



L-2024-104
10 CFR 55a(z)(2)
June 26, 2024

ATTN: Document Control Desk
U. S. Nuclear Regulatory Commission
Washington, DC 20555-0001

RE: St. Lucie Nuclear Plant Unit 1
Docket No. 50-335
Renewed Facility Operating License DPR-67

Response to Request for Additional Information, St. Luce Relief Request (RR) #7, Proposed Alternative in Accordance with 10 CFR 50.55a(z)(1), Extension of Inspection Interval for St. Lucie Unit 1 Reactor Pressure Vessel Welds from 10 to 20 Years

References:

1. Florida Power & Light Company letter L-2024-004, Relief Request (RR) #7, Proposed Alternative in Accordance with 10 CFR 50.55a(z)(1), Extension of Inspection Interval for St. Lucie Unit 1 Reactor Pressure Vessel Welds from 10 to 20 Years, January 18, 2024 (ADAMS Accession No. ML24018A064)
2. Nuclear Regulatory Commission electronic memorandum dated May 29, 2024, RR #7 - Requests for Additional Information (RAIs) (ADAMS Accession No. ML24177A254)

In Reference 1, Florida Power & Light Company (FPL) requested relief from the reactor pressure vessel (RPV) examination requirements of American Society of Mechanical Engineers (ASME), Section XI, Subsection IWB-2411, "Inspection Program", for St. Lucie Nuclear Plant (St. Lucie) Unit 1. The proposed alternative would extend the RPV volumetric examination requirements for Examination Categories B-A and B-D welds from once each 10-year inservice inspection (ISI) interval to once every twenty years.

In Reference 2, the NRC requested additional information deemed necessary to complete its review.

The enclosure to this letter provides FPL's response to the request for additional information. The information included in this RAI response provides additional information that clarifies the application and does not expand the scope of the application.

This letter contains no new or revised regulatory commitments.

Should you have any questions regarding this submittal, please contact Mr. Kenneth Mack, Senior Manager, Licensing and Regulatory Compliance at 561-904-3635.

Sincerely,

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

Paul Rasmus
General Manager, Regulatory Affairs
Florida Power & Light Company

Enclosure

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 Nuclear Plant Unit 1
Response to Request for Additional Information

Relief Request (RR) #7, Extension of Inspection Interval for
Reactor Pressure Vessel Welds from 10 to 20 Years

In Reference 1, Florida Power & Light Company (FPL) requested relief from the reactor pressure vessel (RPV) examination requirements of American Society of Mechanical Engineers (ASME), Section XI, Subsection IWB-2411, "Inspection Program", for St. Lucie Nuclear Plant (St. Lucie) Unit 1. The proposed alternative would extend the RPV volumetric examination requirements for Examination Categories B-A and B-D welds from once each 10-year inservice inspection (ISI) interval to once every twenty years.

In Reference 2, the NRC staff requested additional information (RAI) to complete its review of the proposed alternative, as indicated below. FPL's response to the RAIs follows.

RAI-1

- a. Confirm the start dates and end dates of the third, fourth, fifth and sixth 10-year ISI intervals, and which ISI interval is associated with the cancelled inspection proposed for 2025.

FPL Response:

Below please find the start and stop dates of the requested intervals. FPL is asking for a deferral of Category B-A and B-D examinations for the 5th Interval to be performed in the 6th Interval.

Interval	Start Dates	End Dates
3 rd Interval	February 11, 1998	February 10, 2000
4 th Interval	February 11, 2000	February 10, 2018
5th Interval	February 11, 2018	February 10, 2028
6 th Interval	February 11, 2028	February 10, 2038

- b. Confirm that the inspection in March 2018 was performed as part of the third ISI interval.

FPL Response

These examinations were not performed as part of the 3rd ISI Interval.

The RPV (Reactor Pressure Vessel) welds, nozzle welds, and inner radius examinations for St. Lucie Unit 1 were conducted during the 5th ISI (In-service Inspection) interval in March 2018. However, these examinations were credited to the 4th ISI interval instead.

To ensure completion of the remaining interval exams, the 4th ISI interval was extended in accordance with the ASME Code, specifically paragraph IWA-2430(d)(1). This extension allowed for the necessary exams to be conducted and recorded.

It's important to note that despite this extension and the examinations being performed during the extended interval, the start date of the 5th ISI interval for St. Lucie Unit 1 remained unchanged, beginning on February 11, 2018.

- c. Explain why a proposed inspection in 2037 is considered as part of the sixth ISI interval and not the fifth ISI interval.

FPL Response

Based on the information provided above, during the 5th ISI interval for St. Lucie Unit 1, the RPV Vessel welds, nozzle welds, and inner radius examinations that were performed in March 2018 were credited to the 4th ISI interval, in accordance with the ASME Code, specifically paragraph IWA-2430(d)(1).

Relief is being requested to extend the 5th ISI Interval category B-A and B-D Reactor Vessel examinations to be performed during the 6th interval. This extension is being proposed not to exceed 20 years.

Given the upcoming 24-month refueling outage for St. Lucie Unit 1 in the spring of 2027, the last outage of the 6th interval would be scheduled for the spring of 2037. This timeline allows for the necessary examinations to be conducted within the extended interval period.

- d. Explain why Relief Request RR #7 is applicable to the fifth and sixth ISI intervals, and not to the fourth and fifth ISI intervals.

FPL Response

Answered in RAI-1(c) above.

RAI-2

Explain how the technical basis provided, in combination with any other performance monitoring activities planned, justifies deferral of the weld examinations to 2037.

FPL Response

WCAP-16168-NP-A, Revision 3, serves as the technical basis for decreasing the frequency of inspection by extending the Section XI inspection interval from 10 years to a maximum of 20 years for ASME Section XI Category B-A and B-D reactor vessel welds.

The relief request for St. Lucie Unit 1 proposes to defer the fifth 10-year ISI examination to the sixth 10-year ISI interval, resulting in a maximum extension of 20 years for the inspection interval.

It is important to note that the previous ISI examination for St. Lucie Unit 1 RV (Reactor Vessel) B-A and B-D welds was performed in March 2018 and credited to the fourth 10-year ISI interval (see Table below).

To support the proposed interval extension, the relief request undergoes a plant-specific evaluation based on the NRC-approved WCAP-16168-NP-A, Revision 3. This evaluation is conducted to demonstrate the technical basis and justification for deferring the fifth 10-year ISI examination to the sixth 10-year ISI interval.

If the proposed inspection in spring of 2037 is approved, it would result in a period of approximately 19 years without inspections since the last ISI examination conducted in spring of 2018.

Table 1 Reactor Vessel B-A and B-D Inspections		
Previous Completed 10-Year ISI Exam (4th 10-year ISI)	Deferral of Scheduled 10-Year ISI Exam (5th 10-year ISI)	Proposed 10-Year ISI Exam after Deferral (6th 10-year ISI)
March 2018	Spring 2025	Spring 2037

Note:

The March 2018 examination was credited for the 4th ISI Interval; therefore, the extension is requested for the 5th Interval category B-A and B-D examinations to be performed during the 6th interval not to exceed 20 years. St. Lucie Unit 1 will be starting 24 months refueling during the spring of 2027 which places the last outage of the 6th interval during the spring of 2037.

The latest revised implementation plan for the PWR fleet following WCAP-16168-NP-A, Revision 3 methodology is provided in OG-10-238 [ADAMS Accession No. ML11153A033]. This document provides the proposed inspection schedule including performance monitoring, supported by the technical methodology specified in WCAP-16168-NP-A, Revision 3.

The OG-10-238 letter provides proposed ISI dates for plant-specific inspections of the U.S. PWR fleet as identified by PWROG (pressurized Water Reactor Owners Group) members. The implementation plan demonstrates that a sampling of inspections will be completed each year for the U.S. fleet, ensuring adequate detection of any potential degradation mechanisms.

The St. Lucie Unit 1 proposed inspection date (2037) aligns with the latest revised implementation plan, OG-10-238; thus, justifying the deferral of the St. Lucie Unit 1 Category B-A and B-D weld examinations to Spring 2037.

RAI-3

Discuss how the heatup/cooldown transients per year at St Lucie Unit 1 are bounded by the 13 heatup/cooldown transients per year value for CE plants that is cited in the topical report WCAP-16168-NP, Revision 3.

FPL Response

The demonstration of how the St. Lucie Unit 1 heatup/cooldown transients per year are bounded by the 13 heatup/cooldown transients per year value for CE plants cited in WCAP-16168-NP-A, Revision 3 is based on similar precedence described in Section 3.7.4 of the SER for St. Lucie Unit 2 [ADAMS Accession No. ML21236A131].

Chapter 3 of the St. Lucie Unit 1 UFSAR establishes an upper bound limit of 500 heatup and cooldown cycle for the Reactor Coolant System (RCS) over the design life of the plant. This corresponds to an average of 8.33 for a cumulative 60-year licensing term.

Additionally, according to Section 4.3.1 of the St. Lucie Unit 1 Subsequent License Renewal Application (SLRA) [ADAMS Accession No. ML21285A110], all the projected transient cycles at 80 years of operation are less than or equal to their associated number of design transient cycles. Table 4.3.1-1 of the SLRA also establishes an upper bound limit of 500 RCS heatup and cooldown cycles over an 80-year operating period, which corresponds to an average of 6.25 cycles per reactor year for the cumulative 80-year licensing term.

It is noted that the projected heatup and cooldown cycle projections for the 80-year period in Table 4.3.1-1 of the SLRA (143 cycles for heatup and 141 cycles for cooldown) are significantly lower than the design cycle limits, providing further evidence that the yearly frequency value for St. Lucie Unit 1 is within the maximum frequency limit of 13 cycles per reactor year.

These references and calculations support the conclusion that the number of RCS heatup and cooldown transient cycles for St. Lucie Unit 1 of CE-designed PWRs in WCAP-16168-NP, Revision 3 is within the prescribed limits, demonstrating that the plant's operation is within acceptable bounds assumed in the fatigue crack growth analyses for the Combustion Engineering pilot plant for St. Lucie Unit 1. This also supports the proposed inspection schedule and interval extension.

RAI-4

- a. Confirm whether the subject relief request is the first interval extension request for St. Lucie Unit 1 associated with WCAP-16168-NP-A, Revision 3.

FPL Response

The proposed alternative, as described in WCAP-16168-NP-A, Revision 3, is the first interval extension request for St. Lucie Unit 1.

- b. Confirm whether Item (6) in Section 3.4 of the NRC staff's SE, approving WCAP-16168-NP-A, Revision 3 dated July 26, 2011, applies to St. Lucie Unit 1. If so, provide the results of analyses described in Section (e) of 10 CFR 50.61a.

FPL Response

Item (6) in Section 3.4 of the NRC staff's SE dated July 26, 2011, does not apply to St. Lucie Unit 1.

Per Table 2 of the relief request, four previous inservice inspections were performed, corresponding to the four ISI intervals. Therefore, the current relief request is the first interval extension being sought for St. Lucie Unit 1.

References:

1. Florida Power & Light Company letter L-2024-004, Relief Request (RR) #7, Proposed Alternative in Accordance with 10 CFR 50.55a(z)(1), Extension of Inspection Interval for St. Lucie Unit 1 Reactor Pressure Vessel Welds from 10 to 20 Years, January 18, 2024 (ADAMS Accession No. ML24018A064)
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