



Carolina Power & Light Company

Robinson Nuclear Plant
3581 West Entrance Road
Hartsville SC 29550

Robinson File No.: 13510C

Serial: RNP-RA/95-0173

OCT 03 1995

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. 95-006-00

Gentlemen:

The enclosed Licensee Event Report (LER), is submitted in accordance with 10 CFR 50.73.
This report is required to be submitted to the NRC by October 3, 1995.

Very truly yours,

D. E. Young
Plant General Manager

Enclosure

c: Mr. S. D. Ebnetter, Regional Administrator, USNRC, Region II
Ms. B. L. Mozafari, USNRC Project Manager, HBRSEP
Mr. W. T. Orders, USNRC Senior Resident Inspector, HBRSEP

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Highway 151 and SC 23 Hartsville SC

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NRC FORM 366 (4-95)	U.S. NUCLEAR REGULATORY COMMISSION	APPROVED BY OMB NO. 3150-0104 EXPIRES 04/30/98 ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS MANDATORY INFORMATION COLLECTION REQUEST: 50.0 HRS. REPORTED LESSONS LEARNED ARE INCORPORATED INTO THE LICENSING PROCESS AND FED BACK TO INDUSTRY. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND 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.
LICENSEE EVENT REPORT (LER) (See reverse for required number of digits/characters for each block)		

FACILITY NAME (1) H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2	DOCKET NUMBER (2) 05000-261	PAGE (3) 1 OF 5
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TITLE (4)
 TECHNICAL SPECIFICATIONS VIOLATION DUE TO FAILURE TO MEET MINIMUM DEGREE OF REDUNDANCY

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
09	03	95	95	006	00	10	03	95		05000
										05000

OPERATING MODE (9) N	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5: (Check one or more) (11)									
POWER LEVEL (10) 100		20.2201(b)		20.2203(a)(2)(v)	<input checked="" type="checkbox"/>	50.73(a)(2)(i)		50.73(a)(2)(viii)		
		20.2203(a)(1)		20.2203(a)(3)(i)		50.73(a)(2)(iii)		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)		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 A. L. Garrou, Manager - Licensing/Regulatory Programs (Acting)	TELEPHONE NUMBER (Include Area Code) (803) 857-1544
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COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPROS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPROS
X	JE	TI	W120	Y					

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

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

On September 3, 1995, with H. B. Robinson Steam Electric Plant, Unit No. 2 operating at 100% power, a Reactor Protection System (RPS) Loop 2 Overtemperature Delta-Temperature (OTDT) Temperature Indicator was found to have drifted beyond the acceptable tolerance, and the associated protection channel was declared inoperable. The Minimum Degree of Redundancy required by Technical Specifications (TS) Section 3.5 could not be satisfied until the channel was placed in a tripped condition. TS Section 3.0, which requires that the unit be placed in hot shutdown within eight hours and in cold shutdown within the next 30 hours, was entered since the plant was not in the hot shutdown condition. The cause of this occurrence was an equipment malfunction. The safety significance is considered to be low because the possibility of a temperature transient occurring with the coincident failure of one of the two operable OTDT channels is very small during the time that the TS requirements were not satisfied. The channel was placed in the tripped condition, satisfying the TS Minimum Degree of Redundancy, and TS Section 3.0 was exited at 1049 hours. This report is submitted in accordance with 10 CFR 50.73(a)(2)(B).

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NRC FORM 366A (4-95)		U.S. NUCLEAR REGULATORY COMMISSION			
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		95	-- 006	-- 00	

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

I. DESCRIPTION OF EVENT

On September 3, 1995, with H. B. Robinson Steam Electric Plant (HBRSEP), Unit No. 2 operating at 100% power, licensed Operators in the Control Room identified from Reactor Turbine Generator Board (RTGB) indication that, with no prior alarms or indications, Reactor Protection System (RPS) (EIS System Code: JE) Loop 2 Overtemperature Delta-Temperature (OTDT) Temperature Indicator (TI)-422C (EIS Component Code: TI), had drifted upscale beyond the acceptable tolerance. Loop 2 protection Delta-Temperature, as indicated by TI-422A, is compared against the OTDT setpoint, and as Delta-Temperature increases to the OTDT setpoint, protective features are activated (i.e., a turbine runback, block of automatic and manual control rod withdrawal, and an automatic reactor trip). The range of TI-422C is 0°F to 75°F, and TI-422C had drifted upscale from its normal operating value of approximately 67°F to approximately 72°F. By drifting out of the acceptable tolerance band in the high direction, the difference between actual Delta-Temperature and the OTDT setpoint was increased, resulting in the non-conservative increase of the OTDT setpoint. Thus, the time is increased from a point when an actual Reactor Coolant System (RCS) (EIS System Code: AB) temperature or pressure transient to the point when automatic actuation of the protective features occurs. At 0506 hours, Operators declared the protection channel associated with TI-422C inoperable.

From the time that TI-422C was declared inoperable until the time that the protection channel associated with TI-422C (i.e., the Loop 2 OTDT channel) was placed in the tripped condition, the Minimum Degree of Redundancy required by Technical Specifications (TS) Section 3.5, "Instrumentation Systems," Table 3.5-2, "Reactor Trip Instrumentation Limiting Operating Conditions," Item 5, was not satisfied and the immediate action, "Maintain Hot Shutdown," was not taken. The Minimum Degree of Redundancy could not be satisfied prior to placing the Loop 2 OTDT channel in the tripped condition because the two remaining operable channels in the two out of three logic for the OTDT would not actuate the OTDT trip functions, assuming a single failure of one of the two remaining operable channels. As a result, at 0506 hours, TS Section 3.0 was entered, which requires that the unit be placed in hot shutdown within eight hours and in cold shutdown within the next 30 hours. The plant remained within TS Section 3.0 for five hours and 43 minutes, and TS Section 3.0 was exited when the Loop 2 OTDT channel was placed in the tripped condition at 1049 hours.

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I. DESCRIPTION OF EVENT (Cont'd.)

The Loop 2 OTDT channel was not immediately placed in a tripped condition because of an unrelated problem that occurred earlier that, in combination with placing this protection channel in a tripped condition, risked actuation of an Engineered Safety Feature and causing a reactor trip until the unrelated problem was corrected. Specifically, a failure associated with main turbine first stage pressure channel Pressure Transmitter (PT)-446 (EHS Code: PT) on September 3, 1995, had resulted in the rapid, intermittent actuation of the associated high steamline flow bistable. Consequently, shift Operations personnel conservatively delayed placing the Loop 2 OTDT channel in the tripped condition until the PT-446 channel had been repaired and the associated bistables cleared. Had the Loop 2 OTDT channel been placed in the tripped condition immediately, the Loop 2 low T-avg bistable, TC-422E, would also have to be placed in the tripped condition. Placing the Loop 2 low T-avg bistable in the tripped condition would have provided one of the two-out-of-three coincidence for the Low T-avg input to the Engineered Safety Feature (ESF) actuation system. With one high steamline flow bistable already actuating due to the failure of PT-446, a failure or spike on any one of the other high steam flow and Low T-avg channels would have then resulted in actuation of the ESF actuation system and resultant automatic reactor trip.

II. CAUSE OF EVENT

The cause of this occurrence was an equipment malfunction. The lead-lag controller (EHS Code: CNV) for TI-422C caused the instrument to drift out of tolerance. Since the drift of this instrument was in the non-conservative direction and the channel was not in the tripped condition, the Minimum Degree of Redundancy required by TS Table 3.5-2 was not satisfied. Since the associated TS action statement requires that the plant be immediately placed in the hot shutdown condition without any time allowance to place the inoperable channel in the tripped condition, TS Section 3.0 was entered.

III. ANALYSIS OF EVENT

Section 7.2.1.1.2.d of the Updated Final Safety Analysis Report (UFSAR) states that the OTDT trip function maintains operating limits which avoid bulk boiling and reaching the Departure from Nucleate Boiling (DNB) Ratio safety limits. Avoidance of bulk boiling assures that proper trip compensation is made for the DNB influencing parameters, i.e., coolant temperature and pressure. The Basis for TS Section 2.3 describes the OTDT reactor trip as providing core protection against DNB for all combinations of RCS pressure, nuclear power, RCS temperature, and axial power distribution, provided only that (1) the transient is slow with respect to transport to, and response time of, the temperature detectors (i.e., approximately 4 seconds), and (2) pressure is within the range between the high and low pressure reactor trip setpoints.

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III. ANALYSIS OF EVENT (Cont'd.)

The safety significance of this occurrence is considered low because the possibility of an RCS temperature transient occurring while the TS required Minimum Degree of Redundancy was not satisfied and the coincident failure of one of the two operable OTDT channels is considered to be very small. In the unlikely scenario where such an event did occur, other RPS features would have been available to mitigate the transient. Under worst case assumptions, had an RCS temperature transient occurred during the time that the Loop 2 OTDT channel was not tripped, coincident with an assumed single failure of another redundant channel of the OTDT feature, automatic actuation of the mitigating features associated with OTDT reactor trip would have been delayed and may not have occurred when required. However, UFSAR Section 7.2.1.2.1 states that in addition to reactor trips initiated by OTDT or overpower delta-temperature signals, "Reactor Trips on nuclear overpower and low reactor coolant flow are provided for direct, immediate protection against rapid changes in these parameters."

TS Section 3.5.1.3 states that in the event the number of channels of a particular subsystem in service falls below the required Minimum Operable Channels, or the Minimum Degree of Redundancy cannot be achieved, operation shall be limited in accordance with the requirements of TS Table 3.5-2. TS Table 3.5-2, Item 5, requires two operable OTDT channels with a Minimum Degree of Redundancy of one, or the plant shall be maintained at hot shutdown conditions, i.e., reactor subcritical and Tavg is greater than 200 degrees F. With the Loop 2 OTDT channel out of service in the non-conservative direction and not placed in the tripped condition, the two remaining OTDT channels remained operable; however, the Minimum Degree of Redundancy required by TS Table 3.5-2, Item 5 was not maintained. Since the Minimum Degree of Redundancy could not be satisfied, the plant entered TS Section 3.0, a condition prohibited by the TS. Therefore, this report is submitted in accordance with 10 CFR 50.73(a)(2)(B).

IV. CORRECTIVE ACTIONS

At 0741 hours, actions were completed to remove channel PT-446 from service in accordance with Procedure Operations Work Procedure (OWP) -033, "First Stage Pressure," to facilitate investigation and repair. After receiving confirmation from station Instrumentation and Controls (I&C) personnel that channel PT-446 repairs were complete, and after verifying the associated high steamline flow bistables had cleared, the Loop 2 OTDT channel was placed in the tripped condition. At 1049 hours, the Loop 2 OTDT setpoint was removed from service in accordance with Procedure OWP-028, "Tavg/DT Protection," to facilitate repairs. At that time, TS Section 3.0 was exited since the inoperable channel was now in the tripped condition, and the Minimum Degree of Redundancy requirement of TS Table 3.5-2, Item 5, was satisfied.

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IV. CORRECTIVE ACTIONS (Cont'd.)

Subsequent troubleshooting by I&C personnel found that the lead-lag controller module, TM-422E (EIS Code: IMOD), had drifted out of the acceptable tolerance band in the high direction. As part of further investigation and troubleshooting, the instrument disconnect from the RCS loop Resistance Temperature Detectors (RTDs) (EIS Code: DET) to the Loop 2 OTDT channel were opened and then re-closed. When this action was performed, TM-422E returned to a normal reading. Subsequent inspection and testing of the failed module could not reproduce the random, intermittent drift. The lead-lag controller module, TM-422E, was replaced, tested satisfactorily, and the channel returned to service at 1635 hours on September 3, 1995.

A further investigation into the failure of TM-422E has been initiated. The results of this investigation will be communicated to site engineering personnel to address any broader implications or corrective actions needed. A TS change to provide an allowed outage time for instrumentation channels will be submitted by the end of 1995.

V. ADDITIONAL INFORMATION

A. Failed Component Information

EIS Code: System, JE; Component, TI; Manufacturer, W-120.

B. Previous Similar Events

None