



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

September 30, 2019

Mr. Don Moul  
Vice President, Nuclear Division  
and Chief Nuclear Officer  
Florida Power & Light Company  
Mail Stop: NT3/JW  
15430 Endeavor Drive  
Jupiter, FL 33478

SUBJECT: ST. LUCIE PLANT, UNIT NO. 1 – SAFETY EVALUATION FOR RELIEF  
REQUEST RR#15, REVISION 0, REGARDING LIMITED PIPING  
EXAMINATIONS (EPID L-2019-LLR-0018)

Dear Mr. Moul:

By letter dated February 7, 2019 (Agencywide Documents Access and Management System Accession No. ML19038A471), Florida Power & Light Company (the licensee) submitted Relief Request RR#15 for the fourth 10-year inservice inspection interval at St. Lucie Plant, Unit No 1. Pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) 50.55a(g)(5)(iii), the licensee requested relief from the examination coverage requirements of Section XI of the American Society of Mechanical Engineers Boiler & Pressure Vessel Code as it relates to limited volumetric examinations for Examination Category C-F-1.

The U.S. Nuclear Regulatory Commission (NRC) staff reviewed the submittal and, as set forth in the enclosed safety evaluation, concludes that granting relief pursuant to 10 CFR 50.55a(g)(6)(i) is authorized by law, will not endanger life or 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. Therefore, the NRC staff grants this relief request for the fourth 10-year inservice inspection interval at St. Lucie Plant, Unit No. 1, which commenced on February 10, 2008, and ended on February 10, 2018.

If you have any questions regarding this issue, please contact the project manager, Mr. Michael Wentzel, at (301) 415-6459 or by e-mail at [Michael.Wentzel@nrc.gov](mailto:Michael.Wentzel@nrc.gov).

Sincerely,

*/RA/*

Undine Shoop, Chief  
Plant Licensing Branch II-2  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket No. 50-335

Enclosure:  
Safety Evaluation

cc: Listserv



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO RELIEF REQUEST RR#15

REGARDING LIMITED PIPING EXAMINATIONS

FLORIDA POWER & LIGHT COMPANY

ST. LUCIE PLANT, UNIT NO. 1

DOCKET NO. 50-335

1.0 INTRODUCTION

By letter dated February 7, 2019 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML19038A471), Florida Power & Light Company (the licensee), submitted Relief Request RR#15, Revision 0, to the U.S. Nuclear Regulatory Commission (NRC) for the fourth 10-year inservice inspection (ISI) interval of St. Lucie Plan, Unit No. 1 (St. Lucie 1). The licensee requested relief from the examination coverage requirements for Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," of the American Society of Mechanical Engineers Boiler & Pressure Vessel Code (ASME Code). This safety evaluation covers the licensee's request RR#15 related to limited volumetric examinations for Examination Category C-F-1, "Pressure Retaining Welds in Austenitic Stainless Steel or High Alloy Piping" (i.e., ASME Code Class 2 piping welds).

Specifically, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) 50.55a(g)(5)(iii), the licensee requested relief on the basis that achieving the ASME Code-required examination coverage for the subject welds in RR #15 is impractical.

2.0 REGULATORY EVALUATION

The regulations at 10 CFR 50.55a(g)(4) require that throughout the service life of a boiling or pressurized water-cooled nuclear power facility, components classified as ASME Code Class 1, 2, and 3 components meet the requirements, except the design and access provisions and preservice examination requirements set forth in Section XI of the ASME Code incorporated by reference in 10 CFR 50.55a(a)(1)(ii), subject to the conditions listed in 10 CFR 50.55a(b)(2).

Pursuant to 10 CFR 50.55a(g)(5)(iii), a licensee may request relief from an ASME Code requirement if it determines that conformance with the requirement is impractical at its facility. Additionally, pursuant to 10 CFR 50.55a(g)(5)(iii), the licensee must notify the NRC and submit, as specified in 10 CFR 50.4, information to support the determination. Requests for relief made in accordance with 10 CFR 50.55a(g)(5)(iii) must be submitted no later than 12 months after the expiration of the initial or subsequent 10-year inspection interval.

Pursuant to 10 CFR 50.55a(g)(6)(i), the Commission will evaluate determinations of impracticality under 10 CFR 50.55a(g)(5). After its evaluation, the Commission may grant relief and may impose such alternative requirements as it determines are authorized by law, will not endanger life or 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.

Based on the above, and subject to the following technical evaluation, the NRC staff finds that regulatory authority exists for the licensee to request the relief and the staff to authorize it.

### 3.0 TECHNICAL EVALUATION

The NRC staff evaluated the information in the licensee's submittal for the ASME Code Class 2 piping welds in RR#15 and documented its findings below.

#### 3.1 Components Affected

Details of the welds subject to RR #15 under Examination Category C-F-1 are shown in Table 1 below, which is summarized from Table 1 of the attachment to the licensee's submittal.

Table 1. Examination Category C-F-1 Limited Volumetric Examination Coverage

Item No.	Weld Identification	Weld Material; Component Description	Examination Limitation	Percent Coverage Achieved
C5.21	SI-208-1-SW-2	TP 304 Stainless Steel HPSI Piping 3" SCH 160	Tee to Elbow Configuration	80.5
C5.21	SI-208-FW-1	TP 304 Stainless Steel HPSI Piping 3" SCH 160	Elbow to Valve Configuration	50
C5.11	SI-210-FW-1	TP 304 Stainless Steel SI Piping 4" SCH 80	Valve to Piping Configuration	50
C5.11	SI-219-1-SW-2	TP 304 Stainless Steel HPSI Piping 6" SCH 160	Reducer to Tee Configuration	50
C5.11	SI-142-FW-1	TP 304 Stainless Steel SI Piping 6" SCH 160	Valve to Piping Configuration	50
C5.11	SI-112-FW-9A	TP 304 Stainless Steel SI Piping 6" SCH 160	Piping to Valve Configuration	50

<b>Item No.</b>	<b>Weld Identification</b>	<b>Weld Material; Component Description</b>	<b>Examination Limitation</b>	<b>Percent Coverage Achieved</b>
C5.21	SI-208-1-SW-1	TP 304 Stainless Steel SI Piping 3" SCH 160	Flange to Tee Configuration	33.3
C5.21	SI-210-FW-5	TP 304 Stainless Steel HPSI Piping 4" SCH 80	Piping to Valve Configuration	50
C5.11	SI-213-1-SW-2	TP 304 Stainless Steel SI Piping 6" SCH 120	Tee to Reducer Configuration	50
C5.11	SI-212-FW-1A	TP 304 Stainless Steel HPSI Piping 6" SCH 160	Tee to Pipe Configuration	50
C5.11	SI-212-FW-1	TP 304 Stainless Steel HPSI Piping 6" SCH 160	Piping to Valve Configuration	50
C5.11	SI-105-FW-1	TP 304 Stainless Steel HPSI Piping 6" SCH 160	Valve to Piping Configuration	50
C5.11	SI-129-FW-1	TP 304 Stainless Steel LPSI Piping 6" SCH 160	Valve to Piping Configuration	50
C5.11	SI-113-FW-9	TP 304 Stainless Steel SI Piping 6" SCH 160	Piping to Valve Configuration	50
C5.11	SI-213-FW-2	TP 304 Stainless Steel HPSI Piping 6" SCH 120	Valve to Piping Configuration	50
C5.21	SI-210-FW-4	TP 304 Stainless Steel HPSI Piping 4" SCH 80	Valve to Piping Configuration	50
C5.21	SI-211-11-SW-2	TP 304 Stainless Steel HPSI Piping 3" SCH 160	Piping to Elbow	83.2
C5.21	SI-209-FW-2	TP 304 Stainless Steel HPSI Piping 3" SCH 160	Valve to Piping Configuration	50

### 3.2 Applicable ASME Code Edition and Addenda

The ASME Code of record at St. Lucie 1 for the fourth 10-year ISI interval is the 2001 Edition through the 2003 Addenda of ASME Code, Section XI.

### 3.3 ASME Code Requirements

The ASME Code, Section XI examination requirements for Examination Category C-F-1, Item Nos. C5.11 and C5.21, are delineated in Table IWC-2500-1 and require surface and volumetric examinations of 100 percent of each weld requiring examination. The licensee cited ASME Code Case N-460, "Alternative Examination Coverage for Class 1 and Class 2 Welds, Section XI, Division 1," which defines greater than 90 percent coverage of an examination volume or a surface area, as applicable, as "essentially 100 percent." ASME Code Case N-460 is an NRC-approved alternative that can be used by licensees, as referenced in Regulatory Guide 1.147, Revision 18, "Inservice Inspection Code Case Acceptability" (ADAMS Accession No. ML16321A336).

### 3.4 Reason for Relief Request

The licensee achieved the volumetric coverage shown in Table 1 of this safety evaluation for the subject welds and could not achieve the ASME Code-required examination coverage because of material and physical limitations. For the 18 piping welds listed in Table 1 of the submittal and summarized in Table 1 of this safety evaluation, the licensee's volumetric examinations achieved from 33.3 percent to 83.2 percent of the required examination volume. The licensee indicated that due to the noted limitations, complying with the ASME Code-required examination coverage is impractical; thus, the licensee is requesting relief pursuant to 10 CFR 50.55a(g)(5)(iii).

### 3.5 Proposed Alternative

In lieu of achieving the examination coverage in accordance with ASME Code, Section XI, IWC-2500-1 and Code Case N-460, the licensee proposed the alternate examination coverage for the affected welds, as shown above. In addition, the licensee proposed the following:

- (1) Perform periodic system pressure tests in accordance with ASME Section XI Category C-H, Table IWC-2500-1.
- (2) Conduct ultrasonic examinations to the maximum extent possible.
- (3) Perform regular walkdowns on Class 2 systems to check for leakage, piping configuration, and/or damage. During outages, perform walkdowns on Class 2 systems inside containment. This walkdown is performed to look for system anomalies that could affect plant performance

### 3.6 Basis for Relief Request

The licensee indicated that obtaining the required volumetric examination coverage by using current qualified ultrasonic techniques can only be accomplished by modifying and/or replacing the components associated with the reduced volumetric examination coverage, and therefore, presents a burden of compliance. Additionally, the licensee stated that performing radiography is impractical due to the amount of work being performed near the associated piping and due to

increased radiation dose rates. In lieu of the ASME Code-required volume examination coverage, the licensee examined these welds to the maximum extent practical, achieving the coverages shown in Table 1 above. The volumetric examinations were performed in accordance with Section XI, Appendix VIII, Supplement 2, and the Performance Demonstration Initiative program for ultrasonic examinations (UTs). The licensee noted that UT was performed through the weld to obtain the maximum possible ASME Code-required examination volume, and the UT beam path extended into the far side of the weld for the examinations performed. However, when access was limited from a single side of the weld, no coverage was claimed past the centerline of the weld. The volumetric examinations performed on the subject components did not reveal any recordable flaws. The licensee further stated that surface examinations were performed on all the welds listed in Table 1, covering 100 percent of the accessible ASME Code-required surface area with no recordable or reportable flaws.

The licensee concluded that the extent of examination volumes achieved by the UT examinations, the results of the surface examinations, and the periodic visual examinations performed during the system pressure tests provide an acceptable level of quality and safety for the subject piping welds.

### 3.7 Duration of Relief Request

The licensee submitted RR#15 for the fourth 10-year ISI interval at St. Lucie 1, which began on February 10, 2008, and ended on February 9, 2018.

### 3.8 NRC Staff Evaluation

For the Examination Category C-F-1 welds listed in Table 1 of this safety evaluation, the licensee achieved less than the required volumetric examination coverage due to geometric and material limitations that would entail modification or replacement of the associated components if the licensee was forced to obtain the required coverage (i.e., essentially 100 percent coverage). The NRC staff finds the stated limitations to be an acceptable basis for impracticality of conforming to the requirements and finds that the design modifications necessary to achieve the required coverage would constitute an unnecessary burden upon the licensee.

The licensee used 45-degree and 60-degree degree shear wave scanners, coupled with 70-degree shear wave and 60-degree longitudinal scanners parallel and transverse to the weld; however, because of the noted limitations, the licensee was not able to achieve the required examination volumes for the subject welds.

The NRC staff reviewed the examination coverage and verified the licensee's achieved coverage. The NRC staff finds the licensee's achieved coverages acceptable, given the noted limitations. The examined volumes included weld and base metal and included areas on the inner regions where degradation would be expected to be present, should it occur.

Additionally, the licensee inspected all the subject welds by surface examinations. The licensee performed surface examinations of the ASME Code-required surface areas for each of the subject welds, with no recordable indications.

Furthermore, the NRC staff notes that these locations receive a visual examination during periodic system pressure tests for leakage that are performed during each inspection period. Further, the NRC staff notes that these piping systems are also subject to walkdowns during

outages by systems engineers checking for leakage and conditions that could affect plant performance.

Based on the above discussion, the NRC staff determines that obtaining the ASME Code-required examination volume coverage for the welds listed in Table 1 above is impractical because of the stated limitations and that the modifications necessary to obtain the required coverage would impose a burden upon the licensee. The NRC staff also determines that the volumetric UT examinations performed to the maximum extent practical provide a reasonable assurance of the structural integrity of the subject welds because: (1) the licensee identified no recordable flaws; (2) evidence of significant service-induced degradation in the welds, if it were to occur, would likely have been detected by the volumetric examination coverage obtained by the licensee; (3) the examined weld volumes included the most susceptible regions and were typical of the unexamined volumes; (4) all of the welds were examined by surface examinations with no recordable flaws; and (5) all of the subject welds are subjected to periodic system pressure tests and visual examinations for leakage, which provide further confirmation for structural integrity of these welds.

#### 4.0 CONCLUSION

As set forth above, the NRC staff concludes that it is impractical for the licensee to comply with the requirements of ASME Code Section XI for the examinations of the components noted in RR#15 for St. Lucie 1. The NRC staff concludes that the licensee has adequately addressed all the regulatory requirements set forth in 10 CFR 50.55a(g)(5)(iii). Accordingly, the NRC staff has determined that the granting of relief pursuant to 10 CFR 50.55a(g)(6)(i) is authorized by law and will not endanger life or property or 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. Therefore, the NRC staff grants the use of RR#15 to the licensee for the fourth 10-year ISI interval at St. Lucie 1, which began on February 10, 2008, and ended on February 9, 2018.

All other ASME Code Section XI requirements for which relief was not specifically requested and approved in this relief request remain applicable, including third-party review by the Authorized Nuclear Inservice Inspector.

Principal Contributor: Roger Kalikian

Date: September 30, 2019

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REQUEST RR#15, REVISION 0, REGARDING LIMITED PIPING  
EXAMINATIONS (EPID L-2019-LLR-0018) DATED SEPTEMBER 30, 2019

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