



October 13, 2005

L-2005-220  
10 CFR 50.4  
10 CFR 50.55a

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

Re: St. Lucie Unit 1  
Docket No. 50-335  
Inservice Inspection Plan - Third 10-Year Interval  
Second Request for Additional Information Response Relief Request 26  
Repair of Alloy 600 Small Bore Nozzles Without Flaw Removal

On September 30, 2005, the NRC issued a second request for additional information (RAI) for Unit 1 ISI Relief Request 26 based on discussions between NRC and Florida Power & Light Company (FPL) on September 22, 2005. The response to the NRC RAI is attached.

By letter L-2005-099 dated April 29, 2005, FPL requested approval of Unit 1 Relief Request (RR) 26, *Repair of Alloy 600 Small Bore Nozzles without Flaw Removal*. By letter L-2005-189 dated August 25, 2005, FPL responded to the NRC first RAI dated August 11, 2005, the NRC issued the RAI to support their review of the subject RR. The RAI topics were discussed on July 19, 2005 and August 8, 2005 with FPL.

During prior outage years, by letter L-2003-285 dated November 21, 2003, as supplemented by letter L-2004-065 on March 24, 2004, FPL requested extension of Unit 1 Relief Request (RR) 23. This request was made based on the NRC review status of WCAP-15973-P. Unit 1 RR 23 was previously submitted by FPL letter L-2002-247 on January 8, 2003 and supplemented by FPL letter L-2003-108 on April 23, 2003. The NRC approved the RR for one operating cycle by NRC letters dated May 9, 2003 and May 23, 2003.

The NRC staff stated in their May 9, 2003 and May 23, 2003 letters that prior to use of the half nozzle and sleeved full-nozzle replacements on a permanent basis, FPL will be required to submit a separate relief request for NRC approval. The NRC planned to issue the required conditions for implementing the half nozzle and sleeved full-nozzle repairs on a permanent basis in the NRC staff's safety evaluation of the Westinghouse Topical Report WCAP-15973-P, Revision 01, *Low Alloy Steel Component Corrosion Analysis Supporting Small-Diameter Alloy 600/690 Nozzle Repair/Replacement Programs*, May 2004, that was under NRC staff review.

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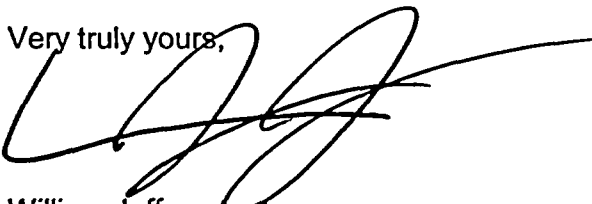
By letter L-2004-100 dated April 20, 2004, FPL requested a one cycle extension of the NRC approval of Unit 1 Relief Request 23, Revision 1. On May 18, 2004, the NRC approved the requested one cycle extension. The extension of the Unit 1 RR 23 for one additional cycle was approved to allow time for the NRC staff to complete the topical report review. It also allowed time for FPL to submit and the NRC to review the permanent RRs.

On January 12, 2005, the NRC approved WCAP-15973-P, Revision 1, and in February 2005 Westinghouse issued the approved version of the topical report, WCAP-15973-P-A, Revision 0, *Low-Alloy Steel Component Corrosion Analysis Supporting Small-Diameter Alloy 600/690 Nozzle Repair/Replacement Programs, Westinghouse Electric Company LLC*, dated February 2005.

NRC approval of the subject permanent repair Relief Request Number 26 for St. Lucie Unit 1 was requested to support the upcoming fall 2005 refueling outage (SL1-20).

Please contact George Madden at 772-467-7155 if there are any questions about this submittal.

Very truly yours,

A handwritten signature in black ink, appearing to be 'WJ', with a long horizontal line extending to the right.

William Jefferson, Jr.  
Vice President  
St. Lucie Plant

WJ/GRM

Attachment

**St. Lucie Unit 1**  
**Response to Second Request for Additional Information**  
**Relief Request No. 26**  
**Repair of Alloy 600 Small Bore Nozzles Without Flaw Removal**

References:

1. FPL Letter L-2005-099 dated April 29, 2005, *Inservice Inspection Plan, Third 10-Year Interval, Relief Request 26 - Repair of Alloy 600 Small Bore Nozzles Without Flaw Removal.*
2. FPL Letter L-2005-189 dated August 25, 2005, *Inservice Inspection Plan - Third 10-Year Interval, Request for Additional Information Relief Request 26, Repair of Alloy 600 Small Bore Nozzles Without Flaw Removal.*
3. NRC Letter dated August 11, 2005, *St. Lucie Nuclear Plant, Unit I- Request For Additional Information Regarding Relief Request No. 26 - Repair Of Alloy 600 Small Bore Nozzles Without Flaw Removal (TAC No. MC6944).*
4. WCAP-15973-P-A, Revision 0, *Low-Alloy Steel Component Corrosion Analysis Supporting Small-Diameter Alloy 600/690 Nozzle Repair/Replacement Programs, Westinghouse Electric Company LLC, dated February 2005.*
5. WCAP-15973-P Revision 01, *Low Alloy Steel Component Corrosion Analysis Supporting Small-Diameter Alloy 600/690 Nozzle Repair/Replacement Programs, May 2004.*
6. NRC Letter dated September 30, 2005, *St. Lucie Nuclear Plant, Unit I- Second Request For Additional Information Regarding Relief Request No. 26 - Repair Of Alloy 600 Small Bore Nozzles Without Flaw Removal (TAC No. MC6944).*
7. NRC letter to WOG, Final Safety Evaluation for Topical Report WCAP-15973-P, Revision 01, *Low-Alloy Steel Component Corrosion Analysis Supporting Small-Diameter Alloy 600/690 Nozzle Repair/Replacement Program, dated January 12, 2005.*
8. A-CEOG-0440-1242<sup>1</sup>, Revision 00, *Evaluation of the Corrosion Allowance for Reinforcement and Effective Weld to Support Small Alloy 600 Nozzle Repairs, June 13, 2000.*

**NRC Request 1:**

Regarding the [FPL] response<sup>2</sup> to RAI question 6<sup>3</sup>:

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<sup>1</sup> FPL identified an apparent typographical error in WCAP-15973-P Revision 1 and WCAP-15973-P-A Revision 0, Reference 12 should be A-CEOG-9449-1242 Revision 00 not A-CEOG-0440-1242 Revision 00 as stated in the topical report on page 5-1 and on page A-2

<sup>2</sup> FPL Letter L-2005-189 dated August 25, 2005, *Inservice Inspection Plan - Third 10-Year Interval, Request for Additional Information Relief Request 26, Repair of Alloy 600 Small Bore Nozzles Without Flaw Removal.*

<sup>3</sup> NRC Letter dated August 11, 2005, *St. Lucie Nuclear Plant, Unit I- Request For Additional Information Regarding Relief Request No. 26 - Repair Of Alloy 600 Small Bore Nozzles Without Flaw Removal (TAC No. MC6944)*

**NRC Request 1(a):**

Provide details regarding the two heat numbers you referenced in your response [Reference 2] such as the heat number and the manufacturer.

**FPL Response 1(a):**

The response [Reference 2] addresses the hot leg piping. The small bore alloy 600 nozzles are welded to straight lengths of hot leg piping. The straight lengths of hot leg piping are made from pieces of plate that are rolled and welded together to form the pipe configuration. The plates were manufactured by Lukens Steel. The material was identified as being from melt number C7293 slab number 65 and melt number C7293 slab number 67.

**NRC Request 1(b):**

If more than those two heats of materials were used for the nozzles identified in Table 1 [Reference 2], provide information (heat number, manufacturer and RT<sub>NDT</sub>) on all heats of materials that are used.

**FPL Response 1(b):**

All the straight lengths of hot leg piping at St. Lucie Unit 1 came from the above two heats, melt number C7293 slab number 65 and melt number C7293 slab number 67.

**NRC Request 1(c):**

You indicated that RT<sub>NDT</sub> of 60 degrees F value was used in the analysis of Westinghouse Topical Report (TR) WCAP-15973-P, Revision 01<sup>4</sup> [Reference 5]. Confirm that this is the bounding value used in the Topical Report. If not, provide justification why the bounding value was not referenced.

**FPL Response 1(c):**

Section 3.5 of the TR [Reference 4] discusses final crack stability comparisons. The second sentence of the second paragraph states, "Also noted in each table was the RT<sub>NDT</sub> for the bounding cases." The table applicable to the hot leg piping shows that RT<sub>NDT</sub> for the hot leg piping is 60 degrees F. Also, reference 4 Appendix A, page A-5, repeats that the RT<sub>NDT</sub> for the hot leg piping is 60 degrees F. The bounding value used in the reference 4 is 60 degrees F.

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<sup>4</sup> WCAP-15973-P Revision 01, *Low Alloy Steel Component Corrosion Analysis Supporting Small-Diameter Alloy 600/690 Nozzle Repair/Replacement Programs*, May 2004.

**NRC Request 2:**

In Table 1 [Reference 2], there are three types of nozzles based on identification tags such as PDT-1121D, TE1112HA, and RC-143. No description was provided regarding each type of nozzle. However, in Table 2, dimensions of two types of nozzles (Flow nozzle and RTD nozzle) are shown. Provide a description of the dimensions for the third type of nozzles as shown in Table 1 [Reference 2]. Are they bounded by the other two types of nozzles?

**FPL Response 2:**

The ID tags identify the nozzle function, however all three nozzle types were installed with the same bore diameter in the hot leg piping. The two sets of dimensions shown in Table 2 [Reference 2] are dimensions of the original weld preparation. The nozzles prefixed with "PDT" and "RC-143" have the same weld prep dimensions and the dimensions are identified as "flow nozzle." The nozzles prefixed with "TE" are identified as "RTD nozzle." All nozzles are bounded by the approved TR [Reference 4].

**NRC Request 3:**

In your response to NRC Question 4.e [Reference 2], you stated that there is no need to track plant operating conditions during the remainder of the current inspection interval as there is sufficient wall thickness margin to maintain the minimum required wall thickness. Please identify which wall thickness dimension you are referring to and also confirm if this dimension is used in the analysis in WCAP-15973-P, Revision 01 [Reference 5] as a limiting dimension. In the referenced statement, please reference the allowable nozzle bore diameter, which is relevant to the issue under discussion and is supported by the discussion provided in the remainder of the response.

**FPL Response 3:**

The response to NRC Question 4.e [Reference 2] addresses item 4.1.3 of the NRC safety evaluation (SE) [Reference 4] which states "Track the time at cold shutdown conditions to determine whether this time does not exceed the assumptions made in the analysis. If these assumptions are exceeded, the licensees shall provide a revised analysis to the NRC, and provide a discussion on whether volumetric inspection of the area is required."

To demonstrate that tracking time at cold shutdown conditions was not necessary, FPL conservatively assumed the plant would not operate for the 27 months remaining in the current inspection interval. This maximizes corrosion and shows that there is sufficient margin available in the hot leg piping to meet the limiting diameter requirements identified in A-CEOG-0440-1242, Revision 00, [Reference 8]. Calculation, A-CEOG-0440-1242, Revision 00, is Reference 12 of WCAP-15973-P-A, Revision 0,

[Reference 4]. The actual plant operating conditions will be reassessed, based on operating data, for the resubmittal of this relief request at the start of the next inspection interval.

A-CEOG-0440-1242, Revision 00, [Reference 8] which is Reference 12 of WCAP-15973-P-A, Revision 0, [Reference 5] is a calculation to determine how much corrosion of nozzle bores is acceptable; that is, how much larger can the bore hole become before the ASME Boiler and Pressure Vessel Code requirements are exceeded. As previously stated in reference 2 response 4.d, the limiting bore diameter for the St. Lucie Unit 1 hot leg piping nozzles is 1.270 inches.

The corrosion margin is the difference between the limiting bore diameter, 1.270 inches, and the design nozzle bore diameter, 0.997 inches. The corrosion margin in this case would be 0.273 inches. As previously stated in reference 2 response 4.e, the hypothetical corroded nozzle bore diameter would be 1.045 inches. Subtracting the corroded bore diameter from the limiting bore diameter results in a difference of 0.225 inches, which is within the corrosion margin.

The subject of reduction of wall diameter, A-CEOG-0440-1242, Revision 00, [Reference 8] which is Reference 12 of WCAP-15973-P-A Revision 0 [Reference 5], is discussed in Section 2.4 of WCAP-15973-P-A Revision 0 [Reference 5].