

# ACCELERATED DISTRIBUTION DEMONSTRATION SYSTEM

## REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR: 8907250137      DOC. DATE: 89/07/19      NOTARIZED: NO      DOCKET #  
 FACIL: 50-400 Shearon Harris Nuclear Power Plant, Unit 1, Carolina      05000400  
 AUTH. NAME      AUTHOR AFFILIATION  
 LEW, G.T.      Carolina Power & Light Co.  
 RICHEY, R.B.      Carolina Power & Light Co.  
 RECIPIENT NAME      RECIPIENT AFFILIATION

SUBJECT: LER 89-011-00: on 890619, reactor power slightly exceeded  
 100% on several occasions due to erroneous FW temp reading.  
W/8      ltr.

DISTRIBUTION CODE: IE22T      COPIES RECEIVED: LTR: 1      ENCL: 1      SIZE: 5  
 TITLE: 50.73/50.9 Licensee Event Report (LER), Incident Rpt, etc.

NOTES: Application for permit renewal filed. 05000400

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	NRR/DLPQ/HFB 10	1    1	NRR/DLPQ/PEB 10	1    1
	NRR/DOEA/EAB 11	1    1	NRR/DREP/RPB 10	2    2
	NUDOCS-ABSTRACT	1    1	<u>REG FILE</u> 02	1    1
	RES/DSIR/EIB	1    1	RES/DSR/PRAB	1    1
	RGN2 FILE 01	1    1		
EXTERNAL:	EG&G WILLIAMS, S	4    4	FORD BLDG HOY, A	1    1
	L ST LOBBY WARD	1    1	LPDR	1    1
	NRC PDR	1    1	NSIC MAYS, G	1    1
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**Carolina Power & Light Company**

HARRIS NUCLEAR PROJECT  
P.O. Box 165  
New Hill, NC 27562

JUL 19 1989

File Number: SHF/10-13510C  
Letter Number: HO-890076 (0)


U.S. Nuclear Regulatory Commission  
ATTN: NRC Document Control Desk  
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SHEARON HARRIS NUCLEAR POWER PLANT UNIT 1  
DOCKET NO. 50-400  
LICENSE NO. NPF-63  
LICENSEE EVENT REPORT 89-011-00

Gentlemen: -

In accordance with Title 10 to the Code of Federal Regulations, the enclosed Licensee Event Report is submitted. This report fulfills the requirement for a written report within thirty (30) days of a reportable occurrence and is in accordance with the format set forth in NUREG-1022, September 1983.

Very truly yours,

  
R. B. Richey, Manager  
Harris Nuclear Project

RBR: sbg

Enclosure

cc: Mr. R. A. Becker (NRR)  
Mr. W. H. Bradford (NRC - SHNPP)  
Mr. S. D. Ebnetter (NRC - RII)

8907250137 890719  
PDR ADOCK 05000400  
S PDC

MEM/LER-89-011/1/OS1



LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) <b>SHEARON HARRIS NUCLEAR POWER PLANT - UNIT 1</b>	DOCKET NUMBER (2) <b>0 5 0 0 0 4 0 0</b>	PAGE (3) <b>1 OF 0 4</b>
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TITLE (4) **REACTOR POWER SLIGHTLY EXCEEDED 100% ON SEVERAL OCCASIONS DUE TO AN ERRONEOUS FEEDWATER TEMPERATURE READING CAUSED BY A CORRODED CONNECTION.**

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		
06	19	89	89	0111	00	07	19	89			
									DOCKET NUMBER(S) <b>0 5 0 0 0</b>		
									DOCKET NUMBER(S) <b>0 5 0 0 0</b>		

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)

OPERATING MODE (9) <b>1</b>	20.402(b)	20.405(c)	50.73(a)(2)(iv)	73.71(b)
POWER LEVEL (10) <b>1 0 0</b>	20.406(a)(1)(i)	50.36(e)(1)	50.73(a)(2)(v)	73.71(c)
	20.405(a)(1)(ii)	50.36(e)(2)	50.73(a)(2)(vi)	<input checked="" type="checkbox"/> OTHER (Specify in Abstract below and in Text, NRC Form 366A)
	20.405(a)(1)(iii)	50.73(a)(2)(i)	50.73(a)(2)(vii)(A)	
	20.406(a)(1)(iv)	50.73(a)(2)(ii)	50.73(a)(2)(vii)(B)	
	20.406(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(ix)	

LICENSEE CONTACT FOR THIS LER (12)

NAME <b>G. T. LEW - PROJECT ENGINEER - REGULATORY COMPLIANCE</b>	TELEPHONE NUMBER
	AREA CODE <b>9 1 9</b> <b>3 6 2</b> <b>2 0 3 5</b>

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS
B	I	D	C	O	N	X	19	19	N

SUPPLEMENTAL REPORT EXPECTED (14)	YES (If yes, complete EXPECTED SUBMISSION DATE)	NO	EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
	<input checked="" type="checkbox"/>	<input type="checkbox"/>				

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

On June 7, 1989 an inaccurate reading from a Resistance Temperature Detector (RTD) used to measure a thermocouple reference junction box temperature was reported to the Plant Reactor engineers. A corroded connection caused the temperature detectors associated with an instrumentation multiplexing cabinet to indicate a higher than actual temperature. The condition affected the accuracy of a feedwater temperature data point used in the determination of the daily reactor power calculation (calorimetric).

The connection was repaired and an analysis of the impact on plant performance initiated on June 9. On June 19, it was concluded that reactor power exceeded 100% thermal power by a small amount on several occasions. The review indicated that 100% thermal power was exceeded on 20 days between May 1 and June 6, 1989. The highest indicated power reached was 100.32% on May 25, 1989. On the remaining days, power levels ranged from 100.06% to 100.29%.

This event is reported as a violation of Section 2.C. (1) of the operating license.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1)  SHEARON HARRIS NUCLEAR POWER PLANT- UNIT 1.	DOCKET NUMBER (2)  0   5   0   0   0   4   U   0	LER NUMBER (6)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
		8   9	-   0   1   1	-   0   0	0   2	OF 0   4

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

DESCRIPTION:

On May 23, 1989 an unexplained high "B" train condensate temperature was observed. Troubleshooting of the problem led to the discovery (on May 25), and repair (on June 6) of a corroded connection on a Resistance Temperature Detector (RTD) used to measure thermocouple reference box temperature.

Separately another engineer, reviewing feedwater temperature data, noted high temperature readings for data point TFW-2000B (feedwater temperature to steam generator "B"). The engineer was not aware of the condensate temperature issue. The engineer checked on the status of the feedwater temperature problem the following day and observed that the temperature had returned to normal. The engineer continued to investigate the problem and discovered that the RTD terminal connection had been repaired. At this time, the engineer recognized that the RTD repair had resolved both the feedwater and condensate temperature issues. The engineer recognized that this feedwater temperature was used in the plant heat balance and immediately informed the reactor Engineering Section and Plant Management of a possible discrepancy in feedwater temperature data.

Reactor engineering was notified of the feedwater temperature data problem on June 7, 1989 and began an investigation of the problem. By June 9, it was determined that the corroded connection would cause an erroneous high temperature reading. Data was collected for actual indicated reactor power and revised calorimetric results were prepared. On June 14, management was notified of the possibility that operation above 100% thermal power had taken place. By June 19, 1989, analysis confirmed that the reactor was operated slightly above 100% thermal power.

The review of temperature data indicated that the temperature discrepancy began about May 1, and existed through repair of the corroded connection on June 6, 1989. The condition resulted in a maximum temperature error of 8° F for one of the three feedwater lines. Normal feedwater temperature for 100% power is on the order of 430° F. Modifying the daily calorimetric calculations by substituting a lower value for TFW-2000B resulted in an error between 0.05 and 0.46%. For calorimetric purposes, feedwater temperatures are used to calculate feedwater enthalpy. Having an indicated temperature higher than the actual temperature translates into an error in feedwater enthalpy and a calculated power which is less than the real power. Adding the calculated error to the indicated power as determined by recorded highest indicated power level showed that the worst case true power condition, when averaged over an 8 hour period, slightly exceeded 100% for 20 of the 37 days. The maximum 8 hour average was 100.32% on May 25, 1989. For minor power fluctuations, the plant policy is to use a 8 hour average power to determine compliance with the license limit.



LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1) SHEARON HARRIS NUCLEAR POWER PLANT- UNIT 1	DOCKET NUMBER (2) 0   5   0   0   0   4   0   0   8   9	LER NUMBER (6)			PAGE (3)	
		YEAR —	SEQUENTIAL NUMBER 0   1   1	REVISION NUMBER —   0   0	0   3	OF 0   4

TEXT (If more space is required, use additional NRC Form 305A's) (17)

CAUSE:

The high temperature readings were caused by corrosion of RTD terminal contacts. The high resistance connection caused a high reference junction temperature reading. This caused the associated feedwater temperature to indicate a higher than actual temperature. The data point was not immediately flagged as an error because the difference between similar indicators was within 8° F.

ANALYSIS:

The power range heat balance or calorimetric calculation is performed daily when operating above 15% power by procedure OST-1004. Feedwater temperature, feedwater pressure and steam generator pressure are measured for each steam generator. The results are used to determine the enthalpy of the feedwater supplied to each steam generator and the enthalpy of the steam leaving each steam generator. The enthalpy rise across the steam generator is multiplied by the measured feedwater flow to determine the power produced by the steam generator. The values obtained for each steam generator, a value for reactor coolant pump heat and a value for thermal losses are summed to obtain net reactor output. The result is compared to the licensed limit of 2775 MW to establish a percent of calculated power. This calculated result is compared to indicated power and used as a basis for adjustment of power range instrumentation.

Table 4.4.6-3 of the FSAR shows that feedwater temperature measurements are expected to be accurate to within 2° F. In combination with the uncertainties of other measure plant parameters, the power (or flow) calculation is accurate to within 1.75%. For conservatism and compliance with 10CFR Appendix K, the accident analysis assumes that initial power levels for transients beginning at 100% rated thermal power are analyzed assuming a minimum of 102% rated thermal power.

For this event, any errors introduced by the erroneous feedwater temperature measurement may be compensated for by opposing errors or by the accuracy of other measured parameters. These compensating effects were not quantified. The slight temperature error has an insignificant effect on the consequences of any design basis accident.

This event is reported as a violation of Section 2.C.(1) of the operating license since the plant was operated at over 100% rated power (2775 MW). There have been no other events of a similar nature for this plant.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1)  SHEARON HARRIS NUCLEAR POWER PLANT- UNIT 1	DOCKET NUMBER (2)  0 5 0 0 0 4 0 0 8 9	LER NUMBER (6)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
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TEXT (If more space is required, use additional NRC Form 386A's) (17)

CORRECTIVE ACTION:

1. The corroded connection was corrected as soon as the condition was noted. Other connections were inspected for corrosion and no problems were found.
2. The calorimetric procedure will be revised to define expected tolerances for data where multiple instruments are measuring the same parameter.

ENERGY INDUSTRY IDENTIFICATION SYSTEM (EIIS) CODES:

<u>Component of System</u>	<u>EIIS Code</u>
Computer System	ID
Condensate System	SD
Feedwater System	SJ