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ACCESSION NBR:9412230215 DOC.DATE: 94/12/16 NOTARIZED: NO DOCKET #
 FACIL:50-261 H.B. Robinson Plant, Unit 2, Carolina Power & Light C 05000261
 AUTH.NAME AUTHOR AFFILIATION
 JURY,K.R. Carolina Power & Light Co.
 YOUNG,D.E. Carolina Power & Light Co.
 RECIP.NAME RECIPIENT AFFILIATION

SUBJECT: LER 94-008-01:on 940507,air pressure in RAB exceeded CR pressure that would exist during emergency pressurization mode of operation.Caused by inadequate sys design & testing program.Plant procedures revised.W/941216 ltr.

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10 CFR 50.73

Carolina Power & Light Company
Robinson Nuclear Plant
PO Box 790
Hartsville SC 29551

Robinson File No.: 13510C
Serial: RNP/94-1874

DEC 16 1994

United States Nuclear Regulatory Commission
Attention: 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. 94-008-01

Gentlemen:

The enclosed supplemental Licensee Event Report (LER), is submitted in accordance with 10 CFR 50.73. This supplement provides additional information concerning the event cause and corrective actions. The revised information is identified by a right hand margin bar.

Very truly yours,

Dale 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

9412230215 941216
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Highway 151 and SC 23 Hartsville SC

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NRC FORM 366
(5-92)

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0104
EXPIRES 5/31/95

LICENSEE EVENT REPORT (LER)

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

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
(MNB 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 2

DOCKET NUMBER (2)

050-261

PAGE (3)

1 OF 5

TITLE (4)

CONDITION OUTSIDE DESIGN BASIS DUE TO CONTROL ROOM HVAC INOPERABILITY

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
05	07	94	94	008	01	11	30	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)		50.73(a)(2)(i)		50.73(a)(2)(viii)(A)		(Specify in Abstract below and in Text, NRC Form 366A)	
		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)			

LICENSEE CONTACT FOR THIS LER (12)

NAME

K. R. Jury: Manager-Licensing/Regulatory Programs

TELEPHONE NUMBER (Include Area Code)

(803) 383-1363

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)

YES	NO	EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
(If yes, complete EXPECTED SUBMISSION DATE).	X				

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

On May 7, 1994, H. B. Robinson Steam Electric Plant (HBRSEP), Unit No. 2 was operating at 100 percent power. Reactor Auxiliary Building (RAB) ventilation system flow balancing was in progress and, with the building supply fan operating, the exhaust fan was secured to support the flow balancing activities. The air pressure in the RAB subsequently increased. Following review of flow measurement data, the plant staff determined that pressure in a room adjacent to the Control Room had exceeded the Control Room pressure that would exist during the emergency pressurization mode of operation. This condition is considered outside the design basis of the plant. The building supply and exhaust fans were immediately secured, resulting in a pressure reduction in the affected areas. Plant procedures were subsequently revised to place operating restrictions on the building supply fan.

This event was caused by an inadequate system design and testing program. Specifically, the design and testing program did not consider all modes of system lineups and the effect of these lineups on Control Room habitability during the Emergency Pressurization mode of operation. Plant procedures have been revised to ensure the most conservative mode of plant ventilation system operation is appropriately considered during testing.

NRC FORM 366A
(5-92)

U.S. NUCLEAR REGULATORY COMMISSION

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TEXT CONTINUATION

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FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
H. B. ROBINSON, UNIT 2	050-261	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	2 OF 5
		94	008	01	

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

I. DESCRIPTION OF EVENT

On May 7, 1994, H. B. Robinson Steam Electric Plant (HBRSEP), Unit No. 2 was operating at 100 percent power. Reactor Auxiliary Building (RAB) Heating, Ventilation and Air Conditioning (HVAC) system (EIIS Code: ACU) flow balancing associated with a recent system modification was in progress in an area containing Emergency Buses E1 and E2 (i.e., E1/E2 Room). This room is located in the Reactor Auxiliary Building (RAB) and is below the Control Room with a common floor/ceiling. When the E1/E2 Room exhaust (i.e., fan HVE-7) (EIIS Code: AHU) was secured as required for the flow balancing activities, the air pressure increased in the immediate area and several rooms adjacent to the Control Room, including a room containing the reactor protection and control analog instrumentation relay racks (i.e., the Hagan Room). Analysis of the situation determined that, under certain accident conditions, HVE-7 would stop operating and that the non safety-related RAB supply fan, HVS-1, could not be relied upon to stop. Therefore, under such conditions, the air pressure in these rooms could become more positive than the Control Room air pressure. This is contrary to the licensing basis of the plant, which states that the Control Room envelope is maintained under a positive differential pressure with respect to adjacent areas during the emergency pressurization mode of operation.

Originally, we concluded that the E1/E2 Room pressure had exceeded the Control Room post accident pressure, and that as a result, an unanalyzed condition existed. On May 7, 1994, at 1536 hours, the NRC was notified via the Emergency Notification System of this condition pursuant to 10 CFR 50.72(b)(1)(ii). The immediate corrective actions taken were to re-start HVE-7, which resulted in a pressure reduction in the E1/E2 Room, until additional administrative controls could be put in place. Subsequent to this notification, following a review of empirical flow measurement data, we determined that, during the emergency pressurization mode of operation with HVS-1 operating and HVE-7 secured, pressure in the E1/E2 Room had not increased above Control Room emergency pressurization mode pressure. However, the pressure in the Hagan Room had in fact exceeded the Control Room emergency pressurization mode pressure.

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(5-92)

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		94	008	01	

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I. DESCRIPTION OF EVENT (Continued)

During subsequent flow balancing activities, a question was raised concerning the amount of outside air makeup going into the Control Room. During a unique HVAC system alignment (i.e., HVS-1 and HVE-7 secured), a negative pressure in the room which contains the Control Room ventilation system equipment, developed. Due to outside air makeup fan housing in-leakage, the outside air makeup to the Control Room increased to approximately 420 cubic feet per minute (CFM), which is beyond Technical Specification (TS) section 4.15 limits.

The exact amount of air increase could not be positively determined. However, to compensate for this concern, the outside air makeup was adjusted and reduced to 340 CFM.

II. CAUSE OF EVENT

The Control Room Ventilation System (CRVS) design as compared with different areas of the Reactor Auxiliary Building (RAB) was incomplete, in that, it did not consider all modes of RAB HVAC system lineups and the effect of these lineups on Control Room habitability. The CRVS design was based on the assumption of a Loss of Coolant Accident (LOCA) coincident with a Loss Of Off-site Power (LOOP). The design did not take into account the impact of a post accident configuration of the ventilation system serving adjacent rooms, on the CRVS during the Emergency Pressurization mode of operation. The design should have considered the scenario of a LOCA with off-site power available, coincident with the failure of a non-safety related ventilation exhaust fan (i.e., HVE-7). During this scenario, the non safety-related RAB supply fan (i.e., HVS-1) would continue to supply air to the RAB, while credit can not be taken for HVE-7 to exhaust air from the E1/E2 room. This configuration would allow the RAB air pressure to increase in relation to the Control Room ventilation envelope, resulting in the pressure in areas adjacent to the Control Room exceeding the Control Room post-accident air pressure. A potential pathway for postulated radioactive material releases into the Control Room would thus be established.

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II. CAUSE OF EVENT (Continued)

The testing program to confirm that a positive pressure could be maintained in the Control Room with respect to areas adjacent to the Control Room, was inadequate due to failure of the modification design to consider the impact of potential ventilation configurations on the safety function of the CRVS during the Emergency Pressurization mode of operation. This failure occurred due to an inadequate understanding of the testing requirements and commitments, and the resultant failure to properly incorporate these requirements and commitments into the surveillance test program.

III. ANALYSIS OF EVENT

The Control Room HVAC testing as committed to in the UFSAR had not been adequately incorporated into the surveillance testing program. Specifically, the UFSAR states "The Control Room envelope is maintained under a positive differential pressure with respect to adjacent areas during the emergency pressurization mode of operation." The UFSAR further states, "Periodic testing is required to demonstrate that at the beginning of each cycle, the Control Room is pressurized to a minimum of 1/8 inches of water gage with respect to the outdoors..." and, "During normal operation, the system will be periodically tested to demonstrate that a positive pressure can be maintained in the Control Room." We have determined that the testing methodology does not test the Control Room envelope with respect to adjacent areas, nor does it contain an acceptance criteria of 1/8 inches of water gage pressure with respect to the outdoors. However, testing during each refueling outage since system installation, which is performed by Engineering Surveillance Test Procedure EST-023, "Control Room Emergency Ventilation System," has demonstrated that the 1/8 inches of water gage pressure design requirement was met.

All TS required testing has been satisfactorily performed. To verify that the Control Room Air Conditioning system will maintain the Control Room environment and adequately remove radioactive material from the incoming ambient air should there be an accidental release of radioactive materials to the atmosphere, Technical Specification (TS) 4.15.c states, "At least once per 31 days, on a staggered testing basis, verify that a positive pressure is maintained in Control Room during the Emergency Pressurization operating mode." TS 4.15.f.4 states, "at least once per 18 months... verify that the system maintains the Control Room at a positive pressure relative to the outside atmosphere at less than or equal to a pressurization rate of 400 ACFM (Actual Cubic Feet per Minute) during the emergency pressurization operating mode."

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III. ANALYSIS OF EVENT (Continued)

Under certain accident conditions, with specific equipment failure assumptions, the Control Room could have been at a pressure less positive than adjacent area pressures. This scenario could have potentially resulted in a release of contaminated materials into the Control Room envelope. However, calculations have been performed demonstrating that plant Operators have up to one hour to secure HVS-1 without radiation dose limits per the General Design Criterion 19 of Appendix A to 10 CFR 50 being exceeded.

IV. CORRECTIVE ACTIONS

On May 8, 1994, exhaust fan HVE-7 and the RAB supply fans (i.e., HVS-1) were secured, and the areas considered "adjacent" (i.e., sharing a common wall, ceiling or floor) to the Control Room, were verified to be at a pressure condition less than that of the Control Room. Plant operating procedures and Emergency Operating Procedures were revised to place operating restrictions on HVS-1. The refueling frequency surveillance test procedure has been revised to add specific initial conditions and acceptance criteria to be used when measuring Control Room pressures and makeup air flow to Control Room HVAC system, during the Emergency pressurization mode of operation. Additionally, a representative sample of other modifications performed as a result of commitments to changes described in NUREG-0737, "Clarification of TMI Action Plan Requirements," is under evaluation to determine the adequacy of the initial design inputs, possible interactions with other systems, and associated surveillance testing adequacy. As part of this evaluation, an action plan has been developed to perform a detailed review of the CRVS; changes to the system, maintenance activities, and surveillance tests will be performed as appropriate.

V. ADDITIONAL INFORMATION

A. Failed Component Information

None

B. Previous Similar Events

None