

## REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR: 8806140476 DOC. DATE: 88/06/06 NOTARIZED: NO DOCKET #  
 FACIL: 50-261 H.B. Robinson Plant, Unit 2, Carolina Power & Light C 05000261  
 AUTH. NAME AUTHOR AFFILIATION  
 SAYRE, D. Carolina Power & Light Co.  
 MORGAN, R. E. Carolina Power & Light Co.  
 RECIP. NAME RECIPIENT AFFILIATION

SUBJECT: LER 88-002-01: on 880506, power reduced for unrelated reasons.  
 Caused by inaccuracy in recalculation of Min Departure for  
 Nucleate Boiling Ratio. reanalysis of ocntrol rod drop  
 transient will reflect change to Tech Specs. W/880606 ltr.

DISTRIBUTION CODE: IE22D COPIES RECEIVED: LTR 1 ENCL 1 SIZE: 5  
 TITLE: 50.73 Licensee Event Report (LER), Incident Rpt, etc.

## NOTES:

	RECIPIENT ID CODE/NAME	COPIES LTTR ENCL	RECIPIENT ID CODE/NAME	COPIES LTTR ENCL
	PD2-1 LA	1 1	PD2-1 PD	1 1
	LO, R	1 1		
INTERNAL:	ACRS MICHELSON	1 1	ACRS MOELLER	2 2
	AEOD/DOA	1 1	AEOD/DSP/NAS	1 1
	AEOD/DSP/ROAB	2 2	AEOD/DSP/TPAB	1 1
	ARM/DCTS/DAB	1 1	DEDRO	1 1
	NRR/DEST/ADS 7E	1 0	NRR/DEST/CEB 8H	1 1
	NRR/DEST/ESB 8D	1 1	NRR/DEST/ICSB 7	1 1
	NRR/DEST/MEB 9H	1 1	NRR/DEST/MTB 9H	1 1
	NRR/DEST/PSB 8D	1 1	NRR/DEST/RSB 8E	1 1
	NRR/DEST/SGB 8D	1 1	NRR/DLPQ/HFB 10	1 1
	NRR/DLPQ/QAB 10	1 1	NRR/DOEA/EAB 11	1 1
	NRR/DREP/RAB 10	1 1	NRR/DREP/RPB 10	2 2
	NRR/DRIS/SIB 9A	1 1	NUDOCS-ABSTRACT	1 1
	REG FILE 02	1 1	RES TELFORD, J	1 1
	RES/DE/EIB	1 1	RES/DRPS DEPY	1 1
	RGN2 FILE 01	1 1		
EXTERNAL:	EG&G WILLIAMS, S	4 4	FORD BLDG HOY, A	1 1
	H ST LOBBY WARD	1 1	LPDR	1 1
	NRC PDR	1 1	NSIC HARRIS, J	1 1
	NSIC MAYS, G	1 1		

## LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2										DOCKET NUMBER (2) 0   5   0   0   0   2   6   1										PAGE (3) 1   OF   0   4																													
TITLE (4) POTENTIAL FOR UNANALYZED REACTOR OPERATION DUE TO TRIP SETPOINT CALCULATION INACCURACY																																																	
EVENT DATE (5) MONTH   DAY   YEAR 0   5   0   6   8   8										LER NUMBER (6) YEAR   SEQUENTIAL NUMBER   REVISION NUMBER 8   8   -   0   0   2   -   0   1										REPORT DATE (7) MONTH   DAY   YEAR 0   6   0   6   8   8										OTHER FACILITIES INVOLVED (8) FACILITY NAMES DOCKET NUMBER(S) 0   5   0   0   0																			
OPERATING MODE (9) N										THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)																																							
POWER LEVEL (10) 0   6   0										20.402(b)										20.405(c)										50.73(a)(2)(iv)										73.71(b)									
										20.405(a)(1)(i)										50.38(c)(1)										50.73(a)(2)(v)										73.71(c)									
										20.405(a)(1)(ii)										50.38(c)(2)										50.73(a)(2)(vii)										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)(viii)(A)																			
										20.405(a)(1)(iv)										50.73(a)(2)(ii)										50.73(a)(2)(viii)(B)																			
										20.405(a)(1)(v)										X 50.73(a)(2)(iii)										50.73(a)(2)(ix)																			
LICENSEE CONTACT FOR THIS LER (12)																																																	
NAME Don Sayre, Senior Specialist - Regulatory Compliance																				TELEPHONE NUMBER AREA CODE 8   0   3   3   8   3   -   1   2   4   2																													
COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)																																																	
CAUSE															CAUSE																																		
SYSTEM															SYSTEM																																		
COMPONENT															COMPONENT																																		
MANUFACTURER															MANUFACTURER																																		
REPORTABLE TO NPDOS															REPORTABLE TO NPDOS																																		
SUPPLEMENTAL REPORT EXPECTED (14)																																																	
X YES (If yes, complete EXPECTED SUBMISSION DATE)																				NO										EXPECTED SUBMISSION DATE (15) MONTH   DAY   YEAR 0   9   0   5   8   8																			

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

It was determined January 1988 that a nonconservative OverTemperature delta Temperature trip setpoint may exist in the Plant Technical Specifications. This setpoint was questioned in December 1987 when reviewing the Resistance Temperature Detection delay response time of the Plant Final Safety Analysis Report (FSAR). The licensee considered that an unanalyzed condition may exist and directed the setpoint be revised. The NRC was notified of the potential unanalyzed condition. In February, the NRC was notified the condition was bound by existing analyses. In May, the nuclear fuel vendor notified the licensee of an inaccurate recalculation of Minimum Departure from Nucleate Boiling Ratio which made invalid an original conclusion. The inaccuracy was due to a failure by the vendor to correct a given value. The NRC was notified pursuant to 10CFR50.72(b)(1)(ii)(A). The fuel vendor will implement steps to minimize the likelihood of a recurrence. The revised setpoint will be reflected in a change to the Technical Specifications. The FSAR will be revised. The licensee will continue to research historical records to determine whether the reactor has been operated in an unanalyzed condition. This LER is submitted under 10CFR50.73(a)(2)(ii).

8806140476 880606  
PDR ADDOCK 05000261  
S PDR

IE22  
111

## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
H. B. ROBINSON S. E. PLANT UNIT 2	0 5 0 0 0 2 6 1	8 8	0 0 2	0 1	0 2	OF	0 4

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

## I. DESCRIPTION OF EVENT

Originally, this LER was submitted to provide information of potential interest to the industry. <sup>1</sup> On January 22, 1988, the licensee had determined that a potentially nonconservative trip setting in the OverTemperature delta Temperature (OTΔT) setpoint existed in H. B. Robinson Technical Specification 2.3.1.2.d. <sup>2,3,4</sup> The setpoint had been initially questioned on December 12, 1987, during review of the Resistance Temperature Detection (RTD) delay response time reflected in the Plant Final Safety Analysis Report (FSAR). <sup>5,6</sup> Specifically, the setpoint reflected an instrument loop delay time of 2.3 seconds when generically a delay time on the order of 6 seconds had been used. The Plant Nuclear Safety Committee (PNSC) at the time found the data insufficient to concur that an unanalyzed condition may exist, but to be conservative, the PNSC directed immediate revision of the OTΔT "K1" bias constant. In addition, the PNSC directed the nuclear fuel vendor to conduct analyses to assess the impact of the longer delay time. <sup>7</sup> On January 22, the NRC was notified of a "potential" unanalyzed condition pursuant to 10CFR50.72(b)(1)(ii)(A).

The licensee evaluated the 6 seconds value but found that 4.75 seconds was the correct value for the existing Plant configuration. This 4.75 seconds value was then provided to the nuclear fuel vendor for use in reanalyses of accidents of impact to the reactor core. On February 18, 1988, the fuel vendor reported that the required reanalyses, based on the 4.75 seconds, were acceptable.

On May 6, 1988, with Unit No. 2 at 60% power reduced for unrelated reasons, the nuclear fuel vendor notified the licensee of an inaccuracy in their recalculation of the Minimum Departure for Nucleate Boiling Ratio (MDNBR) for Control Rod Drop with Automatic Rod Control, one of the analyses of their February 18 report. <sup>8,9</sup> The MDNBR value was part of an analysis correcting the RTD response time in the FSAR and, as such, made invalid a conclusion presented in the original LER. The fuel vendor had inadvertently used the original 2.3 seconds rather than the 4.75 seconds response delay time factor.

<sup>1</sup>/ LER-88-002-00.

<sup>2</sup>/ H. B. Robinson Unit No. 2 is a Westinghouse 700 megawatt Pressurized Water Reactor power plant, in commercial operation since March 1971.

<sup>3</sup>/ OTΔT EIIS Codes: System - AC; Component - Not available; Manufacturer - W120.

<sup>4</sup>/ Plant Technical Specifications through Amendment No. 114.

<sup>5</sup>/ RTD EIIS Codes: System - JE; Component - Not available; Manufacturer - W120.

<sup>6</sup>/ FSAR through Amendment 5.

<sup>7</sup>/ Nuclear fuel vendor: Advanced Nuclear Fuels - Exxon Nuclear Company, Richland, WA.

<sup>8</sup>/ Control Rod Drop with Automatic Rod Control: FSAR Section 15.4.3.1.4 for Dropped Fuel Length RCCA and RCCA Bank in Automatic Rod Control.

<sup>9</sup>/ MDNBR EIIS Codes: System - AC; Component - Not available; Manufacturer - W120.

## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
H. B. ROBINSON S. E. PLANT UNIT 2	0 5 0 0 0 2 6 1	8 8	0 0 2	0 1	0 3	OF	0 4

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

The licensee notified the NRC of the May 6 discovery, as a followup to the initial notification of January 22.

II. CAUSE OF EVENT

During the early 1970's, H. B. Robinson changed nuclear fuel vendors. The change involved the need for the new fuel vendor to develop the required accident analysis codes for the reactor core. The original vendor's data was not available to the new fuel vendor due to the proprietary nature of the information. As a result, the new fuel vendor developed the analysis codes based on the response time published in the FSAR. It was discovered in December 1987 that this value was nonconservative and may have been used in the development of the accident model by the new fuel vendor.

When the RTD delay times and lag constants were revised from 2.3 to 4.75 seconds, the fuel vendor failed to incorporate the 4.75 seconds into their PTSPWR Code using the OTAT trip function to evaluate the Control Rod Drop transient.<sup>10</sup> Instead, the previously accepted 2.3 seconds was used. This oversight by the analyst went uncorrected during independent review verification by the fuel vendor. The inaccuracy was later discovered by the fuel vendor while performing calculations to support a proposed Plant modification to eliminate the RTD bypass piping. Subsequent analysis noted the effect of the proposed Plant modification on the MDNBR for the Control Rod Drop transient was inconsistent with the corresponding change in the MDNBR introduced by the modification for other events being evaluated.

III. ANALYSIS OF EVENT

The contribution of the OTAT to the following FSAR accident analysis events was evaluated by the new fuel vendor: 1) Loss of External Electrical Load; 2) Uncontrolled Rod Withdrawal (single full length RCCA); and, 3) Rod Drop with Automatic Rod Control. Because immediate licensee action to implement reductions in the KI was in the conservative direction, neither the probability nor consequences of an accident as described in the FSAR was increased. The OTAT circuitry would continue to provide the same reactor trips, although at a lower temperature for conservatism. The basis for Plant Technical Specifications Safety Limits establishes a limiting value for the Departure from Nucleate Boiling Ratio (DNBR) of 1.17, which supplies sufficient margin to preclude fuel damage.

<sup>10</sup>/ The PTSPWR Code is proprietary to Advanced Nuclear Fuels; the initialism stands for Plant Transient Simulation model for Pressurized Water Reactors.

## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

APPROVED OMB NO 3150-0104

EXPIRES: 8/31/88

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
H. B. ROBINSON S. E. PLANT UNIT 2	0 5 0 0 0 2 6 1	8 8	— 0 0 2	— 0 1	0 4	OF	0 4

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

With regard to the PTSPWR Code inaccuracy identified on May 6, based on the corrected analysis, the current Plant Technical Specification value of 1.1565 in the OTAT trip equation cannot be shown to maintain the MDNBR above the licensed limit of 1.17 during the Control Rod Drop transient initiated at full power. Classified as a Condition II event, this violates the acceptance criteria for this accident.

The administrative reduction of the OTAT K1 bias value to 1.09, maintained since December 1987, is more than adequate compensation to ensure the MDNBR above the licensed limit. The change conservatively prevents a Departure from Nucleate Boiling, thus fulfilling the basis for the Plant Technical Specifications Safety Limits by precluding nuclear fuel damage. As such, the inaccuracy has no current impact on Plant safety. Prior to December 1987, however, it would have been possible to operate the reactor in an unanalyzed condition using the 1.1565 OTAT value. The licensee is continuing to research historical operating records to determine whether this condition existed.

IV. CORRECTIVE ACTION

The PNSC meeting of December 12, 1987, to discuss this issue, ascertained there was insufficient data available at the time to determine whether an unanalyzed situation existed. For conservatism, the PNSC directed that the OTAT K1 bias constant be changed to 1.09, based on a sensitivity evaluation performed by the nuclear fuel vendor using a 6 seconds time delay.

With regard to the PTSPWR Code inaccuracy reported to the licensee on May 6, the nuclear fuel vendor has committed to implement steps to minimize the likelihood of recurrence of this type of oversight when updating a calculational basis.

The corrected reanalysis of the Control Rod Drop transient will be reflected in a change to the Plant Technical Specifications prior to startup following Refueling Outage No. 12. The existing OTAT K1 bias of 1.09 will be maintained by the licensee for the remainder of the current fuel cycle.

The licensee will research historical operating records to determine whether the reactor has been operated in an unanalyzed condition.

The FSAR instrument loop delay time will be revised to reflect the correct lag time in seconds.

V. ADDITIONAL INFORMATION

## A. Failed Component Identification

None.

## B. Previous Similar Events

LER-88-002-00 (as discussed in this Supplemental Report).



~~CAROLINA POWER & LIGHT COMPANY~~  
Carolina Power & Light Company

ROBINSON NUCLEAR PROJECT DEPARTMENT  
POST OFFICE BOX 790  
HARTSVILLE, SOUTH CAROLINA 29550

JUN 6 1988

Robinson File No: 13510C

Serial: RNPD/88-2750  
(10 CFR 50.73)

United States Nuclear Regulatory Commission  
Attn: Document Control Desk  
Washington, D. C. 20555

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2  
DOCKET NO. 50-261  
LICENSE NO. DPR-23  
LICENSEE EVENT REPORT 88-002-01

Gentlemen:

The enclosed supplemental Licensee Event Report (LER) is submitted in accordance with 10 CFR 50.73 and NUREG-1022 including Supplements No. 1 and 2. This submittal should replace existing copies of the original report of February 19, 1988.

Very truly yours,

R. E. Morgan  
General Manager  
H. B. Robinson S. E. Plant

Enclosure

cc: Dr. J. N. Grace  
Mr. L. W. Garner  
INPO

IER22  
11