Florida Power & Light Company, 6501 S. Ocean Drive, Jensen Beach, FL 34957

May 21, 2009

L-2009-128
10 CFR 50.4

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

Re: St. Lucie Unit 2
Docket No. 50-389
Deviation from EPRI MRP-146 Ultrasonic Examination Schedule –
NEI 03-08 Needed Work Product Element

Florida Power & Light Company (FPL) has prepared a deviation from an NEI 03-08 needed work product element in EPRI Material Reliability Program MRP-146S, "Management of Thermal Fatigue in Normally Stagnant Non- Isolable Reactor Coolant System Branch Lines – Supplemental Guidance," dated January 2009. The specific deviation is to postpone the initial ultrasonic inspection (UT) of three drain lines from the St. Lucie Unit 2 Spring 2009 refueling outage (RFO) until the Fall 2010 RFO. During the Fall of 2010, the three drain lines will be replaced as part of the mitigation of alloy 600 safe ends associated with these drains. This will allow the drain lines to be inspected in a lower dose area away from the remainder of the RCS loop piping. A summary of the technical justification is enclosed.

Nuclear Energy Institute (NEI) document NEI 03-08, "Guidelines for the Management of Material Issues," allows deviations from "Needed" work product elements with the appropriate justification and documentation. The attached justification was approved at the appropriate levels of FPL management.

Pursuant to NEI 03-08, Addendum E, Revision 3, the enclosed technical justification summary does not require any NRC action to be taken.

Sincerely,

Eric S. Katzman
Licensing Manager
St. Lucie Plant

ESK/KWF

Enclosure

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NRR

A) NEI 03-08 Materials Guidelines Deviation Protocol

Nuclear Energy Institute (NEI) document NEI 03-08, "Guidelines for the Management of Material Issues," allows deviations from "Needed" work product elements with the appropriate justification and documentation. From NEI 03-08, Addendum E (Revision 3) the process for reporting a deviation is as follows:

> *Utility Notification of Deviations to the NRC*
> *"Utilities shall notify the NRC of any approved deviations from Mandatory and Needed guideline elements. This notification is for information; NRC approval or other actions are not expected. The notification shall summarize:*
> - *the guidance being deviated from,*
> - *the justification for the deviation, and*
> - *any actions undertaken in lieu of the guidance.*

> *NRC notification should occur at about the same time (45 days from approval) as the justification for deviation is sent to the Issue Program (IP)."*

Guidance Being Deviated From:
MRP-146S [1] and the transmittal letter, MRP 2009-007 [2] identified as a NEI 03-08 needed action, that normally stagnant non-isolable reactor coolant system (RCS) lines that screen in as potentially susceptible to thermal fatigue shall have the initial ultrasonic inspection (UT) prior to the end of the next refueling outage (RFO) that initiates after January 31, 2009.

> *Performance of initial inspections on lines that do not pass the screening criteria in sections 2.1.1/ 2.1.2.1/2.1.2.2 (UH/H) or 2.1.3/2.1.4.1/2.1.4.2 (DH) of MRP-146 prior to the end of the next RFO that initiates after January 31, 2009 is required.*

St. Lucie Unit 2 has three intermediate leg drain lines that require initial inspection during the April/May 2009 refueling outage (SL2-18). This deviation will postpone action meeting the requirements of MRP-146S for one cycle, until the Fall of 2010 (SL2-19). During the SL2-19, these 3 drain lines will be cut out and replaced as part of the efforts to mitigate alloy 600/82/182 butt welds. Therefore the duration of this deviation is one 18 month refueling cycle.

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[1] Materials Reliability Program: Management of Thermal Fatigue in Normally Stagnant Non-Isolable Reactor Coolant System Branch Lines – Supplemental Guidance (MRP-146S). EPRI, Palo Alto, CA: 2009. 1018330.

[2] EPRI MRP Letter 2009-007, "Materials Reliability Program: Management of Thermal Fatigue in Normally Stagnant Non- Isolable Reactor Coolant System Branch Lines – Supplemental Guidance, (MRP-146S), 1018330-Needed Guidance," January 12, 2009.

Summary of Justification for the Deviation:

The previous inspection deadline in MRP-146 [3] gave a deadline for initial screening of susceptible lines within 2 years. If these screenings identify potentially susceptible lines, additional actions (more detailed evaluation, inspection, additional monitoring, etc) shall take place in a timely manor consistent with outage schedules. The MRP-146S modified timely as, "*prior to the end of the next RFO that initiates after January 31, 2009.*"

Thermal fatigue is a function of the magnitude of stress cycles and the number of cycles. The temperature cycling (stress) and frequency (cycles per unit time) for several reactor coolant system configurations has been modeled but the time required for degradation (fatigue limit) is still being developed to determine the inspection frequency for the 60 year plant life. As such, the required date of, "*prior to the end of the next RFO that initiates after January 31, 2009*" does not consider hours of operation and therefore is not based on a fatigue limit.

The horizontal leg and valve of one screened in drain line was replaced in 2003. All three drain lines will be cut out and replaced as part of a modification to eliminate the alloy 600 nozzle that connects these drain lines to the RCS loop piping. Therefore, FPL has concluded that postponement of actions for one RFO meets the intent of timely action.

Postponement of inspection for one RFO will not result in safety significant degradation. The results of an NRC sponsored study, NUREG/CR 6674 [4] indicated that thermal fatigue does not have a significant contribution to core damage frequency and that utilities decision to address the potential effects in non-isolable lines should be a balanced decision based on both economic and plant safety considerations.

NEI 03-08 "Needed" actions are potentially economic and not safety significant as defined by the NEI 03-08 Implementation Protocol. Further, the operational experience (OE) of thermal fatigue failures has been predominantly the result of cold water in-leakage. The St. Lucie Unit 2 lines are dead end lines with a valve and blind flange. The limited thermal fatigue OE that has resulted in leakage, was easily detected by RCS leak rate or containment moisture or radiation monitoring so that safe shutdown was performed long before a safety significant situation occurred. In none of these cases has the occurrence of thermal fatigue cracking resulted in a pipe rupture. Since the time of these leaks reported in the OE, FPL has adopted the more stringent RCS leak rate

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[3] Materials Reliability Program: Management of Thermal Fatigue in Normally Stagnant Non- Isolable Reactor Coolant System Branch Lines – (MRP-146). EPRI, Palo Alto, CA: 2005. 1011955.

[4] NUREG/CR-6674, "Fatigue Life Analysis of Components for 60-Year Plant Life." PNNL for the US NRC, June 2000.

monitoring action levels identified in WCAP-16465-NP [5] and WCAP-16423-NP [6] into the current St. Lucie Unit 2 administrative procedures. In the unlikely event that leakage was to occur as a result of thermal fatigue at one of these locations, it would be detected by these enhanced leakage action levels long before a safety significant situation could occur.

Postponement of inspection of these three drain lines for one refueling cycle (Fall 2010) will result in approximately 0.3 to 0.5 REM saving and is the reason for the deviation.

Summary of Actions Taken in Lieu of the Deviation Guidance:

The three drain lines in the scope of this deviation have had the insulation removed from the vertical run of the drain line during Spring 2009 RFO as part of the preparation walk down for replacement of these drain lines at the next RFO. No degradation or leakage was observed. These three drain lines will be cut out and replaced during the Fall 2010 RFO. After removal, these drain lines will be taken to a lower dose area for UT inspection to meet the requirements of MRP-146 and MRP-146S. Two other non-isolable stagnant RCS lines that screened in as susceptible to thermal fatigue at St. Lucie Unit 2 will be inspected during the Spring 2009 RFO per the requirements of MRP-146 and 146S.

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[5] WCAP-16465-NP, "PWROG Standard RCS Leakage Action Levels and Response Guidelines for PWRs," Pressurized Water Reactor Owners Group.

[6] WCAP-16423-NP, "PWROG Standard Process and Methods," Pressurized Water Reactor Owners Group.