

## LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) St. Lucie, Unit 1										DOCKET NUMBER (2) 0 5 0 0 0 3 3 5					PAGE (3) 1 OF 0 3				
TITLE (4) LOCA-ECCS Analysis in Error																			
EVENT DATE (5)			LER NUMBER (6)				REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)									
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAMES N/A				DOCKET NUMBER(S) 0 5 0 0 0						
0	8	21	8	5	0 0 7	0	0	0	9	2	0	8	5	0 5 0 0 0					
OPERATING MODE (9)		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR § (Check one or more of the following): (11)																	
1		20.402(b)				20.406(e)				50.73(a)(2)(iv)				73.71(b)					
POWER LEVEL (10)		20.408(a)(1)(ii)				50.38(e)(1)				50.73(a)(2)(iv)				73.71(e)					
1 0 0		20.408(a)(1)(iii)				50.38(e)(2)				50.73(a)(2)(vii)				OTHER (Specify in Abstract below and in Text, NRC Form 365A)					
		20.408(a)(1)(iii)				50.73(a)(2)(i)				50.73(a)(2)(viii)(A)									
		20.408(a)(1)(iv)				50.73(a)(2)(ii)				50.73(a)(2)(viii)(B)									
		20.408(a)(1)(v)				50.73(a)(2)(iii)				50.73(a)(2)(ix)									
LICENSEE CONTACT FOR THIS LER (12)																			
NAME Duane Mumper, Technical Staff										TELEPHONE NUMBER AREA CODE 310 15 416 151-13151510									
COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)																			
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC
B	AIC	RICIT	E131610																
SUPPLEMENTAL REPORT EXPECTED (14)										EXPECTED SUBMISSION DATE (15)		MONTH		DAY		YEAR			
<input type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE)										<input checked="" type="checkbox"/> NO									

ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines): (16)

**EVENT:**

During normal full power operation, the Plant was informed by Exxon Nuclear Corporation of a nonconservative error in the Loss of Coolant Accident - Emergency Core Cooling System (LOCA-ECCS) analysis. The error was a result of using the wrong reactor coolant pump torque values as input values. A conservative estimate of the effects of the identified error established a limit of 14.0 kw/ft for Linear Heat Generation Rate (LHGR) to assure compliance with 10 CFR 50.46 criteria.

**CAUSE OF EVENT:**

A design error occurred due to a breakdown in Exxon Nuclear Company internal communications in distributing plant data obtained from Florida Power & Light.

**CORRECTIVE ACTIONS:**

The Facility Review Group approved the new LHGR setpoints.

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## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104

EXPIRES 8-31-85

FACILITY NAME (1)  St. Lucie, Unit 1	DOCKET NUMBER (2)  05000335	LER NUMBER (6)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
		85	007	00	02	OF	03

TEXT (If more space is required, use additional NRC Form 366A's) (17)

**EVENT:**

On August 21, 1985, Exxon Nuclear Company, Inc. (ENC) notified Florida Power & Light Company of a nonconservative error in an input value for the St. Lucie Unit 1 Cycle Six fuel, (AC) Loss of Coolant Accident - Emergency Core Cooling System (LOCA-ECCS) analysis. The input error consists of using an incorrect value for the Reactor Coolant Pump torque. The torque value used was 11,011 ft-lbf rather than the correct torque of 32,495 ft-lbf.

ENC is currently performing LOCA-ECCS calculations for St. Lucie Unit 1 which have incorporated input based on measured plant data and assumes increased levels of steam generator tube plugging. It was during this effort that the error in primary pump input was identified. Pump model input has been corrected for these calculations and preliminary results can be used to estimate the effect of; the pump model change. The limiting break which had been identified in the previous analysis for the licensing basis, has been recalculated and gives a calculated Peak Cladding Temperature (PCT) of 2194°F at the current Linear Heat Generation Rate (LHGR) Technical Specification limit of 15.0 kw/ft and the maximum stored energy point of 2.4 MWD/kg peak rod average burnup, and a tube plugging of 15 percent per steam generator. The PCT dropped to 2042°F at the same LHGR and a peak rod average exposure of 15.0 MWD/kg.

Calculations indicate that the corrections to the pump torque input error in the St. Lucie Unit 1 analysis may affect what size LOCA break is limiting. Results indicated that a larger break may become limiting, and that the PCT for this break may exceed that for the previously limiting break by up to 250°F. Thus, to assure compliance to 10 CFR 50.46 criteria, a reduction in the allowed LHGR limit sufficient to reduce PCT to below 2200°F is needed. A conservative estimate in the sensitivity of PCT to known reductions in LHGR was obtained by performing a heatup calculation with TOODEE2 for St. Lucie Unit 1 with an input reduction in LHGR of 0.1 kw/ft from 15 kw/ft. This calculation gave a PCT reduction of 15.7°F.

Based on this sensitivity of 15.7°F/0.1 kw/ft, an LHGR reduction from the current limit of 15 kw/ft was calculated as a function of burnup. A limit of 14.0 kw/ft would conservatively satisfy the 10 CFR 50.46 criteria from this point in Cycle Six until the next refueling outage.

See LER 335-78-38 for a previous Unit #1 ECCS analysis error.

**CAUSE OF EVENT:**

The cause of this event was a design error by the reactor fuel vendor. According to Exxon Nuclear Company, Inc. letter RAC:057:85; dated August 21, 1985; the cause of this error was as follows:

"The incorrect rated torque value is believed to be the result of an early estimate taken from a previous Combustion Engineering PWR plant analysis in order to expedite system model development and the St. Lucie Unit 1 example calculation. This estimate was not updated due to a breakdown in ENC internal communication in distributing proper plant data, which included primary coolant pump rated torque values (32,495 ft-lbf average) obtained from FP&L. Exxon Nuclear has reviewed the other PWR LOCA-ECCS calculations and verified that the rated pump torque data which was in conformance with data obtained from the plant. The error, therefore, is considered to be specific only to the St. Lucie Unit 1 analysis."

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		85	007	00	03	OF	03

TEXT: If more space is required, use additional NRC Form 386A s) (17)

**SAFETY EVALUATION:**

A brief review indicated that St. Lucie Unit 1 never operated above a LHGR of 14.0 kw/ft during Cycle Six. During normal full power operation, the measured LHGR is approximately 12.5 kw/ft (including uncertainties). The highest expected LHGR during Cycle Six would have been during Moderator Temperature Coefficient testing. During that test, the highest LHGR measured was 13.42 kw/ft. Thus, the conservative margin between the design conditions and the less severe normal operating conditions probably prevented exceeding the 14.0 kw/ft limit.

To put this event into perspective, it should also be noted that for the PCT limit to actually have been exceeded, the break would have to occur early in cycle under worst case conditions, and the plant would have had to be operating above 14.0 kw/ft, and a LOCA would have had to occur, and the break would have had to have been a specific "worst case" size.

**CORRECTIVE ACTIONS:**

1. The Facility Review Group reviewed the Exxon recommendation and LHGR alarm setpoints were reset to 14.0 kw/ft on August 21, 1985.
2. Exxon letter RAC:057:85 indicated the following:  
"The incorrect analysis was performed in 1982. Subsequently, the Exxon Nuclear Company Quality Assurance procedures have been tightened to explicitly require a documented independent overcheck of computer code input values, as well as an overcheck of the reasonableness of the results."
3. Florida Power & Light Company Nuclear Fuels Department will pursue further corrective actions if their evaluation determines such action to be necessary.

SEP 20 1985

L-85-359

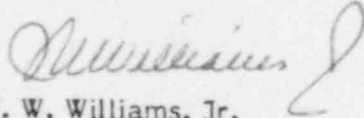
U. S. Nuclear Regulatory Commission  
Document Control Desk  
Washington, D. C. 20555

Gentlemen:

Re: Reportable Event 85-7  
St. Lucie Unit 2  
Date of Event: August 21, 1985  
LOCA-ECCS Analysis in Error

The attached Licensee Event Report is being submitted pursuant to the requirements of 10 CFR to provide notification of the subject event.

Very truly yours,

  
J. W. Williams, Jr.  
Group Vice President  
Nuclear Energy

JWW/SAV:mls

Attachment

cc: Dr. J. Nelson Grace  
Harold F. Reis, Esquire  
File 933.1  
PNS-LI-85-319/2

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