

State of Florida



## Public Service Commission

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TALLAHASSEE, FLORIDA 32399-0850

**-M-E-M-O-R-A-N-D-U-M-**

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**DATE:** August 23, 2010  
**TO:** Ann Cole, Commission Clerk, Office of Commission Clerk  
**FROM:** Lisa C. Bennett, Senior Attorney, Office of the General Counsel *LCB*  
**RE:** Docket No. 100009, Nuclear Cost Recovery Clause

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Please place the attached document from the Nuclear Regulatory Commission in the above-docket.

LCB  
Attachment

DOCUMENT NUMBER DATE

06967 AUG 23 09

FPSC-COMMISSION



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

August 13, 2010

Mr. Mano Nazar  
Executive Vice President and  
Chief Nuclear Officer  
Florida Power and Light Company  
P.O. Box 14000  
Juno Beach, Florida 33408-0420

SUBJECT: ST. LUCIE PLANT UNIT NO. 1 – WITHDRAWAL OF REQUESTED LICENSING  
ACTION REGARDING EXTENDED POWER UPRATE (TAC NO. ME3699)

Dear Mr. Nazar:

By letter dated April 16, 2010, Florida Power & Light Company submitted a license amendment request for St. Lucie Unit 1 for a proposed amendment that would increase the licensed core power level from 2700 megawatt thermal (MWt) to 3020 MWt. The purpose of this letter is to provide the results of the U.S. Nuclear Regulatory Commission (NRC) staff's acceptance review of this amendment request that was performed to determine if there is sufficient technical information in scope and depth to allow the NRC staff to complete its detailed technical review. The acceptance review is also intended to identify whether the application has any readily apparent information insufficiencies in its characterization of the regulatory requirements or the licensing basis of the plant.

Consistent with Section 50.90 of Title 10 of the *Code of Federal Regulations* (10 CFR), an amendment to the license (including the technical specifications) must fully describe the changes requested, and following as far as applicable, the form prescribed for original applications. Section 50.34 of 10 CFR addresses the content of technical information required. This section stipulates that the submittal address the design and operating characteristics, unusual or novel design features, and principal safety considerations.

By letter dated August 13, 2010, you requested to withdraw the application from NRC review. The NRC acknowledges your request to withdraw the application. NRC staff activities on the review have ceased and the associated Technical Assignment Control numbers have been closed.

The NRC staff notes that its review to date has identified that your application did not provide the following technical information in sufficient detail to enable the staff to complete its detailed review. Therefore, if you decide to re-submit the request, it must include information listed in the enclosure.

SEARCHED INDEXED DATE

6967 AUG 23 0

FPSC-COMMISSION CLERK

M. Nazar

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If you have any questions, please contact the St. Lucie, Unit 1 extended power uprate Project Manager, Tracy Orf, at (301) 415-2788.

Sincerely,

A handwritten signature in black ink, appearing to read "Tracy J. Orf". The signature is fluid and cursive, with a long horizontal stroke at the end.

Tracy J. Orf, Project Manager  
Plant Licensing Branch II-2  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket No. 50-335

Enclosure:  
Results of NRC Review

cc: Distribution via Listserv

RESULTS OF NRC REVIEW OF THE SUPPLEMENTAL INFORMATION PROVIDED

AMENDMENT REQUEST

FLORIDA POWER & LIGHT COMPANY

ST. LUCIE PLANT UNIT NO. 1

DOCKET NO. 50-335

The staff's acceptance review identified the following three areas where the application did not provide sufficient technical information in scope and depth to allow the NRC staff to complete its detailed technical review: control element assembly withdrawal at power, station blackout, and the spent fuel pool criticality analysis. The NRC provided FPL with questions in these areas on May 28, 2010, June 14, 2010, and June 23, 2010. FPL provided supplements to its application on July 23, 2010, and July 30, 2010. The supplemental information did not sufficiently address the questions in the following areas:

Spent Fuel Pool Criticality:

Question 8-2 requested a revised spent fuel pool criticality analysis in order to address the depletion uncertainty value of the unborated cases for the pre-extended power uprate (EPU) fuel as well as to revise the statistical treatment of the code bias uncertainty for the pre-EPU current licensing basis. Florida Power & Light Company (FPL, the licensee) agreed to submit a very conservative, cycle-limited, bounding document that would impose additional restrictions and implement additional administrative measures on the spent fuel pool (SFP) as an interim measure until a revised criticality analysis could be submitted that would address the EPU, current fuel conditions, and nonconservatisms.

1. The supplement provided information on only one out of five storage configurations that the licensee has for the pre-extended power uprate (EPU) fuel (Case 4). The licensee did not provide information on the other four storage configurations. Two more cases were more limiting than the case used; therefore, the case it did consider cannot be considered bounding. The criticality increase calculated in the response is not the most conservative.
2. The second issue is the choice of 0.0150  $\Delta k$  as the new depletion uncertainty. This number is nonconservative with regard to the depletion uncertainty used in the 2004 license amendment request (LAR) for the borated scenario. The number used in the 2004 LAR was 0.0192  $\Delta k$ . Even with the use of 0.0150  $\Delta k$ , there are cases that will exceed the total combined impact calculated in the response. Using the 0.0192  $\Delta k$  from the 2004 LAR would significantly increase this impact.
3. The third issue is that the supplement did not contain any information or analysis in regard to the correlation between percent burnup and reactivity credit. Therefore, the staff cannot determine if a 7-percent burnup penalty would be sufficient to offset the additional  $\Delta k$  added using engineering judgment.

DOCUMENT NUMBER: 0413

Enclosure 1

06967 AUG 23 9

FPLSC-00000000-1-0000

**Control Rod Withdrawal at Power:**

In the licensee's July 23, 2010, supplement to its license amendment application, FPL provided a statement that "The high power trip setpoint for St. Lucie Unit 1, as defined in the Technical Specifications (TS Table 2.2-1, Item 2) is a fixed value above the initial operating power level and is not a function of rate or power increase, which is the case for some W-NSSS [Westinghouse Nuclear Steam Supply System] plants with a high flux rate trip. The reactivity insertion rate, and the corresponding rate of power increase, thus does not affect the power level at which the reactor will trip for St. Lucie Unit 1."

On July 27, 2010, it was communicated to the licensee that this is not responsive to the U. S. Nuclear Regulatory Commission (NRC) staff's concern. The reactivity insertion rate has a direct effect on the power ascension, which will continue even after the trip signal is received, regardless of the initial power level. The system and fuel response is dependent on the post-trip characteristics of this transient. With a more reactive core loading, the significance of this issue is magnified at uprate conditions.

FPL provided, as Attachment 3 to its July 30, 2010, supplement, a revised response to the NRC staff concern regarding part-power CEA withdrawal errors.

4. Attachment 3 to the July 30, 2010, supplement provided information discussing analyses performed using the AREVA proprietary S-RELAP5 code that demonstrated that part-power, erroneous CEA withdrawal cases produced more limiting results with respect to reactor coolant system pressure than the hot full power case. Whereas the hot full power case peak pressure was 2535 psia, another, part-power case predicted a peak pressure of 2605 psia.

The FPL basis for not analyzing pressure for the part-power cases was that the pressurization consequences of the control rod withdrawal error event were bounded by the loss of external load (LOEL) event, the predicted peak pressure for which was 2708 psia. Although the hot full power control element assembly withdrawal error event is bounded by the LOEL event with 173 psi of margin, the supplement identified a more limiting case at part-power that is only bounded with 103 psi of margin. The additional analysis of several part-power control element assembly withdrawal error cases has identified an approximately 40-percent reduction in safety margin.

The supplement did not contain a level of detailed discussion concerning these additional analyses for the staff to conclude that the most pressure-limiting cases had been identified, or that the cases were analyzed in a sufficiently conservative manner to produce a bounding pressurization result. In particular, the analyses are not supported by discussion identifying the following:

- a) Time in core life and associated reactivity parameters
- b) Methodology used to analyze transient and produce bounding results
- c) Core design, whether EPU reference or first EPU transition cycle
- d) Whether the cases identified are truly limiting results, or whether a finer power spectrum requires analysis

Station Blackout (SBO) Coping Analysis:

Because one of the review areas for extended power uprates is the impact on SBO analyses, the staff reviewed the information on the licensee's coping analysis.

5. The supplemental information provided on July 30, 2010, did not contain analysis that demonstrates that there is adequate condensate inventory for the first hour of an SBO.
6. A reactor coolant system leakage rate of 60 gpm was assumed in the revised analysis, which is half of the 120-gpm leak rate assumed in the original analysis of record. Also, a 10-gpm leak rate per reactor coolant pump was assumed compared to the 25 gpm in NRC guidance. The licensee should provide a basis for the differences.
7. The application cites NUMARC 87-00, Revision 1, "Guidelines and Technical Bases for NUMARC Initiatives Addressing Station Blackout at Light Water Reactors", dated November, 1987 as an endorsed guidance by the NRC. Since the staff has not endorsed Revision 1 of NUMARC 87-00, the licensee must provide a basis for these differences.
8. The supplement states that analysis has demonstrated that the core remains covered and fuel failure does not occur, therefore containment isolation is not required. The supplemental information provided on July 30, 2010, did not provide supporting analysis and basis for this assertion. The licensee needs to address all open containment isolation valves and the power to shut such valves during the onset of an SBO.
9. The licensee evaluated loss of ventilation to the control room by extrapolating the results of the original 25-minute analysis. Logarithmic extrapolation from 25 minutes to 1 hour results in a maximum room temperature of approximately 116 degrees Fahrenheit. Supplemental information provided on July 30, 2010, did not address whether the operators are going to remain in the control room or abandon it. The licensee needs to submit the heating ventilation and air conditioning analysis for the 1-hour coping time per NRC guidance.

August 13, 2010

M. Nazar

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If you have any questions, please contact the St. Lucie, Unit 1 extended power uprate Project Manager, Tracy Orf, at (301) 415-2788.

Sincerely,

**/RA/**

Tracy J. Orf, Project Manager  
Plant Licensing Branch II-2  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket No. 50-335

Enclosure:  
Results of NRC Review

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**NRR-106**

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DATE	8/13/10	8/12/10	8/13/10	8/13/10	8/13/10	8/13/10

\*via email

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