



**FPL**

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

August 13, 2008

L-2008-187  
10 CFR 50.90

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

RE: St. Lucie Units 1 and 2  
Docket Nos. 50-335 and 50-389  
Proposed License Amendment  
Request for Additional Information Response  
Alternative Source Term Amendment – TAC Nos. MD6173 and MD6202

On July 16, 2007, Florida Power and Light Company (FPL) submitted the St. Lucie Unit 1 and 2 Alternative Source Term (AST) license amendment requests via FPL letters L-2007-085 and L-2007-087. FPL provided responses for additional information on the control room outside air intake (CROAI) radiation monitor matters via FPL letters L-2008-022 and L-2008-121 dated February 14, 2008 and June 2, 2008, respectively. Additional teleconferences between FPL and the Staff were held on June 16, 2008 and June 26, 2008 associated with the design, function, operation and control of the Unit 1 CROAI radiation monitoring system. FPL provided responses to those verbal requests via FPL letter L-2008-161 dated July 11, 2008. Subsequent to that response, FPL decided to replace the existing Unit 1 CROAI radiation monitoring system with a new system. The proposed modifications were discussed with the St. Lucie NRC Program Manager via teleconference on July 25, 2008, and FPL agreed to update the information provided in the L-2008-161 submittal. This letter provides the information for the proposed Unit 1 CROAI radiation monitoring system and replaces the information previously docketed in FPL letter L-2008-161.

Attachment 1 provides the response. Attachment 2 provides word-processed TS pages that reflect Staff recommendations. Attachment 3 revises the commitment of L-2008-161 Attachment 6. The previously submitted no significant hazard analyses remain bounding.

In accordance with the FPL Quality Assurance Topical Report, this RAI followup response was reviewed by the St. Lucie Onsite Review Group. In accordance with 10 CFR 50.91(b)(1), a copy of the proposed amendment was forwarded to the State Designee for the State of Florida.

Based on the increased scope of the proposed modifications to improve the reliability of the Unit 1 CROAI radiation monitoring scheme, FPL requests that implementation of the Unit 1 and Unit 2 AST amendments be changed from the originally requested 90 days to 9 months after NRC approval of the AST amendments. Additionally, implementation of the proposed TS change associated with the Units 1 and 2 CR Habitability TSTF submittal (FPL letter L-2007-084 dated July 16, 2008) needs to be coordinated with the implementation of the AST TSs.

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

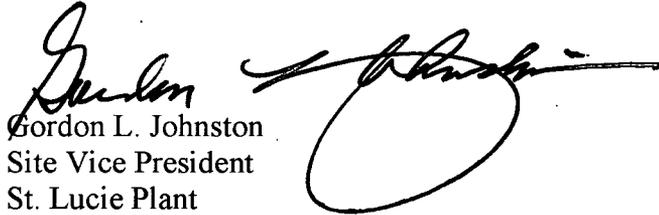
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I declare under penalty of perjury that the foregoing is true and correct.

Executed on the 13<sup>th</sup> day of August 2008.

Very truly yours,

  
Gordon L. Johnston  
Site Vice President  
St. Lucie Plant

GLJ/KWF

Attachment

cc: Mr. William A. Passetti, Florida Department of Health

**Unit 1 Control Room Outside Air Intake (CROAI)  
Radiation Monitoring System  
Design and Proposed Modifications**

Background:

Based on teleconferences between NRR and FPL held on June 16, 2008 and June 26, 2008, FPL is providing additional information concerning the proposed design modifications associated with the St. Lucie Unit 1 control room outside air intake (CROAI) radiation monitoring system.

Current Radiation Monitoring System Design and Proposed Modifications:

The Unit 1 control room outside air intake (CROAI) radiation monitors (RE-26-46 / RIS-26-46 and RE-26-47 / RIS-26-47) are designed to monitor intake air for the protection of control room personnel. RE-26-46 / RIS-26-46 and its associated controls are powered from an A train source. RE-26-47 / RIS-26-47 and its associated controls are powered from a B train source. These power sources are for non-essential loads and as such, are not automatically energized by the emergency diesel generators (EDGs) following loss of power. The sample pumps for both monitors are powered from an AB train source, which is automatically backed by the EDG to which the AB bus is aligned. The sample isolation valves are powered from B train DC power. Attachment 2 of FPL letter L-2008-161 provided a simplified description and diagram of the Unit 1 CROAI radiation monitoring system taken from the operator training program (for information purposes only).

The current Unit 1 CROAI design does not meet single failure criteria. However, the CROAI radiation monitors are important to safety (classified as Quality Related). FPL letter to NRC L-2008-081 (Ref. 3) described the control circuit for Unit 1 CROAI radiation monitors as being modified to ensure the circuit fails safe under loss of power conditions. FPL letter to NRC L-2008-161 (Ref. 4) described proposed modifications to the CROAI radiation monitoring system to improve the reliability of the monitors for the performance of the control room isolation function. FPL proposes to supersede the modifications proposed by FPL letter to NRC L-2008-081 and by FPL letter to NRC L-2008-161 with an alternate design. The alternate design uses redundant safety-related seismically qualified radiation detectors seismically mounted in both the North and South CROAI ducts. There is no flood or missile threat to the detectors in these locations. The safety-related radiation monitors will be provided with Class 1E uninterruptible power. One set of the radiation detectors in the North and South CROAI ducts will be powered from Train SA and the other set of radiation detectors will be powered from Train SB. If "High Radiation" is detected by any of the four safety-related radiation monitors, it will actuate its associated train of Control Room ventilation system isolation/recirculation. The alternate design will be implemented no later than nine months following NRC approval of the LAR.

FPL provides the following responses to the questions the NRC staff had with respect to the proposed modification.

Responses to NRC Request for Additional Information:

**NRC Question 1:**

*How would the operators detect a monitor failure? Is the failure annunciated? What would the operators do upon monitor failure?*

**FPL Response:**

A common reactor turbine generator board (RTGB) annunciator window exists for all radiation monitors in the plant. Upon annunciation of CROAI radiation detector failure in the control room, the operators would declare the associated control room isolation channel inoperable, take the action prescribed by Action 17 of Technical Specification Table 3.3-6, and initiate corrective actions while the other control room isolation channel continues to operate. During accident conditions, control room operators would use the remaining control room isolation channel to assess the north and south outside air intake ducts to determine which intake has lower radiation levels.

**NRC Question 2:**

*Can the monitors credibly fail as-is?*

**FPL Response:**

In the unlikely event a radiation detector fails “as-is,” this modification supports the likelihood that at least one control room isolation channel will remain in service to ensure monitoring for protection of control room personnel.

**NRC Question 3:**

*Describe the differences between the CLB and the new licensing bases with respect to the new important to safety function being performed.*

**FPL Response:**

As described in Section 9.4.1 of the St. Lucie Unit 1 UFSAR, the design basis of the Control Room Ventilations System is, in part, to limit control room doses due to airborne activity to within GDC 19 limits. On receipt of a containment isolation signal (CIS) from either Unit 1 or 2 or a high radiation signal from the in-service Unit 1 outside air intake radiation monitor, outside air is isolated by redundant dampers located in the outside air makeup ducts. The control room air is recirculated through HEPA filters and charcoal adsorbers.

Although the control room is isolated on a CIS or high radiation signal, isolation on high radiation is not credited in the current Unit 1 accident analyses to limit control room doses due to airborne activity to within the limits of GDC 19. With adoption of the Alternative Source Term (AST), the Unit 1 accident analyses will credit control room isolation on high radiation to limit control room doses due to airborne activity to within the limits of 10 CFR 50.67, Accident Source Term for all non-LOCA events.

By FPL letter to NRC L-2007-085 (Ref. 1), FPL proposed to revise Tables 3.3-6 and 4.4-3 of the Unit 1 Technical Specifications (TSs) to add the Control Room Isolation Radiation Monitors to the applicability of TS 3/4.3.3.1, Radiation Monitoring. FPL letter to NRC L-2008-121 (Ref. 2)

provided a revised radiation monitor isolation setpoint as well as a proposed TS surveillance that will provide verification that the Control Room Isolation channel response time is within the assumptions of the AST accident analyses.

**NRC Question 4:**

*Based on the new functional requirements placed on the monitors, discuss how the pedigree of the monitors is appropriate and that the safety function would be met.*

**FPL Response:**

The alternate design uses redundant safety-related radiation detectors mounted in the North and South CROAI ducts. The safety-related radiation detectors will be provided with Class 1E power. Both the North and South CROAI ducts will contain one detector powered from Train SA and one detector powered from Train SB.

The changes to the design of the Unit 1 CROAI radiation monitoring system proposed herein will ensure that the control room ventilation system will be automatically isolated and placed in the recirculation mode of operation as assumed in the AST analyses. The new Surveillance Requirement (SR) proposed in the Reference 2 letter to NRC will provide verification that the Control Room Isolation channel response time is within the assumptions of the AST accident analyses. The combination of the proposed design changes and the proposed SR will provide adequate assurance that the safety function of the radiation monitors to isolate the Control Room on high radiation will be satisfactorily performed under all credible postulated failure modes. As such, the proposed design changes and SR will ensure that control room doses are maintained within the limits of 10 CFR 50.67.

**NRC Question 5:**

*Discuss the allowed outage times associated with less than the minimum number of rad monitors for the Unit 1 CROAI monitors.*

**FPL Response:**

FPL proposed a new ACTION 17 in TS Table 3.3-6 for the Unit 1 CROAI radiation monitors. ACTION 17 states:

*"With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, within 1 hour initiate and maintain operation of the control room emergency ventilation system in the recirculation mode of operation."*

The alternate design uses redundant safety-related seismically qualified radiation detectors seismically mounted in both of the North and South CROAI ducts, which is similar to the design used in St. Lucie Unit 2. New ACTION 17 is consistent with Unit 2 ACTION 26 and the ACTION specified in NUREG-1432 Combustion Engineering Plants Control Room Isolation Signal (CRIS) Standard Technical Specifications.

In the unlikely event that both of the radiation monitors in either the North or South CROAI ducts are inoperable, the proposed ACTION time of one hour allows the operators a short time to restore an inoperable radiation monitor to Operable status and/or prepare to place the control

room ventilation system in the emergency isolation/recirculation mode if that action is proved necessary. If the control room ventilation system is unable to be placed in the emergency isolation/recirculation mode then the generic TS 3.0.3 requirements become applicable.

References:

1. FPL Letter to NRC L-2007-085, St. Lucie Unit 1 Proposed License Amendment Alternative Source Term and Conforming Amendment, dated July 16, 2007
2. FPL letter to NRC L-2008-121, St. Lucie Units 1 and 2 Proposed License Amendment Request for Additional Information Response, Alternative Source Term Amendment – TAC Nos. MD6173 and MD6202, dated June 2, 2008
3. FPL letter to NRC L-2008-081, St. Lucie Units 1 and 2 Proposed License Amendment Request for Additional Information Response, Alternative Source Term Amendment – TAC Nos. MD6173 and MD6202, dated April 14, 2008
4. FPL letter to NRC L-2008-161, St. Lucie Units 1 and 2 Proposed License Amendment Request for Additional Information Response, Alternative Source Term Amendment – TAC Nos. MD6173 and MD6202, dated July 11, 2008

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Word-Processed TS Pages

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Unit 2 Page 3/4 3-25

**TABLE 3.3-6**  
**RADIATION MONITORING INSTRUMENTATION**

<u>INSTRUMENT</u>	<u>MINIMUM CHANNELS OPERABLE</u>	<u>APPLICABLE MODES</u>	<u>ALARM/TRIP SETPOINT</u>	<u>MEASUREMENT RANGE</u>	<u>ACTION</u>
<b>1. AREA MONITORS</b>					
a. Fuel Storage Pool Area	1	*	≤ 15 mR/hr	10 <sup>-1</sup> – 10 <sup>4</sup> mR/hr	13
b. Containment (CIS)	3	****	≤ 90 mR/hr	1 – 10 <sup>5</sup> mR/hr	16
c. Containment Area – Hi Range	1	1, 2, 3, & 4	≤ 10 R/hr	1 – 10 <sup>7</sup> R/hr	15
d. Control Room Isolation	1 per intake	ALL MODES	≤ 320 cpm	10 – 10 <sup>7</sup> cpm	17
<b>2. PROCESS MONITORS</b>					
<b>a. Containment</b>					
i. Gaseous Activity RCS Leakage Detection	1	1, 2, 3 & 4	Not Applicable	10 – 10 <sup>6</sup> cpm	14
ii. Particulate Activity RCS Leakage Detection	1	1, 2, 3 & 4	Not Applicable	10 – 10 <sup>6</sup> cpm	14
<b>b. Fuel Storage Pool Area Ventilation System</b>					
i. Gaseous Activity	1	**	***	10 <sup>-7</sup> – 10 <sup>5</sup> μCi/cc	12
ii. Particulate Activity	1	**	***	1 – 10 <sup>6</sup> cpm	12

- \* With fuel in the storage pool or building.  
\*\* With recently irradiated fuel in the storage pool.  
\*\*\* The Alarm Setpoints are determined and set in accordance with requirements of the Offsite Dose Calculation Manual.  
\*\*\*\* During movement of recently irradiated fuel assemblies within containment.

**TABLE 3.3-6 (Continued)**  
**RADIATION MONITORING INSTRUMENTATION**

<u>INSTRUMENT</u>	<u>MINIMUM CHANNELS OPERABLE</u>	<u>APPLICABLE MODES</u>	<u>ALARM/TRIP SETPOINT</u>	<u>MEASUREMENT RANGE</u>	<u>ACTION</u>
2. PROCESS MONITORS (Continued)					
c. Noble Gas Effluent Monitors					
i. Radwaste Building Exhaust System (Plant Vent Exhaust Monitor)	1	1, 2, 3 & 4	***	$10^{-7} - 10^5 \mu\text{Ci/cc}$	15
ii. Steam Generator Blowdown Treatment Facility Building Exhaust System	1	1, 2, 3 & 4	***	$10^{-7} - 10^{-2} \mu\text{Ci/cc}$	15
iii. Steam Safety Valve Discharge	1/Header	1, 2, 3 & 4	***	$10^{-1} - 10^3 \mu\text{Ci/cc}$	15
iv. ECCS Exhaust	1/Train	1, 2, 3 & 4	***	$10^{-7} - 10^5 \mu\text{Ci/cc}$	15

\*\*\* The Alarm Setpoints are determined and set in accordance with requirements of the Offsite Dose Calculation Manual.

**TABLE 3.3-6**  
**RADIATION MONITORING INSTRUMENTATION**

<u>INSTRUMENT</u>	<u>MINIMUM CHANNELS OPERABLE</u>	<u>APPLICABLE MODES</u>	<u>ALARM/TRIP SETPOINT</u>	<u>MEASUREMENT RANGE</u>	<u>ACTION</u>
<b>1. AREA MONITORS</b>					
a. Fuel Storage Pool Area					
i. Criticality and Ventilation System Isolation Monitor	4	*	≤ 20 mR/hr	10 <sup>-1</sup> – 10 <sup>4</sup> mR/hr	22
b. Containment Isolation	3	****	≤ 90 mR/hr	1 – 10 <sup>7</sup> mR/hr	25
c. Containment Area – Hi Range	1	1, 2, 3 & 4	Not Applicable	1 – 10 <sup>7</sup> R/hr	27
d. Control Room Isolation	1 per intake	ALL MODES	≤ 320 cpm	10 <sup>-7</sup> – 10 <sup>-2</sup> μCi/cc	26
<b>2. PROCESS MONITORS</b>					
a. Fuel Storage Pool Area Ventilation System					
i. Gaseous Activity	1	**	***	10 <sup>-7</sup> – 10 <sup>-2</sup> μCi/cc	24
ii. Particulate Activity	1	**	***	1 – 10 <sup>6</sup> cpm	24
b. Containment					
i. Gaseous Activity RCS Leakage Detection	1	1, 2, 3 & 4	Not Applicable	10 <sup>-7</sup> – 10 <sup>-2</sup> μCi/cc	23
ii. Particulate Activity RCS Leakage Detection	1	1, 2, 3 & 4	Not Applicable	1 – 10 <sup>6</sup> cpm	23

\* With fuel in the storage pool or building.  
\*\* During movement of recently irradiated fuel assemblies or during crane operations with loads over recently irradiated fuel assemblies in the spent fuel storage pool.  
\*\*\* The Alarm/Trip Setpoints are determined and set in accordance with requirements of the Offsite Dose Calculation Manual.  
\*\*\*\* During movement of recently irradiated fuel assemblies within containment.

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## LIST OF COMMITMENTS

FPL requested that the AST TS amendment be effective upon NRC approval and implementation within the next 9 months. FPL will implement a plant modification for the Unit 1 CROAI radiation monitoring system that is representative of the description contained in Attachment 1 prior to implementation of the AST TS amendment.