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NOV 10 1995

SERIAL: BSEP-95-0553
10 CFR 50.73

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

BRUNSWICK STEAM ELECTRIC PLANT UNIT 1
DOCKET NO. 50-325/LICENSE NO. DRP-71
LICENSEE EVENT REPORT 1-95-019

Gentlemen:

In accordance with the Code of Federal Regulations, Title 10, Part 50.73, Carolina Power & Light Company submits the enclosed voluntary Licensee Event Report. This report is submitted in accordance with the format set forth in NUREG-1022, September 1983.

Please refer any questions regarding this submittal to Mr. K. A. Harris at (910) 457-3312.

Sincerely,

W. Levis, Director-Site Operations
Brunswick Nuclear Plant

SFT/

Enclosures

1. Licensee Event Report
2. Summary of Commitments

cc: Mr. S. D. Ebnetter, Regional Administrator, Region II
Mr. D. C. Trimble, Jr., NRR Project Manager - Brunswick Units 1 and 2
Mr. C. A. Patterson, Brunswick NRC Senior Resident Inspector
The Honorable H. Wells, Chairman - North Carolina Utilities Commission

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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)

Brunswick Steam Electric Plant, Unit 1

DOCKET NUMBER (2)

05000325

PAGE (3)

1 of 4

TITLE (4)

Improper Material Configuration Results in Inoperable RHR Service Water Valves

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
10	12	95	95	- 19 -	00	11	10	95	BSEP Unit 2	05000324
									FACILITY NAME	DOCKET NUMBER
										05000

OPERATING MODE (9)	1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following)(11)								
		20.402(b)		20.405(c)		50.73(a)(2)(iv)		73.71(b)		
POWER LEVEL (10)	100	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)	X	OTHER		
		20.405(a)(1)(iii)		50.73(a)(2)(ii)		50.73(a)(2)(viii)(A)		(Specify in Abstract and Text)		
		20.405(a)(1)(iv)		50.73(a)(2)(iii)		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

Tony Harris, Regulatory Affairs Project Analyst

TELEPHONE NUMBER

(910) 457-3312

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
B	BO	PDCV	V037	Y					

SUPPLEMENTAL REPORT EXPECTED (14)

YES (If yes, complete EXPECTED SUBMISSION DATE)	X	NO	EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
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ABSTRACT (Limit to 1400 spaces, i.e. approximately fifteen single space typewriter lines) (16)

On August 23, 1995, during performance of a periodic surveillance test, the Unit 2 B RHR Heat Exchanger Service Water Discharge Valve (2-E11-PDV-F068B) failed to stroke fully closed. The valve plug was found seized in the valve retainer. The Unit 1 E11-PDV-F068A valve failed to stroke fully closed during subsequent testing. The root cause investigation determined that the installed valve material configuration (Inconel 625 retainer and Inconel 625 plug) was subject to galling. Inconel retainers had been installed into these valves in 1994 and 1995. An inadequate analysis of the material change by the engineering organization resulted in an improper material configuration being installed in the valves. Initial investigation identified a similar configuration in the Unit 1 E11-PDV-F068B valve; however, testing of this valve revealed normal run currents during stroking with no indication of binding.

The 2-E11-PDV-F068B and the 1-E11-PDV-F068A valves were repaired and returned to service. The 1-E11-PDV-F068B valve was refurbished with a hard-faced plug on October 12, 1995. CP&L is reviewing this event and developing a plan to assess previous practices for procurement of replacement parts. The valve failures identified in this report occurred during testing. CP&L's evaluation of this event determined that the valves would have passed the minimum design flow rate necessary for the valves to have performed their safety function up to the time of the test failures; however, CP&L is voluntarily reporting this event due to the potential significance of operating these valves for an extended period of time with improper materials installed.

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

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.3 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.

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		95	- 19 -	00	

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

TITLE

Improper Material Configuration Results in Inoperable RHR Service Water Valves

INITIAL CONDITIONS

Unit 1 and Unit 2 were operating at 100% power. Surveillance testing was in progress on the 2B Residual Heat Removal (RHR) Heat Exchanger Service Water (SW) Discharge Valve (2-E11-PDV-F068B).

EVENT NARRATIVE

On August 23, 1995, during performance of a periodic surveillance test, the Unit 2 B RHR Heat Exchanger Service Water Discharge Valve (2-E11-PDV-F068B) failed to stroke fully closed after having been stroked fully open. The valve plug was found seized in the valve retainer. The Unit 1 E11-PDV-F068A valve also failed to stroke fully closed during subsequent testing after having been stroked fully open.

CAUSE OF EVENT

The RHR Service Water F068 valves are 16" by 20" Valtek Mark I, 6-stage channelstream valves with an SMB-2 Limitorque actuator. CP&L disassembled the bound valves and found the valve plug seized in the retainer. Galling was evident between the plug face and the retainer. The retainer basket and plug for both of the failed valves were constructed of Inconel 625 material.

In August of 1992, to eliminate erosion concerns with the original valve retainers, engineering approved a specification waiver which allowed for a change in the retainer material from nickel-aluminum bronze to Inconel 625. The Inconel retainer baskets were installed in the Unit 1 F068B valve in June of 1993, the Unit 2 F068B valve in April 1994, and the Unit 1 F068A valve in April 1995. The Unit 2 F068A valve was not modified.

During the event investigation, CP&L engineers identified that the valve retainer and plug material were of the same hardness. This finding led CP&L to conclude that the galling was due to an incorrect material configuration. The valve vendor was contacted and confirmed that the installed material configuration (Inconel 625 retainer and Inconel 625 plug) was subject to galling. The vendor stated that Inconel 625 retainers should be installed with hard faced plugs to prevent galling.

CP&L's investigation into the valve failures determined that CP&L reviews of the recommended retainer material change had concentrated on the suitability of the material for fluid environment, erosion resistance, and effects on pipe stresses. The cause of the valve binding is attributed to an inadequate analysis of a proposed material change by the CP&L engineering organization. This inadequate analysis resulted in an inconel valve retainer being installed into the F068 valves without also installing a hardened plug.

**LICENSEE EVENT REPORT (LER)
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CORRECTIVE ACTIONS

The 1-E11-PDV-F068A and 2-E11-PDV-F068B valves were re-assembled with Nickel-Aluminum-Bronze retainers and Inconel 625 plugs. Initial investigation identified a similar improper material configuration existed in the Unit 1 E11-PDV-F068B valve; however, testing of this valve revealed normal run currents during stroking with no indication of binding. An Engineering Service Request (ESR 95-01395) evaluation determined the Unit 1 F068B valve was operable. On October 12, 1995, a new hard faced plug was installed in the 1-E11-PDV-F068B valve to preclude galling. A refurbished Inconel retainer was also installed in this valve.

CP&L expanded the event investigation and formed a team with support from the corporate Nuclear Engineering organization to review this event and assess previous practices with respect to procurement of replacement parts. This review is complete and recommended corrective actions to prevent recurrence have been identified. CP&L is currently reviewing these recommended actions.

A third party engineering organization has completed a review to challenge the operability conclusion documented in ESR 95-01395. The reviewer confirmed the adequacy of BNP's failure mode evaluation and determined that valve 1-E11-PDV-F068B was fully functional.

SAFETY ASSESSMENT

The RHR SW F068 valves are used after an accident to regulate SW flow through the RHR system heat exchanger for suppression pool cooling or containment spray. Under normal operating conditions, the valves are closed. Design flow for these valves is 8,000 gpm. Diagnostic testing indicates that these valves reach design flow at approximately 50% open.

The valve failures identified in this report occurred during testing. The test had stroked the Unit 1 F068A valve from the closed to the fully open position. During the stroke test, the valve fully opened and subsequently failed during the closing stroke. The evidence indicates that galled material built up between the valve plug and basket during the closing stroke, resulting in the valve binding. The Unit 2 F068B valve bound up on the upper end of the valve's closing stroke after having also been stroked fully open during testing.

Based on the observed damage in the valves, CP&L believes that the galling failures would have only occurred during a full stroking of the valves. These valves are only subjected to full stroke operation during testing. Since these valves are required to stroke to approximately 50% open during design basis conditions, CP&L concluded that the Unit 1 F068A and Unit 2 F068B valves would have performed their intended safety function and were operable up to the full stroke testing which resulted in the galling failures. Since the valves would have performed their intended safety function, and the redundant valve for each unit was operable, the safety significance of this event is considered to be minimal.

CP&L's initial investigation concluded that the improper material configuration was likely present in the Unit 1 F068B valve. CP&L completed run-current testing and an operability evaluation for this valve on August 31, 1995. CP&L also initiated compensatory measures to ensure continued operability of the Unit 1 F068B valve. On October 12, 1995, while installing a hard-faced plug into the Unit 1 F068B valve to eliminate the improper material issue, CP&L confirmed that an Inconel retainer was

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installed in that valve. Although the valve had some indication of galling on October 12, there was no indication of binding on run-current traces which were performed just prior to dismantling the valve. The valve plug was subsequently replaced with a hard-faced plug, a refurbished retainer installed, and the valve returned to service.

The October 12, 1995 material condition of the Unit 1 F068B valve and the pre-repair full stroke test confirmed CP&L's earlier determination that the Unit 1 F068B valve continued to be operable with the improper material installed. Due to the potential significance of operating these valves for an extended period of time with improper material, CP&L is voluntarily issuing this report. In addition to this voluntary LER, CP&L issued an Operating Experience Report on September 14, 1995 to inform the industry of this issue.

PREVIOUS SIMILAR EVENTS

No previous LERs involving material procurement issues were identified.

EIIS COMPONENT IDENTIFICATION

System/Component

EIIS Code

Residual Heat Removal
Essential Service Water
E11-PDV-F068 Valve

BO
BI
BO/PDCV

Enclosure
List of Regulatory Commitments

The following table identifies those actions committed to by Carolina Power & Light Company in this document. Any other actions discussed in the submittal represent intended or planned actions by Carolina Power & Light Company. They are described to the NRC for the NRC's information and are not regulatory commitments. Please notify the Manager-Regulatory Affairs at the Brunswick Nuclear Plant of any questions regarding this document or any associated regulatory commitments.

Commitment	Committed date or outage
NONE	