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 FACIL: 50-261 H.B. Robinson Plant, Unit 2, Carolina Power & Light C 05000261
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 JURY, K.R. Carolina Power & Light Co.
 YOUNG, D.E. Carolina Power & Light Co.
 RECIP. NAME RECIPIENT AFFILIATION

SUBJECT: LER 94-019-01: on 940822, pressurizer heatup & cooldown rate exceeded. Caused by inadequate procedure. Procedures revised to require logging of pressurizer temps & training being conducted accordingly. W/941114 ltr.

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10 CFR 50.73

Carolina Power & Light Company
Robinson Nuclear Plant
PO Box 790
Hartsville SC 29550

Robinson File No.: 13510C
Serial: RNP/94-1883

NOV 14 1994

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. 94-019-01

Gentlemen:

The enclosed Supplemental Licensee Event Report (LER), is submitted in accordance with 10 CFR 50.73. The revised information is identified by a right hand margin bar.

Very truly yours,

D. E. Young
Plant General Manager

RDC:rdc
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

9411220176 941114
PDR ADOCK 05000261
S PDR

Highway 151 and SC 23 Hartsville SC

NRC FORM 366 (5-92)	U.S. NUCLEAR REGULATORY COMMISSION	APPROVED BY OMB NO. 3150-0104 EXPIRES 5/31/95
LICENSEE EVENT REPORT (LER)		ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNBB 7714), 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.

FACILITY NAME (1) H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2	DOCKET NUMBER (2) 050-261	PAGE (3) 1 OF 5
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TITLE (4) PRESSURIZER HEATUP AND COOLDOWN RATE LIMIT EXCEEDED

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
08	22	94	94	-- 019 --	01	11	14	94	FACILITY NAME	DOCKET NUMBER 05000
									FACILITY NAME	DOCKET NUMBER 05000

OPERATING MODE (9) N	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)										
POWER LEVEL (10) 100	20.402(b)			20.405(c)			50.73(a)(2)(iv)			73.71(b)	
	20.405(a)(1)(i)			50.36(c)(1)			50.73(a)(2)(v)			73.71(c)	
	20.405(a)(1)(ii)			50.36(c)(2)			50.73(a)(2)(vii)			OTHER	
	20.405(a)(1)(iii)			X			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)		

(Specify in Abstract below and in Text, NRC Form 366A)

LICENSEE CONTACT FOR THIS LER (12)

NAME K. R. Jury: Manager - Licensing/Regulatory Programs	TELEPHONE NUMBER (Include Area Code) (803) 383-1363
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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)		
YES (If yes, complete EXPECTED SUBMISSION DATE).	X	NO				

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

On August 22, 1994, H. B. Robinson Steam Electric Plant (HBRSEP), Unit No. 2 was operating at 100% power. Following a review of an event at another CP&L plant, a determination was made that on February 26, 1994, with the plant in cold shutdown condition, the liquid temperature in the pressurizer exceeded the Technical Specifications (TS) limitation of 200 degrees F per hour. The accelerated cooldown rate was a result of an insurge of cooler Reactor Coolant System (RCS) fluid into the pressurizer during a period of relatively high temperature difference between the RCS coolant and the pressurizer liquid space. This event resulted from an inadequate procedure. Due to previous incorrect assumptions made by the plant staff, the procedure did not provide direction to specifically monitor and record the pressurizer cooldown rate. An analysis was performed that confirmed that this transient, as well as other similar transients during previous operations, did not adversely affect the structural integrity of the pressurizer. Procedures have been revised to require logging of pressurizer temperatures to ensure TS compliance; training is being conducted accordingly. This report is submitted pursuant to 10 CFR 50.73(a)(2)(i)(B) as a condition prohibited by TS.

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

I. DESCRIPTION OF EVENT

On August 22, 1994, H. B. Robinson Steam Electric Plant (HBRSEP), Unit No. 2 was operating at 100% power. At 1623 hours, following review of an event at another CP&L plant where pressurizer heatup rate limits were exceeded during cooldown, a determination was made that a condition had previously existed at the HBRSEP that exceeded Technical Specifications (TS) limitations. This condition was created on February 26, 1994, during a rapid cooldown of the pressurizer (EIIS Code: PZR) which occurred while the plant was in cold shutdown condition. TS section 3.1.2.3, "Heatup and Cooldown," states that the pressurizer shall neither exceed a maximum heatup rate of 100 degrees F per hour nor a cooldown rate of 200 degrees F per hour; however, during the pressurizer cooldown, the liquid and steam space temperature change in the pressurizer exceeded the TS limitations. Specifically, the water temperature in the pressurizer decreased by 207 degrees F in a period of 46 minutes. This correlates to a maximum cooldown rate of 270 degrees F per hour. The actual maximum observed water temperature decrease was 240 degrees F in one hour. The steam space temperature cooldown was 212 degrees F in one hour.

II. CAUSE OF EVENT

The accelerated cooldown rate was a result of an in-surge of cooler Reactor Coolant System (RCS) (EIIS Code: AB) fluid into the pressurizer during a period of relatively high temperature difference between the RCS and the pressurizer liquid space. The reason the cooldown in excess of the TS limit occurred is that General Procedure (GP)-007, "Plant Cooldown From Hot Shutdown to Cold Shutdown," revision 32, was inadequate. This procedure contained a precaution that the pressurizer cooldown rate shall not exceed 200 degrees F per hour, and referenced TS section 3.1.2.3. However, the procedure had never provided direction to specifically monitor and log the pressurizer heatup and cooldown rates. Assumptions had been previously made by plant staff that, by maintaining the more restrictive Reactor Vessel heatup and cooldown limits, the temperature in the pressurizer, which directly communicates with the RCS, would be maintained in compliance with the TS section 3.1.2.3 heatup and cooldown rate by default. These assumptions were incorrect.

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III. ANALYSIS OF EVENT

The pressurizer, utilizing a spray nozzle and heaters, provides for a controlled heatup and cooldown of the RCS during startup and shutdowns, respectively, controls system operating pressure, compensates for variations in RCS volume in all modes of RCS operation, and provides a containing boundary for RCS system pressure. The concern created by a rapid pressurizer heatup or cooldown is the potential for over stressing the limiting components of the pressurizer (i.e., surge nozzle, heater wells, immersion heaters, lower head, support skirt, upper head, spray nozzle, safety relief nozzle) and associated weldments due to thermal transients experienced during the accelerated temperature excursion. The heatup and cooldown requirements are developed in accordance with American Society of Mechanical Engineers (ASME) Code, Section III, Appendix G. To address this concern, the information related to this condition, as well as data available from historical cooldowns, was analyzed to determine the potential affects on the pressurizer vessel. The methodology employed by Procedure GP-007 also created, at times, subsequent heatups due to an outsurge of hotter water from the pressurizer due to thermal stratification. This data was reviewed to identify any transients where the 200 degrees F per hour cooldown or 100 degrees F per hour heatup rate TS limits were exceeded in the pressurizer. Substantiating the initial determination, the final analysis confirmed that none of the transients adversely affected the structural integrity of the pressurizer and that continued operation is acceptable. This analysis was submitted to the NRC by letter dated October 28, 1994. Therefore, we have concluded that this event had a minimal affect on plant safety.

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

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IV. CORRECTIVE ACTIONS

A detailed quantitative analysis was performed by the reactor vendor, Westinghouse, that confirmed and documented that this transient did not adversely affect the structural integrity of the pressurizer and that continued operation is acceptable. As part of this analysis, a detailed search of plant records was performed to identify other possible occurrences of similar transients during past operation. The data search determined that cooldown operations could be characterized by two historical periods. During the period from May 1971 (i.e., initial plant startup) to December 1980, routine practice was to take the RCS solid at a coolant temperature above 200 degrees F. This reduced the temperature difference between the coolant in the RCS and in the pressurizer. The potential for exceeding the pressurizer TS cooldown limits under these conditions was minimal. As a result of this practice, one instance of the pressurizer water temperature increasing more than 100 degrees F in one hour was identified. No occurrences of temperature decreasing more than 200 degrees F in one hour were found in the available data.

Thirteen reactor cooldowns since 1980 were analyzed during which conditions and operating practices could have resulted in exceeding TS heatup and cooldown limits. Between 1980 and August 1989, cooldowns were conducted with a steam bubble in the pressurizer for RCS coolant temperatures below 200 degrees F, but temperature recordings were suspended when RCS coolant temperature reached 200 degrees F. This period included seven times where the pressurizer was taken water solid for which data was not available; therefore, based on the absence of data, these seven cooldowns were considered for analysis purposes to have exceeded TS cooldown rates. Plant computer data was available for more recent cooldowns (i.e., August 22, 1989 to November 20, 1993). Data for five cooldowns which occurred during this period were evaluated in addition to the February 26, 1994, cooldown. The data for these cooldowns were reviewed to identify any transients where the 200 degrees F per hour cooldown or 100 degrees F per hour heatup rate TS limits were exceeded in the pressurizer. Three of these cooldowns include some period of time during the evolution when the pressurizer temperature indicates a decrease of greater than 200 degrees F per hour. Additionally, the TS maximum heatup rate limit of 100 degrees F in one hour was exceeded in two cooldown evolutions. The results of the analyses confirmed that none of the transients adversely affected the structural integrity of the pressurizer and that continued operation is acceptable.

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IV. CORRECTIVE ACTIONS (Continued)

Procedure GP-007 has been revised to specifically log pressurizer temperatures to ensure TS compliance. Additionally, TS Section 3 has been reviewed to determine if any other limiting conditions for operations have not been adequately addressed by procedure. No similar instances were found.

Plant operating crews were counseled on the need to question past understandings and practices regarding TS compliance, and additional training will be conducted on this event and the revised procedural guidance by January 15, 1995. Selected Operating Experience information from 1988 to the present will be reviewed for applicability. This review is expected to be complete prior to the next refueling outage, currently scheduled for April, 1994. These corrective actions will preclude similar events from occurring in the future.

V. ADDITIONAL INFORMATION

A. Failed Components

None

B. Previous Similar Events

None