

March 27, 1986

Docket No. 50-335

DISTRIBUTION:

Mr. C. O. Woody  
Vice President  
Nuclear Energy Department  
Florida Power & Light Company  
P. O. Box 14000  
Juno Beach, Florida 33408

Docket File	LFMB
NRC PDR	LTremper
L PDR	OPA
PBD#8 Rdg	ACRS-10
ATHadani	WRegan
PMKreutzer-3	WJones
DSells	TBarnhart-4
JPartlow	EJordan
LJHarmon	OELD
SECY	Gray File +4

Dear Mr. Woody:

In Amendment No. 70 to Facility Operating License No. DPR-67 for St. Lucie Plant, Unit No. 1, a license condition was imposed requiring that you provide a supplement to EXXON Report XN-NF-85-117 addressing the complete large break LOCA spectrum results to demonstrate full compliance with the criteria of 10 CFR 50.46 and Appendix K to 10 CFR Part 50 with 15% tube plugging. Your submittal of January 29, 1986, in response to this license condition, has been reviewed by the Commission and found to be acceptable.

This completes the staff's action on this requirement. The review was completed under TAC No. 60606. A request to delete this license condition may be included in a future application to amend Operating License No. DPR-67.

Our Safety Evaluation is enclosed.

Sincerely,

Donald E. Sells, Project Manager  
PWR Project Directorate #8  
Division of PWR Licensing-B

Enclosure:  
As stated

cc w/enclosure:  
See next page

PBD#8  
PMKreutzer  
3/21/86

*DS*  
PBD#8  
DSells  
3/21/86

*Signed*  
3/27/86  
*DS*

*JVM*  
PBD#8  
ATHadani  
3/27/86

Mr. C. O. Woody  
Florida Power & Light Company

St. Lucie Plant

cc:

Mr. Jack Shreve  
Office of the Public Counsel  
Room 4, Holland Building  
Tallahassee, Florida 32304

Mr. Allan Schubert, Manager  
Public Health Physicist  
Department of Health and  
Rehabilitative Services  
1323 Winewood Blvd.  
Tallahassee, Florida 32301

Resident Inspector  
c/o U.S. NRC  
7585 S. Hwy A1A  
Jensen Beach, Florida 33457

Regional Administrator, Region II  
U.S. Nuclear Regulatory Commission  
Executive Director for Operations  
101 Marietta Street N.W., Suite 2900  
Atlanta, Georgia 30323

State Planning & Development  
Clearinghouse  
Office of Planning & Budget  
Executive Office of the Governor  
The Capitol Building  
Tallahassee, Florida 32301

Harold F. Reis, Esq.  
Newman & Holtzinger  
1615 L Street, N.W.  
Washington, DC 20036

Norman A. Coll, Esq.  
McCarthy, Steel, Hector and Davis  
14th Floor, First National Bank Building  
Miami, Florida 33131

Administrator  
Department of Environmental Regulation  
Power Plant Siting Section  
State of Florida  
2600 Blair Stone Road  
Tallahassee, Florida 32301

Mr. Weldon B. Lewis, County  
Administrator  
St. Lucie County  
2300 Virginia Avenue, Room 104  
Fort Pierce, Florida 33450

Mr. Charles B. Brinkman, Manager  
Washington - Nuclear Operations  
Combustion Engineering, Inc.  
7910 Woodmont Avenue  
Bethesda, Maryland 20814



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
RELATED TO LICENSE CONDITION 2.C.(5) TO FACILITY OPERATING LICENSE NO. DPR-67

FLORIDA POWER AND LIGHT COMPANY

ST. LUCIE PLANT, UNIT NO. 1

DOCKET NO. 50-335

INTRODUCTION

By letter dated December 12, 1985, the Commission issued Amendment No. 70 to Facility Operating License No. DPR-67 for the St. Lucie Plant, Unit No. 1. This amendment was based, in part, on the staff review of XN-NF-85-117, "St. Lucie Unit 1 Revised LOCA-ECCS Analysis with 15% Steam Generator Tube Plugging." Although this report provided sufficient information to review the limiting large break LOCA analysis and the Linear Heat Generation Rate (LHGR) Technical Specification changes proposed in the license amendment, it did not provide the results of the complete large break LOCA spectrum. Therefore, a license condition was included requiring the submittal of a supplement to Exxon Report XN-NF-85-117 for the Commission staff's review and approval. This supplement was to cover the complete large break LOCA spectrum results to demonstrate full compliance with the criteria of 10 CFR 50.46 and Appendix K to 10 CFR Part 50 with 15% steam generator tube plugging.

In accordance with Operating License No. DPR-67, License Condition 2.C.(5), Florida Power and Light Company (FP&L) submitted XN-NF-85-117 Supplement 1, "St. Lucie Unit 1 Revised LOCA-ECCS Analysis with 15% Steam Generator Tube Plugging Break Spectrum and Exposure Results," by letter from C. O. Woody (FP&L) to Frank J. Miraglia, (NRC) dated January 29, 1986. This supplement provides the analysis and completed LOCA-ECCS break spectrum results required to confirm the previously established limiting LOCA break and also provides LOCA analysis results at exposure conditions required to confirm the worst case exposure assumption.

EVALUATION

All of the LOCA-ECCS performance analyses were made using the Exxon Nuclear Company (ENC) EXEM/PWR ECCS NRC-approved evaluation model that satisfies the requirements of Appendix K to 10 CFR Part 50. The approved WREM-I reflood heat transfer correlation was used. The methods for accounting for steam generator tube plugging are based on ENC's experience with the evaluation model and were chosen as being representative of the worst case for the level of tube plugging used. An average of 15% uniform plugging was assumed with as much as 4% asymmetry between the two steam generators. As of November 26, 1985, the fraction of plugged tubes in St. Lucie Plant, Unit No. 1 was 4% and 3.6%.

B604010299 B60327  
PDR ADOCK 05000335  
P PDR

In order to confirm the limiting large break LOCA assumed in the original version of XN-NF-85-117, a break spectrum analysis was performed for a spectrum of seven large cold leg break LOCAs. These included guillotine breaks with discharge coefficients of 1.0, 0.8, 0.6 and 0.4 and split breaks with break areas equal to 1.0, 0.8 and 0.4 times the double-ended pipe area. The results show that the double-ended cold leg guillotine break with a discharge coefficient of 0.8 (0.8 DECLG) has the highest fuel and cladding temperature at the end of the blowdown portion of the LOCA, confirming the limiting break LOCA previously assumed.

The exposure analysis reported in the original version of XN-NF-85-117 assumed a worst case exposure of 1.8 MWD/kg peak rod average burnup at the point of maximum stored energy, which is near beginning-of-life (BOL). To confirm this as the worst case exposure point, ENC performed limiting break LOCA calculations for two additional fuel exposures, 14.0 MWD/kg and 49.1 MWD/kg peak rod average burnups. The results indicate that the maximum stored energy exposure (BOL) case has the highest initial fuel temperature and peak clad temperature (PCT) and, therefore, bounds expected exposure conditions over the life of the ENC fuel.

The St. Lucie 1 core presently contains both ENC and Combustion Engineering (CE) fuel assemblies. The LHGR limits calculated for ENC fuel have been found to be equal to or conservative with respect to those currently in place for CE fuel. In addition, because of the higher CE fuel exposures relative to the ENC fuel, the CE fuel will operate with lower LHGRs than the ENC fuel. Therefore, use of the ENC LHGR limits for both the ENC and CE fuel is conservative for monitoring plant operation.

#### CONCLUSION

The analysis presented in Supplement 1 to XN-NF-85-117 has been made using an NRC-approved evaluation model which satisfies the requirements of 10 CFR 50.46 and Appendix K to 10 CFR Part 50. An average steam generator tube plugging of 15% with a 4% asymmetry between generators is incorporated into the model. The results confirm the limiting LOCA break and the worst case exposure assumption previously assumed in XN-NF-85-117.

The limiting large break LOCA was found to be a 0.8 DECLG break. The limiting LHGR was found to be 15 kw/ft at an elevation of 0.6 of the active core height (0.6x/L). Peak cladding temperature was calculated to be 2188°F, total core hydrogen generation was less than 1%, and the local cladding oxidation was 4.53% for the limiting break. These values are within the required limits as specified in 10 CFR 50.46. Therefore, operation of St. Lucie 1 with ENC 14 x 14 fuel within the limits established in XN-NF-85-117 is acceptable.

Supplement 1 to ENC Report XN-NF-85-117 provides the complete large break LOCA spectrum results to demonstrate full compliance with the criteria of 10 CFR Part 50.46 and Appendix K to 10 CFR Part 50 and, therefore, satisfies the License Condition 2.C.(5) to Operating License No. DPR-67 for St. Lucie 1.

Principal Contributor:  
L. Kopp

Dated: March 27, 1986