

REGULATOR INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR:9601020285 DOC.DATE: 95/12/29 NOTARIZED: NO DOCKET #
 FACIL:50-261 H.B. Robinson Plant, Unit 2, Carolina Power & Light C 05000261
 AUTH.NAME AUTHOR AFFILIATION
 GARROU,A.L. Carolina Power & Light Co.
 YOUNG,D.E. Carolina Power & Light Co.
 RECIP.NAME RECIPIENT AFFILIATION

SUBJECT: LER 95-009-00:on 951129,condition prohibited by Tech Specs
 occurred.Caused by failure to implement adequate procedures
 for maintaining operability of accumulator level
 transmitters.Level transmitter replaced.W/951228 ltr.

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

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

Robinson File No.: 13510C
Serial: RNP-RA/95-0223

DEC 28 1995

United States Nuclear Regulatory Commission
Attn: Document Control Desk
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H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2
DOCKET NO. 50-261/LICENSE NO. DPR-23
LICENSEE EVENT REPORT NO. 95-009-00

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 December 29, 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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NRC FORM 366 (4-95)		U.S. NUCLEAR REGULATORY COMMISSION			APPROVED BY OMB NO. 3150-0104 EXPIRES 04/30/98 <small>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.</small>						
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 6				
TITLE (4) CONDITION PROHIBITED BY TECHNICAL SPECIFICATIONS DUE TO INOPERABLE SAFETY INJECTION ACCUMULATOR											
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	
11	29	95	95	-- 009	-- 00	12	29	95		05000	
									FACILITY NAME	DOCKET NUMBER	
										05000	
OPERATING MODE (9)		N		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5: (Check one or more) (11)							
				20.2201(b)			20.2203(a)(2)(v)			X 50.73(a)(2)(i)	50.73(a)(2)(viii)
POWER LEVEL (10)		100		20.2203(a)(1)			20.2203(a)(3)(ii)			50.73(a)(2)(iii)	50.73(a)(2)(x)
				20.2203(a)(2)(i)			20.2203(a)(3)(iii)			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			
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	
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 15 single-spaced typewritten lines) (16) On November 29, 1995, H. B. Robinson Steam Electric Plant (HBRSEP), Unit No. 2 was operating at 100 percent power. Following an investigation of a discrepancy in Safety Injection (SI) system accumulator Level Transmitter (LT) indication, station Engineering personnel discovered that, at a time between October 28, 1995, and November 3, 1995, both of the LTs for the "C" accumulator had been offset upscale to the extent that the actual level dropped to a point that was less than the amount required by TS. The level remained below TS limits until it was corrected on November 24, 1995. This event was caused by failure to implement adequate procedures for maintaining operability of the accumulator LTs, and inadequacies in the configuration of the transmitter piping and tubing. These inadequacies result in difficulties in removing trapped gasses. The safety significance of this condition is considered minimal. Although the accumulator level was below the TS limit, it never reached a point low enough to place the Reactor Coolant System in an unanalyzed condition. The LTs were replaced, calibrated, and returned to service. Procedures have been revised to provide adequate instructions for maintaining operability of the accumulator LTs, and a review of transmitter tubing/piping configurations is being conducted to determine if improvements can be made for purging trapped gases. Since the TS required action was not taken when the "C" accumulator was rendered inoperable, this LER is submitted pursuant to 10 CFR 50.73(a)(2)(i)(B) as a condition prohibited by the TS.											

NRC FORM 366A
(4-95)

U.S. NUCLEAR REGULATORY COMMISSION

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		YEAR	SEQUENTIAL	REVISION	
H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2	05000-261	95	009	00	2 OF 6

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

I. DESCRIPTION OF EVENT

On November 22, 1995, H. B. Robinson Steam Electric Plant (HBRSEP), Unit No. 2 was operating at 100 percent power. Following an investigation of a discrepancy in Safety Injection (SI) system (EIS System Code: BQ) "B" accumulator (EIS Component Code: ACC) Level Transmitter (LT) (EIS Component Code: LIT) indication, the "A" and "C" accumulator level indication data was reviewed. During this review, station Engineering personnel discovered that one LT of the "C" accumulator level indication had been offset upscale to the extent that the actual level in the accumulator was less than the indicated level for this LT. This concern prompted a more detailed review of accumulator level instrumentation indication, and further investigation revealed that both of the LTs for this accumulator had been offset upscale to the extent that the actual level in the accumulator was less than the indicated level by 6.7 to 7.3 percent. On November 29, 1995, data was collected and reviewed to determine the differences between the indicated level and the actual level of this accumulator from June 16, 1995, (i.e., accumulator operability required as part of start-up from the last refueling outage) through the present, and to determine if the actual level in the accumulator dropped below the Technical Specifications (TS) Section 3.3.1.1.b limit of 825 cubic feet (i.e., 61.5 percent) at any time. On November 29, 1995, the review revealed that at a time between October 28, 1995, and November 3, 1995, the actual level dropped to a point that was less than the amount required by TS. The level remained below TS limits by approximately 2.3 percent (i.e., 0.32 inches, or two cubic feet) until it was adjusted to a value above the TS limit on November 24, 1995. During our review on November 29, 1995, we determined this event to be reportable to the NRC, since the TS required action was not taken when the "C" accumulator was rendered inoperable between October 28, 1995, and November 3, 1995.

II. CAUSE OF EVENT

This event was caused by failure to implement adequate procedures for maintaining operability of the accumulator LTs. Maintenance procedures allowed offsetting transmitter output after calibration, without placing limitations on the amount of offset allowed. These procedures, combined with an Instrumentation and Control (I&C) Supervisor's lack of familiarity with this particular application, and inadequacies in the configuration of the transmitter piping and tubing, led to the "C" accumulator level being below the level allowed by TS due to inaccurate indication.

The originally installed instrumentation for measuring the accumulator's level was replaced early in plant life. This replacement changed the type of transmitters used, and resulted in a slight variation (less than 1/4 inch) between the actual installation elevations of the two transmitters for each accumulator. This elevation variation had an adverse impact for plant operators in that it had the effect of narrowing the allowed accumulator level indication operating band. In order to eliminate the indicated differences caused by this slight variation in the elevation of the transmitters, the practice of offsetting one of the two transmitters on each accumulator to agree with the other, after the transmitters were calibrated and returned to service, was established. The transmitter that was left as calibrated was identified as the "master" and the transmitter that was offset was identified as the "slave."

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II. CAUSE OF EVENT (Continued)

The transmitters are installed in a configuration where the vents are at the bottom of the transmitter. The configuration of the sensing lines increase the difficulty to remove any gases that may be trapped in the wet sensing lines. The sensing line (i.e., 3/8 inch tubing), in effect, starts at the center of a horizontal run of two-inch diameter pipe that comes from the bottom of the accumulator. This configuration results in the potential for gases becoming entrapped above the 3/8 inch tubing connection in the two-inch pipe. The tubing then bends downward to the transmitter, and enters the transmitter at the top, with a vent at the bottom. The vent consists of a petcock that is opened to allow the fluid to drain out. When it is determined that all the gases have been purged, the petcock is closed. There are no visible means to verify the presence, or absence, of trapped gases. The changes in diameter from the two-inch line to the 3/8 inch tubing, to the swagelok fittings, to the transmitter, to the petcock, provide many locations for gases to accumulate and be protected from entering the small purging flow of fluid.

The transmitters are routinely calibrated during plant start-up from refueling outages. During the calibration process, the transmitters are "purged" to remove any gas from the wet sensing lines and moisture from the dry sensing lines, and are adjusted to compensate for the differences in elevation. The "purge" is considered complete when there is no indication of gas in the wet lines and no moisture in the dry lines. However, since the piping/tubing configuration creates difficulty in completing the "purge," excessively long periods of "purge" have been required to achieve acceptable results.

Postulating that the presence of gas in the wet sensing line caused a reduction in the output voltage of the affected transmitter, the following chronology of events is provided. Plant personnel were not aware of the possibility that gas may remain in the sensing lines during these evolutions.

On June 3, 1995, a six percent variance between the two indications of "C" accumulator level was noted, and transmitters LT-928 and LT-930 were vented to correct this variance. LT-930 was selected as the "slave" and a positive voltage adjustment was made to match the LT-928 indication. The work instructions did not direct the technicians to make this voltage adjustment, and the technicians did not complete the "Master/Slave Form" in procedure Process Instrument Calibration (PIC)-012, "Accumulator Level Transmitters," when they made the voltage adjustment. In addition to not completing the "Master/Slave Form," the technicians did not document the magnitude of the offset required to achieve the "master/slave" configuration.

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II. CAUSE OF EVENT (Continued)

Between June 3, 1995, and June 14, 1995, a gas bubble apparently purged itself from the LT-930 loop, causing LT-930 to read higher than LT-928. Based on this change in indication, on June 14, 1995, the transmitters for the "C" accumulator were again vented. After considerable time was spent purging the sensing lines, the technicians recognized that a large offset would be needed to achieve identical outputs from the transmitters. The technicians were unaware that there had been previous work on these transmitters on June 3, 1995, when they designated LT-930 as the "slave" to LT-928. Earlier, during adjustments on a transmitter in an unrelated system, the technicians had been sufficiently concerned about the magnitude of an offset, and stopped work to confer with the I&C Supervisor on the proper action to take. In this earlier case, the use of a large offset had been deemed acceptable. Therefore, with the established precedent for using a large offset to achieve identical outputs, LT-928 was made the "slave" transmitter and the zero was adjusted upwards to match LT-930. This resulted in both transmitters indicating a higher level than actual.

III. ANALYSIS OF EVENT

The SI accumulators are vessels filled with borated water and pressurized with nitrogen gas. The accumulators are isolated from the Reactor Coolant System (RCS) (EIS System Code: AB) during normal operation by two check valves in series. Should the RCS pressure fall below the accumulator pressure, the check valves will open and borated water is forced into the RCS. The design capacity of the accumulators is based on the assumption that, following a postulated Loss of Coolant Accident (LOCA), flow from one of the accumulators spills onto the containment floor through the ruptured RCS loop. The flow from the remaining accumulators provides sufficient water to fill the volume outside the reactor core barrel below the nozzles, the bottom plenum, and one-half the core.

The safety significance of this condition is considered minimal. Although the accumulator level was below the TS limit, it never reached a point low enough to place the RCS in an unanalyzed condition. TS Section 3.3.1.1 states that the reactor shall not be made critical unless each accumulator is pressurized to at least 600 psig and contains at least 825 cubic feet of water with a boron concentration of at least 1950 ppm. TS Section 3.3.1.2 provides an allowed outage time of four hours for one accumulator being isolated or otherwise inoperable. The basis of the TS states that the minimum 825 cubic feet and maximum 841 cubic feet of accumulator water levels correspond to an instrument reading of 61.5 percent and 80.4 percent respectively. The basis of the TS further states, with respect to the core cooling function, there is some functional redundancy for certain ranges of break sizes. The measure of effectiveness of the SI system is the ability of the SI pumps and accumulators to keep the core flooded or to reflood the core rapidly where the core has been uncovered for postulated large area ruptures. The result of the performance is to sufficiently limit any increase in fuel cladding temperature below a value where emergency core cooling objectives are met. The range of core protection is a function of break diameter provided by the various components of the SI system as presented in the Updated Final Safety Analysis Report.

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III. ANALYSIS OF EVENT (Continued)

Based on these assumptions, during the time that "C" accumulator level was below the TS required value, the total amount of coolant available for injection into the core was always above the required 1650 cubic feet. To further substantiate that the plant was not outside of analyzed operation, during 1989, the HBRSEP, Unit No. 2 fuel vendor evaluated the impact of uncertainties in the minimum and maximum allowable accumulator water volumes, and stated that a change in the minimum amount of accumulator volume to 800 cubic feet would have a negligible impact on fuel cladding temperature during a LOCA. Under worst case assumptions, the accumulator level could be allowed to drop to approximately 32 percent before the plant would be outside of analyzed conditions. This analysis remains valid for the current fuel cycle. Therefore, while the "C" accumulator level was slightly below the TS limit, it never reached a point low enough to result in a condition that is unanalyzed.

This LER is submitted pursuant to 10 CFR 50.73(a)(2)(i)(B) as a condition prohibited by the TS.

IV. CORRECTIVE ACTIONS

On November 29, 1995, LT-928 was replaced, calibrated, and returned to service. LT-930 was then calibrated and returned to service, and the "C" accumulator was considered operable.

Procedure PIC-012 has been revised to remove the instructions for establishing the "master/slave" relationship.

A review of the tubing/piping configuration of the accumulator transmitters will be completed during February 1996 to determine if improvements can be made for purging entrapped gases.

A review of all other transmitter configurations that could exhibit erroneous indication due to air entrapment will be completed during February 1996, with the emphasis on level transmitters. Any configuration identified with the potential of air entrapment will be corrected as necessary.

We are currently evaluating the adequacy of Training for I&C personnel on the possible causes of erroneous transmitter readings, removing and returning transmitters to service, and the effects of the process on indicated readings. This evaluation will be completed during February 1996, and training will be conducted based on the results of this evaluation.

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V. ADDITIONAL INFORMATION

A. Failed Component Information

None

B. Previous Similar Events

LER 83-08