



March 14, 2011

L-2011-089  
10 CFR 50.90

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

Re: St. Lucie Plant Unit 1  
Docket No. 50-335  
Renewed Facility Operating License No. DPR-67

Response to NRC Request for Additional Information (RAI) Regarding Extended Power Uprate License Amendment Request

References:

- (1) R. L. Anderson (FPL) to U.S. Nuclear Regulatory Commission (L-2010-259), "License Amendment Request for Extended Power Uprate, November 22, 2010, Accession No. ML103560419.
- (2) Email from T. Orf (NRC) to C. Wasik (FPL), "St. Lucie Unit 1 EPU – request for additional information (Performance and Testing)," March 9, 2011, Accession No. ML110680045.

By letter L-2010-259 dated November 22, 2010 [Reference 1], Florida Power & Light Company (FPL) requested to amend Renewed Facility Operating License No. DPR-67 and revise the St. Lucie Unit 1 Technical Specifications (TS). The proposed amendment will increase the unit's licensed core thermal power level from 2700 megawatts thermal (MWt) to 3020 MWt and revise the Renewed Facility Operating License and TS to support operation at this increased core thermal power level. This represents an approximate increase of 11.85% and is therefore considered an extended power uprate (EPU).

By email from the NRC Project Manager dated March 9, 2011 [Reference 2], additional information related to component performance was requested by the NRC staff in the Component Performance & Testing Branch (CPTB) to support their review of the EPU LAR. The request for additional information (RAI) identified three questions. The response to these RAIs is provided in Attachment 1 to this letter.

AOO1  
NRC

In accordance with 10 CFR 50.91(b)(1), a copy of this letter is being forwarded to the designated State of Florida official.

This submittal does not alter the significant hazards consideration or environmental assessment previously submitted by FPL letter L-2010-259 [Reference 1].

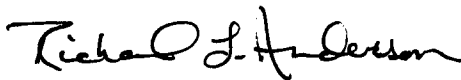
This submittal contains no new commitments and no revisions to existing commitments.

Should you have any questions regarding this submittal, please contact Mr. Christopher Wasik, St. Lucie Extended Power Uprate LAR Project Manager, at 772-429-7138.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge.

Executed on *March 14, 2011.*

Very truly yours,



Richard L. Anderson  
Site Vice President  
St. Lucie Plant

Attachment

cc: Mr. William Passetti, Florida Department of Health

### **Response to Request for Additional Information**

The following information is provided by Florida Power & Light (FPL) in response to the U.S. Nuclear Regulatory Commission's (NRC) Request for Additional Information (RAI). This information was requested to support Extended Power Uprate (EPU) License Amendment Request for St. Lucie Nuclear Plant Unit 1 that was submitted to the NRC by FPL via letter L-2010-259, dated November 22, 2010 (Accession Number ML103560419).

In an email dated March 9, 2011 from NRC (Tracy Orf) to FPL (Chris Wasik), Accession No. ML110680045, Subject: St. Lucie Unit 1 EPU – request for additional information (Performance and Testing), the NRC staff requested additional information regarding FPL's request to implement the EPU. The RAI consisted of three (3) questions from the NRC's Component Performance & Testing Branch (CPTB). These three RAI questions and the FPL responses are documented below.

#### **CPTB-1:**

On page 2.2.4-14, it is stated:

**“As addressed under Topic 10 below, for the MSIV [Main Steam Isolation Valve] safety-related close stroke, the maximum expected differential pressure is increasing for EPU beyond the value used in the current valve/actuator capability analysis. However, the closing margin (percentage of actuator output greater than that required to stroke the valve) for the MSIVs remains adequate for the safety-related close stroke at EPU conditions. The MSIVs are designed to use flow to assist in closure and, therefore the increased steam flow under EPU conditions will enhance the closing of the valve, thus ensuring that the TS [Technical Specification] requirements for closing time (6 seconds) are met.”**

**Please provide the value for the maximum expected differential pressure at EPU conditions since Table 2.2.4-2 does not provide this value. Additionally, please provide the closing margins for the MSIVs at the current and EPU conditions.**

#### **Response:**

The maximum expected differential pressure for the MSIV safety-related close stroke at EPU conditions is 1015.3 psig.

The minimum closing margin for the MSIV safety-related close stroke at current conditions is determined to be 23.2%. The valve required torque used in obtaining this margin for the existing MSIV actuator is conservatively based on the highest MSSV setpoint plus 1% tolerance (1036 psig). The minimum closing margin for the existing MSIV actuator at EPU conditions is determined to be 22.3%, a change of less than 4%. The valve required torque used in obtaining the closing margin for the existing MSIV actuator at EPU conditions is based on the highest MSSV setpoint plus 2% tolerance (1046.1 psig).

As addressed in the response to RAI CPTB-2, the MSIVs are being modified for EPU by redesigning the valve internal parts and replacing the valve actuators. The valve required thrust

and actuator capability margins at EPU conditions will be provided by the supplier of the replacement actuator. The actuator capability is required to be at least 15% greater than the required thrust (i.e., the actuator output thrust is required to be at least 15% greater than that required to stroke the valve).

**CPTB-2:**

On page 2.2.4-14, it is stated:

**“As discussed in LR [Licensing Report] Section 2.5.5.1, modification of the MSIVs is required to improve the structural integrity and fatigue life of the valves in the event of a spurious closure at EPU conditions. This modification does not affect the safety-related function of the valves to close under accident conditions.”**

On page 2.5.5.1-8, the only discussion provided is:

**“The MSIVs will be modified to improve structural integrity and fatigue life in the event of spurious closure at EPU conditions.”**

**Please describe the modifications to the MSIVs in greater detail and explain why the modifications do not affect the safety-related functions of the valves to close under accident conditions.**

**Response:**

The MSIVs internal parts e.g., disc, tail link, H-link, rockshaft bushing, and spindle are being redesigned to increase the structural strength and fatigue life under spurious closure. In addition, the valve bonnet cover will be redesigned to accommodate a new actuator/yoke assembly and a larger spindle diameter. The replacement actuator will be seismically qualified and designed to perform under the following conditions: main steam line break, steam generator tube rupture isolation, normal power operation, safe shutdown, and stroke testing. The actuator will be capable of slowing the valve disc down to reduce the disk impact velocity/stresses during spurious closure. The modifications are accomplished by increasing the component dimensions and/or using higher strength materials. RELAP and finite element analyses with bounding velocity have been performed for the modified components to ensure that the modifications do not affect the safety-related function of the valves to close and meet ASME code requirements under accident and spurious closure conditions. In addition, the actuator will be designed to meet the design basis accident closure function at EPU conditions.

**CPTB-3:**

On page 2.2.4-16, it is stated:

**“As discussed under Topic 10 below, for the SGBS [Steam Generator Blowdown System] containment isolation valve safety-related close stroke, the maximum expected differential pressure is increasing for EPU beyond the value used in the current valve/actuator capability analysis. However, the closing margin for the SGBS containment isolation valves remains adequate for the safety-related close stroke at EPU conditions.”**

**Please provide the value for the maximum expected differential pressure at EPU conditions since Table 2.2.4-2 does not provide this value. Additionally, please provide the closing margin at the current and EPU conditions for the SGBS containment isolation valves and explain why the closing margin at EPU conditions remains adequate.**

**Response:**

The maximum expected differential pressure for the SGBS containment isolation valve safety-related close stroke at EPU conditions is 1071.73 psig.

The SGBS containment isolation valve closing margin at current conditions is 5.9%. The closing margin at EPU conditions has been determined to be 5.0%. Although the closing margin is less than the optimal 10% margin described in FPL engineering guidelines for sizing and evaluation of air operated valve operators, both SGBS containment isolation valves have more than 8% margin based on static tests. The determination of the margin considers valve seating load, which is conservative (there are no seat leakage requirements for these valves). If the seating load is eliminated, the closing margin would be about 13.6%. Additionally, combined setup tolerances result in conservative margin calculations. Accordingly, it is concluded that the valve closing margin remains adequate for the safety-related close stroke.