



L-2023-102
10 CFR 50.55(a)(z)(2)
July 26, 2023

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington D C 20555-0001

RE: St. Lucie Nuclear Plant, Unit 2
Docket No. 50-389
Renewed Facility Operating Licenses NPF-16

St. Lucie Unit 2 Relief Request PSL2-I5-RR-01, Proposed Alternative to ASME Section XI Code Examination Requirements for Reactor Vessel Bottom Area and Piping in Covered Trenches

Pursuant to 10 CFR 50.55a(z)(2), Florida Power & Light Company (FPL) hereby requests for St Lucie Nuclear Plant Unit 2, Nuclear Regulatory Commission (NRC) approval of a proposed alternative to certain Inservice Inspection (ISI) requirements of American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), Section XI. The request relates to the visual inspection of the reactor vessel bottom area and Reactor Coolant System (RCS) support piping that passes through covered trenches. Due to the inaccessibility of these areas, compliance with the ASME Code Section XI requirements would constitute a hardship or unusual difficulty without a compensating increase in the level of quality or safety.

The enclosure to this letter provides FPL's evaluation of the proposed alternative. FPL requests approval in time to support the St. Lucie Unit 2 refueling outage currently scheduled August 2024.

This letter contains no new regulatory commitments.

Should you have any questions regarding this submission, please contact Mr. Kenneth Mack, Fleet Licensing Manager, at 561-904-3635.

Sincerely,

A handwritten signature in black ink, appearing to read 'D Strand', is written over a horizontal line.

Dianne Strand
General Manager, Regulatory Affairs
Florida Power & Light Company

Enclosure
Attachments

cc: USNRC Regional Administrator, Region II
USNRC Project Manager, St. Lucie Nuclear Plant, Units 1 and 2
USNRC Senior Resident Inspector, St. Lucie Nuclear Plant, Units 1 and 2
Mr. Clark Eldredge, Florida Department of Health

**St. Lucie Unit 2 Fifth Interval Relief Request PSL2-I5-RR-01, Revision 0
Request for Relief from the Requirements of IWA-5000, IWB-5000, and IWC-5000
System Test Requirements**

Proposed Alternative
In Accordance with 10 CFR 50.55a(z)(2)
--Hardship or Unusual Difficulty without Compensating Increase
in Level of Quality or Safety--

1. ASME Code Components Affected

St. Lucie Unit 2 Reactor Vessel and associated Class 1 and Class 2 piping in covered trenches rendered inaccessible due to Containment Building configuration.

Exam Category	Item No.	Component Description
B-P	B15.10 B15.20	Reactor Vessel – Pressure Retaining Boundary Bottom Head Area. Material: Carbon Steel
		Piping - Pressure Retaining Boundary (Covered portions only) Material: Stainless Steel SI Headers: Lines 12-SI-148, 149, 150, 151 Charging Line: 2-CH-147 Letdown Line: 2-RC-142
C-H	C7.10	Piping - Pressure Retaining Components (Covered portions only) Material: Stainless Steel SDC Suction Lines:10-SI-362, 363 Hot Leg Injection Lines: 3-SI-179, 181

2. Applicable Code Edition and Addenda

ASME Boiler and Pressure Vessel Code, Section XI, Division 1, “Rules for Inservice Inspection of Nuclear Power Plant Components,” 2019 Edition.

3. Applicable Code Requirements

The requirements for performing visual examinations in conjunction with the pressure testing of Class 1 and 2 components are provided in ASME Section XI, Articles IWA-5000, IWB-5000, and IWC-5000.

Paragraph IWA-5241(b) states the following: “For components whose external surfaces are inaccessible for direct VT-2 visual examination, only the examination of the surrounding area (including floor areas or equipment surfaces located underneath the components) for evidence of leakage shall be required.”

Paragraph IWA-5241(h) states the following: “When examining insulated components, the examination of surrounding area (including floor areas or equipment surfaces located underneath the components) for evidence of leakage, or other areas to which leakage may be channeled, shall be required.”

Paragraph IWB-5221(b) states the following: “For all other systems, the system leakage test shall be conducted at a pressure not less than the pressure corresponding to 100% rated reactor power.”

**St. Lucie Unit 2 Fifth Interval Relief Request PSL2-I5-RR-01, Revision 0
Request for Relief from the Requirements of IWA-5000, IWB-5000, and IWC-5000
System Test Requirements**

Paragraph IWC-5221(a) states the following: "For Class 2 [Table IWC-2500-1 (C-H)] components operated continuously or routinely during normal plant operation, cold shutdown, or refueling operations, the system leakage test shall be conducted at the system pressure obtained while the system, or portion of the system, is performing its safety function. If portions of a system are associated with more than one safety function, the visual examination need only be performed during a test conducted at the higher of the operating pressures for the respective system safety function."

Paragraph IWC-5221(b) states the following: "For Class 2 [Table IWC-2500-1 (C-H)] components in standby systems (or portions of standby systems) that are not operated routinely except for testing, the leakage test shall be conducted at the system pressure developed during a test conducted to verify system operability (e.g., to demonstrate system safety function or satisfy technical specification surveillance requirements). If portions of a system are associated with more than one safety function, the visual examination need only be performed during the test conducted at the higher of the test pressures for the respective system safety function."

4. Reason for the Request

The design of the St. Lucie Unit 2 Plant does not provide access for a direct visual examination of the reactor vessel bottom area during the ASME Section XI System Leakage Test and associated VT-2 visual examination walkdown. There are three possible pathways that lead to the area. Two are in the electrical tunnel at the bottom of the containment "keyway" and are blocked by the Reactor Cavity Relief Dampers (Blast Dampers). These dampers consist of horizontal louvers approximately 11-inch wide and normally remain in the closed position. They are not intended for human passage. The third pathway is through the reactor cavity sump, a small tunnel from the cavity to the weir pit. A cooling duct runs through this tunnel limiting the height to a crawl space to approximately one foot high and six to eight feet long. Ambient conditions during VT-2 examinations at normal operating conditions create an extreme heat stress environment and combined with a nearly impossible exit pathway, make examination of this area an excessively hazardous work situation. For these reasons, St. Lucie VT-2 inspectors have considered the reactor bottom area to be inaccessible for examination at normal operating conditions. The increase in the level of quality and safety gained by performing a visual inspection at normal operating conditions does not compensate for the safety hazard the inspector would be subjected to.

Some segments of Class 1 and Class 2 reactor support piping pass through trenches that are covered and secured during normal operation. These trenches are required to be covered and secured prior to entering Mode 4 following a shutdown to ensure containment sump recirculation flow paths are maintained. This is outlined in the St. Lucie response to NRC Bulletin 2003-01 (FPL Letter L-2003-201). The trench covers prohibit direct examination of horizontal insulation joints and low points as required by IWA-5241. However, due to gaps and handholes in the trench covers and the use of grating in some locations, surrounding areas can be observed for evidence of leakage. Areas to which leakage may be channeled are also open in many locations throughout the containment for observation during the System Leakage Test. This is in compliance with the requirements of IWA-5241(h).

5. Proposed Alternative and Basis for Use

Proposed Alternative:

Pursuant to 10CFR50.55a(z)(2), FPL requests approval to perform the examination of the reactor vessel bottom head area and piping in covered trenches at different plant conditions than those

**St. Lucie Unit 2 Fifth Interval Relief Request PSL2-I5-RR-01, Revision 0
Request for Relief from the Requirements of IWA-5000, IWB-5000, and IWC-5000
System Test Requirements**

required by the ASME Code. FPL will continue to perform the required system pressure tests as prescribed by IWB-5000 each refueling outage and IWC-5000 each period and will examine all accessible components in accordance with IWA-5241.

For those portions of components rendered inaccessible by Containment Building configuration, as an alternative to the requirements of IWA-5241, FPL will open the inaccessible areas each refueling outage and perform a VT-2 examination of the reactor vessel bottom and other associated piping following plant cooldown and depressurization. This inspection will check insulation surfaces and joints for signs of leakage or residue. Any evidence of leakage will be evaluated in accordance with IWA-5250, which may include additional inspections and insulation removal as deemed necessary.

Basis for Use:

The objective of the required visual examination at normal operating conditions is to detect evidence of leakage and thereby verify the integrity of the reactor coolant system (RCS) pressure boundary. FPL believes the same evidence of leakage can be identified by visual examination following cooldown for refueling. The St. Lucie reactors have no bottom head penetrations and have been volumetrically examined in accordance with the rules of Section XI with no relevant indications identified. There is no expectation of leakage due to the solid configuration of the bottom of the reactor pressure vessel. In addition, the reactor cavity is monitored for leakage continuously during operation, and inventory balance is performed daily throughout the operating cycle. Therefore, FPL concludes that the proposed alternative provides reasonable assurance of system integrity and an acceptable level of quality and safety comparable to an examination performed at normal operating conditions.

6. Duration of Proposed Alternative

The proposed alternative will be used for the Fifth 10-Year Inservice Inspection Interval of the Inservice Inspection Program for St. Lucie 2 that commences on August 8, 2023 and is scheduled to end on August 7, 2033.

7. Precedents

This alternative was previously authorized by the NRC at St. Lucie during the Unit 1 Third Inservice Inspection Interval, Relief Request No. 25, and the Unit 2 Third Inservice Inspection Interval, Relief Request No. 4, in a safety evaluation report dated April 13, 2004 (ADAMS Accession No. ML041040851).

This alternative was previously authorized by the NRC at St. Lucie during the Unit 2 Fourth Inservice Inspection Interval, Relief Request No. 4, in a safety evaluation report dated May 31, 2015 (ADAMS Accession No. ML15085A237).