CATEGORY 1

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR:9902030176 DOC.DATE: 99/01/29 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 98-005-02:on 981017,reactor & TT were noted.Caused by FW & steam dump cotrol problems.Gain potentiometer setting has been corrected & revised applicable calibration data sheets. With 990129 ltr.

DISTRIBUTION CODE: IE22T COPIES RECEIVED:LTR 1 ENCL 1 SIZE: 8
TITLE: 50.73/50.9 Licensee Event Report (LER), Incident Rpt, etc.

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10 CFR 50.73

CP&L

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

Robinson File No: 13510C
Serial: RNP-RA/99-0002

JAN 2 9 1999

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. 1998-005-02
REACTOR AND TURBINE TRIP CAUSED BY
FEEDWATER AND STEAM DUMP CONTROL PROBLEMS

Sir or Madam:

The attached Licensee Event Report revision is submitted in accordance with 10 CFR 50.73. If you have any questions regarding this matter, please contact Mr. R. L. Warden.

Sincerely,

T. D. Walt
Plant General Manager

MSL/msl 0300

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)

APPROVED BY OMB NO. 3150-0104

Estimated burden per response to comply with this mandatory information collection request: 50 hrs. Reported lessons learned are incorporated into the licensing process and fed back to industry. Forward comments regarding burden estimate to the Records Management Branch (T-6 F33), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, and to the Paperwork Reduction Project (3150-0104), Office of Management and Budget, Washington, DC 20503. If an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

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TITLE (4)

REACTOR AND TURBINE TRIP CAUSED BY FEEDWATER AND STEAM DUMP CONTROL PROBLEMS

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	-- 005 --	02	01	29	1999	FACILITY NAME	DOCKET NUMBER
										05000

OPERATING MODE (9)	1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)									
POWER LEVEL (10)	100		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
E	IG	JI	Westinghouse	Y	B	JB	ZC	Babcock & Wilcox	Y
A	JI	IMOD	NUS/Halliburton	Y	B	JB	TD	Fisher	Y

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

On October 17, 1998, at approximately 0208 EDT, during surveillance testing of nuclear instrumentation, a control power fuse blew, causing a turbine runback. During the runback the steam dump valves did not open automatically. The operators selected an alternate control mode to open the steam dump valves. The "C" Steam Generator level increased to the high level trip setpoint causing a turbine trip. An automatic reactor trip resulted from the turbine trip. The investigation of the event identified that a degraded power supply caused the blown fuse that resulted in the turbine runback. The degraded power supply has been replaced. The steam dump system failure was the result of an incorrect bias potentiometer setting on the module that controls the steam dump valves. The bias potentiometer setting has been corrected and the module was re-calibrated. The high steam generator level was the result of the failure of a feedwater regulating valve to adequately control level. The feedwater regulating valve failure was the result of an incorrect gain potentiometer setting on the feedwater regulating valve controller. The gain potentiometer setting has been corrected and applicable calibration data sheets are being revised to include verification of potentiometer settings on selected control modules.

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

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

DESCRIPTION OF EVENT (EIIS system and component codes are identified in the text as [xx].

On October 17, 1998, at approximately 0200 EDT, while operating at 100% power, plant personnel were performing a routine Operations Surveillance Test (OST)-005, "Nuclear Instrumentation Power Range." This surveillance is performed to verify proper operation of the power range bistable [IG][3] action related to permissive functions, rod stops, and reactor trips. This surveillance satisfies 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 on a 92 day FREQUENCY while in MODE 1 or 2.

The channel being tested must be bypassed to prevent a Dropped Rod/Rod Stop bistable [IG][3] state change and subsequent turbine runback during the surveillance test. The bypass function prevents a Dropped Rod/Rod Stop bistable state change by maintaining +25 Volts Direct Current (VDC) control power voltage on the Dropped Rod/Rod Stop bistable.

OST-005 requires insertion of a test signal, with the channel in bypass, until the required value is indicated on the channel power indicator. At approximately 0207 EDT, after insertion of the test signal on Power Range Channel NI-44 [IG][JI], the Power Range HI Flux Trip bistable [IG][3] tripped and reset repetitively.

At this time, the control power fuse [IG][FU] for the +25 VDC control power supply blew. The Dropped Rod/Rod Stop bistable de-energized, because of the loss of control power, and initiated a NIS Runback / Dropped Rod Runback in the turbine control system. The runback reduces turbine load by closing the turbine governor valves. During the runback the steam dump valves [JI][FCV] failed to open automatically in response to the loss of turbine load and high reactor coolant temperature, and therefore failed to transfer the excess steam flow from the turbine to the condenser. At approximately 0208 EDT, the pressurizer power operated relief valve (PORV) [AB][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 opened after being switched to the "Steam Pressure Mode" in accordance with procedures. This increased steam flow from the steam generators. The increased steam flow caused a decrease in steam generator pressure. The feedwater regulating valve (FRV) [SJ][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 the high level in the "C" Steam Generator. The high steam generator level resulted in a signal to close the feedwater regulating valves for the "C" Steam Generator and trip both main feedwater pumps. The motor driven auxiliary feedwater pumps started as the result of the main feedwater pump breakers opening.

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

Although not significant to this event the following two equipment problems were identified after the reactor trip. A Source Range Channel [IG][JI] (NI-32) failed to indicate properly (i.e., low count rate). Additionally, the Condensate Pump Recirculation Valve [SD][FCV] (FCV-1446) did not open as required.

At approximately 0431 EDT, the NRC Operations Center was notified of this event in accordance with 10 CFR 50.72(b)(2)(ii) as the result of the reactor protection system actuation (i.e., Reactor Trip).

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.

CAUSE OF EVENT

The initiating event causing the bistable actuation at approximately 0207 EDT was attributed to a failed +25 VDC control power supply [EJ][JX] in Power Range Channel NI-44. The output of the power supply was found to have a 1.4 Volts Alternating Current (VAC) ripple, as the result of degraded filtering capacitors. The voltage ripple apparently caused an oscillation in the indicated power level which caused the Power Range Hi Flux Trip bistable to cycle. The current surges resulting from the repetitive bistable cycling apparently caused the fuse element to open. 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 blown control power fuse. The other control power fuse in this power supply was replaced as a precaution. Power Range Channel NI-44 was returned to service on October 17, 1998, at approximately 1252 EDT.

The steam dump system failure was the result of the bias potentiometer [JI][FD] being out of position on control module TC-408E [JI][IMOD]. Although it could not be definitively determined, the investigation of this event concluded that the bias potentiometer was apparently mispositioned during calibration activities in the TC-408E control cabinet. The modules in the cabinet were last calibrated by a combination of nonlicensed licensee and contractor personnel. 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 until procedures directed the operators to select an alternate control mode.

The inadequate response of the "C" FRV was the result of an improper gain setting on the "C" FRV controller [SJ][FC]. The improper gain setting was apparently the result of an inadvertent mispositioning of the gain potentiometer during maintenance activities. Additionally, the electro-pneumatic transducer [SJ][TD] and the valve positioner [SJ][ZC] for the "C" FRV were found outside of the calibration tolerance band as the result of instrumentation drift.

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

The cause of the low source range channel indication on NI-32 was fatigue of the high voltage cable connectors or cable and signal cable connectors. The fatigue was the result of repetitive flexure of the cables during channel adjustments over a period of several years. The source range 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.

The Condensate Pump Recirculation Valve failure was the result of an improperly assembled flow indication switch [SD][FIS] that opens the valve on low flow. The condensate pump recirculation valve was repositioned to the open position by isolating the instrument air supply [LD][ISV] to the valve positioner. The flow indication switch was reassembled correctly and the switch was calibrated and returned to service.

ANALYSIS OF EVENT

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. This event had a negligible impact on plant safety. The event that occurred 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 Power Range Power Indicator (NI-44), which failed during the initiation of this event, was provided by three separate redundant Power Range Power Indicators (NI-41,NI-42,NI-43).

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

CORRECTIVE ACTIONS

Actions taken to address the Power Range Hi Flux Trip bistable actuation and associated blown fuse included replacement of the control power fuses for the failed power range detector (i.e., NI-44); and replacement of the +25 VDC low voltage power supply in the power range drawer (i.e., NI-44B). In addition, a review will be conducted to determine an appropriate schedule and priority for the replacement of nuclear instrumentation power supplies. This review will be completed by December 31, 1998.

The steam dump system failure was addressed by re-calibration of control module TC-408E, which contains the bias potentiometer that had been mispositioned. Additionally, selected NUS and Hagan modules will be inspected to verify potentiometer settings. These inspections will be completed by January 15, 1999. In addressing the human performance aspects of the steam dump system failure, technicians were counseled and stand-down meetings were conducted for technicians to emphasize self-checking and to discuss issues related to this event. Additional training for technicians regarding self-checking and this event will be completed by January 29, 1999.

Since contract personnel are involved in calibration activities, lessons learned from this event will be incorporated into contractor and shared resources orientation by June 30, 1999.

Actions taken with regard to the performance of the "C" FRV included calibration of the electro-pneumatic transducer and valve positioner. By March 31, 1999, Fisher Model 546 electro-pneumatic transducers will be evaluated with regard to age and type of operation to determine if additional actions are warranted for these transducers. Based on identification of the improperly set gain potentiometer, the feedwater regulating valve gain potentiometer vernier dial and locking mechanism were replaced and correctly set. Work instructions for selected control modules have been changed to include verification of potentiometer settings. Additional corrective actions to be completed by December 31, 1999, will change the calibration data sheets for selected control modules to require verification of potentiometer settings.

Although not significant to this event, the problem encountered with Source Range Indicator NI-32 was addressed by replacing the high voltage cable, high voltage cable connectors, and signal cable connector. The maintenance procedure for cleaning and inspection of the nuclear instrumentation cabinets will be revised to include a determination on whether movement of the cables produces erratic indications.

The problem with the Condensate Recirculation Flow Indicating Switch was addressed by correcting the assembly of FIS-1446.

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: JI - 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

Failed Component: Flow Controller (FC-498)
EIIS Sys - Comp: SJ- FC
Manufacturer: Westinghouse
Model Number: 4111080-001

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

LICENSEE EVENT REPORT (LER)

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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
B	IG	JI	Westinghouse	Y					
A	SD	FIS	Barton	N					
A	SJ	FC	Westinghouse	Y					