



Progress Energy

JUN 14 2005

SERIAL: BSEP 05-0052

10 CFR 50.73

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

Subject: Brunswick Steam Electric Plant, Unit No. 1
Docket No. 50-325/License No. DPR-71
Licensee Event Report 1-2005-002

Gentlemen:

In accordance with the Code of Federal Regulations, Title 10, Part 50.73, Carolina Power & Light Company, now doing business as Progress Energy Carolinas, Inc., submits the enclosed Licensee Event Report. This report fulfills the requirement for a written report within sixty (60) days of a reportable occurrence.

Please refer any questions regarding this submittal to Mr. Edward T. O'Neil, Manager – Support Services, at (910) 457-3512.

Sincerely,

David H. Hinds
Plant General Manager
Brunswick Steam Electric Plant

CRE/cre

Enclosure: Licensee Event Report

Progress Energy Carolinas, Inc.
Brunswick Nuclear Plant
P.O. Box 10429
Southport, NC 28461

cc (with enclosure):

U. S. Nuclear Regulatory Commission, Region II
ATTN: Dr. William D. Travers, Regional Administrator
Sam Nunn Atlanta Federal Center
61 Forsyth Street, SW, Suite 23T85
Atlanta, GA 30303-8931

U. S. Nuclear Regulatory Commission
ATTN: Mr. Eugene M. DiPaolo, NRC Senior Resident Inspector
8470 River Road
Southport, NC 28461-8869

U. S. Nuclear Regulatory Commission
ATTN: Ms. Brenda L. Mozafari (Mail Stop OWFN 8G9) **(Electronic Copy Only)**
11555 Rockville Pike
Rockville, MD 20852-2738

Ms. Jo A. Sanford
Chair - North Carolina Utilities Commission
P.O. Box 29510
Raleigh, NC 27626-051

LICENSEE EVENT REPORT (LER)

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

Estimated burden per response to comply with this mandatory information collection request: 50 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records and FOIA/Privacy Service Branch (T-5 F52), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infoclocks@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NE08-10202 (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose 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.

1. FACILITY NAME Brunswick Steam Electric Plant (BSEP), Unit 1		2. DOCKET NUMBER 05000325	3. PAGE 1 OF 5
---	--	------------------------------	-------------------

4. TITLE
Reactor Core Isolation Cooling System Manual Actuation During Plant Shutdown

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
04	15	2005	2005	-- 002 --	00	06	14	2005	FACILITY NAME	DOCKET NUMBER 05000
									FACILITY NAME	DOCKET NUMBER 05000

9. OPERATING MODE 3	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more)										
	<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.73(a)(2)(f)(C)	<input type="checkbox"/> 50.73(a)(2)(vii)							
10. POWER LEVEL 000	<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)							
	<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.73(a)(2)(ii)(B)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)							
	<input type="checkbox"/> 20.2203(a)(2)(i)	<input type="checkbox"/> 50.36(c)(1)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)(A)							
	<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input checked="" type="checkbox"/> 50.73(a)(2)(iv)(A)	<input type="checkbox"/> 50.73(a)(2)(x)							
	<input type="checkbox"/> 20.2203(a)(2)(iii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(v)(A)	<input type="checkbox"/> 73.71(a)(4)							
	<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.46(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(v)(B)	<input type="checkbox"/> 73.71(a)(5)							
	<input type="checkbox"/> 20.2203(a)(2)(v)	<input type="checkbox"/> 50.73(a)(2)(f)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(C)	OTHER Specify in Abstract below or in NRC Form 366A							
	<input type="checkbox"/> 20.2203(a)(2)(vi)	<input type="checkbox"/> 50.73(a)(2)(f)(B)	<input type="checkbox"/> 50.73(a)(2)(v)(D)								

12. LICENSEE CONTACT FOR THIS LER

FACILITY NAME Charles R. Elberfeld, Lead Engineering Technical Support Specialist	TELEPHONE NUMBER (Include Area Code) (910) 457-2136
--	--

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX
B	SJ	FCV	Fisher	Y	B	SJ	ISV	Crane	Y

14. SUPPLEMENTAL REPORT EXPECTED				15. EXPECTED SUBMISSION DATE			MO	DAY	YEAR
YES (If yes, complete EXPECTED SUBMISSION DATE).				X	NO				

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

On April 15, 2005, at approximately 2200 hours, as part of a pre-planned sequence of events, Unit 1 control room operators manually inserted a Reactor Protection system trip to shut down the reactor from approximately 23 percent of rated thermal power to begin a planned maintenance outage. At 2222 hours, the Reactor Core Isolation Cooling (RCIC) system was manually started to maintain reactor pressure vessel (RPV) coolant level after the 1A and 1B Reactor Feedwater Pumps (RFPs) could not be restarted to maintain level. The RCIC system started and maintained RPV coolant level until the 1A RFP could be returned to service.

The cause of the event is attributed to coincident failures of the 1A RFP Minimum Flow Valve and the 1B RFP Suction Valve to reposition upon demand and provide start permissives to the associated RFP start logic. The 1A RFP Minimum Flow Valve was repaired by replacing galled internal parts, most likely caused by the presence of foreign material in the system. Replacement of RFP suction flange gaskets will remove the suspected source of the foreign material. The 1B RFP Suction Valve, a motor-operated gate valve, would not open due to the setting of the open torque switch bypass allowing the open torque switch to stop the motor before the gate could unwedge from its seat. Torque switch bypass adjustment and procedure changes will prevent recurrence. The safety significance of this occurrence is considered minimal.

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET (2)	LER NUMBER (6)			PAGE (3)
Brunswick Steam Electric Plant (BSEP), Unit 1	05000325	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	2 OF 5
		2005	-- 002	-- 00	

NARRATIVE (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 April 15, 2005, at approximately 2200 hours, as part of a pre-planned sequence of events, Unit 1 control room operators manually inserted a Reactor Protection system [JC] (RPS) trip to shut down the reactor from approximately 23 percent of rated thermal power (RTP) to begin a planned maintenance outage. At 2222 hours, the Reactor Core Isolation Cooling [BN] (RCIC) system was manually started to maintain reactor pressure vessel (RPV) coolant level after the 1A and 1B Reactor Feedwater [SJ] Pumps (RFPs) [P] could not be restarted to maintain level. At the time of the event, the plant was in Mode 3 (i.e., Hot Shutdown) at zero percent of RTP. The use of the RCIC system was not pre-planned; therefore, this event is being reported in accordance with 10 CFR 50.73(a)(2)(iv)(A) as an event that resulted in manual or automatic actuation of the RCIC system.

EVENT DESCRIPTION

On April 15, 2005, at 1630 hours, activities commenced to shut down Unit 1 from 100 percent of RTP to implement a planned maintenance outage. At 1724 hours, with RTP at approximately 59 percent, the 1B RFP was secured and the suction valve [ISV] was closed in accordance with plant procedures. By 2200 hours, RTP was reduced to approximately 23 percent, and control room operators manually inserted a RPS trip. All control rods fully inserted. An expected RPV coolant level shrink resulted in the coolant level decreasing below the Low Level 1 setpoint, which resulted in a Primary Containment Isolation System (PCIS) isolation signal to Group 2 (i.e., Drywell Equipment and Floor Drain, Traversing In-core Probe, Residual Heat Removal (RHR) Discharge to Radwaste, and RHR Process Sample) primary containment isolation valves (PCIVs), Group 6 (i.e., Containment Atmosphere Control/Dilution, Containment Atmosphere Monitoring, and Post Accident Sampling System) PCIVs, and Group 8 (i.e., RHR Shutdown Cooling Suction and RHR Inboard Injection) PCIVs. The isolation signal closed all of the PCIVs that were open at the time of the expected actuation. Other affected plant equipment and systems responded as designed. After the expected coolant level shrink, reactor coolant level increased, as expected, above the RFP high level trip setpoint, and the 1A RFP tripped.

At 2204 hours, operators placed the Mode Switch in the "Shutdown" position and reset the RPS trip. At 2216 hours, operators noted that the 1A RFP minimum flow valve [FCV] (i.e., 1-FW-FV-46) (i.e., Manufacturer: Fisher, Model Number: EWT-8X4) failed to stroke fully open, preventing the 1A RFP from starting and maintaining RPV coolant level. Additionally, the 1B RFP suction valve (i.e., 1-COD-V50) (i.e., Manufacturer: Crane, Model Number: 33-1/2XC-20") failed to stroke fully open, preventing the 1B RFP from starting. Instrumentation and Controls (I&C) technicians were directed to investigate the problems. At 2218 hours, the PCIS Groups 2, 6, and 8 isolation signal was reset. At 2222 hours, operators manually started the RCIC system to maintain RPV coolant level. At 2232 hours, RHR loop B was placed in the Suppression Pool Cooling mode of operation.

By 2252 hours, the 1-FW-FV-46 valve was opened and the 1A RFP was placed in service. At 2259 hours, the RCIC system was secured. At 2324 hours, General Plant Operating Procedure, OGP-05, "Unit Shutdown," was entered to continue the Unit 1 shutdown activities.

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET (2)	LER NUMBER (6)			PAGE (3)
Brunswick Steam Electric Plant (BSEP), Unit 1	05000325	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	3 OF 5
		2005	-- 002	-- 00	

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

EVENT DESCRIPTION (continued)

Initially, operators on shift concluded that the event was not reportable, and did not make a notification to the NRC operations center. Subsequent review of the event, days later, determined that the conditions met the reporting criteria of 10 CFR 50.72(b)(3)(iv)(A) (i.e., 8-hour non-emergency report for a valid RCIC system actuation) as well as 10 CFR 50.73(a)(2)(iv)(A) (i.e., 60-day LER).

EVENT CAUSE

The cause of the event is attributed to coincident failures of the 1A RFP Minimum Flow Valve and the 1B RFP Suction Valve to reposition upon demand and provide start permissives to the associated RFP start logic. This resulted in the manual actuation of the RCIC system to maintain RPV coolant level until the Reactor Feedwater system could be restarted. Each valve failure is discussed separately.

1-FW-FV-46, 1A RFP Minimum Flow Valve

Valve 1-FW-FV-46 is an air-operated valve that uses a plug and cage assembly. Subsequent inspection of the valve revealed galling damage between the plug and cage assembly which prevented the valve from stroking fully open and providing a start permissive to the 1A RFP start logic. The most likely cause of this galling was foreign material lodging between the plug and cage assembly, reducing the clearance between the two assemblies and initiating the galling process. Although foreign material was not found during disassembly, it is possible that when the valve was stroked in an attempt to open it, during the event, the foreign material was flushed down stream. A small piece of foreign material lodged between the cage and plug assembly can eliminate the clearance and initiate galling. Inspection of the gall damage patterns on the cage and plug supports this conclusion. The most likely source of foreign material was from degraded RFP suction flange gaskets. Degradation of the gaskets is caused by radial buckling of the gasket material into the flow path. Degraded RFP suction flange gaskets were previously discovered on Unit 2 and gaskets of a different design were installed on Unit 2 to prevent further intrusion. Other causes of galling considered, but not identified as primary, were assembly of the valve, material compatibility, machined tolerances, and flow induced failure.

1-COD-V50, 1B RFP Suction Valve

Valve 1-COD-V50 is a motor-operated solid disk gate valve. When I&C technicians initially investigated the cause of failure, it was determined that the motor operator thermal overloads were not tripped, and that the operator was stopped by the opening torque switch before the operator could remove the gate from the valve seat. A characteristic of gate valves is an initial requirement for the disk to unwedge from the seat when traveling in the open direction. This requires a short duration of increased tensile stem thrust, which reduces to packing load thrust values after unwedging. The required thrust may be exacerbated by thermal changes in the valve (i.e., the thrust required to open the valve may be greater if the valve is closed hot, cools, and then is called upon to reopen). The open direction motor control circuit contains an initial torque switch bypass so that the control circuit does not open prematurely during unwedging.

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET (2)	LER NUMBER (6)			PAGE (3)
Brunswick Steam Electric Plant (BSEP), Unit 1	05000325	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	4 OF 5
		2005	-- 002	-- 00	

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

EVENT CAUSE (continued)

The valve was closed by operators approximately five hours prior to attempting to reopen during the event. This allowed the valve to cool and resulted in thermal binding of the valve internals as discussed above. The setting of the torque switch bypass did not accommodate operation of the valve under the conditions present during the event.

CORRECTIVE ACTIONS

1-FW-FV-46, 1A RFP Minimum Flow Valve

1. Valve internals (i.e., the plug and cage assembly) were replaced and the valve bonnet surface machined due to an uneven mating surface. The valve was tested and returned to service.
2. To minimize chances of recurrence, Unit 1 RFP suction flange gaskets will be replaced with a different design that prevents radial buckling. This action is scheduled to be completed by the end of the next refuel outage (i.e., April 27, 2006). The Unit 2 gaskets have already been replaced.
3. A design change will be implemented for both the 1A and 1B RFP Minimum Flow Valves to replace the valve internals with those made of a more gall-resistant material. This action is scheduled to be completed by the end of the next refuel outage (i.e., April 27, 2006). The Unit 2 valves have already been modified.

1-COD-V50, 1B RFP Suction Valve

After initial investigation, the system/valve temperatures stabilized before additional troubleshooting was performed on the valve. The valve and motor operator then performed satisfactorily. No corrective actions were performed on the valve at that time, and the valve was returned to service.

1. To prevent recurrence, the open torque switch bypass setting for the Unit 1 (i.e., 1A and 1B) and Unit 2 (i.e., 2A and 2B) RFP Suction Valves will be adjusted to ensure that the unwedging of each valve is completed before its open torque switch is unbypassed. These actions are scheduled to be completed by the end of the next refuel outage (i.e., April 27, 2006, for Unit 1, and April 26, 2007, for Unit 2).
2. Steps had previously been placed in operating procedures 1OP-32 and 2OP-32, "Condensate and Feedwater System Operating Procedure," to isolate (i.e., close the RFP Suction Valve) a recently shutdown RFP from condensate system pressure to minimize seal leakage and prevent oil contamination. The steps in these procedures will be removed until the associated RFP Suction Valve open torque switch bypass settings have been readjusted. These procedure changes are scheduled to be implemented by July 13, 2005.

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET (2)	LER NUMBER (6)			PAGE (3)
Brunswick Steam Electric Plant (BSEP), Unit 1	05000325	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	5 OF 5
		2005	-- 002	-- 00	

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

CORRECTIVE ACTIONS (continued)

Missed NRC Notification

Upon discovery that the 8-hour notification requirement of 10 CFR 50.72(b)(3)(iv)(A) for the RCIC system actuation was not met, the resident inspector was informed and a Nuclear Condition Report (NCR) was written to address the issue through the corrective action program. Individuals were coached and reviewed the appropriate guidance in plant procedures and NUREG-1022, "Event Reporting Guidelines 10 CFR 50.72 and 50.73," Revision 2. Training for all licensed operators on this event is scheduled to be completed by November 9, 2005.

SAFETY ASSESSMENT

The safety significance of this occurrence is considered minimal. The RCIC system is designed to operate either automatically or manually following RPV isolation, accompanied by a loss of normal coolant flow from the Reactor Feedwater system, to provide adequate core cooling, and control of the RPV coolant level. The function of the RCIC system is to respond to transient events by providing makeup coolant to the reactor. For this event, the RPV was not isolated, but there was a loss of normal coolant flow from the Reactor Feedwater system. The RCIC system was manually started and successfully controlled RPV coolant level for approximately 37 minutes until Reactor Feedwater system flow could be restored to the RPV. All emergency core cooling systems were operable and ready for use, if needed, during this event. This transient is bounded by the analyses in the Updated Final Safety Analysis Report.

PREVIOUS SIMILAR EVENTS

LER 1-2003-001 documented a January 12, 2003, event in which loss of Reactor Feedwater flow to the RPV resulted in a RPS trip without RPV isolation and the subsequent manual starting of the RCIC system to maintain RPV coolant level. The cause of the event was attributed to RFP Turbine 1B trip due to lube oil pressure issues. None of the associated corrective actions would be reasonably expected to prevent the event documented herein.

NCR 124054 documented an April 9, 2004, failure of 1-FW-FV-46 during power ascension due to galling between the plug and cage assembly. The plug and cage assembly were replaced and the valve returned to service. This failure did not result in a reportable event. The cause of the galling could not be determined; however, foreign material initiation of the galling could not be ruled out. The problem with radial buckling of installed gaskets causing the presence of foreign material had not yet been identified.

COMMITMENTS

No regulatory commitments are contained in this report. Those actions discussed in this submittal will be implemented in accordance with corrective action program requirements.