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

July 12, 2006

L-2006-183
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
Date of Event: June 29, 2006
License Condition 3.H Report on Overpower Event

This letter provides the Florida Power and Light Company (FPL) written follow-up report due within 14 days of St. Lucie Unit 2 exceeding the maximum power level allowed by the Renewed Facility Operating License Condition 3.A. This report is required by the St. Lucie Unit 2 Renewed Facility Operating License Condition 3.H.

The Distributed Control System (DCS) is used to calculate calorimetric power to validate that reactor core power levels do not exceed 2700 MWt in accordance with the Renewed Facility Operating License Condition 3.A. The DCS calorimetric function for St. Lucie Unit 2 was originally developed and installed under Plant Change/Modification (PC/M) 02042. The St. Lucie Unit 2 DCS calorimetric function was modified during the SL2-16 refueling outage via PC/M 05034 to make it consistent with display and data quality conventions applied to the St. Lucie Unit 1 DCS. The DCS calorimetric is currently used at St. Lucie Unit 2 to satisfy the Technical Specification 3/4.3.1 requirement for a daily channel calibration of the excore power range detectors in accordance with procedure 2-OSP-69.01, "Nuclear and Delta T Power Calibration."

On June 29, 2006, at approximately 1330 hours, an FPL non-licensed system engineer discovered an anomaly in the Unit 2 DCS calorimetric function. Feedwater flow, a component used to calculate reactor power, appeared to be clamped at a slightly lower flowrate than the actual flowrate, a condition that could cause indicated reactor power to be less than actual at full power conditions. Engineering bounded the potential overpower condition at approximately 0.5% power and Operations commenced a controlled reactor downpower to 98% power while Engineering evaluated the condition. At 1800 hours, Engineering confirmed an error in the DCS calorimetric function that resulted in the observed condition.

The DCS calculation of reactor power includes a "redundant sensor algorithm" that validates and calculates the average of the good inputs. During implementation of PC/M 05034, a DCS "block parameter" for averaging feedwater flow inputs was incorrectly set to 800 inches water column (iwc) instead of 900 iwc as specified, limiting the result of the average calculation. Verification and validation processes failed to detect the error.

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The application of this software clamp in the feedwater flow component of the calorimetric calculation resulted in periodic overpower conditions up to 100.3% reactor power. This condition existed from June 20, 2006, when St. Lucie Unit 2 first achieved 100% power during the startup from the SL2-16 refueling outage until June 29, 2006, when the condition was noted. A power level increase to 100.3% is well within the 1.3 % uncertainty for calorimetric power and is bounded by the assumed safety analysis initial power level of 102%. The indicated increase did not exceed the Operations' control criteria for control of minor power excursions.

The DCS issue resulted in exceeding the licensed maximum power of the Unit 2 Operating License Condition 3.A. In accordance with License Condition 3.H. of the Operating License, this was reported to the NRC on June 29, 2006. Condition Report 2006-19608 documents this event in the plant's corrective action program. FPL completed an extent of condition review and determined that this condition was not applicable to St. Lucie Unit 1. No additional issues were discovered during a review of every settable parameter on every block of the Unit 2 DCS calorimetric function. The error was corrected and reactor power was increased to 100% on June 30, 2006, at 1730 hours. The root cause will be determined and long-term corrective actions identified in accordance with the corrective action program.

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

Very truly yours,

Gordon L. Johnston
Vice President
St. Lucie Plant

GLJ/KWF

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