



Carolina Power & Light Company
P.O. Box 10429
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June 1, 1999

10 CFR 50.73

SERIAL: BSEP 99-0088

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

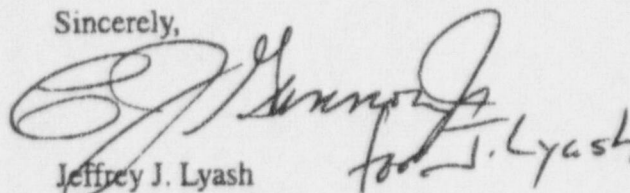
BRUNSWICK STEAM ELECTRIC PLANT, UNIT NO. 2
DOCKET NO. 50-324
LICENSE NO. DPR-62
LICENSEE EVENT REPORT 2-99-004

Gentlemen:

In accordance with the Code of Federal Regulations, Title 10, Part 50.73, Carolina Power & Light Company submits the enclosed Licensee Event Report. This report fulfills the requirement for a written report within thirty (30) days of a reportable occurrence. No regulatory commitments are contained in this submittal.

Please refer any questions regarding this submittal to Mr. Keith R. Jury, Manager - Regulatory Affairs, at (910) 457-2783.

Sincerely,



Jeffrey J. Lyash
Plant General Manager
Brunswick Steam Electric Plant

CRE/cre

Enclosure: Licensee Event Report

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Document Control Desk
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cc (with enclosure):

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NRC FORM 366 U.S. NUCLEAR REGULATORY COMMISSION (6-1998)										APPROVED BY OMB NO. 3150-0104 EXPIRES 06/30/2001 Estimated burden per response to comply with this mandatory information collection request: 50 hrs. Reported lessons learned are incorporated into the licensing process and fed back to industry. Forward comments regarding burden estimate to the Records Management Branch (T-6 F33), 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. If an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.									
LICENSEE EVENT REPORT (LER) (See reverse for required number of digits/characters for each block)																			
FACILITY NAME (1) Brunswick Steam Electric Plant (BSEP), Unit No. 2										DOCKET NUMBER (2) 05000 324					PAGE (3) 1 OF 4				
TITLE (4) Reactor Recirculation System Bypass Valve Inoperability Results in Operation Prohibited by Technical Specifications																			
EVENT DATE (5)			SERIAL 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	02	1999	1999	004	00	06	01	1999	FACILITY NAME					DOCKET NUMBER					
OPERATING MODE (9)		5		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR (Check one or more) (11)															
POWER LEVEL (10)		0		20.2201(b)			20.2203(a)(2)(v)			<input checked="" type="checkbox"/> 50.73(a)(2)(i)					50.73(a)(2)(viii)				
				20.2203(a)(1)			20.2203(a)(3)(i)			50.73(a)(2)(ii)					50.73(a)(2)(x)				
				20.2203(a)(2)(i)			20.2203(a)(3)(ii)			50.73(a)(2)(iii)					73.71				
				20.2203(a)(2)(ii)			20.2203(a)(4)			50.73(a)(2)(iv)					OTHER				
				20.2203(a)(2)(iii)			50.36(c)(1)			50.73(a)(2)(v)					Specify in Abstract below or in NRC Form 366A				
				20.2203(a)(2)(iv)			50.36(c)(2)			50.73(a)(2)(vii)									
LICENSEE CONTACT FOR THIS LER (12)																			
NAME Charles R. Elberfeld, Senior Analyst - Regulatory Affairs										TELEPHONE NUMBER (include Area Code) (910) 457-2136									
COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)																			
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX
B	AD	ISV	Anchor/Darling Valve Company	Y															
SUPPLEMENTAL REPORT EXPECTED (14)										EXPECTED					MONTH DAY YEAR				
YES (If yes, complete EXPECTED SUBMISSION DATE).										<input checked="" type="checkbox"/> NO									
ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)																			
<p>On May 2, 1999, based on the results of inspection of the internals of the "B" loop Reactor Recirculation system pump discharge bypass valve 2-B32-F032B, it was determined that the valve had previously been inoperable for an extended period. The Low Pressure Coolant Injection (LPCI) "B" subsystem is considered to be inoperable in accordance with Technical Specifications (TS) Limiting Condition for Operation (LCO) 3.5.1 when valve 2-B32-F032B is inoperable and open. Due to previous extended periods of LPCI "B" inoperability, LCO 3.5.1 Required Action Completion Times were exceeded.</p> <p>The cause of the event is attributed to a combination of valve internal component tolerances and a missing wedge spring. This established a condition in which pre-wedging could occur, causing the valve electrical circuit to trip on thermal overloads before the valve could complete its full stroke in the closed direction.</p> <p>Valve 2-B32-F032B and its motor-operated actuator were inspected, rebuilt, and tested in accordance with plant procedures, prior to returning the valve to service. Maintenance histories of valve 2-B32-F032A and the two corresponding valves on Unit No. 1 were reviewed to verify that there were no similar failures. This condition is being reported in accordance with 10 CFR 50.73(a)(2)(i)(B), as a condition that resulted in operation prohibited by the plant's TS.</p>																			

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(6-1998)

U.S. NUCLEAR REGULATORY COMMISSION

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

Energy Industry Identification System (EIIIS) codes are identified in the text as [XX].

INTRODUCTION

On May 2, 1999, based on the results of inspection of the internals of the "B" loop Reactor Recirculation system [AD] pump discharge bypass valve [ISV] (i.e., 2-B32-F032B), manufactured by Anchor/Darling Valve Company, Model No. S150WDD, it was determined that the valve had previously been inoperable for an extended period. The Low Pressure Coolant Injection (LPCI) "B" subsystem [BO] is considered to be inoperable in accordance with Technical Specifications (TS) Limiting Condition for Operation (LCO) 3.5.1 when valve 2-B32-F032B is inoperable and open. Due to previous extended periods of LPCI "B" inoperability, LCO 3.5.1 Required Action C.1 and C.2 Completion Times were exceeded. Additionally, LCO 3.0.4 was not met during these previous periods. At the time of the determination, Unit No. 2 was in a refueling outage with the fuel removed from the reactor pressure vessel. This condition is being reported in accordance with 10 CFR 50.73(a)(2)(i)(B), as a condition that resulted in operation prohibited by the plant's TS.

EVENT DESCRIPTION

On March 29, 1999, Unit No. 2 was shutdown by an automatic Reactor Protection system actuation as documented in LER 2-99-002. As part of the restart activities, TS Surveillance Requirement (SR) 3.5.1.5 was performed on valve 2-B32-F032B, to verify that the valve cycled through one complete cycle of full travel. On March 29, 1999, at approximately 1926 hours, valve 2-B32-F032B tripped on thermal overloads while being stroked closed. On March 30, 1999, the valve was mechanically closed and de-energized. The plant was subsequently returned to power operation until April 17, 1999, when Unit No. 2 was shutdown for its scheduled refueling outage.

During the refueling outage, the actuator for valve 2-B32-F032B was disassembled and no problems were identified. The rebuild of the actuator included installation of a new motor. On May 2, 1999, the valve itself was disassembled and inspected. The internal inspection revealed that the wedge spring and spring plate were not installed in the valve. No damage of consequence to the valve internals was identified. Based on the internal inspection results and the valve performance history, the previous operability of the valve was put into question. New internal valve parts (e.g., upper and lower wedges, stem, wedge spring, spring plate, and discs) were installed in the valve, the valve was reassembled, tested in accordance with plant procedures, and returned to service at approximately 1714 hours, on May 10, 1999.

EVENT CAUSE

The cause of the event is attributed to a combination of valve internal component tolerances and the missing wedge spring/spring plate. This established a condition in which pre-wedging could occur, causing the valve

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electrical circuit to trip on thermal overloads before the valve could complete its full stroke in the closed direction. Valve 2-B32-F032B is a motor-operated, four inch, double-disc gate valve with its gate oriented horizontally in a vertical run of piping.

With the valve gate oriented horizontally, and no wedge spring installed, the valve was susceptible to frictional forces on the discs, associated with valve internal dimensions, causing premature expansion of the disc pack (i.e., pre-wedging). The pre-wedging condition resulted in the valve internals resisting the closing forces imposed by the motor-operated actuator until the associated electrical circuit tripped on thermal overloads, thus preventing the valve from going fully closed.

Both valve 2-B32-F032B and the "A" loop Reactor Recirculation system pump discharge bypass valve (i.e., 2-B32-F032A) were last disassembled by the vendor in October 1989, for stem packing modifications. Documentation in the modification package did not address installation of the wedge spring and spring plate although the disc pack was removed for each valve. Due to the construction of the disc pack, it is not believed that the wedge spring and the spring plate could have come out of position and entered the Reactor Recirculation system once the disc pack was installed in the valve.

Since the last disassembly, valve 2-B32-F032B has failed to close and tripped on thermal overloads, three times, i.e., August 1990, August 1998, and March 1999. In August 1990, and in August 1998, the valve was successfully stroked numerous times after each occurrence and the failure was attributed to internal binding in the valve that was "polished away" by the stroking of the valve. For each of these two occurrences, the valve was declared operable and returned to service. On March 29, 1999, when the valve failed to stroke closed, the valve was declared inoperable and maintained closed until it could be disassembled and inspected. Valve 2-B32-F032A has not failed to stroke upon demand since it was last disassembled in 1989.

The corresponding valves on Unit No. 1 were not modified, and have also not displayed any performance problems such as those associated with valve 2-B32-F032B.

CORRECTIVE ACTIONS

Valve 2-B32-F032B and its motor-operated actuator were inspected, rebuilt, and tested in accordance with plant procedures, prior to returning the valve to service.

Maintenance histories of valve 2-B32-F032A and the two corresponding valves on Unit No. 1 were reviewed to verify that there were no similar failures. Based on the results of this review, it was determined that internal inspections of these valves were not needed.

A review will be conducted to identify and evaluate any valves of similar design and installation configuration, and to determine if any additional corrective actions are necessary.

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SAFETY ASSESSMENT

The safety significance of this event is considered to be minimal. The TS Bases for SR 3.5.1.5 states, in part, "Cycling the recirculation pump discharge and bypass valves through one complete cycle of full travel demonstrates that the valves are mechanically OPERABLE and will close when required. Upon initiation of an automatic LPCI subsystem injection signal, these valves are required to be closed to ensure full LPCI subsystem flow injection in the Reactor Pressure Vessel (RPV). De-energizing the valves in the closed position will also ensure the proper flow path for the LPCI subsystem. ...If the valve is inoperable and in the open position, the associated LPCI subsystem must be declared inoperable."

Due to the identified cause and random nature of the failure of the valve, conservatively and retrospectively, valve 2-B32-F032B could not be depended upon to close when required, and as such, was inoperable. The plant has been operated for extended periods since 1989 with valve 2-B32-F032B inoperable and open, which also means that the LPCI "B" subsystem was inoperable, for TS LCO 3.5.1 purposes.

However, according to plant Calculation # 2B32-0007, "Reactor Recirculation Pump Bypass Line Flow," the maximum expected flow through the bypass line, should valve 2-B32-F032B fail to close during an accident condition, is approximately 1,173 gallons per minute. This flow diversion would have minimal negative effect on the required amount of LPCI flow to the RPV in the event of an accident. LPCI flow testing has consistently demonstrated that there is an approximate 3,000 gallons per minute margin above the TS required flow for the LPCI "B" subsystem. Therefore, it is expected that the LPCI "B" subsystem could have performed its required functions, when needed, during the period of valve 2-B32-F032B inoperability.

PREVIOUS SIMILAR EVENTS

No previous similar events have been identified.

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Fax

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