

# ACCELERATED DISTRIBUTION DEMONSTRATION SYSTEM

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR: 9002220270      DOC. DATE: 90/02/08      NOTARIZED: NO      DOCKET #  
 FACIL: 50-261 H.B. Robinson Plant, Unit 2, Carolina Power & Light Co      05000261  
 AUTH. NAME      AUTHOR AFFILIATION  
 BAUCOM, C.T.      Carolina Power & Light Co.  
 RECIP. NAME      RECIPIENT AFFILIATION

SUBJECT: LER 90-001-00: on 900110, power to rod position indication sys  
 lost, resulting in actuation of automatic turbine.

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.

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INTERNAL:	ACRS MICHELSON	1 1	ACRS MOELLER	2 2
	ACRS WYLIE	1 1	AEOD/DOA	1 1
	AEOD/DSP/TPAB	1 1	AEOD/ROAB/DSP	2 2
	DEDRO	1 1	NRR/DET/ECMB 9H	1 1
	NRR/DET/EMEB9H3	1 1	NRR/DET/ESGB 8D	1 1
	NRR/DLPQ/LHFB11	1 1	NRR/DLPQ/LPEB10	1 1
	NRR/DOEA/OEAB11	1 1	NRR/DREP/PRPB11	2 2
	NRR/DST/SELB 8D	1 1	NRR/DST/SICB 7E	1 1
	NRR/DST/SPLB8D1	1 1	NRR/DST/SRXB 8E	1 1
	REG FILE 02	1 1	RES/DSIR/EIB	1 1
	RGN2 FILE 01	1 1		
EXTERNAL:	EG&G WILLIAMS, S	4 4	L ST LOBBY WARD	1 1
	LPDR	1 1	NRC PDR	1 1
	NSIC MAYS, G	1 1	NSIC MURPHY, G.A	1 1
	NUDOCS FULL TXT	1 1		

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Carolina Power & Light Company

ROBINSON NUCLEAR PROJECT DEPARTMENT  
POST OFFICE BOX 790  
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United States Nuclear Regulatory Commission  
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H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2  
DOCKET NO. 50-261  
LICENSE NO. DPR-23  
LICENSEE EVENT REPORT 90-001

Gentlemen:

The enclosed Licensee Event Report (LER) is submitted in accordance with 10 CFR 50.73 and NUREG-1022 including Supplements No. 1 and 2.

Very truly yours,

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

CTB:lht

Enclosure

cc: Mr. S. D. Ebnetter  
Mr. L. W. Garner  
INPO

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## 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 4		
TITLE (4) LOSS OF ALL CONTROL ROD POSITION INDICATION																
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				DOCKET NUMBER(S)			
01	10	90	90	001	00	02	08	90					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)														
N		20.402(b)				20.405(c)				50.73(a)(2)(iv)				73.71(b)		
POWER LEVEL (10)		20.405(a)(1)(i)				50.36(c)(1)				50.73(a)(2)(v)				73.71(c)		
1 0 0		20.405(a)(1)(ii)				50.36(c)(2)				50.73(a)(2)(vii)				OTHER (Specify in Abstract below and in Text, NRC Form 366A)		
		20.405(a)(1)(iii)				X 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)				50.73(a)(2)(iii)				50.73(a)(2)(x)						
LICENSEE CONTACT FOR THIS LER (12)																
NAME C. T. Baucom, Senior Specialist										TELEPHONE NUMBER						
										AREA CODE 8 0 3 3 8 3 - 1 2 5 3						
COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)																
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPD		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPD						
X	A A	B K R	S 3 4 5													
SUPPLEMENTAL REPORT EXPECTED (14)																
YES (If yes, complete EXPECTED SUBMISSION DATE)										X NO		EXPECTED SUBMISSION DATE (15)		MONTH	DAY	YEAR

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

On January 10, 1990, at 0908 hours, power was lost to the Rod Position Indication (RPI) System which resulted in the actuation of an automatic turbine runback from 100% power. The unit was stabilized at approximately 46% power following the transient. With the RPI System de-energized, the Rod Position Deviation monitoring function was unavailable. This function is provided by the plant process computer using input data received from the RPI System, and is one part of the Control Rod Misalignment Monitor as required by Technical Specification Table 3.5-2, Item 15. The Technical Specifications also require that the Control Room analog RPI be monitored if the minimum required channels of the Rod Position Deviation monitor are not operable. However, the loss of power to the RPI System also caused the Control Room analog RPI to be unavailable. Therefore, implementation of Technical Specification 3.0 was required. The cause of the event was the failure of a two pole, single phase, 120 volt AC circuit breaker which supplies the RPI System. The required repairs and post maintenance testing were completed, and the RPI System was returned to service at 1540 hours on January 10, 1990. This Licensee Event Report is submitted pursuant to 10CFR50.73(a)(2)(i)(B).

## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104  
EXPIRES: 6/31/86

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
H. B. ROBINSON, UNIT NO. 2	0 5 0 0 0 2 6 1 9 0	0	0 1	0	0	2 OF 4

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

## I. Description of Event

On January 10, 1990, the unit was operating at steady-state conditions with reactor power at 100% and net electrical generation at approximately 740 MW.<sup>1</sup> At 0908 hours, several alarms associated with the Rod Control and Position Indication System were simultaneously received and a turbine runback was automatically initiated. Using normal boration methods and manual rod control, reactor power was stabilized at approximately 46% following the transient.

Subsequent investigation revealed that a loss of power to the Rod Position Indication (RPI) System had occurred. This was attributed to the failure of a two pole, single phase, 120 volt AC circuit breaker which supplies the RPI System.<sup>2</sup> The loss of power generated a control rod drop/rod bottom signal which initiated the automatic turbine runback. This loss of RPI had no direct affect on the movement or operation of the control rods, and there was no indication of a dropped or otherwise misaligned control rod.

A review was subsequently performed to establish operability, reportability, and limiting condition for operation (LCO) requirements. This review identified Technical Specification Table 3.5-2, Item 15, which provides minimum requirements for the Control Rod Misalignment Monitor. This function is performed by two independent monitors which are the Rod Position Deviation monitor (subpart a) and the Quadrant Power Tilt monitor (subpart b). The Rod Position Deviation monitoring function is fulfilled by a control rod deviation monitoring program in the plant process computer. With the RPI System de-energized, the required inputs were not available to the plant process computer, causing this monitoring feature to be inoperable. With less than the required Minimum Channels Operable for this monitoring feature, the Technical Specifications require the Operator to "log individual rod position once/hour, and after a load change > 10% or after > 30 inches of control rod motion." Since the loss of power to the RPI System also caused the Control Room analog RPI to be unavailable, this action could not be performed. This in turn required implementation of Technical Specification 3.0 which specifies hot shutdown within 8 hours and cold shutdown within the next 30 hours due to "circumstances in excess of those addressed in the specification." There were no problems noted with respect to the Quadrant Power Tilt monitor (subpart b requirement).

<sup>1</sup>H. B. Robinson Steam Electric Plant, Unit No. 2 is a Westinghouse Pressurized Water Reactor power plant in operation since March 1971.

<sup>2</sup>Cause Code: X

## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104

EXPIRES: 8/31/88

FACILITY NAME (1)  H. B. ROBINSON, UNIT NO. 2	DOCKET NUMBER (2)  0 5 0 0 0 2 6 1 9 0	LER NUMBER (8)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
		0	0 0 1	0 0	3 OF	4

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

## II. Cause of Event

The cause of this event was the failure of a two pole, single phase, 120 volt AC circuit breaker which supplies the Rod Position Indication System.<sup>3</sup> This circuit breaker is connected to its buss receptacle by a "plug in" type connector. There is no bolting or clamping mechanism to physically attach the breaker to the buss receptacle. It was determined that this connection had degraded sufficiently to allow heating and arcing, which overheated and physically damaged the breaker and the buss receptacle. The heating and failure caused the breaker to trip, which ultimately resulted in the loss of power to the RPI System.

A review of data from the plant process computer indicates that the duration of the turbine runback was 16.6 seconds which resulted in a final, steady-state power level of approximately 46%. This runback is normally expected to last for approximately 9 seconds, or until turbine first stage pressure is reduced to approximately 70% of the full power first stage pressure. A comparison of this event with a 1987 turbine runback event showed that the plant responded similarly in both cases. Although the plant response was conservative and consistent in both cases, the magnitude and duration of the runback warrants further investigation.

## III. Analysis of Event

The RPI System is an analog indication which is provided to allow monitoring of control rod movement, and to aid in identifying a stuck or misaligned control rod. The RPI System provides information to the plant process computer, and supplies Control Room indication and alarms. The system also provides signals to initiate an automatic turbine runback. The RPI System is not safety-related and provides no inputs or functions with respect to the Reactor Protection System or Engineered Safety Features.

The loss of the RPI System resulted in a loss of direct indication for individual control rods. This degraded the ability of plant Operators to detect a dropped or misaligned control rod. Assuming a worst case scenario, the failure to detect a dropped or misaligned control rod could result in adverse power distributions and localized peaking of core power.

However, based on the redundant instrumentation which remained available, no indications of a dropped or misaligned control rod were observed. These included direct monitoring of excore nuclear instrumentation channels, and the use of these channels for computation of core quadrant power tilts. Also, Reactor Coolant System average temperatures and loop differential temperatures were available and indicated no imbalances or anomalies.

<sup>3</sup>EIIS Code: System - AA; Component - BKR; Manufacturer - S345

## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104

EXPIRES: 8/31/86

FACILITY NAME (1)  H. B. ROBINSON, UNIT NO. 2	DOCKET NUMBER (2)  0 5 0 0 0 2 6 1 9 0	LER NUMBER (8)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
		0	0 0 1	0 0	4	OF 4

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

## III. Analysis of Event (Continued)

Finally, the incore nuclear instrumentation system was available and could have been employed to verify proper core power distribution. Therefore, although no actual control rod drop or misalignment occurred, sufficient redundant instrumentation was available to detect such a condition.

As provided within NUREG-1022, Supplement No. 1, this event is reportable pursuant to 10CFR50.73 (a)(2)(i)(B) as an operation or condition prohibited by the plant's Technical Specifications.

## IV. Corrective Actions

The failed RPI System circuit breaker and the associated buss receptacle were replaced. The system was energized and post maintenance testing was performed which involved control rod movement and varying RPI circuit loads. At 1540 hours on January 10, 1990, the system was declared back in service and the LCO terminated.

Also, as stated previously, the magnitude and duration of the turbine runback warrants further investigation. This investigation will examine whether the runback feature operated properly, and whether any adjustments or modifications may be needed to the associated circuitry or hardware. This review will be completed by June 29, 1990.

## V. Additional Information

- A. Failed Component Identification  
70 amp, 120 volt AC circuit breaker manufactured by Square D Company
- B. Previous Similar Events  
None