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REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR:8905100285 DOC.DATE: 89/05/01 NOTARIZED: NO DOCKET #
FACIL:50-261 H.B. Robinson Plant, Unit 2, Carolina Power & Light C 05000261
AUTH.NAME AUTHOR AFFILIATION
BAUCOM,C.T. Carolina Power & Light Co.
MORGAN,R.E. Carolina Power & Light Co.
RECIP.NAME RECIPIENT AFFILIATION

SUBJECT: LER 89-006-00:on 890330,reactor trip due to loss of Turbine E-H control power supplies.

W/8 ltr.

DISTRIBUTION CODE: IE22D COPIES RECEIVED:LTR 1 ENCL 1 SIZE: 5
TITLE: 50.73/50.9 Licensee Event Report (LER), Incident Rpt, etc.

NOTES:

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	PD2-1 LA	1	1	PD2-1 PD	1	1
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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	IRM/DCTS/DAB	1	1
	NRR/DEST/ADE 8H	1	1	NRR/DEST/ADS 7E	1	0
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	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/RPB 10	2	2
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	REG FILE 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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RIDS/ADDS

RIDS/ADDS

Enclosure to Serial: RNPD/89-1428

NRC Form 366 (9-83)

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO. 3150-0104
EXPIRES: 8/31/88

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2	0 5 0 0 0 2 6 1	1 OF 0 4

TITLE (4)

REACTOR TRIP DUE TO LOSS OF TURBINE E-H CONTROL POWER SUPPLIES

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 0 0 0
0 3	3 0	8 9	8 9	— 0 0 6	— 0 0	0 5	0 1	8 9		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)	X 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)	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	TELEPHONE NUMBER
	AREA CODE
C. T. BAUCOM, SENIOR SPECIALIST	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 NPRDS		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	
X	J J	R J X	W 1 2 0								

SUPPLEMENTAL REPORT EXPECTED (14)		EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
YES (If yes, complete EXPECTED SUBMISSION DATE)	X NO				

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

On March 30, 1989, at 0320 hours, the unit experienced a reactor trip from 100% power. The reactor trip signal was initiated by a turbine trip, which resulted from the loss of both the main and backup +15 volt turbine electro-hydraulic (E-H) control power supplies. Loss of both the main and backup power supplies initiates an automatic turbine trip, which in turn will initiate a reactor trip when the unit is above 10% power. At 0400 hours, the licensee made notification to the NRC of the reactor trip pursuant to 10CFR50.72(b)(2)(ii) via the Emergency Notification System. Subsequent investigation and troubleshooting identified blown fuses in both the main and backup power supplies and five defective or suspect power supply regulating transistors. The power supply fuses and transistors were replaced. Also, adjustments were made to overvoltage protective circuitry settings. Subsequent post-maintenance testing showed all equipment to be operating properly. This Licensee Event Report is submitted pursuant to the requirements of 10CFR50.73(a)(2)(iv).

IE22

NRC Form 366A (9-83)

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO. 3150-0104
EXPIRES: 8/31/88

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, UNIT NO. 2	0 5 0 0 0 2 6 1	8 9	— 0 0 6	— 0 0	0 2 OF 0 4

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

I. Description of Event

On March 30, 1989, the unit was operating at 100% power with routine activities in progress and all parameters and indications normal.[1] At 0320 hours, an automatic reactor trip was received. The initiating reactor trip signal was determined to be a turbine trip. Plant conditions were stabilized in accordance with Emergency Operating Procedures with no significant problems or discrepancies. At 0400 hours, the licensee made notification to the NRC of the reactor trip pursuant to 10CFR50.72(b)(2)(ii) via the Emergency Notification System.

Subsequent investigation by licensee Instrumentation and Control (I&C) personnel revealed that both the main and backup +15 volt turbine electro-hydraulic (E-H) control power supplies had failed.[2] Loss of both +15 volt power supplies initiates an automatic turbine trip, which in turn will initiate a reactor trip when the unit is above 10% power.

II. Cause of Event

Subsequent troubleshooting and investigation revealed two factors which contributed to the loss of both the main and backup +15 volt power supplies. These factors are identified and described below:

a) Regulating transistors in the main +15 volt power supply: Troubleshooting of the power supply failures resulted in the replacement of five regulating transistors in the main +15 volt power supply. These transistors were identified as either defective or suspect; all showed indications of "leakage" current (improper passing of current through the transistor which is indicative of transistor breakdown) which increased the gain on the output stage of the power supply. The increase in output voltage apparently triggered an overvoltage protective circuit which caused the output fuse to blow. When the backup +15 volt power supply assumed the load, its overvoltage protective circuitry was also triggered, which caused its output fuse to blow. The degraded condition of these transistors has been attributed to aging.

b) Power supply interconnections: The main and backup +15 volt power supplies are effectively "auctioneered" in that the main power supply is set to carry normal load and the backup power supply is set to assume load upon a failure of the main unit. However, these power supplies are not completely isolated from one another. Interconnecting cables between the power supplies allow them to work as a unit. This interconnection allows the possibility of transferring an independent fault created within an individual power supply, which could result in the loss of both the main

[1] 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.

[2] EIIS Codes: System - JJ; Component - RJX; Manufacturer - W120.

★U.S.GPO 1986-0-624-538/455

NRC Form 366A (9-83)

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO. 3150-0104
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TEXT (If more space is required, use additional NRC Form 366A's) (17)

and backup power supplies.

III. Analysis of Event

The Reactor Protection System (RPS) is designed to trip the reactor upon receipt of a turbine trip signal when the unit is above 10% power. This feature protects the Reactor Coolant System from an overpressure or overtemperature condition due to a loss of export load.

Failure of both the main and backup +15 volt E-H control power supplies provides an automatic turbine trip signal. The unit power level at the time of the event in conjunction with the automatic turbine trip signal required an actuation of the RPS. The RPS performed as designed, and at no time during the event was there any threat to the health and safety of the public. Also, the E-H control system and the associated +15 volt power supplies are not safety-grade equipment and have no required functions during a Safeguards or RPS actuation.

This event is reported in accordance with the provisions of 10CFR50.73(a)(2)(iv).

IV. Corrective Actions

The following actions have been taken to address the power supply failures:

a) Suspect (i.e., marginal) and defective regulating transistors have been replaced in the main +15 volt power supply. Also, the blown fuses were replaced in both the main and backup power supplies.

b) The overvoltage protective circuitry settings were adjusted in both power supplies. The main power supply was electrically aligned, and both power supplies were tested separately and in parallel with satisfactory results.

c) The existing power supplies are original installation equipment. It was recognized prior to the last refueling outage that these power supplies are outdated and should be replaced with new, upgraded models which are recommended and supplied by the turbine vendor. Replacement power supplies have already been procured. The installation of the new power supplies and support equipment is expected to be accomplished during the next refueling outage, or during the next outage of sufficient duration to allow completion of installation and testing. This is contingent upon finalization of installation and testing methods, and the availability of parts and vendor services.

A detailed investigation of this event will continue in accordance with the plant Corrective Action Program. Any additional corrective actions that result from this further investigation will be reported as a supplement to this LER.

NRC Form 366A (9-83)

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION
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TEXT *(If more space is required, use additional NRC Form 366A's)* (17)

V. Additional Information

A. Failed Component Identification

Westinghouse E-H Control Power Supply
Manufactured by Solid State Controls, Inc.
Model PS-R14-DCA

B. Previous Similar Events

None

★U.S.GPO:1986-0-624-538/455

CP&L
Carolina Power & Light Company

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

MAY 01 1989

Robinson File No: 13510C

Serial: RNPD/89-1428
(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 89-006-00

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:dwm

Enclosure

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

IE22
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