



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
OF THE SECOND TEN YEAR INTERVAL INSERVICE INSPECTION PROGRAM PLAN
REQUEST FOR RELIEF NO. 18
FOR
FLORIDA POWER AND LIGHT COMPANY
ST. LUCIE NUCLEAR POWER PLANT, UNIT 2
DOCKET NUMBER: 50-389

1.0 INTRODUCTION

The Technical Specifications for St. Lucie Nuclear Power Plant, Unit 2, 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 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).

10 CFR 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 ten-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) on the date 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 St. Lucie Nuclear Plant, Unit 2, second 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.

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

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licensee that could result if the requirements were imposed. In a letter dated October 15, 1993, Florida Power and Light Company submitted to the NRC its second 10-year interval inservice inspection program plan Request for Relief No. 18 for the St. Lucie Nuclear Plant, Unit 2.

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 for Relief No. 18 for St. Lucie Nuclear Plant, Unit 2. Based on the information submitted, the staff adopts the contractor's conclusions and recommendations presented in the Technical Evaluation Letter Report attached. The staff finds that the proposed alternatives will provide an acceptable level of quality and safety in that they are sufficient to ensure pipe integrity against leakage.

The alternative contained in Request for Relief No. 18, Part C is authorized pursuant to 10 CFR 50.55a(a)(3)(i). The alternatives contained in Parts B and D of Request for Relief No. 18 are authorized pursuant to 10 CFR 50.55a(a)(3)(i), with the conditions as follows: For Part B the alternative is authorized provided the licensee remove at least one bolt, nearest the source of leakage, for a VT-1 visual examination as part of the evaluation, and for Part D the alternative is authorized provided that the licensee meet the requirements of IWA-5260 for any pressure tests performed at pressures or temperatures exceeding nominal operating pressure.

Part A is not approved at this time, and will be the subject of separate correspondence.

TECHNICAL EVALUATION LETTER
OF THE SECOND 10-YEAR INTERVAL INSERVICE INSPECTION
REQUEST FOR RELIEF NUMBER 18
FOR
FLORIDA POWER AND LIGHT COMPANY
ST. LUCIE NUCLEAR PLANT, UNIT 2
DOCKET NUMBER: 50-389

1.0 INTRODUCTION

The licensee, Florida Power and Light Company (FPL), submitted Request for Relief Number 18, for the second 10-year inservice inspection (ISI) interval, in a letter dated October 15, 1993. The Idaho National Engineering Laboratory (INEL) has evaluated the subject request for relief in the following sections.

2.0 EVALUATION

The Code of record for the St. Lucie Nuclear Plant, Unit 2, second 10-year inservice inspection (ISI) interval, which began August 8, 1993, is the 1989 Edition. The information provided by the licensee in support of a request for relief from impractical requirements has been evaluated and the bases for granting relief from those requirements are documented below.

The evaluation of Relief Request Number 18 has been divided into four subject areas. The licensee provided an all inclusive "Basis For Relief" and "Alternative Examinations or Tests" under Parts D and E of their submittal. For purposes of the evaluation, the four subjects are addressed independently, using applicable paragraphs from the "Basis For Relief" and "Alternative Examinations or Tests."

A. Relief Request Number 18 (Part A), Paragraph IWA-5242(a), Visual Examination of Insulated Components

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

Licensee's Code Relief Request: The licensee requested relief from the removal of insulation on pressure-retaining bolted connections in borated systems for the sole purpose of VT-2 visual examination during system pressure testing as required by IWA-5242(a).

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

For systems borated for the purpose of controlling reactivity, the requirement to remove insulation from pressure retaining bolted connections for visual examination VT-2, assumes that the only time these systems are examined is during a Code required pressure test.

The IWA-5242 requirement does not take into consideration any additional, and more frequent visual examinations, such as (1) Technical Specification surveillance requirements; (2) preventative maintenance activities; (3) system walkdowns; and (4) repairs and/or replacement activities, for which, the majority of these additional visual examinations are performed. To a large extent, these additional visual examinations are performed when the system is in-service.

IWA-5242(a), (b), and (c) provide enough direction for performing visual examinations on insulated components, whether the pressure retaining bolted connection is located in a borated line or not.

In addition to the above requirements, FPL is implementing ASME Code Case N-498 for all Class 1 and 2 pressure retaining components. This code case allows in lieu of the hydrostatic pressure test, the use of a system leakage test at or near the end of the inspection interval. As a condition to the use of this code case, the hold time for insulated components is upgraded from essentially no hold time to a four hour hold time.

FPL feels that the four hour hold time will be more than adequate for the examination of insulated components, and substantially increase the assurance of identifying leakage during the conduct of a system pressure test without the removal of insulation.

IWA-5250 (a) also requires FPL to locate the source of leakage detected during the conduct of a system pressure test. Locating the source of leakage will in most cases require the removal of the insulation.

The removal of insulation on each pressure retaining bolted connection will require a significant expenditure of manpower for the erection of scaffolding, the removal and the reinstallation of insulation following performance of the pressure test and examination.

This additional manpower, not to mention, the increase in radiation exposure (man/rem), will contribute significantly to the operations and maintenance costs without any substantial compensating increase in the quality or safety of the unit.

The additional costs, manpower expenditures, and radiation exposure (man/rem),, do not provide any compensating increase in the quality of the examination/test, nor in the safety of the unit.

Licensee's Proposed Alternative Examination (as stated):

For borated systems, insulation shall be removed from pressure retaining bolted connections, when determined by evaluation that the removal of insulation is warranted, or when leakage to be

identified during a system pressure test that requires the source of the leakage to be identified in accordance with IWA-5250. The decision to remove insulation during the evaluation process may be based on (a) type and location of leakage; (b) historical leakage; (c) construction materials of the leaking component; (d) visual evidence of corrosion; (e) corrosiveness of process fluid; and (f) the bolt material degradation history due to corrosion in a similar environment.

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 dated 3/8/94, and 26992 dated 3/25/94). Because degradation rates cannot be reliably predicted and bolting material records may not be accurate, the direct visual examination and immediate corrective action for leakage at bolted connections is warranted. Therefore, Part A cannot be approved at this time. In telephone conversations on January 12, and January 26, 1995, the licensee committed to submit additional information. Based on that, Part A of the Relief Request 18 will be the subject of separate correspondence.

B. Relief Request Number 18 (Part B), IWA-5250(a)(2), Corrective Measures for Leakage at Bolted Connections

Code Requirement: Paragraph IWA-5250(a)(2) requires that if leakage occurs 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 removal of all pressure-retaining bolting from a bolted connection when leakage is observed during a system pressure test, as required by IWA-5250(a)(2).

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

The removal of all pressure retaining bolting from a bolted connection solely because leakage was observed during a system pressure test is impractical. This requirement does not take in consideration (1) the type and location of leakage; (2) historical leakage; (3) construction material of the leaking component; (4) corrosiveness of process fluid; and (5) the bolting material degradation history due to corrosion in a similar environment.

In addition to the considerations (1) through (5) above, this requirement does not take into account the results of previous inspections, examination, tests, and/or previous corrective actions taken. This requirement restricts FPL from performing an evaluation of the condition(s) based on actual facts/data, and to implement corrective action based on the actual severity of the evaluation as allowed under Section XI.

IWA-5250(a)(2) was changed in the 1992 Edition of Section XI, to require only one of the bolts to be removed, if leakage occurs at a bolted connection.

The additional costs, manpower expenditures, and radiation exposure (man/rem),, do not provide any compensating increase in the quality of the examination/test, nor in the safety of the unit.

Licensee's Proposed Alternative Examination (as stated):

If the evaluation process indicates that the pressure retaining bolting is not susceptible to corrosion, removal of bolting will not be required.

If the evaluation process indicates that the pressure retaining bolting may be susceptible to corrosion and requires removal, the bolt closest to the source of leakage shall be removed.

When the visual examination VT-1 is required and leakage is identified on a pressure retaining bolted connection that is in service, and the evaluation justifies continued service, the removal of a pressure retaining bolt for visual examination VT-1 may be deferred to the next time the system is out of service, but no later than the next refueling outage.

When the degradation of a removed pressure retaining bolt exceeds FPL acceptance criteria and the evaluation determines that the bolting is susceptible to corrosion, all remaining pressure retaining bolting shall be removed. A visual examination VT-1 shall be performed and the results of the examination shall be compared against the acceptance criteria of IWB-3517.1.

Evaluation: In accordance with the 1989 Edition of the Code, when leakage occurs at a bolted connection during the conduct of a system pressure test, all bolting is required to be removed for VT-3 visual examination. The licensee has proposed to perform an evaluation of the leakage and bolting in bolted connections 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. In addition, the licensee has proposed to perform a VT-1 visual examination as part of the evaluation in lieu of the VT-3 visual examination.

The licensee's alternative VT-1 visual examination in lieu of the Code-required VT-3 visual examination is considered acceptable because the VT-1 visual examination is considered more stringent and has clearer acceptance criteria. However, the evaluation of the bolted connection without the removal of at least one bolt nearest the source of leakage as part of the evaluation should not be considered acceptable.

The licensee's proposed alternative to the removal of bolting when leakage is discovered is not sufficient. However, the removal of at least one bolt for evaluation should detect degradation, if present. This approach in combination with a VT-1 visual examination should provide an acceptable level of quality and safety. Therefore, pursuant to 10 CFR 50.55a(a)(3)(i), it is recommended that relief be authorized provided the licensee remove at least one bolt, nearest the source of leakage, for a VT-1 visual examination as part of the evaluation.

C. Relief Request Number 18 (Part C), IWA-5250(a)(2), Visual Examination Requirements Associated With Corrective Measures if Leakage Occurs at a Bolted Connection

Code Requirement: IWA-5250(a)(2) requires that if leakage occurs 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 performing a VT-3 visual examination of bolting removed from bolted connections where leakage occurred.

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

The performance of a visual examination VT-3 for evidence of corrosion on pressure retaining bolting is impractical, since Section XI consistently references the visual examination VT-1 for pressure retaining bolting. FPL procedures were written to use the acceptance criteria for VT-1 examinations of bolting. The VT-3 examination does not provide adequate acceptance criteria for pressure retaining bolting. The additional cost of revising the test, visual examination, and inspection procedures solely for the purpose of changing the VT-1 examination to VT-3 is impractical.

The additional costs, manpower expenditures, and radiation exposure (man/rem),, do not provide any compensating increase in the quality of the examination/test, nor in the safety of the unit.

Licensee's Proposed Alternative Examination (as stated):

A visual examination VT-1 shall be performed in accordance with IWA-2211, in lieu of the visual examination VT-3. The results of the examination shall be compared against the acceptance criteria of IWB-3517.1.

The evaluation and the visual examination VT-1 documentation shall be traceable to the visual examination VT-2 record.

Evaluation: Paragraph IWA-5250(a)(2), requires a VT-3 visual examination of the bolting for corrosion as part of the corrective action when leakage occurs at bolted connection during the conduct of a system pressure test. Table IWB-2500-1, Examination Categories B-G-1 and B-G-2, require a VT-1 visual examination for inservice examinations. The licensee has developed the FPL inspection procedure for bolting visual examinations to comply with VT-1 visual examination requirements.

The licensee has proposed a VT-1 visual examination in accordance with IWA-2211, in lieu of the VT-3 visual examination specified for bolting removed from joints that exhibit leakage. Based on a review of the Code requirements, it has been determined that the VT-1 examination of bolting provides more stringent examination requirements and clearer acceptance criteria. As a result, the VT-1 visual examination will provide an acceptable level of quality and safety when such examinations are required. Therefore, pursuant to 10 CFR 50.55a(a)(3)(i), it is recommended that the proposed alternative be authorized.

D. Relief Request Number 18 (Part D), IWA-5261, Type of Instruments Used for Pressure Tests

Code Requirement: Paragraph IWA-5261, requires that any "Type" 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 (i.e. instrument "Accuracy," "Calibration," "Ranges," and "Location").

Licensee's Code Relief Request: The licensee requested relief from the requirements of IWA-5261 and the associated requirements of IWA-5260, "Instruments For Pressure Tests" for normal operating system instrumentation (such as control room instruments) when used for system pressure testing.

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

The additional instrumentation requirements for accuracy, calibration, range, and location, defined in IWA-5260 are intended for hydrostatic pressure test, where the pressures and temperatures could, without proper controls, encroach on specific design criteria. To invoke these requirements on normal operating system pressure and temperature instrumentation (such as control room instruments) is impractical.

The 1992 Edition of Section XI corrected this requirement, by changing the title of IWA-5260 to "Instruments for System Hydrostatic Tests."

The additional costs, manpower expenditures, and radiation exposure (man/rem),, do not provide any compensating increase in the quality of the examination/test, nor in the safety of the unit.

Licensee's Proposed Alternative Examination:

The licensee has proposed, as an alternative, to use installed plant instrumentation, which is calibrated and maintained in accordance with plant procedures, to perform system pressure tests.

Evaluation: The Code requires that test equipment used for pressure tests meets the criteria stated in IWA-5260. The criteria contained in IWA-5260 includes accuracy, calibration requirements, ranges, and locations for test instruments. The licensee has proposed, as an alternative, to use installed plant instrumentation, which is calibrated and maintained in accordance with plant procedures, to perform system pressure tests.

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.

Therefore, pursuant to 10 CFR 50.55a(a)(3)(i), it is recommended that the proposed alternative be authorized provided that the licensee meets the requirements of IWA-5260 for any pressure tests performed at pressures or temperatures exceeding nominal operating pressure.

3.0 CONCLUSION

The INEL staff has reviewed the licensee's Request for Relief Number 18 and concludes that the proposed alternative provided in Part C of the evaluation provides an acceptable level of quality and safety and, therefore, pursuant to 10 CFR 50.55a(a)(3)(i), it is recommended that the proposed alternatives be authorized.

For requests for relief in Part B and D of the evaluation, it has been determined that the proposed alternatives in combination with the conditions stated in the evaluation will provide an acceptable level of quality and safety and, therefore, pursuant to 10 CFR 50.55a(a)(3)(i), it is recommended that the proposed alternatives be authorized with the conditions stated.

Part A is not approved at this time, and will be the subject of separate correspondence.