

# ACCELERATED DISTRIBUTION DEMONSTRATION SYSTEM

## REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR:8806160152 DOC.DATE: 88/06/09 NOTARIZED: NO DOCKET #  
 FACIL:50-261 H.B. Robinson Plant, Unit 2, Carolina Power & Light C 05000261  
 AUTH.NAME AUTHOR AFFILIATION  
 LEGETTE,F.L. Carolina Power & Light Co.  
 MORGAN,R.E. Carolina Power & Light Co.  
 RECIP.NAME RECIPIENT AFFILIATION

SUBJECT: LER 88-011-00:on 880512,automatic reactor trip due to turbine trip from turbine overspeed protection.

W/8 ltr.

DISTRIBUTION CODE: IE22D COPIES RECEIVED:LTR 1 ENCL 1 SIZE: 4  
 TITLE: 50.73 Licensee Event Report (LER), Incident Rpt, etc.

### NOTES:

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	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						

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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 0 3	
TITLE (4) AUTOMATIC REACTOR TRIP DUE TO TURBINE TRIP FROM TURBINE OVERSPEED PROTECTION															
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)		
0 5	1 2	8 8	8 8	0 1	1	0 0	0 6	1 1	8 8					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 1 0		20.402(b)				20.405(c)				X 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)(iii)				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)(ii)				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 Freddie L. Legette, Senior Reactor Operator										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	MANUFAC-TURER	REPORTABLE TO NPRDS		CAUSE	SYSTEM	COMPONENT	MANUFAC-TURER	REPORTABLE TO NPRDS					
X	T	A	0 0 1 2	W	1 2 0	Y									
SUPPLEMENTAL REPORT EXPECTED (14)										EXPECTED SUBMISSION DATE (15)		MONTH	DAY	YEAR	
X YES (If yes, complete EXPECTED SUBMISSION DATE)										NO		0 9	3 0	8 8	

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

On May 12, 1988, at 1129 hours, with the reactor at 60 percent power, the Plant experienced an automatic turbine trip/reactor trip while surveillance testing of the Turbine Redundant Overspeed Trip System (TROTS) was in progress. The turbine trip was caused by a 2/3 TROTS logic. Maintenance had placed one TROTS channel in test when a second channel spuriously actuated due to degraded insulation on its speed probe. The insulation has been repaired and the speed probe replaced. The NRC was notified of the trip pursuant to 10CFR50.72(b)(2)(ii). Subsequently, the licensee found that the periodic TROTS functional test and calibration procedures required by Technical Specification Table 4.1-1 Item 28 have omitted the TROTS solenoid valves on the turbine stop and control valves. The solenoid valves were functionally tested on May 14, 1988, and will be tested on a monthly basis. Elimination of the TROTS is under evaluation. The reactor was returned to power operation at 0144 hours, May 15, 1988. This LER is submitted pursuant to 10CFR50.73(a)(2)(iv).

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PDR ADOCK 05000261  
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## 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 STEAM ELECTRIC PLANT UNIT NO. 2	05000261	88	011	00	02	OF	03	

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

I. DESCRIPTION OF EVENT

On Thursday, May 12, 1988, at 1129 hours, the Unit was operating at 60 percent power.<sup>1,2</sup> A Maintenance surveillance test procedure for the Turbine Redundant Overspeed Trip System (TROTS) was in progress at the time.<sup>3</sup> All preliminary checks to ensure no channel trip/failure signals were present had been completed. The licensee Technician performing the test had placed the Channel 1 test selector in the "Overspeed Test" position, with two out of three Channels required for an overspeed trip signal. The turbine tripped automatically, resulting in an automatic reactor trip (power greater than 10%).

Subsequent investigation of the incident has revealed a separate but relevant condition. Plant Technical Specifications, Table 4.1-1, Item 28, requires periodic functional tests and calibration of the TROTS. This requirement includes functional operability testing of the TROTS redundant solenoid valves. The solenoid valves are designed to open on an overspeed condition and dump high pressure electro-hydraulic (E-H) fluid back into the E-H reservoir, allowing the governor, reheat, intercept, and stop valves to shut (i.e., Turbine Trip). However, it was discovered that the procedures implemented to conduct the surveillance tests and calibration have omitted these solenoid valves.

The licensee notified the NRC via the Emergency Notification System on May 12, 1988, of the trip pursuant to 10CFR50.72(b)(2)(ii).

II. CAUSE OF EVENT

The insulation on two of the three speed probes for TROTS, degraded in time due to oil impingement to the speed probe leads from the turbine-generator bull gear. The probes are located adjacent to the rotating bull gear teeth to sense turbine-generator speed. This degradation apparently resulted in Channel-Two intermittent signals, which when coupled with the overspeed test signal inserted by the Technician, satisfied the turbine trip logic, i.e., two out of three overspeed signals present initiates an automatic turbine trip.

With regard to the deficiency in the TROTS surveillance test, the cause of the omission is under investigation and will be reported in a supplement to this LER.

<sup>1</sup>H. B. Robinson Steam Electric Plant, Unit No. 2 is a Westinghouse 700 megawatt Pressurized Water Reactor power plant, in commercial operation since March 1971.

<sup>2</sup>Plant Technical Specifications Amendment No. 115 limits reactor power to 1380 megawatts thermal.

<sup>3</sup>MST-552, Revision 3, Turbine Redundant Overspeed Trip System Testing.

## 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 STEAM ELECTRIC PLANT - UNIT NO. 2	0 5 0 0 0 2 6 1	8 8	0 1 1	0 0	0 3	OF	0 3

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

III. ANALYSIS OF EVENT

The Engineered Safety Features and Reactor Protection System performed as designed. At no time did the Plant operate in an unsafe condition. This event is being reported as a condition that resulted in an automatic actuation of a reactor trip.

Although the TROTS surveillance procedures did not perform a complete functional test regarding the actuating solenoids, the fact that the spurious trip signal was successful on May 12 demonstrated that the system was functional. The solenoids are redundant with two installed on each of fourteen turbine valves. It is therefore unlikely that the inadequate surveillance would have prevented the TROTS from performing its intended function, i.e., prevent overspeed of the unit.

The TROTS is, as titled, a redundant overspeed trip system to assure an overspeed trip. It is redundant to a mechanical overspeed device on the turbine and an electrical overspeed protection controller located in the E-H control system. TROTS was initially installed in resolution of an original licensing issue regarding turbine missiles. However, the licensee has since replaced the original low pressure turbine rotors with fully integral turbine rotors and the continued need for TROTS is under evaluation.

IV. CORRECTIVE ACTIONS

Maintenance has repaired the insulation and replaced the TROTS speed probes. An oil shield has been installed to protect the speed probes by minimizing the potential for oil from the turbine bull gear from damaging the wiring. The TROTS solenoid valves were functionally tested on May 14, 1988, and procedures for monthly testing are being developed. Efforts are in progress preparing the justification and request for a Technical Specification revision to eliminate the TROTS. Until TROTS Protection is analyzed to be no longer required and appropriate Technical Specifications revised, the licensee intends to functionally test the 28 TROTS solenoid valves on a monthly basis.

V. ADDITIONAL INFORMATION

## A. Failed Component Identification

Unit Pickup No. EC724114, for TROTS.

## B. Previous Similar Events

There have been two prior TROTS turbine trips: June 20 and July 21, 1973.

Robinson Nuclear Project Department  
POST OFFICE BOX 790  
HARTSVILLE, SOUTH CAROLINA 29550

**JUN 9 1988**

Robinson File No: 13510C

Serial: RNP/88-2713  
(10 CFR 50.73)

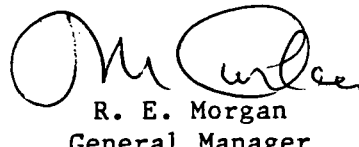
United States Nuclear Regulatory Commission  
Attn: Document Control Desk  
Washington, D. C. 20555

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2  
DOCKET NO. 50-261  
LICENSE NO. DPR-23  
LICENSEE EVENT REPORT 88-011

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

Enclosure

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

*IE22*  
*11*