FPL

Florida Power & Light Company, 6351 S. Ocean Drive, Jensen Beach, FL 34957

March 13, 2000

L-2000-57
10 CFR 50.4

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
Requested Corrections/Clarifications to NRC Safety Evaluation
For LPSI AOT Extension License Amendments 164 and 106

During the implementation review of the NRC Safety Evaluation (SE) for Unit 1 and Unit 2 license amendments 164 and 106, respectively, dated February 15, 2000, Florida Power & Light Company (FPL) identified several items in the SE that were not consistent with the FPL license amendment application. The SE was for the low pressure safety injection (LPSI) allowed outage time (AOT) extension. As requested by the NRC Project Manager, the inconsistencies are identified in the attachment to this letter. The NRC is requested to review the FPL comments and correct/clarify the SE as appropriate.

By letter L-2000-49 dated February 21, 2000, FPL requested an extension of the implementation period for these license amendments to 60 days from the date of receipt. The extension is needed to allow time for FPL to complete the procedure development and training associated with the implementation of the Configuration Risk Management Program (CRMP) required by this amendment. This letter confirms a telephone approval of the extension by the NRC Project Manager for St. Lucie, Kahtan Jabbour, as discussed with George Madden of my staff on February 28, 2000.

Please contact us if there are any questions about this submittal.

Very truly yours,

Rajiv S. Kundalkar
Vice President
St. Lucie Plant

Attachment

RSK/GRM

cc: Regional Administrator, Region II, USNRC
Senior Resident Inspector, USNRC, St. Lucie Plant

FPL Comments on LPSI AOT Extension
Staff Safety Evaluation St. Lucie Unit 1 and Unit 2
License Amendments 164 and 106 Dated February 15, 2000

SE Section 4.1:

"The primary role of the low pressure safety injection (LPSI) system during power operation is to contribute to the mitigation of a large loss of coolant accident (LOCA). The postulated frequency of **a large LOCA event is on the order of 10^{-4} per year**. In contrast, during Modes 5 and 6, the operability of at least one LPSI train operating in the shutdown cooling mode is required at all times for reactor coolant system (RCS) heat removal. Thus, in the broad view, performing preventive and corrective maintenance at power on the LPSI system can contribute to an overall enhancement of plant safety by increasing the availability of at least one LPSI train for shutdown cooling (SDC) when it is needed in **Modes 5 and 6**."

FPL Comment 1

Staff states the large LOCA frequency is on the order of E-4/yr. The proposed license amendment (PLA) states "on the order of E-5/yr." (see below)
Staff says SDC in Modes 5 and 6, PLA stated "Modes 4, 5, and 6." (see below)

Applicable FPL PLA section 3.2

"In the upper operating modes, LPSI trains must be available in the event that LOCA mitigation becomes necessary. The estimated frequency of ***a large LOCA is on the order of E-05 per year****. The LPSI system would also be used for RCS heat removal in the event of a SGTR or other non-LOCA design basis events, which have estimated frequencies on the order of E-03 per year and lower. In contrast, at least one LPSI train is required to be operable for RCS heat removal during normal shutdown operations* ***in Modes 4, 5, and 6,*** *and is almost always in operation when in these modes. Therefore, in the broad view, performing preventive and corrective maintenance on LPSI trains when at power can enhance overall plant safety by increasing the availability and reliability of the LPSI system for normal shutdown-cooling operations, i.e., when it is most often needed."*

SE section 4.2 first paragraph

"The two trains of the LPSI system, in combination with the two trains of the high pressure safety injection (HPSI) system, form two redundant ECCS trains. The two LPSI pumps are high volume, low head centrifugal pumps designed to supplement the SIT inventory in reflooding the reactor vessel to ensure core cooling during the early stages of a large break LOCA. The LPSI pumps take suction from **the refueling water storage tank (RWST),**

during the injection phase of a LOCA event, and pump the water through a common discharge header. Once inside containment, the LPSI headers combine with HPSI and SIT discharge piping, and flow is directed through independent injection headers into each of the four reactor coolant system (RCS) cold legs and into the reactor vessel. The LPSI system pumps start and valves open upon receipt of a safety injection actuation signal. When the **RWST** level is drawn down by inventory transfer during the injection phase, a low **RWST** level actuates a recirculation actuation signal which stops the LPSI pumps. This step is necessary to ensure adequate net positive suction head remains available for the HPSI pumps and the containment spray pumps. By design, post-LOCA long term core cooling is supplied by the HPSI pumps and containment spray pumps taking suction from the containment sump."

FPL Comment 2

Staff refers to "RWST" and the PLA refers to the "RWT." (See below)
Staff states "LPSI injects through a common header." This is not correct for Unit 2. The PLA describes the difference between Unit 1 and Unit 2. (See below).

Applicable FPL PLA section 2.1

"Each LPSI train contains a high volume, low head, centrifugal pump designed to supplement the Safety Injection Tank (SIT) inventory in re-flooding the reactor vessel with borated water during the early stages of a large break loss of coolant accident (LOCA). The LPSI system is actuated by an automatic or manually initiated Safety Injection Actuation Signal (SIAS) which starts the associated pump and causes the LPSI flow control valves to open. The LPSI pumps transfer borated water from the ***Refueling Water Tank (RWT),*** *through the LPSI header(s), and into the safety injection penetrations to the Reactor Coolant System (RCS) cold legs. During the recirculation phase of the LOCA scenario, the LPSI pumps are stopped by an automatic or manually initiated Recirculation Actuation Signal (RAS) and long term core cooling is supplied by the HPSI pumps taking suction from the containment sump.* ***The LPSI systems for both St. Lucie units are functionally the same, but contain differences in the piping arrangement, e.g., PSL1 has a common LPSI header which branches out to each of the four high pressure cold leg penetrations whereas PSL2 has two independent LPSI headers, each branching out to two of the high pressure cold leg penetrations."***

SE section 4.2 third paragraph

"In the event that one LPSI train is out of service and the second LPSI train fails, the operator can continue to control the plant during an SGTR event by drawing steam off of the unaffected steam generator. Even though loss of both LPSI trains is beyond the design basis accident assumptions, this cooling mechanism can be maintained indefinitely, provided condensate is available to the unaffected steam generator. **Without considering condensate storage tank replenishment, St. Lucie, Units 1 and 2, have a sufficient inventory to steam the**

unaffected steam generator for more than 24 hours. St. Lucie, Units 1 and 2, also have the ability to realign the containment spray pumps to provide RCS SDC capability. Therefore, having one LPSI train out of service should not affect the licensee's ability to mitigate an SGTR event, including conditions beyond design basis."

FPL Comment 3

Both units do not have sufficient condensate inventory to steam for 24 hours without makeup. Unit 2 has sufficient volume, but Unit 1 does not. (See below)

Applicable FPL PLA section 3.2.1

*"**Table 6.2.1-1 of CE NPSD-995 provides a comparison of secondary side heat removal capabilities for CEOG plants, and includes the approximate condensate storage depletion time (without refill).** The minimum contained volume of condensate required by the PSL1 and PSL2 TS is 116,000 gallons and 307,000 gallons, respectively. However, **the steam generator heat sink can be maintained indefinitely provided make-up condensate remains available to the Condensate Storage Tank (CST). Plant procedures provide instructions for replenishing condensate inventory storage, and also include instructions for supplying the PSL1 Auxiliary Feedwater Pumps from the PSL2-CST in the event that the smaller PSL1-CST becomes unavailable. Extending the LPSI AOT would not impact this defense-in-depth capability."***

FP Position Supported by SE section 4.3.3:

*The licensee re-evaluated all offsite power recovery cases for both St. Lucie units. One case was added **to the Unit 1 analysis for recovery of offsite power in 9 hours (approximately 1 hour before the Unit 1 condensate storage tank (CST) would deplete without condensate replenishment).***

SE section 4.3.2

"The LPSI preventive and corrective maintenance (staff-estimated) weighted average single AOT risks for St. Lucie, Units 1 and 2, are 8.74E-08 for Unit 1 and 8.36E-08 for Unit 2, and are less than the acceptance guideline value 5.0E-07 from Regulatory Guide (RG) 1.177. In addition, **the change in the St. Lucie, Units 1 and 2, updated baseline core damage frequency (CDF) (as reported in the CEOG Joint Application Report) due to the LPSI AOT change is about 3%, i.e., from 2.14E-05 per year for Unit 1 and 2.35E-05 per year for Unit 2 to 2.2E-05 per year for Unit 1 and 2.4E-05 per year for Unit 2.** The change in CDF of 6E-07 per year for Unit 1 and 5E-07 per year for Unit 2 is within the acceptance guidelines published in RG 1.174. The staff-estimated weighted average incremental conditional large early release probabilities (ICLERPs) are 2.12E-09 for Unit 1 and 1.46E-09 for Unit 2, assuming a baseline early containment failure probability (ECFP) of 0.01.

Corresponding ICLERPs for an ECFP of 0.1 are 9.95E-09 for Unit 1 and 8.95E-09 for Unit 2. All of these ICLERP values are within the RG 1.177 guideline of 5.0E-08."

FPL Comment 4

The Staff references risk assessment results provided in the original CEOG Joint Applications report but states/implies these are based on the St. Lucie updated baseline CDF. As discussed in the PLA (see below), the input to the CEOG report was based on the Internal Plant Events (IPE) results and the PLA results are based on updated models. The Staff in section 4.3.3, however, repeats the PLA words regarding use of the IPE for the CEOG report and updated models for the PLA.

Applicable FPL PLA section 3.2.2

"The considerations, assumptions, methodologies, and detailed results of the initial risk assessment are reported in CE NPSD-995, Joint Applications Report for Low Pressure Safety Injection System AOT Extension, Final Report CEOG Task 836, prepared for the CE Owners Group, May 1995, as supplemented by the associated RAI response dated May 31, 1996 (CEOG Letter 96-254, D.F. Pilmer to C.I. Grimes, Chief, Technical Specifications Branch, NRR, Project No. 692; June 14, 1996). **CE NPSD-995 also contains other generic information relevant to the proposed AOT extension that is applicable to both St. Lucie units. The joint applications report, as supplemented, in conjunction with the improved data and PSA model enhancements that have been incorporated subsequent to 1995 as described in the following paragraphs, forms the risk-informed justification/basis for the proposed license amendments.**

The St. Lucie contribution to the 1995 preparation of CE NPSD-995 was generated using the IPE models developed in response to Generic Letter (GL) 88-20, *Individual Plant Examination for Severe Accident Vulnerabilities,* and associated supplements.....

Since then, FPL has updated both the models and the reliability/unavailability databases for St. Lucie Units 1 and 2. The updated models and databases were then used to re-calculate the risk numbers for the units."

SE section 4.3.2

"The Tier 3 requirements for configuration risk management are considered to be adequately satisfied, since the licensee has an on-line PRA-based monitor, called the **Safety Monitor**, to analyze the risk impact of outage configurations in a timely manner. **Procedures related to use of the Safety Monitor are St. Lucie, Units 1 and 2, Plant Administrative Procedure, ADM-17.08, "Implementation of 10 CFR 50.65, the Maintenance Rule."** The licensee has proposed adding TS Bases 3/4.5.2 and B 3/4.5.3, "ECCS SUBSYSTEMS," to provide a

means of implementing and controlling their Tier 3 process. The licensee and the staff have agreed to implementation of the Configuration Risk Management Program (CRMP as described below....."

FPL Comment 5

The PLA does not refer to our risk assessment tool as the "Safety Monitor." The PLA refers to it as the "On-line Risk Monitor." (see below)
The PLA states that we propose to include the description of the CRMP in our maintenance rule procedure. The SE implies that the procedure already has references to use of a "Safety Monitor."

Applicable FPL PLA section 3.2.3:

.... The primary tool for performing CRMP risk assessments for each St. Lucie unit will be the PSA-informed On-Line Risk Monitor (OLRM).....

Applicable FPL PLA section 3.2.4:

FPL proposes to include the description of the CRMP and its essential elements in the St. Lucie Plant Administrative Procedure (ADM) that ensures compliance with the Maintenance Rule (currently identified as ADM-17.08, Implementation of 10 CFR 50.65, the Maintenance Rule).

SE section 4.3.2 - CRMP Key Element 1

"**The intent of the CRMP is to implement Maintenance Rule, Section 50.65(a)(4) of 10 CFR** with respect to on-line maintenance for risk-informed technical specifications, with the following additions and clarifications:"

FPL Comment 6

*The intent of the CRMP as committed to in the PLA is **NOT** to implement 10 CFR 50.65(a)(4) of the maintenance rule but to implement 10 CFR 50.65(a)(3) of the maintenance rule (see below). RG 1.177, which provides the requirements of the CRMP, also states that the intent is to implement 10 CFR 50.65(a)(3). 10 CFR 50.65(a)(4) is **NOT** in effect yet, therefore FPL DOES NOT know the final scope, and thus FPL has **NOT** committed to it at this time. The work done to date for development of the CRMP (including proposed procedure changes and OLRM) **DOES NOT** ensure compliance with 10 CFR 50.65(a)(4), just the CRMP.*

Applicable FPL PLA section 3.2.4.2:

"Key Component 1, Implementation of CRMP: The intent of the CRMP is to implement Section a(3) of the Maintenance Rule with respect to on-line maintenance for risk-informed TS"

FPL Position Supported by RG 1.177

"2.3.7.2 Key Components of the CRMP. The licensee should ensure that the CRMP contains the following key components. Key Component 1: Implementation of CRMP
The intent of the CRMP is to implement Section a(3) of the Maintenance Rule (10 CFR 50.65) *with respect to on-line maintenance for risk-informed TS, with the following additions and....."*

SE section 4.3.2

FPL Comment 7

The SE only refers to what the CRMP requirements are as stated by general RG 1.177 descriptions. The PLA is more detailed on how we proposed to comply. Do we only have to address the program as stated in the SE or meet our more detailed description as stated in the PLA?

SE section 4.3.3

"Reference 5, section 5.2, and the discussion of Reference 6 in **part b., above**, provide a summary of the original IPE model peer review process."

"The licensee has updated both the models and the reliability/unavailability databases for St. Lucie Units 1 and 2. The updated models and databases were then used to re-calculate the risk numbers in support of the requested St. Lucie LPSI AOT extension. The significant model and data changes are summarized in Section 3.2.2 of the St. Lucie proposed license amendment (Reference 1) and **in part b., above**. As discussed in Reference 1, outside peer review was not performed for the update because changes that were implemented are not extensive. One or more licensee PSA engineers implemented the changes, and a licensee PSA engineer not involved with implementation of the changes performed an independent review."

"Description of PRA Quality Assurance methods."

"As noted in **paragraph b. above** and in Reference 1, the models used in the licensee's analyses were generated using the IPE models developed in response to GL 88-20, Individual Plant Examination for Severe Accident Vulnerabilities..."

FPL Comment 9

There are some references to a "part b. above." FPL could not find this "part b." It may be an incorrect reference.

SE section 4.3.5:

"The licensee **has** implemented a risk-informed Configuration Risk Management Program to assess the risk associated with the removal of equipment from service during the proposed LPSI AOT. The program **provides** the necessary assurances that appropriate assessments of plant risk configurations using the **Safety Monitor**, augmented by additional analysis, when appropriate, are sufficient to support the present AOT extension requests for the LPSI system (Tier 3)."

FPL Comment 10

The PLA does not refer to our risk assessment tool as the "Safety Monitor." The PLA refers to it as the "On-line Risk Monitor." (See FPL submittal section 3.2.3)

The SE states/implies that we now have a program in place which meets the CRMP requirements, instead of stating that we will implement a program as part of our TS implementation.