative requirements that are determined to be authorized by law, will not endanger life, property, or the common defense and security, and are otherwise in the public interest, giving due consideration to the burden upon the licensee that could result if the requirements were imposed. In a letter dated December 14, 1995, Florida Power and Light Company submitted to the NRC its Third Ten-Year Interval Inservice Inspection Program Plan, Request for Relief No. 16 regarding the use of Code Case N-416-1 as an alternative to Code requirements and to use the 1989 Code Edition in lieu of the 1992 Code Edition specified by Code Case N-416-1 for Turkey Point, Units 3 and 4.

2.0 EVALUATION AND CONCLUSIONS

The staff, with technical assistance from its contractor, the Idaho National Engineering Laboratory (INEL), has evaluated the information provided by the licensee in support of its second 10-year interval inservice inspection program plan, request to use Code Case N-416-1, and to use the 1989 Code Edition in lieu of the 1992 Code Edition as stipulated in Code Case N-416-1 for Turkey Point, Units 3 and 4.

The 1989 Editions of Sections III and XI are the latest Code editions referenced in 10 CFR 50.55a. The NRC staff has compared the system pressure test requirements of the 1992 Edition of Section XI to those of the 1989 Edition and found minor differences between the two editions.

The licensee also requested to invoke Code Case N-416-1 for a previous replacement of Turkey Point, Unit 4, Class 2 steam generator nozzle-to-reducer joints which had originally invoked Code Case N-416. Code Case N-416-1 allows the deferred hydrostatic test of Code Case N-416 to be eliminated once the requirements of Code Case N-416-1 have been met.

In summary, compliance with the Code-required hydrostatic testing for welded repairs or replacements of Code Class 1, 2, and 3 components would result in a hardship without a compensating increase in the level of quality and safety. Furthermore, it is the opinion of the staff that Code Case N-416-1 requires use of the 1992 Edition of Section XI for the pressure test variables alone, and not the certification of visual examiners. Performance of a system leakage test in accordance with the 1992 Edition of Section XI, at nominal operating temperature and pressure, using a VT-2 visual examiner certified in accordance with the 1989 Edition of Section XI, is acceptable.

Therefore, the licensee's proposed alternative, use of Code Case N-416-1, is authorized pursuant to 10 CFR 50.55a(a)(3)(ii), provided (1) an additional surface examination is performed on the root pass layer of butt and socket welds on the Class 3 pressure-retaining boundary during repair and replacement

activities and; 2) the system leakage test is performed in accordance with IWA-5000 of the 1992 Edition of Section XI, at nominal operating temperature and pressure. The use of this Code Case is authorized, for Turkey Point Units 3 and 4, until the Code Case is approved for general use by reference in Regulatory Guide 1.147. After that time, the licensee may continue to use Code Case N-416-1 with the limitations, if any, listed in Regulatory Guide 1.147.

Principle Contributor: T. McLellan

Date: March 11, 1996

TECHNICAL LETTER REPORT
ON THE THIRD 10-YEAR INSERVICE INSPECTION INTERVAL
REQUEST FOR RELIEF 16
TURKEY POINT UNITS 3 AND 4
FLORIDA POWER AND LIGHT COMPANY
DOCKET NUMBERS: 50-250 AND 50-251

1.0 INTRODUCTION

By letter dated December 14, 1995, Florida Power and Light Company submitted Request for Relief 16. The Idaho National Engineering Laboratory (INEL) staff has evaluated the subject request for relief in the following section.

2.0 EVALUATION

The Code of record for the Turkey Point Units 3 and 4 third 10-year inservice inspection interval, which began February 23, 1994, for Unit 3 and April 15, 1994, for Unit 4, is the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI, 1989 Edition. The information provided by the licensee in support of the request for relief from Code requirements has been evaluated and the basis for disposition is documented below.

Request for Relief 16, Use of Code Case N-416-1, Alternative Pressure Test Requirements for Welded Repairs or Installation of Replacement Items by Welding, Section XI, Division 1

Code Requirement: IWA-4700(a), *Pressure Test*, requires that after repair by welding on the pressure-retaining boundary a system hydrostatic test shall be performed in accordance with IWA-5000.

IWA-5214, *Repairs and Replacements*, requires that a component repair or replacement shall be pressure tested prior to resumption of service if required by IWA-4400 and IWA-4600.

The test pressure and temperature for a system hydrostatic test subsequent to the component repair or replacement shall comply with the system test pressure and temperature specified in IWB-5222, IWC-5222, and IWD-5223, as applicable to the system that contains the repaired or replaced component.

Licensee's Code Relief Request: The licensee has requested to use Code Case N-416-1, *Alternative Pressure Test Requirements for Welded Repairs or Installation of Replacement Items by Welding, Section XI, Division 1* following welded repairs or replacements. The licensee has also requested to use Code Case N-416-1 for the prior replacement of the Turkey Point, Unit 4 steam generator nozzle-to-reducer joints which had originally invoked Code Case N-416.

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

"Hydrostatic tests result in hardships without a compensating increase in the level of safety and quality. Their purpose is to enhance leak detection. Industry experience has demonstrated that leaks are not being discovered as a result of hydrostatic test pressures propagating a pre-existing flaw through wall. Most leaks are being found when the system is at normal operating pressure. Hydrostatic tests are time consuming, require extensive operator support, and usually mean radiation exposure to personnel. Often additional equipment must be brought in to test a localized repair/replacement, which may involve additional exposure and expense. In many cases, a system hydrostatic test must be conducted over large parts of the system.

"Code hydrostatic tests subject the piping system to a small increase in pressure over the nominal operating pressure and is not intended to present a significant challenge to pressure boundary integrity. It is used primarily as a means to enhance leak detection during the examination of components under pressure, rather than as a measure to determine the structural integrity of components.

"Monthly walkdowns by system engineers are performed on Class 2 systems outside containment to check for leakage, piping configuration, and/or damage. During outages, system engineers walk down Class 1, Class 2, and

Class 3 systems inside containment. This walkdown is performed to look for system anomalies which could effect plant performance.

"Hydrostatic tests place a burden on the systems, increase radiation exposure and costs, require significant setup time, and add marginal value (if any) to the repair or replacement quality. These tests result in hardships without a compensating increase in the level of quality and safety. Performing the tests in accordance with the proposed alternative will provide reasonable assurance that flaws will be discovered."

Licensee's Proposed Alternative Examination (as stated):

"In lieu of the Code required hydrostatic testing for repairs and replacements and the steam generator reducer welds, FPL will use the alternative rules of ASME Code Case N-416-1. The following examination requirements will be used:

- "a. NDE be performed in accordance with the methods and acceptance criteria of the 1992 Edition of Section III;
- "b. Visual examinations (VT-2) will be performed in conjunction with a system leakage test using the 1989 Edition of Section XI, in accordance with IWA-5000, at nominal operating pressure;
- "c. The use of the Code Case will be documented on the NIS-2 or equivalent, except for the steam generator reducer welds, which was submitted to the NRC (FPL letter L-93-139, dated May 17, 1993).

"FPL will comply with the requirements of the Code Case with the following exception:

"FPL will perform VT-2 examinations using the requirements of the 1989 Edition of Section XI instead of the 1992 Edition as specified in Code Case N-416-1. FPL's current ISI Program meets the 1989 Edition of Section XI and has proven effective at finding leaks. The 1992 Edition of Section XI would require the creation and maintenance of a separate VT-2 program, and would not be cost effective."

Evaluation: Section XI of the Code requires a system hydrostatic test to be performed in accordance with IWA-5000 after repairs made by welding on the pressure-retaining boundary. Code Case N-416-1 specifies that NDE of the welds be performed in accordance with the applicable subsection of the 1992 Edition of Section III. The Code Case allows a VT-2 visual examination to be performed at nominal operating pressure and temperature in conjunction with a system leakage test, in accordance with Paragraph IWA-5000 of the 1992 Edition of Section XI. Furthermore, the

Code Case allows the deferred hydrostatic test of Code Case N-416 to be eliminated once the requirements of Code Case N-416-1 have been met.

The 1989 Editions of Sections III and XI are the latest Code editions referenced in 10 CFR 50.55a. The NRC staff has compared the system pressure test requirements of the 1992 Edition of Section XI to those of the 1989 Edition. In summary:

- 1) The test frequencies and the pressure conditions associated with these tests have not changed;
- 2) The hold times have either remained unchanged or increased;
- 3) The terminology associated with the system pressure test requirements for all three Code classes has been clarified and streamlined; and
- 4) The NDE requirements for welded repairs remain the same.

Piping components are designed to withstand the loading mechanisms that are postulated to occur under the various modes of plant operation. Hydrostatic testing subjects the piping components to a small increase in pressure over the design pressure and, therefore, does not present a significant challenge to pressure boundary integrity. Accordingly, Section XI hydrostatic pressure testing is primarily regarded as a means to enhance leak detection during the examination of components under pressure rather than a measure of the structural integrity of the components.

Considering the NDE performed on Code Class 1 and 2 systems and that the hydrostatic pressure tests rarely result in pressure boundary leaks that would not have occurred during system leakage tests, it is the opinion of the INEL staff that the added assurance of integrity provided by the hydrostatic test is not commensurate with the associated burden, which typically includes the installation of blanks, cutting and removing supports for access, and removing insulation to prepare and restore the systems, all of which increase radiation exposure for plant personnel.



However, for Class 3 components, there are no ongoing NDE requirements except for the visual examination for leaks in conjunction with the 10-year hydrostatic test and periodic pressure tests. Therefore, eliminating the hydrostatic test and solely performing the system pressure test for Class 3 components is only considered acceptable if an additional surface examination is performed on the root pass layer of butt and socket welds on the pressure-retaining boundary during repair and replacement activities.

The licensee's alternative includes an exception to Code Case N-416-1. This proposed exception is to certify visual examiners using the requirements of the 1989 Edition of Section XI instead of the 1992 Edition. The INEL staff believes that it was the intent of Code Case N-416-1 to require use of the 1992 Edition of Section XI for the pressure test variables alone, and not the certification of visual examiners. Therefore, this exception is acceptable. Code Case N-416-1 requires the system leakage test and associated VT-2 visual examination to be performed in accordance with the 1992 Edition of Section XI. Therefore all requirements of IWA-5000 of the 1992 Edition of Section XI, including the ten-minute hold time for non-insulated components, and four-hour hold time for insulated components, must be met. Furthermore, Code Case N-416-1 adds the additional requirement that the system leakage test be performed at nominal operating pressure and *temperature*.

The licensee also requested to invoke this Code Case for a previous replacement that had used Code Case N-416. Code Case N-416-1 allows the deferred hydrostatic test of Code Case N-416 to be eliminated once the requirements of Code Case N-416-1 have been met.

In summary, compliance with the Code-required hydrostatic testing for welded repairs or replacements of Code Class 1, 2, and 3 components would result in a hardship without a compensating increase in the level of quality and safety as described above. Furthermore, it is the opinion of the INEL staff that Code Case N-416-1 requires use of the 1992 Edition of Section XI for the pressure test variables alone, and not the certification

of visual examiners. Performance of a system leakage test in accordance with the 1992 Edition of Section XI, at nominal operating temperature and pressure, using a VT-2 visual examiner certified in accordance with the 1989 Edition of Section XI, is acceptable. Therefore, it is recommended that the proposed alternative, use of Code Case N-416-1, be authorized pursuant to 10 CFR 50.55a(a)(3)(ii), provided; 1) an additional surface examination is performed on the root pass layer of butt and socket welds on the Class 3 pressure-retaining boundary during repair and replacement activities and; 2) the system leakage test is performed in accordance with IWA-5000 of the 1992 Edition of Section XI, at nominal operating temperature and pressure.

3.0 CONCLUSION

The INEL staff has evaluated Request for Relief 16. It was concluded that compliance with the Code-required hydrostatic testing for welded repairs or replacements of Code Class 1, 2, and 3 components would result in a hardship without a compensating increase in the level of quality and safety. Performance of the a system leakage test in accordance with the 1992 Edition of Section XI using VT-2 visual examiners certified in accordance with the 1989 Edition of Section XI, will provide reasonable assurance of operational readiness. Therefore, it is recommended that Request for Relief 16, be authorized pursuant to 10 CFR 50.55a(a)(3)(ii), provided; 1) an additional surface examination is performed on the root pass layer of butt and socket welds on the Class 3 pressure-retaining boundary during repair and replacement activities and; 2) the system leakage test is performed in accordance with IWA-5000 of the 1992 Edition of Section XI, at nominal operating temperature and pressure. The use of this Code Case should be authorized, for Turkey Point Units 3 and 4, until the Code Case is approved for general use by reference in Regulatory Guide 1.147. After that time, the licensee may continue to use Code Case N-416-1 with the limitations, if any, listed in Regulatory Guide 1.147.



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