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Technical Evaluation Report on the Third 10-year Interval Inservice Inspection Program Plan: Florida Power and Light Company, Turkey Point Nuclear Power Plant, Units 3 and 4, Docket Numbers 50-250 and 50-251

B. W. Brown
E. J. Feige
S. G. Galbraith
A. M. Porter

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Idaho National Engineering Laboratory
Lockheed Idaho Technologies Company
Idaho Falls, Idaho 83415

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ABSTRACT

This report presents the results of the evaluation of the *Turkey Point Nuclear Power Plant, Units 3 and 4, Third 10-Year Interval Inservice Inspection Program Plan*, Revision 0, submitted September 9, 1993, including the requests for relief from the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI, requirements that the licensee has determined to be impractical. The *Turkey Point Nuclear Power Plant, Units 3 and 4, Third 10-Year Interval Inservice Inspection Program Plan* is evaluated in Section 2 of this report. The inservice inspection (ISI) program plan is evaluated for (a) compliance with the appropriate edition/addenda of Section XI, (b) acceptability of the examination sample, (c) correctness of the application of system or component examination exclusion criteria, and (d) compliance with ISI-related commitments identified during previous Nuclear Regulatory Commission (NRC) reviews. The requests for relief are evaluated in Section 3 of this report.

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SUMMARY

The licensee, Florida Power and Light, has prepared the *Turkey Point Nuclear Power Plant, Units 3 and 4, Third 10-Year Interval Inservice Inspection Program Plan*, Revision 0, to meet the requirements of the ASME Boiler and Pressure Vessel Code, Section XI, 1989 Edition. The third 10-year interval began February 23, 1994, for Unit 3 and April 15, 1994, for Unit 4.

The information in the *Turkey Point Nuclear Power Plant, Units 3 and 4, Third 10-Year Interval Inservice Inspection Program Plan*, Revision 0, submitted September 9, 1993, was reviewed. Included in the review were the requests for relief from the ASME Code Section XI requirements that the licensee has determined to be impractical.

In the review of the *Turkey Point Nuclear Power Plant, Units 3 and 4, Third 10-Year Interval Inservice Inspection Program Plan*, Revision 0, the licensee's responses to the Nuclear Regulatory Commission's request for additional information (RAI), and the recommendations for granting relief from the ISI examinations that cannot be performed to the extent required by Section XI of the ASME Code, the only deviations from regulatory requirements or commitments identified were in Requests for Relief 3 (in part), 6, 9, and 10 and the exceptions noted in Section 2.3 of this report. Request for Relief 4 will be evaluated by the Mechanical Engineering Branch.

CONTENTS

TECHNICAL EVALUATION REPORT ON THE
THIRD 10-YEAR INTERVAL INSERVICE INSPECTION PROGRAM PLAN
FLORIDA POWER AND LIGHT COMPANY
TURKEY POINT NUCLEAR POWER PLANT, UNITS 3 AND 4
DOCKET NUMBERS 50-250 AND 50-251

1. INTRODUCTION

Throughout the service life of a water-cooled nuclear power facility, 10 CFR 50.55a(g)(4) (Reference 1) requires that components (including supports) that are classified as American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code Class 1, Class 2, and Class 3 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* (Reference 2), to the extent practical within the limitations of design, geometry, and materials of construction of the components. This section of the regulations also requires that inservice examinations of components and system pressure tests conducted during successive 120-month inspection intervals shall comply with the requirements in the latest edition and addenda of the Code incorporated by reference in 10 CFR 50.55a(b) on the date 12 months prior to the start of the 120-month inspection interval, subject to the limitations and modifications listed therein. The components (including supports) may meet requirements set forth in subsequent editions and addenda of this Code that are incorporated by reference in 10 CFR 50.55a(b) subject to the limitations and modifications listed therein and subject to Nuclear Regulatory Commission (NRC) approval. The licensee, Florida Power and Light Company (FPL), has prepared the *Turkey Point Nuclear Power Plant, Units 3 and 4, Third 10-Year Interval Inservice Inspection Program Plan*, Revision 0 (Reference 3), to meet the requirements of the 1989 Edition of the Code. The third 10-year interval began February 23, 1994, for Unit 3 and April 15, 1994, for Unit 4.

As required by 10 CFR 50.55a(g)(5), if the licensee determines that certain Code examination requirements are impractical and requests relief from them, the licensee shall submit information and justification to the NRC to support that determination.

Pursuant to 10 CFR 50.55a(g)(6), the NRC will evaluate the licensee's determination that Code requirements are impractical to implement. The NRC 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 on the facility.

Alternatively, pursuant to 10 CFR 50.55a(a)(3), the NRC will evaluate the licensee's determination that either (i) the proposed alternatives provide an acceptable level of quality and safety, or (ii) Code compliance would result in hardship or unusual difficulty without a compensating increase in safety. Proposed alternatives may be used when authorized by the NRC.

The information in the *Turkey Point Nuclear Power Plant, Units 3 and 4, Third 10-Year Interval Inservice Inspection Program Plan*, Revision 0, submitted September 9, 1993, was reviewed, including the requests for relief from the ASME Code Section XI requirements that the licensee has determined to be impractical. The review of the ISI Program Plan was performed using the Standard Review Plans (SRP) of NUREG-0800 (Reference 4), Section 5.2.4, "Reactor Coolant Boundary Inservice Inspections and Testing," and Section 6.6, "Inservice Inspection of Class 2 and 3 Components."

In a letter dated April 4, 1994 (Reference 5), the NRC requested additional information that was required to complete the review of the ISI Program Plan. Florida Power and Light provided the requested information in a letter dated May 31, 1994 (Reference 6). In this response, Sections 2.5.4 and 4.5 were revised and three additional requests for relief were submitted.

The *Turkey Point Nuclear Power Plant, Units 3 and 4, Third 10-Year Interval Inservice Inspection Program Plan* is evaluated in Section 2 of this report. The ISI Program Plan is evaluated for (a) compliance with the appropriate edition/addenda of Section XI, (b) acceptability of examination sample, (c) correctness of the application of system or component examination exclusion criteria, and (d) compliance with ISI-related commitments identified during the NRC's previous reviews.

The requests for relief are evaluated in Section 3 of this report. Unless otherwise stated, references to the Code refer to the ASME Code, Section XI, 1989 Edition. Specific inservice test (IST) programs for pumps and valves are being evaluated in other reports.

2. EVALUATION OF INSERVICE INSPECTION PROGRAM PLAN

This evaluation consists of a review of the applicable program documents to determine whether or not they are in compliance with the Code requirements and any previous license conditions pertinent to ISI activities. This section describes the submittals reviewed and the results of the review.

2.1 Documents Evaluated

Review has been completed on the following information from the licensee:

(a) *Third Ten-Year Inservice Inspection Program for Turkey Point Nuclear Power Plant, Units 3 and 4*, submitted September 9, 1993 (Reference 3).

(b) Response to Request for Additional Information, Third 10-Year Interval Inservice Inspection Program, submitted May 31, 1994 (Reference 6).

2.2 Compliance with Code Requirements

2.2.1 Compliance with Applicable Code Editions

The ISI Program shall be based on the Code editions defined in 10 CFR 50.55a(g)(4) and 10 CFR 50.55a(b). Based on the starting dates of February 23, 1994, for Unit 3 and April 15, 1994, for Unit 4, the Code applicable to the third interval ISI program is the 1989 Edition. As stated in Section 1 of this report, the licensee has prepared the *Turkey Point Nuclear Power Plant, Units 3 and 4, Third 10-Year Interval Inservice Inspection Program Plan* to meet the requirements of the 1989 Edition.

2.2.2 Acceptability of the Examination Sample

Inservice volumetric, surface, and visual examinations shall be performed on ASME Code Class 1, 2, and 3 components and their supports using sampling schedules described in Section XI of the ASME Code and 10 CFR 50.55a(b). The sample size and weld selection have been

implemented in accordance with the Code and 10 CFR 50.55a(b) and appear to be correct.

2.2.3 Exemption Criteria

The criteria used to exempt components from examination shall be consistent with Paragraphs IWB-1220, IWC-1220, IWC-1230, IWD-1220, and 10 CFR 50.55a(b). The exemption criteria have been applied by the licensee in accordance with the Code, as discussed in the ISI Program Plan, and appear to be correct.

2.2.4 Augmented Examination Commitments

In addition to the requirements specified in Section XI of the ASME Code, the licensee has committed to perform the following augmented examinations:

(a) Volumetric and surface examination of the Reactor Coolant Pump Flywheels in accordance with Regulatory Guide 1.14 (Reference 7)

(b) Reactor pressure vessel examinations, including the closure head, in accordance with Regulatory Guide 1.150, Rev. 1 (Reference 8)

(c) Examination of welds in those portions of systems addressed in USNRC Branch Technical Position APCSB 3.1 para. B.2.c(4)

(d) Examination of welds in those portions of systems addressed in SRP 6.6 paragraph I.8

(e) Steam Generator Feedwater Nozzle Piping Augmented Examination - FPL will perform an augmented examination each refueling outage on the Steam Generator Feedwater Nozzle piping from the nozzle taper to a point one pipe diameter down on the first elbow. These examinations will continue until an engineering evaluation concludes that they are no longer required.

2.3 Conclusions

Based on the review of the documents listed above, it is concluded that the *Turkey Point Nuclear Power Plant, Units 3 and 4, Third 10-Year Interval Inservice Inspection Program Plan*, Revision 0, no deviations from regulatory requirements or commitments have been identified with the exception of the following:

Component Supports (Section 2.5.4)

The licensee has stated in its ISI Program, "Component supports with flaw indications that are accepted for continued service by evaluation need not be scheduled for reexamination except as required by Inspection Plan B."

This position is unacceptable. When component supports are found unacceptable during ISI and require evaluation and acceptance for continued service, the requirements for successive examinations must be met. Successive examinations are used to verify that a stable condition exists for flaw indication/findings.

Support Indications (Section 4.5 Component)

The licensee has stated in the response to the RAI, "If an evaluation is conducted on a component support in accordance with IWF-3122.3 and the support is analyzed and/or tested to the extent necessary to substantiate its integrity for its intended service, then corrective action and additional exams are not required."

This position is unacceptable. IWF-3122.3, "Acceptance by Evaluation or Test", is an alternative to IWF-3122.2, "Acceptance by Correction", for component supports found unacceptable for continued service. When conditions are found during ISI that require evaluation for acceptance for continued service, the requirements for additional examinations must be met. This concept is further substantiated by the requirement to perform successive examinations for flaws found acceptable for continued service by evaluation or

tests. Additional examinations validate that findings are isolated and provide assurance of system integrity.

Class 2 Piping Welds

In the RAI (Reference 5), it was recommended that the licensee augment the examination of Class 2 piping welds in the Residual Heat Removal, Emergency Core Cooling, and Containment Heat Removal Systems by volumetric examination of a sample of welds excluded from selection based on wall thickness. In the response to the RAI (Reference 6), the licensee noted that additional examinations are not warranted. The INEL staff maintains that due to the safety significance of the subject systems, the licensee should reconsider its position and augment their ISI program by volumetric examination of a sample of thin-wall pipe welds in portions of the subject systems. Volumetric examination of these welds, excluded from examination based on wall thicknes, will provide assurance that any flaws that may develop in these welds will be identified prior to leakage.

3. EVALUATION OF RELIEF REQUESTS

The requests for relief from the Code requirements that the licensee has determined to be impractical for the third 10-year inspection interval are evaluated in the following sections.

3.1 Class 1 Components

3.1.1 Reactor Pressure Vessel

3.1.1.1 Request for Relief No. 1, Examination Category B-A, Item B1.30, Shell-to-Flange Weld in the Reactor Pressure Vessel and Examination Category B-D, Item B3.90, Reactor Pressure Vessel Nozzle-to-Shell Welds

Code Requirement: Section XI, Table IWB-2500-1, Examination Category B-A, Item B1.30 requires 100% volumetric examination of the reactor pressure vessel shell-to-flange weld as defined in Figure IWB-2500-4.

Examination Category B-D, Item B3.90 requires 100% volumetric examination of the reactor pressure vessel nozzle-to-shell welds as defined in Figure IWB-2500-7.

Licensee's Code Relief Request: The licensee requested relief from the Code-required 100% volumetric coverage of the following welds:

Item Number	Turkey Point 3	Turkey Point 4
B1.30	3-WR-18	4-WR-18
B3.90	3-DO-A 3-DO-B 3-DO-C	4-DO-A 4-DO-B 4-DO-C

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

"Configuration of the outlet nozzles and flange-to-shell welds prohibit 100% ultrasonic examination coverage of the required code examination volume.

"1. Nozzle-to-Shell Weld Limitations

When performing computerized Ultrasonic examinations of the Nozzle to Shell Welds from the vessel wall, several areas were described as having limited examination scans. These limitations were restricted to the last several scans of the nozzle-to-shell examination and were due to the physical limitations imposed by the adjacent nozzles. The limitations all occurred in the vicinity of the 90° and 180° nozzle azimuth relative to nozzle orientation.

"2. Reactor Pressure Vessel Shell-to-Flange Weld

There are areas that did not receive 0 degree, 45 degree transverse, or 60 degree transverse weld coverage due to the geometric configuration of the flange radius located just above the weld.

Examinations performed from the shell side of the weld provided essentially 100 percent coverage of the weld and 1/2t of the base material on the shell side."

RPV Nozzle-to-Shell Weld Limitations		
Examination Type	Percentage of Coverage Achieved	Remarks
Parallel Scans	100%	None
Transverse Scans	88.79%	Exams from the shell were limited due to interference from the integral attachment

Reactor Pressure Vessel Shell to Flange Weld		
Examination Type	Percentage of Coverage Achieved	Remarks
Parallel Scans	77.22%	Exams from the shell surface were limited due to the flange inside taper
Transverse Scans	54.87%	Exams from the shell surface were limited due to the flange inside taper
Total Weld Length = 488.51"		

Licensee's Proposed Alternative Examination (as stated):

"Periodic System Leakage Tests per Category B-P and the achievable ultrasonic testing. The extent of examination volume achieved ultrasonically and the alternative system pressure tests provide assurance of an acceptable level of quality and safety."

Evaluation: The Code requires that the subject shell-to-flange and nozzle-to-shell welds be 100% volumetrically examined during the inspection interval. Due to scanning limitations and the geometry of the components, complete Code examination of the subject areas is impractical. To provide complete volumetric coverage, design modifications or component replacement with a design providing for complete coverage would be required. Imposition of this requirement would cause a considerable burden on the licensee.

The licensee proposes to perform the examinations to the extent practical. Based on the significant percentage of the Code-required volumetric coverage obtainable, it is reasonable to conclude that degradation, if present, will be detected. As a result, reasonable assurance of operational readiness will be provided.

Conclusion: Complete Code-required volumetric coverage of the reactor pressure vessel shell-to-flange and nozzle-to-shell welds is impractical due to scanning limitations. The licensee's

proposed examinations of the subject welds should provide reasonable assurance of operational readiness. Therefore, pursuant to 10 CFR 50.55a(g)(6)(i), it is recommended that relief be granted as requested.

3.1.1.2 Request for Relief No. 13, Examination Category B-A, Item B1.40, Reactor Pressure Vessel Head-to-Flange Weld

Code Requirement: Section XI, Table IWB-2500-1, Examination Category B-A, Item B1.40 requires 100% volumetric and surface examination of the reactor pressure vessel head-to-flange weld as defined in Figure IWB-2500-5.

Licensee's Code Relief Request: The licensee requested relief from the Code-required 100% volumetric coverage of head-to-flange welds 3-WH-12 (Unit 3) and 4-WH-12 (Unit 4).

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

"The configuration of the head to flange welds on both units prohibit 100% volumetric examination coverage of the Code required volume.

"An arrow is welded to the head above stud hole No. 1. The arrow prohibits scanning a total length of 7" of head to flange weld.

"There are three welded lugs, located 120 degrees apart, that are located between stud holes 10/11, 29/30, and 48/49. Each lug prohibits 3-1/8" of circumferential scanning of the head to flange weld. The combined length of weld not examined from the top side is 16-3/8."

"No examination is possible from the bottom flange surface due to its configuration. There is limited examination from the flange side of the weld due to its configuration."

Licensee s Proposed Alternative Examination (as stated):

"FPL will conduct surface and volumetric examinations on the head to flange welds to the extent possible and perform a System Leakage Test in accordance with Category B-P requirements during each refueling outage."

Evaluation: The licensee has requested relief from the Code-required 100% volumetric examination of the head-to-flange weld.

Based on the sketches provided, it appears that scanning limitations associated with attachments to the head and the head-to-flange geometry preclude a complete Code examination. To obtain complete volumetric coverage, design modifications would be required. Imposition of this requirement would cause a considerable burden on the licensee.

The licensee proposes to perform the examinations to the extent practical (approximately 72% Code coverage). Based on the significant percentage of volumetric coverage obtainable, in conjunction with the Code-required surface examination, it is reasonable to conclude that degradation, if present, will be detected. As a result, reasonable assurance of operational readiness will be provided.

Conclusion: Complete Code-required volumetric examination is impractical for the subject welds. Based on the significant percentage of volumetric coverage obtainable, in conjunction with the Code-required surface examinations, it can be concluded that reasonable assurance of structural integrity will be provided. Therefore, pursuant to 10 CFR 50.55a(g)(6)(i), it is recommended that relief be granted as requested.

3.1.1.3 Request for Relief No. 5, Examination Category B-D, Items B3.90 and B3.100, Reactor Pressure Vessel Nozzle-to-Shell Welds and Nozzle Inner Radius Sections

Code Requirement: Examination Category B-D, Items B3.90 and B3.100 require 100% volumetric examination of the reactor pressure vessel nozzle-to-shell welds and the nozzle inner radius sections as defined in Figure IWB-2500-7. At least 25% but not more than 50% (credited) of the nozzles shall be examined by the end of the first inspection period, and the remainder by the end of the inspection interval.

Licensee's Code Relief Request: The licensee requested relief from examining at least 25% of the Examination Category B-D welds

and inside radius sections in the reactor pressure vessels of Turkey Point Units 3 and 4 by the end of the first inspection period.

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

"During the 1990-1991 Outages for both Turkey Point Units 3 and 4, 100% of the Reactor Pressure Vessel welds were examined (Categories B-A, B-D, and B-F). The examinations consisted of using the Enhanced Data Acquisition System from Southwest Research Institute (SwRI), which captures essentially 100% of the Ultrasonic signal for processing. Several of the SwRI personnel had qualified for certification with this equipment through an internal program. The Electric Power Research Institute Nondestructive Examination Center had qualified several of these SwRI personnel in IGSCC detection. Every recorded indication was evaluated to determine its nature. No reportable indications were found. This was the third Inservice Inspection of these nozzles and inside radius sections.

"These examinations met the requirements of 10 CFR 50.55a (g)(6)(ii)(A), Augmented Examination of Reactor Vessels."

Licensee's Proposed Alternative Examination (as stated):

"Florida Power and Light will perform 100% of the Category B-D nozzle welds and inside radius sections in the Reactor Pressure Vessels approximately 10 years after the previous examination."

Evaluation: The Code requires that at least 25% but not more than 50% (credited) of the nozzles be examined by the end of the first inspection period, and the remainder by the end of the inspection interval. During the 1990-1991 refueling outage, the licensee examined 100% of the reactor pressure vessel nozzle welds. No reportable indications were found. The licensee performed the reactor pressure vessel nozzle examinations three times in the twenty year period. As a result, a current level of quality and safety was established.

The requirement to perform examinations on a percentage of the Examination Category B-D, Item Nos. B3.90 and B3.100 in the first period, when the same examinations were performed during the previous period is considered an imposition. Therefore, the proposed alternative schedule for examination of Examination

Category B-D Item Nos. B3.90 and B3.100 in conjunction with the third 10-year interval RPV examinations should be authorized provided that the required examinations are completed within the same period in which the preceding examinations were performed, or earlier, so that there is no more than 10 years between examinations.

Conclusion: The licensee has established a current level of quality and safety for the Examination Category B-D reactor pressure vessel nozzles by examination of the subject areas during the last period of the previous interval. Based on that examination, a new schedule for successive examinations can be established that maintains essentially ten years between examinations. Therefore, pursuant to 10 CFR 50.55a(g)(3)(i), it is recommended that the proposed alternative be authorized provided that the licensee allows no more than ten years between examinations.

3.1.1.4 Request for Relief No. 2, Examination Category B-F, Item B5.10, Examination of Reactor Pressure Vessel Nozzle-to-Safe End Pressure-Retaining Dissimilar Metal Welds

Code Requirement: Section XI, Table IWB-2500-1, Examination Category B-F, Item B5.10 requires 100% volumetric and surface examination of reactor pressure vessel nozzle-to-safe end butt welds 4 inch nominal pipe size or greater.

Licensee's Code Relief Request: The licensee requested relief from the Code-required 100% surface and volumetric examinations for the following welds:

Unit-3 Inlets	Unit-4 Inlets
27.5"-RCS-1307-14	27.5"-RCS-1407-14
27.5"-RCS-1306-14	27.5"-RCS-1406-14
27.5"-RCS-1309-14	27.5"-RCS-1409-14

Unit-3 Outlets	Unit-4 Outlets
29"-RCS-1304-1	29"-RCS-1404-1
29"-RCS-1305-1	29"-RCS-1405-1
29"-RCS-1308-4	29"-RCS-1408-1

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

"1. Portions of the required volumetric and surface area are inaccessible due to permanent physical obstructions in the Reactor Pressure Vessel.

"2. In order to conduct these examinations at Turkey Point, access is from the refuel pool, which requires seal ring and sand plug cover removal.

"3. Non-removable vessel and piping insulation and limited space in the sand plug area restricts access to the exterior surface. 100% of the surface area can not be effectively examined.

"4. Performance of these examinations on the nozzles involves excessive cost, manhours, and radiation exposure with little or no compensating increase in the level of quality and safety.

"5. The examinations conducted provide assurance of an acceptable level of quality and safety."

Surface Examination Coverage				
Weld No. Inlet	CW Coverage from TDC	CCW Coverage from TDC	Weld Length	Percentage Covered
27.5"-RCS-1306-14	10"	17"	86.4"	31.3%
27.5"-RCS-1307-14	21"	23"	86.4"	50.9%
27.5"-RCS-1309-14	21"	21"	86.4"	48.6%
27.5"-RCS-1406-14	3"	4"	86.4"	8.1%
27.5"-RCS-1407-14	3"	4"	86.4"	8.1%
27.5"-RCS-1409-14	3"	3"	86.4"	6.9%

Licensee's Proposed Alternative Examination (as stated):

"1. Conduct volumetric and surface examinations to the extent possible on the Inlet Reactor Pressure Vessel Nozzle Safe-End Welds.

"2. Conduct a full volume ultrasonic examination including the outside surface of the Reactor Pressure Vessel outlet nozzle safe end welds in lieu of the surface examinations.

"3. The volumetric examination technique utilized will cover the entire volume of the weld and 1/2" of the base metal from the edge of the weld. This examination will interrogate the outside surface of the weld from two different directions circumferentially and axially. This technique was used for previous examinations on these welds with satisfactory results in accordance with the previous Relief Request.

"4. Conduct system pressure tests as required by the Turkey Point Inservice Pressure Test Program.

"5. The examination volume achieved by surface and/or ultrasonic examination, combined with the system pressure tests, provide an acceptable level of quality and safety."

Evaluation: The Code requires that the subject nozzle-to-safe end welds receive 100% volumetric and surface examinations. However, due to the nozzle-to-safe end configuration and accessibility, complete surface and volumetric Code coverage is impractical from the outside surface. To obtain complete Code coverage from the outside surface, design modifications would be required.

The licensee has proposed to perform volumetric and surface examinations to the extent possible on the inlet reactor pressure vessel nozzle-to-safe-end welds.

For the reactor pressure vessel outlet nozzle-to-safe end welds, the licensee proposes to perform a full-volume ultrasonic examination that includes the outside surface in lieu of the surface examinations. The volumetric examination technique will cover the entire volume of the weld and include 1/2 inch of the base metal.

To consider the licensee's proposed alternative to the Code-required surface examination acceptable, the licensee should be required to qualify the ultrasonic technique by demonstration. This demonstration should require the detection of actual cracks, not notches, and be subject to NRC approval. The licensee's proposed alternative to the surface examination should be considered an acceptable approach provided that the qualification of the ultrasonic technique includes the following:

(1) The remote volumetric examination from the inside surface includes the entire weld volume and heat-affected zone instead of only the inner one-third of the weld.

(2) The ultrasonic testing instrumentation and procedure are demonstrated to be capable of detecting OD surface-connected defects, in the circumferential orientation, in a laboratory test block with cracks and not machined notches.

The licensee has proposed to perform the surface and volumetric examinations to the extent practical for the RPV inlet nozzle-to-safe end welds and perform a full volumetric examination of the RPV outlet nozzle-to-safe end welds. These examinations, combined with the system pressure tests, should provide an acceptable level of quality and safety.

Conclusion: Based on the proposed alternative, it is reasonable to conclude that degradation, if present, will be detected provided that the ultrasonic technique is demonstrated to be capable of detecting flaws as noted above. Therefore, pursuant to 10 CFR 50.55a(a)(3)(i), it is recommended that the proposed alternative examinations be authorized provided that the licensee demonstrate that the ultrasonic technique is capable of detecting outside surface flaws.

3.1.2 Pressurizer (No relief requests)

3.1.3 Heat Exchangers and Steam Generators

3.1.3.1 Relief Request No. 3, Examination Categories B-B, B-D, B-H, and B-J, for Examination Areas Associated with the Regenerative Heat Exchanger (RHX)

Code Requirement: The examination requirements for the areas addressed in Relief Request No. 3 are listed in the table below.

Exam. Category	Item No.	Examination Requirements per Table IWB-2500-1
B-B	B2.51 B2.61	Volumetric examination to include 100% of the length of circumferential tubesheet-to-shell welds and head-to-shell welds per Figures IWB-2500-1, -3, or -6 as applicable.
B-D	B3.150 B3.160	Volumetric examination to include 100% of each nozzle-to-vessel weld and nozzle inside radius section per Figure IWB-2500-7.
B-H	B8.40	Volumetric or surface examination to include 100% of each integrally welded support per Figure IWB-2500-13, -14, or -15 as applicable.
B-J[a]	B9.21	Surface examination to include 100% of weld surface on approximately 25% of the total interconnecting piping joints per Figure IWB-2500-8.
B-J[a]	B9.40	Surface examination of essentially 100% of the weld length of selected welds during each interval per Figure IWB-2500-8.
F-A	All Code Item Numbers as Applicable	Examine welds, mechanical connections, clearances, alignment, sliding surfaces, and assembly of the supports
a. Per Table IWB-2500-1, Examination Category B-J, "Note: (1) Examinations shall include the following. (a) All terminal ends in each pipe of branch run connected to vessels".		

Licensee's Code Relief Request: The licensee requested relief from the Code-required examinations on the RHX shell welds, interconnecting piping welds, support welds, and connecting terminal end piping welds as listed in the table below.

Item No.	Examination Areas	Examination Requirement	Number of Welds	
			Unit 3	Unit 4
B2.51	Head-to-Shell Circ welds	Volumetric	6	6
B2.61	Shell-to-Tubesheet welds	Volumetric	6	6
B3.150	Nozzle-to-Shell welds	Volumetric	12	12
B3.160	Nozzle Inside Radius Section	Volumetric	12	12
B8.40	Welded Support	Volumetric or Surface as Applicable	3	3
B9.21	Interstage Piping, butt welds	Surface	10	10
B9.40	Socket Welds	Surface	2	2
All Code Item Numbers as Applicable	Supports	Visual	1 Support	1 Support

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

"The Regenerative Heat Exchanger is located in a locked high radiation area. This area has a general field of 2 Rem/hr with contact dose rates of up to 10 Rem/hr, is highly contaminated, and requires the use of a full face respirator. Turkey Point Health Physics (HP) rules require the constant presence of an 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 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 regenerative heat exchanger. 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 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 the 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 Regenerative Heat Exchangers for both Turkey Point Units 3 and 4 during the first inspection interval (approximately early 1972 through late 1983) before the original relief request 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 100% volumetric and/or surface examinations.

"Terminal ends in Category B-J welds are to receive surface and/or volumetric examinations. FPL has performed examinations on terminal end welds on other components in the Chemical Volume and Control system. Since 1985, VT-2 and VT-3 examinations have been performed on the terminal end welds listed in this relief. These were performed in accordance with the previous approved relief request, 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."

Licensee's Proposed Alternative Examination (as stated):

"Florida Power and Light will perform a VT-3 at the beginning of the outage for leakage and boric acid accumulation, and a VT-2 examination during the system leakage test. These examinations are currently performed in accordance with the previous approved relief request on the Regenerative Heat Exchangers."

Evaluation: The licensee has requested relief from all nondestructive examinations associated with the RHX. The licensee stated that the Code-required examinations are impractical due to component configuration, limited accessibility, potential hazards associated with insulation, and high radiation levels. Based on this review, it has been

determined that the extent of Code-required RHX examinations represents a burden. Therefore, relief should be granted for the vessels, welded supports, and associated piping welds, (including terminal ends associated with the interstage piping) with the following exception. For the terminal ends of piping to the RHX assembly, there is a high probability that the connections are subjected to stresses related to the pipe moments acting at the connections. Based on the statement by the licensee that the Code-required examinations were performed on the RHX during the first 10-year interval, it is the opinion of the INEL staff that performance of the Code-required examinations on the terminal ends of piping on the RHX assembly is not impractical and, therefore, it is recommended that relief be denied for the terminal ends associated with the RHX assembly. These welds are a critical segment of this system and the examination will provide assurance of structural integrity for the component.

Conclusion: The INEL staff reviewed the licensee's submittal and recommends that, pursuant to 10 CFR 50.55a(g)(6)(i), relief be granted for the vessels, welded supports, and associated piping welds (including terminal ends associated with the interstage piping). However, relief should be denied for the terminal ends of piping at the inlets and outlets of the RHX assembly.

3.1.4 Piping Pressure Boundary

3.1.4.1 Request for Relief No. 7 (Part 1), Examination Category B-J, Items B9.12 and B9.22, Examination of Class 1 Piping Longitudinal Welds

Code Requirement: Examination Category B-J, Item B9.12 requires 100% volumetric and surface examination of longitudinal piping welds nominal pipe size 4 inch and larger. The examination area shall include at least a pipe-diameter length but not more than 12 inches of each longitudinal weld intersecting the circumferential weld required to be examined by Examination Categories B-F and B-J.

Item B9.22 requires 100% surface examination of the longitudinal piping welds, nominal pipe size less than 4 inch. The examination area shall include at least a pipe-diameter length but not more than 12 inches of each longitudinal weld intersecting the circumferential welds required to be examined by Examination Categories B-F and B-J.

Licensee's Code Relief Request: The licensee requested relief from the Code-required surface and volumetric examinations for Class 1 piping longitudinal welds to include at least a pipe-diameter length but no more than 12 inches of each longitudinal weld intersecting the circumferential weld required to be examined by Examination Category B-J.

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

"Longitudinal welds are fabricated under controlled shop conditions, which produce higher quality and more uniform residual stress patterns. They undergo heat treatment in the shop, which enhances the material properties of the weld and reduces the residual stresses created by welding.

"Intergranular stress corrosion cracking (IGSCC) or other corrosion problems have not occurred in PWR austenitic stainless steel or carbon steel piping longitudinal welds to any significant extent due to the non-oxygenated environment.

"Results of previous weld inspections through out the industry indicate that longitudinal welds have not been a safety concern, nor has there been any evidence of longitudinal weld defects compromising safety at nuclear power plants.

"Longitudinal welds have not been shown to be susceptible to any particular degradation mechanism. The only area of a longitudinal weld which may be considered suspect are the ends of the weld where it is adjacent to the field fabricated circumferential welds. These areas fall within the volumetric examination boundaries of the adjacent circumferential welds.

"The man-rem exposure and cost associated with the inspection of longitudinal welds is dependent on the time it would take to remove/reinstall insulation and interferences, locate the weld, prepare the weld for examination and perform the examination.

"Based on the above arguments, there is little, if any, technical benefit to performing inservice inspections on longitudinal piping welds. Radiation exposure and cost associated with these inspections would be reduced."

Licensee's Proposed Alternative Examination (as stated):

"Florida Power and Light will perform the required examinations on the length of longitudinal weld that is normally examined with the intersecting circumferential weld.

"The volumetric examinations at the intersection of circumferential and longitudinal welds will include both transverse and parallel scans within the length of longitudinal weld which falls within the circumferential weld examination volume. The examination of intersecting longitudinal welds will be noted to document the extent of the examination."

Evaluation: The licensee requested relief from performing the surface and volumetric examinations, as applicable, of the longitudinal welds to the extent required by the Code. The request for relief is based on the position that longitudinal welds are unlikely to fail (due to fabrication controls and low susceptibility to conditions that lead to failure), and on the additional radiation exposures. The licensee maintains that the potentially critical portion of the longitudinal welds (the portion that intersects the circumferential weld) will be examined in conjunction with the circumferential welds.

The licensee's proposed alternative is to perform the surface examination of the longitudinal weld in conjunction with the circumferential weld examination. The volumetric examination of the circumferential weld, when applicable, will include both transverse and parallel scans. As a result, the length of longitudinal weld that falls within the circumferential weld examination area will be examined. The examination records for the circumferential weld examinations will be used to document the extent of longitudinal weld examined.

Based on the extent of examinations performed, an acceptable level of quality and safety will be provided.

Conclusion: Examination of the length of longitudinal weld required to be examined for Code compliance results in an unusual difficulty without a compensating increase in the level of

quality and safety. The licensee's proposed alternative, to examine a portion of longitudinal weld in conjunction with the circumferential weld, provides reasonable assurance of structural integrity. Therefore, pursuant to 10 CFR 50.55a(a)(3)(ii), it is recommended that the proposed alternative be authorized.

3.1.5 Pump Pressure Boundary (No relief requests)

3.1.6 Valve Pressure Boundary (No relief requests)

3.1.7 General (No relief requests)

3.2 Class 2 Components

3.2.1 Pressure Vessels (No relief requests)

3.2.2 Piping

3.2.2.1 Request for Relief No. 7 (Part 2), Examination Categories C-F-1 and C-F-2, Items C5.12, C5.22, C5.42, C5.62 and C5.82, Examination of Class 2 Piping Longitudinal Welds

Code Requirement: Examination Categories C-F-1 and C-F-2, Items C5.12, C5.22, and C5.62 require 100% volumetric and surface examination of longitudinal piping welds for 2.5T at the intersection of a circumferential weld. Items C5.42 and C5.82 require 100% surface examination of the longitudinal piping welds for 2.5T at the intersection of a circumferential weld.

Licensee's Code Relief Request: The licensee requested relief from the Code-required surface and volumetric examinations of the longitudinal piping welds for 2.5T at the intersection of a circumferential weld for Examination Categories C-F-1 and C-F-2, Items C5.12, C5.22, and C5.62.

The licensee requested relief from the Code-required surface examinations of the longitudinal piping welds for 2.5T at the

intersection of a circumferential weld for Examination Categories C-F-1 and C-F-2, Items C5.42 and C5.82.

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

"Longitudinal welds are fabricated under controlled shop conditions, which produce higher quality and more uniform residual stress patterns. They undergo heat treatment in the shop, which enhances the material properties of the weld and reduces the residual stresses created by welding.

"Intergranular stress corrosion cracking (IGSCC) or other corrosion problems have not occurred in PWR austenitic stainless steel or carbon steel piping longitudinal welds to any significant extent due to the non-oxygenated environment.

"Results of previous weld inspections through out the industry indicate that longitudinal welds have not been a safety concern, nor has there been any evidence of longitudinal weld defects compromising safety at nuclear power plants.

"Longitudinal welds have not been shown to be susceptible to any particular degradation mechanism. The only area of a longitudinal weld which may be considered suspect are the ends of the weld where it is adjacent to the field fabricated circumferential welds. These areas fall within the volumetric examination boundaries of the adjacent circumferential welds.

"The man-rem exposure and cost associated with the inspection of longitudinal welds is dependent on the time it would take to remove/reinstall insulation and interferences, locate the weld, prepare the weld for examination and perform the examination.

"Based on the above arguments, there is little, if any, technical benefit to performing inservice inspections on longitudinal piping welds. Radiation exposure and cost associated with these inspections would be reduced."

Licensee's Proposed Alternative Examination (as stated):

"Florida Power and Light will perform the required examinations on the length of longitudinal weld that is normally examined with the intersecting circumferential weld.

"The volumetric examinations at the intersection of circumferential and longitudinal welds will include both transverse and parallel scans within the length of longitudinal weld which falls within the circumferential weld examination volume. The examination of intersecting longitudinal welds will be noted to document the extent of the examination."

Evaluation: The Code requires examination, as applicable, of the longitudinal piping welds for 2.5T at the intersection of a circumferential weld. The licensee requested relief from performing the required examinations of the longitudinal welds based on the position that longitudinal welds are unlikely to fail (due to fabrication controls and low susceptibility to conditions that lead to failure), and on the additional radiation exposures. The licensee maintains that the potentially critical portion of the longitudinal welds (the portion that intersects the circumferential weld) will be examined in conjunction with the circumferential welds.

The licensee's proposed alternative is to perform the surface examination of the longitudinal welds in conjunction with the circumferential weld examination. The volumetric examination of the circumferential welds will include both transverse and parallel scans. As a result, the length of longitudinal weld that falls within the circumferential weld examination area will be examined providing an acceptable level of quality and safety. The examination records for the circumferential weld examinations will be used to document the extent of longitudinal weld examined.

Conclusion: Examination of the 2.5T segment of longitudinal welds results in an unusual hardship without a compensating increase in the level of safety. The licensee's proposed alternative, to examine a portion of longitudinal weld in conjunction with the circumferential weld, provides reasonable assurance of structural integrity. Therefore, pursuant to 10 CFR 50.55a(a)(3)(ii), it is recommended that the proposed alternative examination be authorized.

3.2.3 Pumps (No relief requests)

3.2.4 Valves (No relief requests)

3.2.5 General

3.2.5.1 Request for Relief No. 9, Paragraph IWB-2420, IWC-2420, and IWC-2420, Successive Examinations of Components

Code Requirement: Paragraphs IWB-2420, IWC-2420, and IWF-2420 require the sequence of component examinations establisned during the first inspection interval to be repeated during each successive inspection interval, to the extent practical.

Licensee's Code Relief Request: The licensee requested relief from repeating the sequence of examinations established during the first and second inspection intervals.

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

"Florida Power and Light performed examinations on only Class 1 systems during the first two Periods of the first interval (1970 Edition of Section XI). During the third period, the examinations performed on Class 2 and 3 components and supports were pro-rated for the interval (1974 Edition with Addenda through Summer 1975).

"The sequence of examinations for the majority of the Class 2 and 3 components and supports was established during the second Interval. The second interval examinations covered all Code classes, unlike the first interval.

"Optimizing the sequence of examinations reduces the need for personnel to prepare and examine components in essentially the same area several times. The reduction in time and manpower required to perform these tasks can be significantly reduced by changing the sequence of examinations.

"The problem areas that FPL has identified at Turkey Point receive augmented examinations that exceed Code requirements. These areas will continue to be monitored on a more frequent basis. The majority of the ex ..ation areas at Turkey Point have not demonstrated any flaws.

"Changing the sequence of examinations will not affect the safety of the Plants. Reduced activity due to changing the sequence of examinations will lower the number of problems created by examination activities, preparation, and recovery."

In the licensee's response to the RAI (Reference 6), the licensee provided the following additional basis (as stated):

"Section XI requires the sequence of examinations established during the first inspection interval be repeated during successive intervals to the extent practical. FPL has requested relief from this requirement on two different issues.

"During the first interval, first and second periods, components were examined to the 1970 Edition of Section XI. The third period was performed to the 1974 Edition with Summer 1975 Addenda. The 1970 Edition covered Class 1 systems only. During the third period, only a few Class 2 and Class 3 welds and components were examined. FPL is requesting relief from using the first interval as the guide for successive examinations and, instead, using the second interval. The second interval examinations repeated the first to the extent practical, but most of the Class 2 and Class 3 examinations were performed for the first time.

"During the second ISI interval, FPL performed examinations on systems within the boundaries of all three Code Classes. In many cases, scaffold was built in the identical place and fashion two or more times. Piping and other components were also stripped and cleaned two or more times. In very few cases were the same welds or components examined more than once. In an ongoing reassessment of plant support and operations, it was decided that a reduction of the radiation exposure and costs associated with ISI was justified and necessary. The examination schedule should be altered so scaffold and necessary weld cleaning would be performed only one time. This would result in significant savings and lower radiation exposure to NDE examiners, maintenance crews, Health Physics technicians and those personnel who are working in the examination areas at the time."

Licensee's Proposed Alternative Examination (as stated):

"Florida Power and Light will schedule the same areas for examination that were performed during the Second Interval to the extent practical. The sequence of examinations will be altered to reduce radiation exposure and cost, and allow the examinations, preparations of areas, and the recovery process to be minimized."

Evaluation: The licensee has proposed the rescheduling of examinations to reduce the duplication of effort, and attendant radiation exposure and costs, for the 10-year interval. In the review of the request for relief, the following were noted:

* When implementing Table IWB-2412-1, Inspection Program B, the 10-year interval is divided into periods of 3, 4, and 3 years, respectively. The duration of each period in itself should provide adequate scheduling flexibility for

examinations while still maintaining the successive scheduling requirements of the Code. The proposed rescheduling of examinations results in noncompliance with the percent of examinations required to be performed each period (Reference the ISI Program, Section 2.0).

* In the case of Examination Category B-D, the licensee established a new schedule for examination of the RPV nozzles by the reexamination of the RPV nozzles in the last period of the previous interval (see Section 3.1.1.3 of this report). In addition, relief has previously been granted from the scheduling requirements of the reactor pressure vessel nozzles because of the burden associated with bringing in a remote examination tool. The licensee has not proposed establishment of a schedule that will provide approximately 10 years between examinations.

* In the response to the RAI, the licensee stated that it is not possible or practical to predict that examinations will be repeated on a schedule that will not exceed ten years.

* The licensee is using a combination of examination schedules from Units 3 and 4 to justify the rescheduling of examinations. Each unit has its own unique operating parameters and, therefore, the two cannot be considered as a single operating unit. Further, the licensee stated that problems occurring in one unit are assumed to be in the other, and appropriate examinations or actions are performed. This could be interpreted to mean, for example, that if flaws found during ISI in Unit 3 require additional examinations, then additional examinations will also be performed in Unit 4.

* The licensee has requested relief from Code scheduling requirements on a generic basis. The details of examination scheduling are considered administrative in nature.

Conclusion: The licensee's proposed rescheduling of examinations for the third interval results in noncompliance with the successive examination requirements as well as with the percentages of examinations to be performed each inspection period. The licensee has not provided sufficient justification to support the proposed alternative. Therefore, it is recommended that relief be denied.

3.2.5.2 Request for Relief No. 6, Paragraph IWA-6620, Preparation of Owner's Reports, Forms NIS-1 and NIS-2, and Submittal of 90-Day Summary Reports

Code Requirement: IWA-4800, IWA-6210(c), IWA-6220(c), IWA-6220-(d), IWA-6230 Paragraph IWA-6220, and IWA-7520(a), require that the licensee prepare NIS-1 (Owner's Report for Inservice Inspections) and NIS-2 (Owner's Report for Repair or Replacements) and file these reports, within 90 days of the completion of the inservice inspection conducted during each refueling outage, with the enforcement and regulatory authorities having jurisdiction at the plant site.

Licensee's Code Relief Request: The licensee requested relief from :

1. Preparation of the Owner's Report for Inservice Inspection, Form NIS-1.

2. Preparation of the Owner's Report for Repair or Replacement, Form NIS-2.

3. Submittal of the Summary Report within 90 days following completion of the inservice inspection conducted during each refueling outage.

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

"Florida Power and Light Company (FPL) considers the summary report required by IWA-6000 does not contain the information

necessary to assure compliance with Code requirements, and therefore does not provide a compensating increase in the quality and/or safety of Turkey Point.

"The summary report does not furnish evidence of compliance with ASME Boiler and Pressure Vessel Code, Section XI, Inspection Program B, percentage requirements as mandated by IWB-2412, IWC-2412, and IWD-2412.

"Class 3 components are not required to be included in the summary report submittal.

"Both a Final Report and Summary Report must be prepared, reviewed and approved in order to comply with IWA-6220 and IWA-6310.

"The preparation, review, approval and certification of each record and report within the time frame of 90 days following completion of each refueling outage substantially increases the costs associated with inservice inspection activities. This puts an unreasonable time constraint on FPL without increasing assurance of Code compliance."

Licensee's Proposed Alternative Examination (as stated):

"As an alternate to the requirements of IWA-6000, Florida Power and Light Company proposes the following:

"1) Repair/Replacement Plan

Repair/Replacement plans shall meet the requirements of IWA-4140 (1992 Edition), to the extent required, for all Code Classes.

Each Repair/Replacement Plan shall be given a unique identification number. The unique identification number may be the number of the document utilized for the repair and/or replacement as required by FPL procedures or instructions. (i.e., NCR, CNR, PCM, MEP, CWO, PWO, etc.).

All other applicable requirements of IWA-4000, 1989 Edition, shall be met.

"2) Repair/Replacement Certification Record

As an alternate to the NIS-2 Report, FPL shall prepare and certify the Repair/Replacement Plan Certification Records, form NIS-2A (or similar), following completion of repairs or replacements.

The completed Form NIS-2A shall become part of the Repair/Replacement Plan and shall be maintained in accordance with IWA-6300. FPL shall maintain an index and update regularly the status of the index of all Repair/Replacement Plans for all Code Classes. The index shall identify the

unique identification number and interval and period during which the repair or replacement was completed.

The index shall be maintained in accordance with IWA-6300. It will be made available upon request for review by the enforcement and regulatory authorities having jurisdiction at the plant site.

"3) Summary Report

A Summary Report shall be prepared and submitted to the regulatory and enforcement authorities having jurisdiction at the plant site within 120 days following the end of the Inspection Period as identified in Program B.

The Summary Report shall include examinations, tests, repairs and replacements results for all ASME Class items which have been completed since the previously submitted Summary Report. The Summary Report shall contain the following:

a. Summary Report Cover Sheet, Form NIS-1A, (or similar)

b. Abstract of examination and tests information, Form NIS-1B, (or similar)

c. Listing of examinations, Form NIS-1C (or similar), that were not performed and were identified in the inspection plan for the inspection period, and when or if they are planned for a later date. Any alternate examinations (IWA-2240), that were performed.

d. A listing of all flaws that require analytical evaluation, Form NIS-1D, (or similar)

e. Abstract of repairs and replacements Form NIS-2B (or similar), which were required due to an item having exceeded an acceptance criteria."

Evaluation: The report forms and submittal of the 90-Day Summary Report are mandatory Code requirements. Consistent, industry-wide use of these forms establishes a uniform reporting methodology for evaluating Code compliance for inservice examinations and the extent of repairs and replacements for regulatory purposes. The licensee has not demonstrated the burden associated with the reporting requirements as they are administrative requirements only.

Conclusion: The Code has established a standard reporting methodology for the industry. The licensee should present

proposals for changing the reporting methodology to the applicable Section XI Code committee. Therefore, it is recommended that this request for relief be denied.

3.3 Class 3 Components (No relief requests)

3.4 Pressure Tests

3.4.1 Class 1 System Pressure Tests (No relief requests)

3.4.2 Class 2 System Pressure Tests (No relief requests)

3.4.3 Class 3 System Pressure Tests (No relief requests)

3.4.4 General

3.4.4.1 Request for Relief No. 10, Paragraph IWA-5242(a), Visual Examination of Insulated Components

Code Requirement: Paragraph IWA-5242(a) requires that insulation be removed from pressure-retaining bolted connections for VT-2 visual examination of systems borated for the purpose of controlling reactivity.

Licensee's Code Relief Request: The licensee requested relief from the removal of insulation on pressure-retaining bolted connections in borated systems during VT-2 visual examination.

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

"Removing the insulation on bolted borated connections will require significant manpower (insulation removal, scaffold, and recovery) and radiation exposure. The System Engineers and others who perform routine surveillance examinations check the entire lines for leakage, movement, or other conditions that would indicate a problem has occurred. These surveillance checks are performed, to a large extent, when the system is in service. This means the lines are checked on a more frequent basis than required by Code and during a period when system pressure has typically been present for a longer period of time. The ability to detect a leak is greatly enhanced as water, insulation

discoloration, or Boron crystals would be evident, since no drying of the area would have occurred. This is the same condition being sought during VT-2 examinations that would only take place on a scheduled and less frequent basis.

"Looking for system leakage during routine system examinations is more cost effective, performs the desired Code examinations, and requires far less radiation dose."

Licensee's Proposed Alternative Examination (as stated):

"Florida Power and Light will check bolted connections for leakage when performing routine system examinations:

During the monthly flow path verification by the System Engineer; and

when the unit is offline, a leak inspection is performed inside the containment per the plant surveillance program (required by Technical Specifications).

"These routine surveillances will include looking for the following conditions:

Pooling of water directly under the bolted connections;

Water leaking from the lowest elevation section of vertical lines containing bolted connections;

Examining insulation around bolted connections for discoloration or boric acid residue;

Examination of leakage collection systems to insure their operability; and

When repairs or replacements are made, the examination will be limited to that area of the system.

"Florida Power and Light will perform required and scheduled VT-2 examinations on systems per Code requirements without removal of insulation."

Evaluation: Paragraph IWA-5242(a) requires the removal of insulation from pressure-retaining bolted connections in borated systems for direct VT-2 visual examination during system pressure testing. The licensee implies that insulation removal for direct VT-2 visual examination of bolted connections is a hardship.

Recent incidences of degraded bolting have reinforced the requirement to remove insulation at bolted connections when

performing the VT-2 visual examinations (Reference: Event Report Numbers 26899 and 26992). Because degradation rates cannot be reliably predicted and bolting records may not be accurate, the direct visual examination and immediate corrective action for leakage at bolted connections is warranted.

Conclusion: Based on the above referenced incidences of degraded bolting, it is recommended that relief be denied.

3.4.4.2 Request for Relief No. 11, Paragraph IWA-5250(a)(2), Corrective Measures for Leakage at Bolted Connections

Code Requirement: Paragraph IWA-5250(a)(2) states that the source(s) of leakage detected during the conduct of a system pressure test shall be located and evaluated by the Owner for corrective action. For leakage occurring at a bolted connection, the bolting shall be removed, VT-3 visually examined for corrosion, and evaluated in accordance with IWA-3100.

Licensee's Code Relief Request: The licensee requested relief from the removal and VT-3 visual examination of bolting on bolted connections when leakage is observed during a system pressure test.

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

"The requirement to remove all bolting from a bolted connection to check for degradation is an unnecessary burden. This requirement does not take into account the corrosiveness of the fluid, the material of the leaking component, the type and location of the leakage, and the history of material degradation in a similar environment. The 1992 Edition of ASME Section XI changed the IWA-5250 requirements to allow the removal of t... bolt closest to the source of leakage, reducing the number of bolts to be examined.

"Code interpretation XI-1-92-01 states that new bolting or bolting that has received a VT-3 examination prior to installation and has not been inservice does not have to be evaluated in accordance with this section. This is recognition by the Code that leakage at this point would be considered a maintenance item.

"Performing VT-3 visual examinations on bolting for evidence of corrosion is impractical since Section XI has consistently referenced the VT-1 examination for pressure retaining bolting. FPL procedures include the acceptance criteria for VT-1 examinations of bolting. The VT-3 examination does not provide adequate acceptance criteria for bolting. Revising procedures solely for the purpose of changing the VT-1 requirements to VT-3 does not provide any additional benefit."

Licensee's Proposed Alternative Examination (as stated):

"FPL will evaluate the consequences of leakage found at bolted connections during the conduct of system pressure tests. If the evaluation indicates the bolting may be susceptible to corrosion, the bolt closest to the source of leakage shall be removed and a VT-1 examination will be performed in accordance with IWA-2211. The results of the examination will be compared against the acceptance criteria of IWB-3517.1.

"When the leakage is identified on bolting that is inservice and a VT-1 examination is required, and the evaluation justifies continued service, the removal of the bolting may be deferred to the next time that portion of the system is out of service, but no later than the next refueling outage.

"If the removed bolting shows evidence of degradation exceeding the acceptance criteria and the evaluation determines the bolting is susceptible to corrosion, the remaining bolting will be removed, a VT-1 examination performed, and the results compared against the acceptance criteria.

"The extent of required examinations, the proposed alternatives, and surveillance of systems on a regular basis provides an acceptable level of quality and safety."

Evaluation: In accordance with the 1989 Edition of the Code, when leakage occurs at bolted connections, all bolting is required to be removed for VT-3 visual examination. Recent incidences of degraded bolting at leaking connections have reinforced the corrective action requirement to remove bolting as part of the evaluation. Because degradation rates cannot be reliably predicted and bolting material records may not be accurate, the removal of a bolt for evaluation and immediate corrective action for leakage at bolted connections is warranted. (Reference: Event Report Numbers 26899 and 26992).

The licensee has proposed to perform an evaluation to determine if the removal of bolting may be deferred until the next

refueling outage, at which time the bolting would be removed and examined. This proposed alternative is acceptable only if the licensee removes at least one bolt, closest to the source of leakage as part of the evaluation. The VT-1 visual examination in lieu of the VT-3 visual examination is considered acceptable as a VT-1 visual examination is considered a more stringent examination.

Conclusion: It is reasonable to conclude, that the degradation of bolting, if present, would be detected provided that the licensee remove at least one bolt, closest to the source of leakage and perform a VT-1 visual examination as part of the evaluation. As a result of this action, an acceptable level of quality and safety will be provided. Therefore, pursuant to 10 CFR 50.55a(a)(3)(i), it is recommended that the proposed alternative be authorized provided the licensee remove at least one bolt, closest to the source of leakage, and perform a VT-1 visual examination as part of the evaluation.

3.5 General

3.5.1 Ultrasonic Examination Techniques (No relief requests)

3.5.2 Exempted Components (No relief requests)

3.5.3 Other

3.5.3.1 Request for Relief No. 4, Paragraph IWF-5300, Inservice Examination and Test Requirements for Snubbers

Note: This request for relief is considered a part of the Inservice Testing Program (IST) and is therefore not included in this evaluation. The FPL Snubber Functional and Visual Testing Program will be evaluated by the Mechanical Engineering Branch.

3.5.3.2 Request for Relief No. 8, Examination Categories C-C, D-A, D-B, and D-C, Requirements For Examination of Integrally Welded Attachments

Code Requirement: Examination Category C-C, Item Nos. C3.10, C3.20, C3.30, and C3.40 require 100% surface examination of integrally-welded attachments to Class 2 pressure vessels, piping, pumps, and valves as defined in Figure IWC-2500-5.

Examination Categories D-A, D-B, and D-C require a VT-3 visual examination of Class 3 integrally-welded attachments as defined in Figure IWD-2500-1.

Licensee's Code Relief Request: The licensee requested relief from examining Class 2, Examination Category C-C, integral attachments, and Class 3, Examination Categories D-A, D-B, and D-C integral attachments in accordance with the Code.

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

"Florida Power and Light has not experienced any significant problems with integral attachments in Class 1, 2, and 3 systems in over 40 years of operating experience at Turkey Point.

"Turkey Point still has numerous areas that have asbestos insulation. These areas must be tented and special precautions must be observed during the insulation removal.

"Many of integral attachments are within radiation areas. The additional exposure required to prepare the areas for examination is significant. If the examination area is covered with asbestos insulation, the additional time required for its removal increase radiation exposure.

"Based on the above arguments, there is little technical benefit to performing inservice inspections on the number o. .ntegral attachments required by the Code. Reducing the number of integral attachments examined would lower the radiation exposure and costs associated with these examinations."

Licensee's Proposed Alternative Examination (as stated):

"Florida Power and Light will perform surface examinations on 10% of the Integral Attachments of Class 1 and Class 2 vessels, piping, pumps, and valves in accordance with the guidelines of Code Case N-509.

"VT-1 examinations will be performed on 10% of the Integral Attachments of Class 3 piping, pumps, and valves.

"In the case of multiple vessels of similar design, function, and service, only one integral attachment of only one of the multiple vessels will be examined.

"Examinations will be performed on integral attachments when a component support member deformation (e.g., broken, bent, or pulled out parts) is identified during operation, refueling, maintenance, examination, inservice inspection, or testing."

Evaluation: The licensee proposes, as an alternative to the Code requirements, to apply the requirements of Code Case N-509 for the examination of integral attachments on Code Class 1, 2, and 3 piping and components. The licensee proposes to perform a surface examination on 10% of intregral attachments for Code Class 1 and Class 2. A VT-1 visual examination will be performed on 10% of the integral attachments of Class 3 piping, pumps, and valves. The licensee has noted burdens associated with integral attachment examination requirements, namely, radiation exposure and safety concerns related to asbestos hazards.

Code Case N-509 provides an alternative to the examination of Class 1, 2, and 3 integral attachments. The licensee has selected 10% of Code Class 3 integral attachments for examination. However, based on review of the licensee's program, it appears that no Class 1 or Class 2 integral attachments are scheduled.

Conclusion: The licensee has proposed to examine Code Class 1, 2, and 3 integral attachments in accordance with Code Case N-509 as an alternative to Code requirements. The INEL staff believes that the licensee's proposed alternative for the examination of integral attachments will provide an acceptable level of quality and safety provided that a 10% sample of integral attachments in each Code Class is examined. Therefore, pursuant to 10 CFR 50.55a(a)(3)(i), it is recommended that the licensee's proposed alternative be authorized provided that a 10% sample of

integral attachments in each Code Class be scheduled for examination.

3.5.3.3 Request for Relief No.12, Paragraphs IWA-5260 and IWA-5261, Types of Instruments for Pressure Tests

Code Requirement: Paragraph IWA-5261 states that any pressure measuring instrument or sensor, analog or digital, including the pressure measuring instrument of the normal operating system instrumentation (such as control room instruments), may be used, provided the requirements of IWA-5260 are met. IWA-5260 provides the criteria that instruments for pressure tests must meet; these include accuracy, calibration, ranges, and location.

Licensee's Code Relief Request: The licensee requested relief from the criteria established for instruments used in the performance of pressure tests.

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

"The additional instrument requirements for accuracy, calibration, ranges, and location, as defined in IWA-5260, are applicable for hydrostatic pressure testing (IWB-5222, IWC-5222, IWD-5222), where pressures and temperatures could encroach, without proper controls, on specific design criteria. Invoking these requirements for measuring normal operating system pressures and temperatures is impractical.

"The 1992 Edition of Section XI corrected this inaccuracy by changing the IWA-5260 title to read "INSTRUMENTS FOR SYSTEM HYDROSTATIC TESTS.""

Licensee's Proposed Alternative Examination (as stated):

"FPL will use installed plant instrumentation during system pressure tests. These instruments are periodically calibrated and maintained in accordance with plant procedures. They provide an acceptable level of accuracy for the required pressure tests."

Evaluation: The Code requires that test equipment used for pressure tests meet the criteria stated in IWA-5260. This criteria is specifically required when performing a hydrostatic test. The licensee has proposed, as an alternative, to use

installed plant instrumentation, which is calibrated and maintained in accordance with plant procedures.

To ensure that systems are not challenged by pressure tests at elevated pressures or temperatures, instrument accuracy is imperative and tests of instrument accuracy in such cases should be performed. However, for pressure tests at normal operating pressure, using instrumentation calibrated and maintained in accordance with plant procedures should provide an acceptable level of quality and safety.

Conclusion: The licensee has requested relief from the criteria for instruments used for pressure tests. For pressure tests performed at nominal operating pressure, the licensee's proposed alternative, to use instruments that are calibrated and maintained in accordance with plant procedures, should provide an acceptable level of quality and safety. Therefore, pursuant to 10 CFR 50.55a(a)(3)(i), it is recommended that the proposed alternative be authorized provided that the licensee meet the requirements of IWA-5260 for any pressure tests performed at pressures or temperatures exceeding nominal operating pressure.

4. CONCLUSION

Pursuant to 10 CFR 50.55a(g)(6)(i), it has been determined that certain inservice examinations cannot be performed to the extent required by Section XI of the ASME Code. For Requests for Relief Nos. 1 and 13, the licensee has demonstrated that specific Section XI requirements are impractical; it is therefore recommended that relief be granted. For Request for Relief No. 3, the licensee has demonstrated that specific Section XI requirements are impractical in part, and it is therefore recommended that relief be granted with the exception of the terminal ends of piping at the inlets and outlets of the RHX assembly. The granting of relief will not endanger life, property, or the common defense and security and is otherwise in the public interest, giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility.

Pursuant to 10 CFR 50.55a(a)(3), it is concluded that for Requests for Relief No. 7 (Parts 1 and 2) the licensee's proposed alternative provides an acceptable level of quality and safety in lieu of the Code required examination and should be authorized.

In addition, pursuant to 10 CFR 50.55a(a)(3), it is recommended that the licensee's proposed alternative be authorized for Requests for Relief Nos. 2, 5, 8, 11, and 12, provided that the licensee satisfies the conditions stated in the particular Request for Relief evaluation.

Request for Relief 4 will be evaluated by the Mechanical Engineering Branch.

For Requests for Relief No. 3 (terminal ends of piping at the inlets and outlets of the RHX assembly) and Nos. 6, 9, and 10, it is concluded that the licensee has not provided sufficient information to support the determination that the Code requirement is impractical, or that requiring the licensee to comply with the Code requirement would result in hardship. Therefore, in these cases it is recommended that relief be denied.

Based on the review of the *Turkey Point Nuclear Power Plant, Units 3 and 4, Third 10-Year Interval Inservice Inspection Program Plan*, Revision 0, the licensee's responses to the Nuclear Regulatory Commission's request for

additional information (RAI), and the recommendations for granting relief from the ISI examinations that cannot be performed to the extent required by Section XI of the ASME Code, the only deviations from regulatory requirements or commitments identified were in Requests for Relief 3 (in part), 6, 9, and 10 and the exceptions noted in Section 2.3 of this report.

This technical evaluation has not identified any practical method by which the licensee can meet all the specific inservice inspection requirements of Section XI of the ASME Code for the existing Turkey Point Nuclear Power Plant, Units 3 and 4. Compliance with all the exact Section XI required inspections would necessitate redesign of a significant number of plant systems, procurement of replacement components, installation of the new components, and performance of baseline examinations for these components. Even after the redesign efforts, complete compliance with the Section XI examination requirements probably could not be achieved. Therefore, it is concluded that the public interest is not served by imposing certain provisions of Section XI of the ASME Code that have been determined to be impractical.

5. REFERENCES

1. Code of Federal Regulations, Title 10, Part 50.

2. American Society of Mechanical Engineers Boiler and Pressure Vessel Code, Section XI, Division 1:

   1989 Edition

3. *Turkey Point Nuclear Power Plant, Units 3 and 4, Third 10-Year Interval Inservice Inspection Program Plan*, Revision 0, submitted September 9, 1993.

4. NUREG-0800, *Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants*, Section 5.2.4, "Reactor Coolant Boundary Inservice Inspection and Testing," and Section 6.6, "Inservice Inspection of Class 2 and 3 Components," July 1981.

5. Letter, dated April 4, 1994, containing request for additional information on the Third 10-Year Interval ISI Program Plan.

6. Letter, dated May 31, 1994, T. F. Plunkett (FPL) to Document Control Desk, containing the response to the NRC's request for additional information.

7. Regulatory Guide 1.14, *Reactor Coolant Pump Flywheel Integrity*, Revision 1, dated August 1975.

8. NRC Regulatory Guide 1.150, *Ultrasonic Testing of Reactor Vessel Welds During Preservice and Inservice Examinations*, Revision 1, February 1983.

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B. W. Brown, E. J. Feige, S. G. Galbraith, A. M. Porter

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11. ABSTRACT (200 words or less)

This report documents the results of the evaluation of the *Turkey Point Nuclear Plant, Units 3 and 4, Third 10-Year Interval Inservice Inspection (ISI) Program Plan*, Revision 0, submitted September 9, 1993, including the request for relief from the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code Section XI requirements that the licensee has determined to be impractical. The *Turkey Point Nuclear Plant, Units 3 and 4, Third 10-Year Interval Inservice Inspection (ISI) Program Plan*, Revision 0 is evaluated in Section 2 of this report. The ISI Program Plan is evaluated for (a) compliance with the appropriate edition/addenda of Section XI, (b) acceptability of examination sample, (c) correctness of the application of system or component examination exclusion criteria, and (d) compliance with ISI-related commitments identified during previous Nuclear Regulatory Commission (NRC) reviews. The request for relief is evaluated in Section 3 of this report.

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