



10 CFR 50.73

January 20, 2013

Serial: BSEP 13-0005

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 2-2011-001, Supplement 2

References

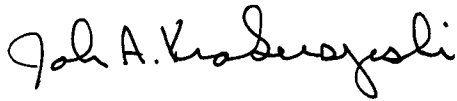
1. Brunswick Licensee Event Report (LER) 2-2011-001, "Condition Prohibited by Technical Specifications due to RWCU Instrumentation Inoperable," dated September 26, 2011 ADAMS Accession Number ML11277A025
2. Brunswick Licensee Event Report (LER) 2-2011-001, Supplement (Withdrawal), "Condition Prohibited by Technical Specifications due to RWCU Instrumentation Inoperable," dated November 20, 2011 ADAMS Accession Number ML11333A012
3. Brunswick Response to Integrated Inspection Report Nos.: 05000325/2011004 and 05000324/2011004, dated December 14, 2011 ADAMS Accession Number ML11356A087
4. NRC Letter dated November 20, 2012, "Response to Disputed Non-Cited Violation - Brunswick Steam Electric Plant - NRC Integrated Inspection Report Nos.: 05000325/2011004 and 05000324/2011004 Dated November 14, 2011," ADAMS Accession Number ML12326A721

On September 26, 2011, Carolina Power & Light Company (CP&L) submitted LER 2-2011-001 (i.e., Reference 1) in accordance with 10 CFR 50.73(a)(2)(i)(B). The LER reported a condition prohibited by Technical Specifications (TS) due to inoperable Reactor Water Cleanup (RWCU) system instrumentation, and that an evaluation was in progress to substantiate the operability of the RWCU instrumentation. On November 20, 2011, a supplement withdrawing LER 2-2011-001 (i.e., Reference 2) was submitted based on CP&L's conclusion that the RWCU system instrumentation was operable and no condition prohibited by TSs existed. This was followed, on December 14, 2011, by a CP&L submittal denying a licensee identified violation regarding this issue (i.e., Reference 3). In a letter dated November 20, 2012 (i.e., Reference 4), the NRC provided a determination that the RWCU system instrumentation was, in fact, inoperable. Based on this determination, CP&L submits the enclosed LER 2-2011-001, Supplement 2, in accordance with 10 CFR 50.73(a)(2)(i)(B).

IE22
NRR

Please refer any questions regarding this submittal to Mr. Lee Grzeck, Manager – Regulatory Affairs, at (910) 457-2487.

Sincerely,



John A. Krakuszeski
Plant Manager
Brunswick Steam Electric Plant

MAT/mat

Enclosure:

LER 2-2011-001, Supplement 2

cc (with enclosure):

U. S. Nuclear Regulatory Commission, Region II
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Atlanta, GA 30303-1257

U. S. Nuclear Regulatory Commission
ATTN: Ms. Michelle P. Catts, NRC Senior Resident Inspector
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U. S. Nuclear Regulatory Commission
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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 3
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4. TITLE
Condition Prohibited by Technical Specifications due to RWCU Instrumentation Inoperable

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
07	28	2011	2011 - 001 - 02			01	20	2013	FACILITY NAME	DOCKET NUMBER

9. OPERATING MODE 1	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: <i>(Check all that apply)</i>									
10. POWER LEVEL 100	<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)						
	<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 Mark Turkal, Lead Engineer - Licensing	TELEPHONE NUMBER (Include Area Code) (910) 457-3066
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13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX

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 July 28, 2011, a system data review identified that the Unit 2 Reactor Water Cleanup (RWCU) System inlet flow rate was reading approximately 18 percent lower than the system outlet flow rate. Investigation subsequently determined that the inlet flow was inaccurate because the flow orifice for the system inlet flow element, 2-G31-FE-N035, had been installed backwards during maintenance activities completed on March 20, 2011. It was concluded that the lower flow readings from the RWCU inlet flow instrumentation would result in non-conservatism and, subsequently, it has been determined that this non-conservatism resulted in the RWCU system isolation on Differential Flow-High (i.e., Technical Specifications Table 3.3.6.1-1, "Primary Containment Isolation Instrumentation," Function 5.a) being inoperable. This condition is being reported as an operation or condition prohibited by Technical Specifications. The safety consequences of this event were minimal.

This event was caused by inadequate work instructions, which did not illustrate or describe flow directional characteristics of the orifice. Additionally, the individual planning the work activity did not provide the rigor commensurate with the importance of the task being planned. Corrective actions were taken to reinstall the flow orifice in the correct orientation, enhance existing plant drawings associated with RWCU flow orifices, and reinforce expectations regarding work order development with work planners.

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

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
Brunswick Steam Electric Plant (BSEP), Unit 2	05000324	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	2 of 3
		2011 -- 001 -- 02			

NARRATIVE

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

Introduction

Initial Conditions

At the time of the event, Unit 2 was in Mode 1, at 100 percent of rated thermal power (RTP).

Reportability Criteria

Technical Specifications (TS) Table 3.3.6.1-1, "Primary Containment Isolation Instrumentation," [JM] Function 5.a (i.e., Differential Flow - High) is required to be operable in Modes 1, 2, and 3. Unit 2 entered Mode 2 on April 13, 2011, following the spring 2011, Unit 2 refueling outage and again on April 20, 2011, following a forced outage, with this function inoperable. This constitutes operation prohibited by Limiting Condition for Operation (LCO) 3.0.4. Additionally, with Function 5.a isolation capability not maintained, the Required Actions of TS 3.3.6.1 (i.e., Required Actions B.1, F.1, and H.1) would require the unit to be in Mode 3 within 14 hours. This shutdown requirement was not entered after both the refueling outage and the forced outage.

This event is being reported in accordance with 10 CFR 50.73(a)(2)(i)(B) as operation prohibited by the plant's TSs.

Event Description

On July 28, 2011, a system data review identified that the Unit 2 Reactor Water Cleanup (RWCU) System [CE] inlet flow rate was reading approximately 18 percent lower than the system outlet flow rate, with no reject flow. It was subsequently determined that the inlet flow was inaccurate because the flow orifice for the system inlet flow element, 2-G31-FE-N035, had been installed backwards on March 20, 2011.

Historical RWCU system flow data was reviewed and it was determined that the discrepancy in the RWCU inlet flow readings initially occurred during the spring 2011 refueling outage. A review of maintenance history identified that the flow orifices for the 2-G31-FE-N035 and 2-G31-FE-N040 were removed to support the Unit 2 RWCU System chemical decontamination evolution and then re-installed. Engineering personnel determined that the installation of the flow orifice in the wrong direction would result in the indicated flow being 8 to 25 percent lower than the actual flow. This corresponded to the approximately 18 percent lower than expected reading that was observed.

On August 3, 2011, it was confirmed that the 2-G31-FE-N035 flow orifice was installed incorrectly and that the 2-G31-FE-N040 flow orifice was installed correctly. The flow orifice for 2-G31-FE-N035 was removed and properly reinstalled.

Event Cause

The incorrect installation of the flow orifice occurred because the work order instructions provided to install the flow orifice did not specify provisions for proper orientation. There were two apparent causes for the lack of instructions. First, the drawing used to prepare the work instructions did not illustrate or

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NARRATIVE

Event Cause (continued)

describe flow directional characteristics of the orifice. Second, the individual planning the work activity did not provide the rigor commensurate with the importance of the task in researching available reference documents.

Work instructions are typically developed from numerous sources including plant procedures, approved vendor manual, available work history, system and component drawings, engineering references, and planner knowledge. In this case, a single foreign print for an orifice flange and plate was included in the electronic work order package material. This was the basis for the planner's understanding of the orifice design. This drawing did not provide any schematic diagram or specification text that indicated that the orifice plate was flow directional. Therefore, the planner was unaware of the need for any specific orifice plate orientation instructions to be included in the work package.

Safety Assessment

The safety significance of this condition is considered minimal. BSEP determined that the approximately 18 percent error associated with the incorrectly installed RWCU inlet flow orifice was within the existing margin to the analytical limit. The flow element installation error did not affect the operation of the transmitter or trip device and as such, the additional error did not prevent the loop from meeting the analytical limit for the RWCU Differential Flow - High function.

Corrective Actions

The following corrective actions have been completed.

- The 2-G31-FE-N035 flow orifice was removed and properly reinstalled.
- The drawings associated with the Unit 1 and Unit 2 RWCU System flow orifices have been revised to indicate proper installation orientation.
- Available data was reviewed to validate proper orientation of flow orifices installed in plant systems over the past five years.
- Expectations were reinforced with work planners to ensure that the significance of the components being worked and the consequence of error during maintenance matches the level of effort put forth in planning the work instructions, including research of reference documents and determining post-maintenance testing requirements.

Previous Similar Events

A review of LERs and corrective action program condition reports for the past three years did not identify any previous similar occurrence.

Commitments

No regulatory commitments are contained in this report.