CATEGORY 1

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR:9811230069 DOC.DATE: 98/11/16 NOTARIZED: NO DOCKET #
FACIL:50-261 H.B. Robinson Plant, Unit 2, Carolina Power & Light C 05000261
AUTH.NAME AUTHOR AFFILIATION
CHERNOFF,H.K. Carolina Power & Light Co.
WALT,T.D. Carolina Power & Light Co.
RECIP.NAME RECIPIENT AFFILIATION

SUBJECT: LER 98-005-00:on 981017,automatic reactor trip resulted from turbine trip due to high SG level in "C" SG.Caused by FW & steam dump control sys failures.Control module TC-408E recalibr IAW applicable procedure.With 981116 ltr.

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TITLE: 50.73/50.9 Licensee Event Report (LER), Incident Rpt, etc.

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CATEGORY 1 DOCUMENT

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CP&L

Carolina Power & Light Company
Robinson Nuclear Plant
3581 West Entrance Road
Hartsville SC 29550

Robinson File No: 13510C
Serial: RNP-RA/98-0208

NOV 16 1998

United States Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2
DOCKET NO. 50-261/LICENSE NO. DPR-23

LICENSEE EVENT REPORT NO. 1998-05-00
REACTOR AND TURBINE TRIP CAUSED BY
FEEDWATER AND STEAM DUMP CONTROL SYSTEM FAILURES

Sir or Madam:

The attached Licensee Event Report is submitted in accordance with 10 CFR 50.73. Should you have any questions regarding this matter, please contact Mr. H. K. Chernoff, Supervisor, Licensing/Regulatory Programs.

Very truly yours,

Timothy P. Cleary for

T. D. Walt
Plant General Manager

JMF/jmf

Attachment
c: Mr. L. A. Reyes, NRC, Region II
Mr. R. Subbaratnam, NRR, NRC
NRC Resident Inspector, HBRSEP

NRC FORM 366 U.S. NUCLEAR REGULATORY COMMISSION
(6-1998)

LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

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H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2	05000261	1 OF 6

TITLE (4)

REACTOR AND TURBINE TRIP CAUSED BY FEEDWATER AND STEAM DUMP CONTROL SYSTEM FAILURES.

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 NAME	DOCKET NUMBER
										05000
10	17	1998	1998	-- 05 --	00	11	16	1998	FACILITY NAME	DOCKET NUMBER
										05000

OPERATING MODE (9)	1
POWER LEVEL (10)	100

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

	20.2201(b)		20.2203(a)(2)(v)		50.73(a)(2)(i)		50.73(a)(2)(viii)
	20.2203(a)(1)		20.2203(a)(3)(i)		50.73(a)(2)(ii)		50.73(a)(2)(x)
	20.2203(a)(2)(i)		20.2203(a)(3)(ii)		50.73(a)(2)(iii)		73.71
	20.2203(a)(2)(ii)		20.2203(a)(4)	X	50.73(a)(2)(iv)		OTHER
	20.2203(a)(2)(iii)		50.36(c)(1)		50.73(a)(2)(v)	Specify in Abstract below or in NRC Form 366A	
	20.2203(a)(2)(iv)		50.36(c)(2)		50.73(a)(2)(vii)		

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (Include Area Code)
H. K. Chernoff, Supervisor, Licensing/Regulatory Programs	(843) 857-1437

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX
B	IG	JI	Westinghouse	Yes	B	JB	ZC	Babcock & Wilcox	Yes
A	AB	IMOD	NUS/Halliburton	Yes	B	JB	TD	Fisher	Yes

SUPPLEMENTAL REPORT EXPECTED (14)			EXPECTED	MONTH	DAY	YEAR
X	YES (If yes, complete EXPECTED SUBMISSION DATE).	NO		12	31	1998

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

On October 17, 1998, at approximately 0211, an automatic reactor trip resulted from a turbine trip due to high steam generator level in the "C" Steam Generator. The high steam generator level resulted from the failure of the steam dump system to operate and the failure of the "C" Feedwater Regulating Valve to adequately control level. During the performance of a nuclear instrumentation surveillance procedure, a control power fuse blew on a power range channel as the result of a degraded power supply. This resulted in a turbine runback. During the runback the steam dump valves did not open to transfer the steam flow to the condenser. The steam dump system failure resulted from the misposition of the bias potentiometer on the module that controls the steam dump valves. Operators selected an alternate control mode to open the steam dump valves. After the steam dump valves opened, the "C" Feedwater Regulating Valve failed to adequately control the "C" Steam Generator Level. The "C" Steam Generator Level increased to the turbine trip setpoint. The control module for the steam dump system has been calibrated and the nuclear instrumentation power supply has been replaced. The feedwater regulating valve positioner and transducer have been calibrated. This report is submitted in accordance with 10 CFR 50.73(a)(2)(iv) as an event or condition that resulted in a manual or automatic actuation of an engineered safety system, including the reactor protection system.

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

DESCRIPTION AND CAUSE OF EVENT

On October 17, 1998, at approximately 0200 EDT, while operating at 100% power, plant personnel were performing Operations Surveillance Test (OST)-005, "Nuclear Instrumentation Power Range." This surveillance is performed to verify proper operation of the power range bistable (EIIS: system IG, component 3) action related to permissive functions, rod stops, and reactor trips. This surveillance satisfies the Technical Specification Surveillance Requirement (SR) 3.3.1.7 Table 3.3.1-1 Function 2a, "Power Range Neutron Flux High," for a Channel Operational Test (COT) which is required to be performed every 92 days while in MODE 1 or 2. The procedure inserts a test signal until a reading of 109.5% is indicated on the channel power indicator (EIIS: system IG, component JI). Immediately after inserting the test signal on Power Range Channel NI-44 (EIIS: system IG, component JI), the Power Range HI Flux Trip Bistable (EIIS: system IG, component 3) tripped and reset 16 times in 1.02 seconds. This bistable actuation at approximately 0207 EDT was attributed to a failed +25 Volts Direct Current (VDC) power supply (EIIS: system EJ, component JX).

The output of the power supply was found to have a 1.4 Volts Alternating Current (VAC) ripple which caused the bistable to cycle. The heat resulting from the rapid bistable actuation caused the control power fuse (EIIS: system IG, component FU) for the power range channel to open. The dropped rod bistable (EIIS: system IG, component 3) de-energized, as the result of the open control power fuse, and a NIS Runback / Dropped Rod Runback was initiated in the turbine control system. The runback reduces turbine (EIIS system TA) load by closing the turbine governor valves (EIIS: system SB, component FCV). During the runback the steam dump valves (EIIS: system JI, component FCV) failed to open automatically in response to the mismatch between reactor power and turbine generated power, and therefore failed to transfer the excess steam flow from the turbine directly to the condenser (EIIS: system SG, component COND). The steam dump system failure resulted from the bias potentiometer (EIIS: system JI, component FD) being out of position on control module TC-408E (EIIS: system JI, component IMOD). The bias potentiometer was mispositioned during the calibration of another module in the same control cabinet. The mispositioned bias potentiometer caused an increase in the temperature differential required to open the steam dump valves. The increased differential temperature was not reached during the transient, and therefore the steam dump valves remained shut. At approximately 0208 EDT, the pressurizer power operated relief valve (PORV) (EIIS: system AB, component RV) PCV-455C cycled open 5 times over an 18 second period as the result of the increased primary system pressure caused by the failure of the steam dump system.

At approximately 0209 EDT the steam dump valves were switched to the "Steam Pressure Mode" and the valves opened. When the steam dump valves were opened the steam generator levels (EIIS: system SJ, component HX) increased rapidly. The feedwater regulating valve (FRV) (EIIS: system SJ, component FCV) to the "C" Steam Generator failed to maintain steam generator level below the high level trip setpoint. At approximately 0211 EDT, the reactor tripped as the result of

a turbine trip from High "C" Steam Generator Level. The high steam generator level resulted in a signal to close the feedwater regulating valves and trip the main feedwater pumps.

The inadequate response of the "C" FRV resulted from the electro-pneumatic transducer (EIIS: system SJ, component TD) and the valve positioner (EIIS: system SJ, component ZC) being outside of the calibration tolerance band as the result of instrumentation drift.

After the reactor trip a Source Range Channel (EIIS: system IG, component JI) (NI-32) failed to indicate properly (i.e., low count rate). The cause of this failure is still under evaluation, and the results of this evaluation will be reported to the NRC in a supplemental report. The channel was removed from service on October 17, 1998, at approximately 0619 EDT, and the high voltage cable, high voltage cable connectors and signal cable connector were replaced. Source Range Channel NI-32 was returned to service on October 17, 1998, at approximately 2138 EDT. Power Range Channel NI-44 was removed from service on October 17, 1998, at approximately 0616 EDT, for replacement of the +25 VDC power supply and replacement of the control power fuse. Power Range Channel NI-44 was returned to service on October 17, 1998, at approximately 1252 EDT. Additionally, a failure occurred in that the Condensate Pump Recirculation Valve (EIIS: system SD, component FCV) (FCV-1446) did not open as required. The Condensate Pump Recirculation Valve failure was the result of a failed flow indication switch (EIIS: system SD, component FIS) that opens the valve on low flow. The flow indication switch failure was the result of an improperly installed gasket during maintenance activities. Plant personnel attempted to bypass the Condensate Pump Recirculation Valve, but the bypass valve (EIIS: system SD, component ISV) developed a packing leak, and the bypass valve was closed. The Condensate Pump Recirculation Valve was forced to the open position by isolating the instrument air supply (EIIS: system LD, component ISV) to the valve positioner.

At approximately 0431 EDT, the NRC Operations Center was notified of this event in accordance with 10CFR50.72(b)(2)(ii) due to the reactor protection system actuation (i.e., Reactor Trip).

ANALYSIS OF EVENT

This report is submitted in accordance with 10CFR50.73(a)(2)(iv) as an event or condition that resulted in a manual or automatic actuation of an engineered safety system, including the reactor protection system. This event had a negligible impact on plant safety. The event that occurred is similar to a loss of condenser vacuum event which is bounded by the event described in the Updated Final Safety Analysis Report, Section 15.2.2, "Loss of External Electrical Load."

The function of the Source Range Power Indicator, which failed during the event, was provided by a separate redundant Source Range Power Indicator (NI-31). The function of the Power Range Power Indicator (NI-44), which failed during the initiation this event, was provided by three separate redundant Power Range Power Indicators (NI-41,42,44). The failure of the steam dump

FAILED COMPONENT INFORMATION

Failed Component: +25VDC Power Supply in Power Range Drawer (NI-44B)
EIIS Sys - Comp: IG - JI
Manufacturer: Power Designs
Model Number: UPM-44

Failed Component: Control Module (TC-408E)
EIIS Sys - Comp: AB - IMOD
Manufacturer: NUS/Halliburton
Model Number: MTH800-05/05/05/05-07-08

Failed Component: Valve Positioner (FCV-498 V/P)
EIIS Sys - Comp: JB - ZC
Manufacturer: Babcock & Wilcox
Model Number: AP412100

Failed Component: Current/Pressure Transducer (FCV-498 I/P)
EIIS Sys - Comp: JB - TD
Manufacturer: Fisher
Model Number: 546

Failed Component: Source Range Channel (NI-32)
EIIS Sys - Comp: IG - JI
Manufacturer: Westinghouse
Model Number: 6051D50G01

Failed Component: Flow Indication Switch (FIS-1446)
EIIS Sys - Comp: SD - FIS
Manufacturer: Barton
Model Number: 288A

NRC FORM 366A (6-1998) U.S. NUCLEAR REGULATORY COMMISSION

LICENSEE EVENT REPORT (LER)
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TEXT *(If more space is required, use additional copies of NRC Form 366A)* **(17)**

CORRECTIVE ACTIONS

The following corrective actions have been completed: (1) Control module TC-408E was re-calibrated in accordance with the applicable procedure; (2) The "C" FRV electro-pneumatic transducer and valve positioner were calibrated in accordance with applicable procedures; (3) The positive 25 VDC low voltage power supply in the power range drawer (i.e., NI-44B) was replaced; (4) Control power fuses for the failed power range detector were replaced (i.e., NI-44); (5) Source Range Indicator NI-32 high voltage cable, high voltage cable connectors and signal cable connector were replaced; (6) The orientation of the gasket on FIS-1446, Condensate Recirculation Flow Indicating Switch was corrected; (7) Technicians involved with this incident were counseled; and, (8) Stand-down meetings were conducted for technicians to emphasize self checking and to discuss issues related to this event.

The following are additional corrective actions planned: (1) Evaluate and provide training to technicians by December 31, 1998, regarding self checking and the issues related to this event; (2) Review and evaluate Fisher Model 546 electro-pneumatic transducers by March 31, 1999, with regard to age and type of operation as related to this event; (3) Incorporate lessons learned from this event by June 30, 1999, into contractor orientation and shared resources orientation; (4) Determine and prioritize nuclear instrumentation power supply replacement by December 31, 1998; and, (5) Inspect NUS and Hagan modules by January 15, 1999, to ensure potentiometer settings are correct.

NRC FORM 366B
(6-1998)

U.S. NUCLEAR REGULATORY COMMISSION

LICENSEE EVENT REPORT (LER)

FAILURE CONTINUATION

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX
X	IG	JI	Westinghouse	Yes					
A	SD	FIS	Barton	No					