FPL.

November 6, 2014

L-2014-340
10 CFR 50.4
10 CFR 50.55a

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

Re: St. Lucie Unit 2
Docket No. 50-389
Inservice Inspection Plan
RAI Reply - Fourth Ten-Year Interval Unit 2 Relief Request No. 4

References

1. FPL Letter L-2014-170 dated June 30, 2014, "Inservice Inspection Plan Fourth Ten-Year Interval Unit 2 Relief Request No. 4, Revision 0," ADAMS Accession No. ML14203A005
2. NRR E-mail Capture – "RAIs regarding Saint Lucie 2 - Fourth 10-year Interval Relief Request No. 4 for Visual Examination of the reactor Vessel and Associated piping (MF4473)," ADAMS Accession No. ML14290A213

In Reference 1, Florida Power & Light (FPL) requested relief from the requirements for performing visual examinations of the reactor vessel and associated Class 1 and Class 2 piping in covered trenches rendered inaccessible in conjunction with the pressure testing of Class 1 and 2 components. In Reference 2, the NRC provided a request for additional information (RAI) on the Reference 1submittal. Attachment 1 provides the FPL response to the RAI and Attachment 2 provides the conforming changes to the relief request.

Please contact Ken Frehafer at (772) 467-7748 if there are any questions about this submittal.

Sincerely,

Steve Catron
Licensing Manager
St. Lucie Plant

Attachments

CS/KWF

cc: NRC Region II Administrator
NRC Site Resident Inspector

A047
NRR

St. Lucie Unit 2
FOURTH INSPECTION INTERVAL
RAI REPLY - RELIEF REQUEST NUMBER 4

By letter dated June 30, 2014 (Accession No. ML14203A005), Florida Power and Light Company (the licensee) requested relief from the requirements of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (B&PV Code). The request relates the requirements for performing visual examinations of the reactor vessel and associated Class 1 and Class 2 piping in covered trenches rendered inaccessible in conjunction with the pressure testing of Class I and 2 components are provided in ASME Code Section XI, Articles IWA-5000, IWB 5000 and IWC-5000.

The NRC staff has reviewed the relief request submitted by FPL and determined that additional information is needed. The NRC staff requests that you respond to the following request for additional information (RAI) by Component Performance, NDE, Testing branch (EPNB) and Vessels & Integral Integrity Branch (EVIB).

NRC EPNB Request 1:

For Class 1 components, the licensee requests relief under ASME Code, Section XI, articles IWA-5000 and IWB-5000. For class 1 components, IWB-5210 requires pressure testing in accordance with Table IWB 2500-1, Examination Category B-P. Table IWB-2500-1, Examination Category B-P requires a system leakage test in accordance with IWB 5220 prior to plant startup following a refueling outage and a VT-2 visual examination in accordance with IWA-5240. IWB-5220 establishes temperature requirements above ambient conditions. Tests are required every refueling outage.

a. Confirm that relief is being requested from the pressure and temperature requirements of IWB-5220. Additionally please confirm that an extension in the time interval between VT-2 inspections is being requested from once every refueling outage to once every period.

b. If an extension is being sought for the VT-2 examination of Class 1 components, please provide justification for this increase.

FPL EPNB Response 1a:

For Class 1 components, FPL will continue to perform the required system pressure tests as prescribed by IWB-5000 each refueling outage and will examine all accessible components in accordance with IWA-5241. For those portions of components rendered inaccessible by containment building configuration, 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.

FPL EPNB Response 1b:

The FPL submittal has been revised to specify Class 1 components will receive a VT-2 examination each refueling outage as required by IWB-5000.

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NRC EPNB Request 2:

For Class 2 components, the licensee requests relief under ASME Code, Section XI, articles IWA-5000 and IWC-5000. For Class 2 components, IWC-5210 requires pressure testing in accordance with Table IWC 2500-1, Examination Category C-H. Table IWC-2500-1, Examination Category C-H requires a system leakage test in accordance with IWC 5220 and a VT-2 in accordance with IWA-5240. IWC-5220 establishes temperature requirements above ambient conditions. Tests are required each inspection period. Confirm that relief is being requested only from the pressure and temperature requirements of IWC-5220. Provide materials of construction for the Class 1 and 2 components for which relief is sought.

FPL EPNB Response 2:

For Class 2 components, FPL will continue to perform the required system pressure tests as prescribed by IWC-5000 each inspection period and will examine all accessible components in accordance with IWA-5241. For those portions of components rendered inaccessible by containment building configuration, FPL will open the inaccessible areas each refueling outage and perform a VT-2 examination of associated piping following plant cooldown and depressurization.

Class 1 and 2 components affected by containment building configuration are constructed of the following materials:

Class	Component	Material
1	Reactor Vessel Bottom Head Area	Carbon Steel
1	SI Header 12-SI-148	Stainless Steel
1	SI Header 12-SI-149	Stainless Steel
1	SI Header 12-SI-150	Stainless Steel
1	SI Header 12-SI-151	Stainless Steel
1	Charging 2-CH-147	Stainless Steel
1	Letdown 2-RC-142	Stainless Steel
2	SDC Suction 10-SI-362	Stainless Steel
2	SDC Suction 10-SI-363	Stainless Steel
2	Hot Leg Injection 3-SI-179	Stainless Steel
2	Hot Leg Injection 3-SI-181	Stainless Steel

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NRC EPNB Request 3:

Discuss any industry or plant specific operating experience applicable to the components under consideration.

FPL EPNB Response 3:

There is no plant-specific, NextEra fleet, or industry operating experience regarding potential degradation specific to the items included in this relief request. However, isolated occurrences of stress corrosion cracking have occurred in stainless steel materials in the industry. To address the concerns of these isolated cases, the periodic inspections made possible by removal of the access limitations provides assurance that any isolated degradation would be identified at the onset before a safety concern could develop.

NRC EPNB Request 4:

Discuss the hardship associated with visually inspecting Class 1 components each refueling outage under the proposed temperature and pressure conditions.

FPL EPNB Response 4:

The FPL submittal has been revised to perform the proposed alternative examination of Class 1 components each refueling outage.

There is no direct access to the bottom of the reactor to perform an examination at pressure and temperature. Access is obtained during refueling outages by propping open the damper and accessing the area. Access in this manner is not possible while the plant is in operation at pressure and temperature. Some segments of Class 1 and 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 flowpaths 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 directed by IWA-5241.

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NRC EVIB Request 1:

The American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME BPVC) Section XI requires that Examination Category B-P, Item Number B15.10, the Reactor Vessel – Pressure Retaining Boundary Bottom Head Area be examined during each refueling outage at full pressure and temperature according to Table IWB-2500-1 and Article IWB-5000.

However, the licensee, in its relief request in Paragraph 2 under "Proposed Alternative" stated that "For those portions of components rendered inaccessible by Containment Building configuration, as an alternative to the requirements of IWA-5241, at least once each period during refueling FPL will open the inaccessible areas and perform a VT-2 examination of the reactor vessel bottom and other associated piping following plant cooldown and depressurization."

Explain how reducing frequency of inspections from each refueling outage to each period [3 times per a 10-year interval] during refueling outage for the reactor vessel bottom provides a level of quality and safety comparable to the current ASME Code requirements.

FPL EVIB Response 1:

The FPL submittal has been revised to perform the proposed alternative examination of Class 1 components each refueling outage.

FPL will continue to perform the required system pressure tests for the reactor vessel pressure retaining boundary bottom head area as prescribed by IWB-5000 each refueling outage. For areas rendered inaccessible by containment building configuration during normal operating conditions, FPL will open the inaccessible areas each refueling outage and perform a VT-2 examination of the reactor vessel bottom following plant cooldown and depressurization.

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RELIEF REQUEST NUMBER 4, REVISION 1

Proposed Alternative
In Accordance with 10CFR50.55a(a)(3)(ii)

--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 Cat.	Item Nos.	Examination Description
B-P	B15.10, B15.20	Reactor Vessel – Pressure Retaining Boundary Bottom Head Area
		Piping - Pressure Retaining Boundary (covered portions only) SI Headers 12-SI-148, 149, 150, 151 Charging 2-CH-147 Letdown 2-RC-142
C-H	C7.10	Piping - Pressure Retaining Components (covered portions only) SDC Suction 10-SI-362, 363 Hot Leg Injection 3-SI-179, 181

2. Applicable Code Edition and Addenda

The Code of record for St. Lucie Unit 2 (PSL-2) is the 2007 Edition with 2008 Addenda of the ASME Boiler and Pressure Vessel Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components."

3. Applicable Code Requirement

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*

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components) for evidence of leakage, or other areas to which leakage may be channeled, shall be required."

Paragraph IWB-5221(a) states the following:

"The system leakage test shall be conducted at a pressure not less than the pressure corresponding to 100% rated reactor power."

Paragraph IWC-5221 states the following:

"The system leakage test shall be conducted at the system pressure obtained while the system, or portion of the system, is in service performing its normal operating function or 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).

4. Reason for Request

St. Lucie Plant does not have access for a direct visual examination of the reactor vessel bottom area during the ASME Section XI System Leakage Test visual examination VT-2 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 flowpaths 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 directed 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).

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5. Proposed Alternative and Basis for Use

Proposed Alternative

Pursuant to 10CFR50.55a(a)(3)(ii), 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 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

FPL will implement the alternative requirements during the fourth 10-year Inservice Inspection interval at PSL-2 which began August 8, 2013 and ends August 7, 2023.

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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.

8. Attachments to the Request

None