

# ACCELERATED DISTRIBUTION DEMONSTRATION SYSTEM

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SUBJECT: LER 90-004-00:on 900204,breach of containment integrity due to failure of personnel airlock door.

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**Carolina Power & Light Company**

Company Correspondence

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**MAR. 02 1990**

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H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2  
DOCKET NO. 50-261  
LICENSE NO. DPR-23  
LICENSEE EVENT REPORT 90-004-00

Gentlemen:

The enclosed Licensee Event Report (LER) is submitted in accordance with 10 CFR 50.73 and NUREG-1022 including Supplements No. 1 and 2.

Very truly yours,

R. E. Morgan  
General Manager  
H. B. Robinson S. E. Plant

RDC:dwm

Enclosure

cc: Mr. S. D. Ebnetter  
Mr. L. W. Garner  
INPO

*TELL  
11*

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2	DOCKET NUMBER (2) 0 5 0 0 0 2 6 1	PAGE (3) 1 OF 0 6
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TITLE (4)  
BREACH OF CONTAINMENT INTEGRITY DUE TO FAILURE OF THE PERSONNEL AIRLOCK DOOR

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 NAMES			DOCKET NUMBER(S)
0 2	0 4	9 0	9 0	0 0 4	0 0	0 3	0 2	9 0				0 5 0 0 0
												0 5 0 0 0

OPERATING MODE (9) N	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)											
POWER LEVEL (10) 1 0 0	20.402(b)			20.405(c)			50.73(a)(2)(iv)			73.71(b)		
	20.405(a)(1)(i)			50.38(c)(1)			50.73(a)(2)(v)			73.71(c)		
	20.405(a)(1)(ii)			50.38(c)(2)			50.73(a)(2)(vii)			OTHER (Specify in Abstract below and in Text, NRC Form 366A)		
	20.405(a)(1)(iii)			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)						

LICENSEE CONTACT FOR THIS LER (12)									
NAME David Crook, Senior Specialist - Regulatory Compliance							TELEPHONE NUMBER		
							AREA CODE		
							8 0 3	3 8 3 - 1 1 7 9	

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)										
CAUSE	SYSTEM	COMPONENT	MANUF. TURER	REPORTABLE TO NPRDS		CAUSE	SYSTEM	COMPONENT	MANUF. TURER	REPORTABLE TO NPRDS
B	B D	A L	3 1 0	Y						

SUPPLEMENTAL REPORT EXPECTED (14)				EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
<input type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE)	<input checked="" type="checkbox"/> NO						

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

On February 4, 1990, Unit No. 2 was operating at 100 percent power. Licensee Maintenance personnel entered the Containment personnel air lock to repair the inner door seal, which was suspected to be the source of Penetration Pressurization System (PPS) leakage. Repairs were affected and were considered to be successful. On February 7, 1990, PPS leakage was again detected, and licensee operators began leak rate monitoring to ensure required pressure could be maintained on the PPS header while repair efforts were planned. On February 9, 1990, leak rate monitoring indicated that the required pressure could not be maintained. The licensee entered Technical Specification 3.0 when entry was made into the air lock to repair the inner door seal. Repairs to the leakage source were made, and the airlock was returned to service on February 10, 1990.

The cause of the leakage was attributed to failure of the inner air lock door assembly adjustment to center the door seal on the gasket seating surface.

This LER is submitted pursuant to 10CFR50.73.(a)(2)(i)(B).

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
		9 0	0 0 4	0 0	0 2	OF	0 6

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

Description of Event

On February 1, 1990, Unit No. 2 was operating at 100 percent power.<sup>1</sup> At 2130 hours, leakage on "A" Penetration Pressurization System (PPS) header was detected. As a result, Licensee operators performed the actions of Abnormal Operating Procedure AOP-023, "Loss of Containment Integrity". The source of leakage was determined to be due to the failure of a door of the personnel air lock to seal. Isolation of PPS to the air lock left the PPS header at 44 psig and 0.32 scfm leakage. When PPS was valved back in to the air lock, the leakage rose to greater than .532 scfm (off scale high) within fifteen minutes. At 2145 hours, the Operations Manager was notified of the situation, and was informed that the leakage was suspected to be on the inner air lock door due to the fact that Containment pressure relief had been performed frequently over the past week. The Operations Manager instructed the Operators to monitor "A" PPS header to ensure at least 42 psig was being maintained. In addition, PPS to the personnel air lock was to be periodically isolated in order to determine leakage on the remainder of the "A" PPS header. The outer door to the personnel air lock was checked for leakage using a soap solution at the gasket interface, and none was detected. Therefore Containment integrity was being maintained by the outer door.

On February 2, 1990, the Plant Nuclear Safety Committee convened to review a proposed interpretation to the Technical Specification 1.7.c definition of Containment Integrity. Specifically, the Committee was concerned with the words "properly closed and sealed" with regard to the personnel air lock door. The PNSC determined that an acceptable method of determining that the air lock is properly closed and sealed is the ability to maintain at least 42 psig of PPS header pressure on at least one air lock seal.

On February 4, 1990, at 1630 hours, licensee Maintenance personnel and the air lock manufacturers technical representative entered the air lock to repair the inner door.<sup>2</sup> CV integrity was considered to be intact because 42 psig of PPS header pressure was being maintained on the inner door seal whenever the outer door was open. The door closure roller plate shims, the door seals, and the door latch bolts were replaced. The air lock was exited at 1810 hours. At 1924 hours, "A" PPS header was pressurized, and air lock leakage was measured at .34 scfm. Total PPS leakage was .87 scfm. The maintenance effort was considered to be successful.

<sup>1</sup> H.B. Robinson Unit No. 2 is a Westinghouse pressurized water reactor nuclear power plant in commercial operation since March, 1971.

<sup>2</sup> Containment Personnel Air Lock EIIS Codes: System-BD; Component-AL; Manufacturer-310.

NRC Form 366A (9-83)	<b>LICENSEE EVENT REPORT (LER) TEXT CONTINUATION</b>	U.S. NUCLEAR REGULATORY COMMISSION APPROVED OMB NO. 3150-0104 EXPIRES: 8/31/88															
FACILITY NAME (1)  H. B. ROBINSON STEAM ELECTRIC PLANT UNIT NO. 2	DOCKET NUMBER (2)  0   5   0   0   0   2   6   1	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="3">LER NUMBER (8)</th> <th colspan="2">PAGE (3)</th> </tr> <tr> <th>YEAR</th> <th>SEQUENTIAL NUMBER</th> <th>REVISION NUMBER</th> <th></th> <th></th> </tr> <tr> <td style="text-align: center;">9   0</td> <td style="text-align: center;">-   0   0   4</td> <td style="text-align: center;">-   0   0</td> <td style="text-align: center;">0   3</td> <td style="text-align: center;">O F 0   6</td> </tr> </table>	LER NUMBER (8)			PAGE (3)		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			9   0	-   0   0   4	-   0   0	0   3	O F 0   6
LER NUMBER (8)			PAGE (3)														
YEAR	SEQUENTIAL NUMBER	REVISION NUMBER															
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TEXT (If more space is required, use additional NRC Form 366A's) (17)

On February 7, 1990, at 1330 hours, leakage on the "A" PPS header was again detected, and Licensee operators initiated actions of Abnormal Operating Procedure AOP-023. At 1538 hours, the source of the leakage was identified to be at the seal of the inner Personnel Air Lock door. CV integrity was being maintained by the outer door seal. Operators then began monitoring PPS pressure hourly to ensure that at least 42 psig could be maintained on the PPS header. A Special Procedure was then initiated to install an extended range rotameter to accurately quantify the leakage. The procedure was completed on February 9, 1990, at 2005 hours, but the total flow was beyond the range of the meter, and an accurate leak rate determination could not be made. At 2030 hours, leak rate monitoring indicated that 42 psig could not be maintained on the PPS header, and Technical Specification 3.0 was entered when the outer air lock door was opened to repair the inner door seal. The repair effort consisted of replacing the door seal gasket and adjusting the air lock door via the roller bearing pillow block to properly center it on the seal. In addition, the latch plate was readjusted to cause the door to seat harder against the seals. Repairs were completed at 0030 hours on February 10, 1990, and Operations personnel exited Technical Specification 3.0.

This report is submitted pursuant to 10CFR50.73(a)(2)(i)(B) as a condition prohibited by the Plants Technical Specifications.

II. Cause of Event

The primary cause of this event is attributed to failure of the Personnel Air Lock inner door assembly adjustment to center the door seal knife edge on the door gasket. Contributing to this was the roller bearing pillow block bolts becoming loose enough for the door to move approximately one-eighth inch, thus becoming misaligned on the seal.

III. Analysis of Event

Technical Specification 3.6.1.a states that containment integrity shall not be violated unless the reactor is in cold shutdown condition. Technical Specification 1.7.c states that containment integrity is defined to exist when at least one door in the personnel air lock is properly closed and sealed. On February 4, 1989, reliance was being placed on the Technical Specification Interpretation to maintain 42 psig of PPS header pressure on the inner door seal with the outer door open. This interpretation was subsequently determined to be inappropriate and was canceled on February 19. This misplaced reliance caused a violation of Technical Specifications in that Specification 3.0 should have been entered on February 4 and it was not. The period of time that the plant should have been in Technical Specification 3.0 did not exceed the eight hour allowance for plant shutdown. Although the Technical Specifications

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TEXT (If more space is required, use additional NRC Form 364A's) (17)

were not violated when Specification 3.0 was entered on February 7, when the air lock was entered a second time, the Plant was considered to be operating in a "condition prohibited by the plant's Technical Specifications" as discussed in NUREG 1022, Supplement 1.

This condition is considered to have minimal safety significance. It is unlikely that the technical specification limit for total containment leakage could have been exceeded (0.1 weight percent of containment volume in 24 hours) for the following reasons:

- 1- The PPS leakage escaped into containment via the inner door assembly when the outer door was closed.
- 2- Both doors are normally closed when the reactor is above 200 degrees, except for brief periods for containment inspections and minor maintenance activities. Then only one door at a time can be opened due to the mechanical interlock.
- 3- The door configuration is such that for both the inner and outer doors, an increase in containment pressure (i.e. during an accident) will increase sealing pressure on the door.

IV. Corrective Action

The following corrective actions were taken during the repair of the air lock door seal leakage. Refer to the attached diagram.

On February 4, 1990, the latching mechanism and shims on the inner air lock door were removed. The shims were replaced using a one-piece shim. The latching mechanism bolts were replaced and torqued. The raised door seating surface (knife edge) was examined, and minor repairs were made per the manufacturers specifications. On February 9, licensee Maintenance personnel and the manufacturers' technical representative entered air lock and discovered that the inner door seals were being forced out of position by PPS pressure. The inner door seals were removed and the gasket seating surface was cleaned. With the gasket removed, door gaps and settings were measured for any possible door warpage or defect, and no concerns were found. With new gaskets installed, measurements were made to determine if the door was seating properly on the gaskets. The door was found to be mispositioned approximately one-eighth inch. The eight roller bearing pillow block bolts on the inner door were then loosened, the door was adjusted approximately one-eighth inch so the knife edges fit into the center of the gaskets, and the pillow block bolts were re-tightened and torqued as required. The door latch bolts were loosened and the latch readjusted to ensure that the door would seat harder onto the gaskets. The door was tested, and left in satisfactory condition.

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To prevent recurrence of this condition, major maintenance is scheduled to be performed on the air lock during the next refueling outage, and any worn or suspect parts will be replaced as necessary. In addition, a Preventative Maintenance procedure is being developed to periodically check components within the personnel air lock.

V. Additional Information

A. Failed Component Information

This condition is attributed to failure of air lock door. The air lock is manufactured by Chicago Bridge and Iron Company, EIIS Codes: System-BD; Component-AL; Manufacturer-310.

B. Previous Similar Events

LER-89-015-00

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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TEXT (if more space is required, use additional NRC Form 364A's) (17)

PERSONNEL AIR LOCK DOOR ASSEMBLY  
(OUTER DOOR SHOWN)

GASKET & SEATING  
SURFACE NOT  
SHOWN.

