



George T. Hamrick
Vice President
Brunswick Nuclear Plant

Duke Energy Progress
P.O. Box 10429
Southport, NC 28461
o: 910.457.3698

10 CFR 50.73

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Serial: BSEP 13-0077

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

Subject: Brunswick Steam Electric Plant, Unit No. 2
Docket No. 50-324
Licensee Event Report 2-2013-003

In accordance with the Code of Federal Regulations, Title 10, Part 50.73, Duke Energy Progress, Inc., formerly known as Carolina Power & Light Company (CP&L) submits the enclosed Licensee Event Report (LER). 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. Lee Grzeck, Manager – Regulatory Affairs, at (910) 457-2487.

Sincerely,

George Hamrick

SWR/swr

Enclosure: Licensee Event Report

JE22
NRR

cc (with enclosure):

U. S. Nuclear Regulatory Commission, Region II
ATTN: Mr. Victor M. McCree, Regional Administrator
245 Peachtree Center Ave, NE, Suite 1200
Atlanta, GA 30303-1257

U. S. Nuclear Regulatory Commission
ATTN: Ms. Michelle P. Catts, NRC Senior Resident Inspector
8470 River Road
Southport, NC 28461-8869

U. S. Nuclear Regulatory Commission
ATTN: Mr. Christopher Gratton (Mail Stop OWFN 8G9A)
11555 Rockville Pike
Rockville, MD 20852-2738

Chair - North Carolina Utilities Commission
P.O. Box 29510
Raleigh, NC 27626-0510

LICENSEE EVENT REPORT (LER)

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

1. FACILITY NAME Brunswick Steam Electric Plant (BSEP), Unit 2	2. DOCKET NUMBER 05000324	3. PAGE 1 of 4
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4. TITLE
Machining Surface Leads to Setpoint Drift in Main Steamline Safety/Relief Valves

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
05	21	2013	2013 - 003 - 00			07	22	2013	FACILITY NAME	DOCKET NUMBER

9. OPERATING MODE 1	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)									
	<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.73(a)(2)(i)(C)	<input type="checkbox"/> 50.73(a)(2)(vii)						
10. POWER LEVEL 100	<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 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)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(C)	<input type="checkbox"/> OTHER							
<input type="checkbox"/> 20.2203(a)(2)(vi)	<input checked="" type="checkbox"/> 50.73(a)(2)(i)(B)	<input type="checkbox"/> 50.73(a)(2)(v)(D)	Specify in Abstract below or in NRC Form 366A							

12. LICENSEE CONTACT FOR THIS LER

FACILITY NAME Stephen Reed, Senior Engineer - Licensing	TELEPHONE NUMBER (Include Area Code) (910) 457-7927
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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
D	SB	SRV	Target Rock	No					

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

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

On May 21, 2013, the Brunswick Steam Electric Plant as-found testing of 11 safety/relief valves (SRVs) which had been removed from Unit 2 during the spring 2013 refueling outage was completed. The testing indicated that four of the 11 valves were found to lift at more than 3 percent above their Technical Specifications required setpoints. Therefore, these four valves were determined to have been inoperable while the unit was in operation. Since Technical Specification 3.4.3, "Safety/Relief Valves," requires at least 10 of the 11 valves to be operable, this condition is being reported in accordance with 10 CFR 50.73(a)(2)(i)(B) as operation prohibited by the plant's Technical Specifications.

The setpoint drift occurred because of less than optimum surface finish on SRV pilot discs which caused a loss of the platinum coating followed by corrosion bonding of the discs and seats. Surface finish requirements were known to the personnel who developed the platinum coating process, but these requirements were not included in the procedure used to refurbish the SRVs.

Corrective actions for this event include defining pilot disc conical seating surface finish requirements for platinum coating and revising the procedure used to control the SRV pilot valve machining process. The entire population of Unit 2 SRVs was replaced during the spring refueling outage with valves that had the correct surface finish on the pilots.

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NARRATIVE

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

Introduction

Initial Conditions

At the time the condition was found, Unit 2 was in Mode 1 at approximately 100 percent rated thermal power.

Reportability Criteria

Unit 2 Technical Specification (TS) 3.4.3 requires at least 10 of 11 main steam [SB] safety/relief valves (SRVs) to be operable. Per Surveillance Requirement (SR) 3.4.3.1, each valve is required to open within 3 percent of its opening setpoint. As-found testing of the valves indicated that four of the valves had lift setpoints greater than this amount and were therefore determined to have been inoperable when the unit was in operation. Consequently, the plant was operated in a condition which is prohibited by the TS; that is, with fewer than the required number of SRVs having lift setpoints within the 3 percent tolerance. Therefore, the condition is being reported per 10 CFR 50.73(a)(2)(i)(B) for operation in a condition prohibited by the TS.

Event Description

During the spring 2013 Unit 2 refueling outage, all 11 Model 7657F Target Rock Two-Stage pilot valve assemblies in the SRVs were replaced with certified spares. The removed SRV pilot valves were sent to Wyle Laboratories to determine the as-found set pressure. On May 21, 2013, the as-found testing was completed. The test results showed that four of the 11 valves actuated at pressures outside of the 3 percent tolerance allowed by Technical Specifications 3.4.3. The test data for the four valves found out of tolerance are shown below.

Valve Identification	TS Setpoint (psig)	As-Found Lift Pressure (psig)	Percent Difference
S/N 1201 2-B21-F013G	1130	1188	5.1
S/N 1083 2-B21-F013C	1130	1199	6.1
S/N 1095 2-B21-F013E	1140	1181	3.6
S/N 1091 2-B21-F013K	1140	1220	7.0

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Event Cause

The affected SRVs experienced setpoint drift because of corrosion bonding of the pilot disc to its seat. The SRVs are refurbished using a process that deposits a thin film of platinum on the surface of the pilot disc. A correctly prepared pilot disc has a very smooth machine finish. In the valves which experienced setpoint drift, the surface finish was left more coarse. Surface tension effects around sharp edges then tended to thin the coating as it was applied. This made certain regions more susceptible to loss of the platinum coating due to localized stresses imposed by contact with the seat. The loss of coating, in turn, allowed conditions to develop which were conducive to corrosion bonding.

The root cause of the event was omission of relevant information in a procedure or process. The need for a certain finish on the pilot valve surface was known to the personnel who first established the platinum coating process in 1993. The original process prepared the surface for platinum coating by using a certain sequence of polishing steps. However, these polishing steps were not explicitly stated as requirements for the surface preparation, and documentation did not identify that the required surface finish would be finer than what was previously required by the vendor for an uncoated valve disc. When BSEP began performing SRV maintenance in-house, the omission was carried forward, and surface finish requirements were not incorporated into the site procedure written in 2000 to control the work.

Safety Assessment

This event had no impact on nuclear safety. The as-found condition of the Unit 2 SRVs was compared to the cycle-specific analysis for Brunswick fuel cycle 20. That analysis assumes that of the four lowest pressure SRVs, one fails to open; two open at 6 percent above setpoint, one at 10 percent above setpoint, and the remaining seven at 3 percent above setpoint. The analysis bounds the as-found condition in which four valves opened at 3.6 percent, 5.1 percent, 6.1 percent and 7.0 percent above their setpoints, and all other valves were within their 3 percent tolerance. Therefore, the SRVs always remained capable of performing their safety function of preventing overpressurization of the reactor vessel.

Based on the foregoing analysis, it is concluded that this event had no impact on nuclear safety.

Corrective Actions

Any changes to the corrective actions and schedules noted below will be handled in accordance with the site's corrective action program.

The complete population of 11 Unit 2 SRV pilot valves was replaced with refurbished and certified spares during the spring 2013 refueling outage. All the spares had the correct surface finish on the discs.

To prevent recurrence, conical seating surface finish requirements will be defined by engineering, and these requirements will be incorporated into procedure OCM-VSR509, "Main Steam Relief Valves Target Rock Model 7567 Air Operators and Pilot Assembly, Disassembly, Inspection, and Reassembly," by August 8, 2013.

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Previous Similar Events

A review of LERs and corrective action program condition reports identified no previous similar occurrences within the past three years.

Commitments

No regulatory commitments are contained in this report.