March 16, 2006

Mr. J. A. Stall
Senior Vice President, Nuclear and
Chief Nuclear Officer
Florida Power and Light Company
P.O. Box 14000
Juno Beach, Florida 33408-0420

SUBJECT: ST. LUCIE NUCLEAR PLANT, UNIT 2 - REQUEST FOR ADDITIONAL INFORMATION REGARDING PROPOSED RELIEF REQUEST NO. 5, REVISION 1 (TAC NO. MC9502)

Dear Mr. Stall:

By letter dated January 4, 2006, Florida Power and Light (FPL) submitted Relief Request No. 5, Revision 1 regarding repair of Alloy 600 small bore nozzles without flaw removal at St. Lucie Unit 2.

The U.S. Nuclear Regulatory Commission staff has reviewed your submittal and finds that the additional information contained in the enclosed Request for Additional Information is needed before we can complete the review. This was discussed with members of the FPL staff and, on March 13, 2006, Mr. Ken Frehafer indicated that a response would be provided within 3 weeks of the date of this letter.

If you have any questions, please contact me at (301) 415-3974.

Sincerely,

/RA/

Brendan T. Moroney, Project Manager
Plant Licensing Branch II-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-389

Enclosure: Request for Additional Information

cc w/encl: See next page

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REQUEST FOR ADDITIONAL INFORMATION

FLORIDA POWER AND LIGHT COMPANY, ET AL.

ST. LUCIE NUCLEAR POWER PLANT, UNIT 2

DOCKET NUMBER 50-389

By letter dated January 4, 2006, Florida Power & Light company submitted Relief Request No. 5, Revision 1, for the third 10-year inservice inspection interval at St. Lucie Unit 2. To complete its review, the U.S. Nuclear Regulatory Commission (NRC) staff requests the following additional information:

1. Page 1, Section 2, identifies the applicable code for this relief request as the 1999 Edition through the 2000 Addenda of the American Society of Mechanical Engineers (ASME) Code. In accordance with the June 8, 2004, NRC staff safety evaluation of Relief Request No. 1 for St. Lucie Unit 2, the code of record for the third 10-year inspection interval at St. Lucie Unit 2 is the 1998 Edition through the 2000 Addenda, with conditions. Please confirm the appropriate code version applicable to this request and correct the submittal, as necessary.

2. Page 1, Section 3, requests an alternative to paragraph IWB-3132.2 of the ASME Code, Section XI, which involves the examination and acceptance of the remnant flaws. Based on similar submittals, the NRC staff has found that the following ASME Code paragraphs may also apply to the proposed repair: (A) Section XI, Code Case N-638, which provides requirements for the temper bead welding; (B) Section III, Paragraph NB-4622, which provides requirements for the post-weld heat treatment; (C) Section III, Paragraphs NB-4453, NB-5244, and NB-5245, which provide the nondestructive examinations requirements; and (D) Section XI, Paragraph IWA-4540 (or Section III, Paragraph NB-6111.1), which requires a system hydrostatic test after repairs. Please confirm that the proposed repairs take no exceptions to the above ASME Code requirements, or request relief from the aforementioned requirements.

3. Page 5. The response to Question 2 in Section 4.1 of the NRC's safety evaluation for Westinghouse Report WCAP-15973-P-A, states that the corrosion rate of 1.06 mils per year (mpy) is applicable only to the half-nozzle repair.

    a. Discuss the applicability of the half-nozzle corrosion rate to the sleeve repair.

    b. Since the sleeve repair was first used in 1989, recalculate the corrosion rate using all of the corrosion data from 1989 to December 31, 2004, or justify why the corrosion data from 1989 to 1995 is not applicable to the corrosion rate calculation for the half-nozzle repair.

Enclosure

c. Discuss why the bounding corrosion rate on Page 2-6 of WCAP-15973-P-A, which is more conservative than the 1.06 mpy, was not applied to St. Lucie, Unit 2.

4. Page 7. The response to Question 4 in Section 4.1 of the NRC's safety evaluation for WCAP-15973-P-A, states that the corrosion rate for a tight crevice, as discussed in Section 2.5 of the WCAP report, is applicable to the sleeve repairs.

   a. The corrosion rate discussed in Section 2.5 of the WCAP report is related to the mechanical nozzle seal assembly (MNSA) repair, not to the sleeve repair. Justify the use of the corrosion rate of the MNSA repair for the sleeve repair.

   b. On page 2 of the submittal, you stated that sleeves are either rolled in the bore of the nozzle or welded to the interior surface of the piping or pressurizer. For the sleeves that are rolled in the nozzle/penetration bore, the bore may be dilated during certain transients such that the interference fit between the sleeve and the bore could become relaxed. In addition, the sleeve is made of Alloy 690 and the piping or pressurizer base metal is carbon steel. The thermal expansion of the two materials is different, which could contribute to the relaxation of the interference fit. A crevice could be generated between the sleeve and the base metal under this scenario. The borated solution could come in contact with the carbon steel of the piping or pressurizer, which would lead to a leakage path and potential flaw initiation. In the absence of an assurance that this scenario would not occur, a crevice should be assumed to exist between the sleeve and piping/pressurizer base metal, which means that the corrosion rate for the sleeve repair would be similar to, if not the same as, the corrosion rate for the half-nozzle repair. Address the likelihood of this scenario and, if it is relevant, recalculate the life span of the sleeve repair.

5. Page 8. The response to Question 2 in Section 4.2 of the NRC's safety evaluation for WCAP-15973-P-A provided the cooldown rate for the pressurizer water space. If the cooldown rate exceeds the specified 75 degrees Farenheit per hour, describe what corrective actions will be taken, including whether an analysis would be performed to demonstrate the impact of an out-of-limit event on the structural integrity of the pressurizer base material (given the existence of remnant flaws in the nozzles or heater sleeves).

6. Page 8. The response to Question 3 in Section 4.2 of the NRC's safety evaluation for WCAP-15973-P-A states that "The [elastic-plastic fracture mechanics] analysis was not performed on the upper head [of the pressurizer] because the upper head is not affected by the large in-surge transient or thermal stress which occurs at the lower head and lower shell." Table 1 of the submittal shows that indications were detected on the three pressurizer upper head nozzles at St. Lucie Unit 2 in 1994. Table 1 does not show whether indications were detected in the pressurizer lower head, although they were preventively repaired. The pressurizer upper head is at least as susceptible to cracking as the lower head, even though the upper head may not experience the in-surge transient or high thermal stress as the lower head.

a. Discuss the root cause of the indications found in the upper head nozzles in 1994 and the likelihood of the indications occurring in the replacement Alloy 690 nozzles.

b. The submital provided conclusions on the acceptability of the upper shelf energy for the pressurizer lower shell and lower head, but not the upper head. Confirm that the upper shelf energy for the pressurizer upper head is also acceptable.

c. In light of indications detected in the pressurizer upper head, confirm that the elastic-plastic fracture mechanics analysis performed in WCAP-15973-P-A (as presented in Reference 17 of the report) bounds the pressurizer upper head at St. Lucie Unit 2.

7. Page 10. You state that Relief Request No. 5, Revision 1, applies to all previous repairs to Alloy 600 small bore nozzles on the reactor coolant hot leg piping and pressurizer that have remaining nozzles in place. Confirm that the previously performed half-nozzle repairs utilized the same repair method (i.e., welding, installation, design, corrosion calculations, flaw evaluation, and qualification tests) as the half-nozzle repair described in WCAP-15973-P-A.

8. Page 13. The footnote in Table 1 states "*Nozzle welded to a nickel alloy weld pad." Identify the alloy material and welding process of the weld pad.

9. Page 2-10 of WCAP-15973-P-A, provides a brief discussion of the inspection results of the repaired nozzles at St. Lucie Unit 2.

a. Provide a detailed discussion of the examination technique used, the inspection scope (which areas of the repair were examined and which nozzles were inspected), and inspection results of the nozzle and sleeve repairs made on the hot leg nozzles and pressurizer upper and lower heads since 1989. If a visual examination was performed, identify whether it was a VT-1, VT-2, or VT-3 examination.

b. Describe the inservice inspection strategy for the future nozzle and heater sleeve repairs.

10. Please confirm that the external welds of the 26 half-nozzle and sleeve repairs listed in Table 1 have been evaluated for mechanical and thermal fatigue in accordance with ASME Section III Class 1 design requirements, and that the Class 1 stress and fatigue criteria are met for the life of the plant.

Mr. J. A. Stall
Florida Power and Light Company

ST. LUCIE PLANT

cc:

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