



Carolina Power & Light Company

Brunswick Nuclear Plant
P. O. Box 10429
Southport, N.C. 28461-0429

APR 16 1993

FILE: B09-13510C
SERIAL: BSEP-93-0056

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U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D. C. 20555

BRUNSWICK STEAM ELECTRIC PLANT UNIT 2
DOCKET NO. 50-324
LICENSE NO. DPR-62
LICENSEE EVENT REPORT 2-93-005

Gentlemen:

In accordance with Title 10 of the Code of Federal Regulations, the enclosed Licensee Event Report is submitted. This report fulfills the requirement for a written report within thirty (30) days of a reportable occurrence and is submitted in accordance with the format set forth in NUREG-1022, September 1983.

Very truly yours,

C. C. Warren, Plant Manager Unit 2
Brunswick Nuclear Plant

GMT/gmt

Enclosure

cc: Mr. S. D. Ebner
Mr. P. D. Milano
Mr. R. L. Prevatte

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EXPIRES: 5/31/95

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 60.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNBB 7714), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20545-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)

Brunswick Steam Electric Plant, Unit 2

DOCKET NUMBER (2)

05000324

PAGE (3)

1

TITLE (4)

REACTOR COOLANT CHLORIDE LEVELS COULD NOT BE RESTORED BELOW THE LIMITS WITHIN 48 HOURS

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
03	16	93	93	- 05 -	0	04	19	93	FACILITY NAME	DOCKET NUMBER
										05000
										05000

OPERATING MODE (9)	4	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following)(11)							
POWER LEVEL (10)	0	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)(vi)		OTHER	
		20.405(a)(1)(iii)	X	50.73(a)(2)(i)		50.73(a)(2)(viii)(A)		(Specify in Abstract and Text)	
		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)(ix)			

LICENSEE CONTACT FOR THIS LER (12)

NAME

Glen M. Thearling, Regulatory Compliance Specialist

TELEPHONE NUMBER

(919) 457-2038

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC

SUPPLEMENTAL REPORT EXPECTED (14)

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

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

On March 16, 1993, Unit 2 was in Cold Shutdown to support the outage started April 21, 1992. The B loop of Residual Heat Removal (RHR) had been placed in Shutdown Cooling at 0400 on March 16, 1993.

At 0500, on March 16, 1993, the Reactor Coolant sample found the chloride level at .571 ppm. This is above the Technical Specification limit of .2 ppm, and actions were initiated to find the source of the chlorides and restore chemistry. The source of the chlorides was the Residual Heat Removal Service Water (RHRSW) to RHR System cross-tie. On March 11, 1993, maintenance had been performed on the inboard and outboard RHRSW injection valves. During these repairs it was noted that the normally open drain line between the RHRSW to RHR Cross-Tie was clogged and a Work Request/Job Order was written. As this piping section could not drain, service water entered the piping between the inboard injection valve and the downstream check valve when maintenance testing required cycling the inboard valve. Later, when the B loop RHR was placed in Shutdown Cooling, the chlorides migrated past the check valve and were introduced into the Reactor Coolant system. Repairs have been completed for both injection valves and the clogged section of the drain line was cleared.

The recovery from the high chloride condition was delayed when the site experienced a Loss of Off-site Power due to the severe winter storm that affected much of the Eastern United States. At 2030 on March 18, 1993, Reactor Coolant system chlorides were restored, but this was 15 hours 30 minutes beyond the Technical Specification time limit.

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**LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION**

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Brunswick Steam Electric Plant Unit 2	05000324	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	2
		93	- 05 -	0	

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

TITLE

REACTOR COOLANT CHLORIDE LEVELS COULD NOT BE RESTORED BELOW THE LIMITS WITHIN 48 HOURS

INITIAL CONDITIONS

Unit 2 was in Cold Shutdown to support the outage started April 21, 1992. On March 11, 1993, maintenance was performed on the inboard and outboard Residual Heat Removal Service Water (RHRSW) to Residual Heat Removal (RHR) injection valves (see attachment 1). During these repairs, a Work Request/Job Order (WR/JO) 93-AJEZ1 was written documenting the RHRSW to RHR Cross-Tie Drain line as being clogged. Upon completion of the repairs to the injection valves, full flow pump testing of the B RHR loop was performed which directed water through the Torus and the B RHR heat exchanger. At 0400, on March 16, 1993, the B loop RHR was aligned to the reactor vessel for Shutdown Cooling (SDC).

EVENT NARRATIVE

At 0500, on March 16, 1993, a Reactor Coolant sample found the chloride level at .571 ppm. This was above the Technical Specification limit of .2 ppm, and actions were initiated to find the source of the chlorides and restore chemistry. The reactor chloride concentration peaked at 1.73 ppm at 0815 on March 16.

The source of the chlorides was determined to be the RHRSW to RHR System cross-tie. The clogged drain line trapped service water (brackish water) that had leaked past the outboard RHRSW injection valve, until the inboard RHRSW injection valve packing adjustment required cycling the valve for run currents, prior to and after adjusting the valve packing. Later, when a partial performance of Periodic Test (PT) 08.1.5 was used for post-maintenance testing the valve was again cycled. These valve cycles allowed the trapped service water to pass and resulted in a chloride source with only a check valve between it and the rest of the B RHR loop. At this point, minor perturbations (i.e. swapping to SDC, stopping pumps, etc.) and time were all that was needed to put chlorides in either the Reactor Coolant system or the Torus.

After the repairs, the B RHR loop was first run aligned to the Torus and then swapped to SDC. A Torus sample after the event indicated an increase in chlorides, but the torus was still within administrative limits. From the Torus and Reactor Coolant sample results, it is estimated that less than 10 gallons of service water entered the RHR system.

The recovery from the high chloride condition within the Technical Specification limit of 48 hours was delayed at 1855 on March 16, when the severe winter storm that affected much of the Eastern United States resulted in the site experiencing an extended Loss of Off-site Power. This resulted in the isolation of the Reactor Water Cleanup System and delayed restoration of the filter/demineralizers. At 2030 on March 18, 1993, Reactor Coolant system chlorides were restored, with sample results indicating .193 ppm. This was 15 hours 30 minutes beyond the Technical Specification time limit.

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		93	- 05 -	0	

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

CAUSE OF EVENT

A combination of the following led to this reportable event:

- 1) The outboard RHRSW to RHR System cross-tie valve was leaking by its seat.
- 2) The drain line between the RHRSW to RHR Cross-Tie valves was clogged and trapped the service water until the inboard valve was cycled. While a WR/JO was written, the immediate consequence of this deficiency was not put in the context of the on-going maintenance that required cycling the inboard RHRSW to RHR cross-tie injection valve.
- 3) The inboard RHRSW to RHR System cross-tie valve had a packing leak that required it to be cycled as part of the packing adjustment.
- 4) Loss of Off-site Power delayed the recovery.

CORRECTIVE ACTIONS

The clogged drain line has been cleared (WR/JO 93-AJEZ1) with additional supports being installed to maintain the proper slope needed to minimize corrosion on the drain piping (WR/JO 93-AKXT1).

The inboard (WR/JO 93-AJAJ1) and outboard (WR/JO 93-AJAB1) RHRSW to RHR Cross-Tie valves were repaired.

Periodic Test PT-08.1.5, RHR-SW Cross-Tie Valves Operability Test, and RHR Operating Procedures are being evaluated for additional sampling/flush requirements. (Due July 30, 1993)

On Units 1 and 2, the volume between the inboard RHRSW to RHR Cross-Tie valve and the check valve have been sampled and drained.

Enhancements to the RHR system sampling capability are being evaluated (EWR # 12066). (Due October 28, 1993)

SAFETY ASSESSMENT

With the Reactor in Cold Shutdown the introduction of chlorides into the Reactor Coolant System is of minor safety significance.

PREVIOUS SIMILAR EVENTS

None

EIIS COMPONENT IDENTIFICATION

System/Component

EIIS Code

Residual Heat Removal/Shutdown Cooling

BO

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

ATTACHMENT 1

