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10 CFR 50.73

June 9, 2017

Serial: BSEP 17-0049

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

Subject: Brunswick Steam Electric Plant, Unit No. 2
Renewed Facility Operating License No. DPR-62
Docket No. 50-324
Licensee Event Report 2-2017-002

In accordance with the Code of Federal Regulations, Title 10, Part 50.73, Duke Energy Progress, LLC, submits the enclosed Licensee Event Report (LER). This report fulfills the requirement of 10 CFR 50.73(a)(1) 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,

William R. Gideon

SWR/swr

Enclosure: Licensee Event Report 2-2017-002

cc (with enclosure):

U. S. Nuclear Regulatory Commission, Region II
ATTN: Ms. Catherine Haney, Regional Administrator
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NRC FORM 366 (04-2017) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB: NO. 3150-0104 EXPIRES: 03/31/2020

Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Information Services Branch (T-2 F43), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to Infocollects.Resource@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-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.

LICENSEE EVENT REPORT (LER)

(See Page 2 for required number of digits/characters for each block)

(See NUREG-1022, R.3 for instruction and guidance for completing this form http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1022/r3/)

1. FACILITY NAME	2. DOCKET NUMBER	3. PAGE
Brunswick Steam Electric Plant (BSEP) Unit 2	05000324	1 OF 4

4. TITLE

Plant Mode Change with Primary Containment 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
										05000
04	13	2017	2017	- 002	- 00	06	09	2017	FACILITY NAME	DOCKET NUMBER
										05000

9. OPERATING MODE	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: *(Check all that apply)*			
2	☐ 20.2201(b)	☐ 20.2203(a)(3)(i)	☐ 50.73(a)(2)(ii)(A)	☐ 50.73(a)(2)(viii)(A)
	☐ 20.2201(d)	☐ 20.2203(a)(3)(ii)	☐ 50.73(a)(2)(ii)(B)	☐ 50.73(a)(2)(viii)(B)
	☐ 20.2203(a)(1)	☐ 20.2203(a)(4)	☐ 50.73(a)(2)(iii)	☐ 50.73(a)(2)(ix)(A)
	☐ 20.2203(a)(2)(i)	☐ 50.36(c)(1)(i)(A)	☐ 50.73(a)(2)(iv)(A)	☐ 50.73(a)(2)(x)
10. POWER LEVEL	☐ 20.2203(a)(2)(ii)	☐ 50.36(c)(1)(ii)(A)	☐ 50.73(a)(2)(v)(A)	☐ 73.71(a)(4)
	☐ 20.2203(a)(2)(iii)	☐ 50.36(c)(2)	☐ 50.73(a)(2)(v)(B)	☐ 73.71(a)(5)
	☐ 20.2203(a)(2)(iv)	☐ 50.46(a)(3)(ii)	☐ 50.73(a)(2)(v)(C)	☐ 73.77(a)(1)
000	☐ 20.2203(a)(2)(v)	☐ 50.73(a)(2)(i)(A)	☑ 50.73(a)(2)(v)(D)	☐ 73.77(a)(2)(i)
	☐ 20.2203(a)(2)(vi)	☑ 50.73(a)(2)(i)(B)	☐ 50.73(a)(2)(vii)	☐ 73.77(a)(2)(ii)
		☐ 50.73(a)(2)(i)(C)	☐ OTHER Specify in Abstract below or in NRC Form 366A	

12. LICENSEE CONTACT FOR THIS LER

LICENSEE CONTACT	TELEPHONE NUMBER *(Include Area Code)*
Lee Grzeck, Manager - Regulatory Affairs	(910) 457-2487

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

☐ YES *(If yes, complete 15. EXPECTED SUBMISSION DATE)* ☑ NO

15. EXPECTED SUBMISSION DATE

MONTH	DAY	YEAR

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

On April 13, 2017, Unit 2 was in Mode 4 preparing to exit a refueling outage. The primary containment was being vented to ensure habitability of the Drywell. The valve alignment for Drywell ventilation makes the primary containment inoperable due to the Drywell and Suppression Chamber airspaces being in communication with each other. At 23:47 Eastern Daylight Time (EDT), the reactor mode was changed from Mode 4 to Mode 2 with ventilation still in progress. In Mode 2, the Primary Containment is required to be operable. Therefore, the plant entered a condition prohibited by the Technical Specifications, and the event is reportable per 10 CFR 50.73(a)(2)(i)(B). It is also reportable per 10 CFR 50.73(a)(2)(v)(D) because the primary containment safety function was lost. The condition was discovered 28 minutes later on April 14, 2017, at 00:15 EDT and was corrected by closing the ventilation flowpaths at 00:30 EDT on April 14, 2017. This event resulted from Control Room personnel not initiating a tracking document while in Mode 4 with the primary containment inoperable. When preparing to change the plant mode from Mode 4 to Mode 2, the primary containment ventilation status was overlooked. Corrective actions for this event included closing the containment ventilation paths and remediating the Shift Manager and Control Room Supervisor.

LICENSEE EVENT REPORT (LER) CONTINUATION SHEET

1. FACILITY NAME	2. DOCKET NUMBER	3. LER NUMBER		
		YEAR	SEQUENTIAL NUMBER	REV NO.
Brunswick Steam Electric Plant (BSEP) Unit 2	05000324	2017	- 002	- 000

NARRATIVE

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

Background

Initial Conditions

On April 13, 2017, at approximately 23:47 Eastern Daylight Time (EDT), Unit 2 was in Mode 4 (i.e. Cold Shutdown) in preparation for exiting a refueling outage. At that time, the ventilation valves for both the Drywell and Suppression Chamber were open to ensure the atmosphere in the containment was breathable for personnel performing maintenance in the Drywell.

Reportability Criteria

This event is reportable per 10 CFR 50.73(a)(2)(i)(B) because the plant entered a condition which is prohibited by the plant's Technical Specifications (TS). Specifically, TS 3.6.1.1 requires the primary containment to be operable in Modes 1, 2, and 3. With the drywell and suppression chamber atmospheres communicating, the containment is inoperable. Additionally, TS Limiting Condition for Operation (LCO) 3.0.4 requires all LCOs to be met for the plant condition to be entered, prior to entry. Primary containment operability is required in Mode 2 (i.e., Startup). Therefore, at 23:47 EDT on April 13, 2017, when the plant changed modes from Mode 4 to Mode 2 without meeting the LCO for primary containment, this failed to meet TS LCO 3.0.4.

This event is reportable per 10 CFR 50.73(a)(2)(v)(D) because the plant experienced a loss of the safety function of a system designed to mitigate the consequences of an accident. Since the containment was rendered inoperable by having the Drywell and Suppression Chamber airspaces in communication with each other, the safety function was lost.

This event is also reportable per 10 CFR 50.72(b)(3)(v)(D) via an 8-hour telephone report. The telephone report was completed as Event Number 52679 at 07:37 EDT on April 14, 2017.

Event Description

On April 13, 2017, Unit 2 was in Mode 4 preparing to exit a refueling outage. At 20:48 EDT, Control Room personnel began ventilating the primary containment in preparation for a personnel entry into the Drywell to perform minor maintenance. The ventilation procedure requires valves be opened from the Suppression Chamber atmosphere and the Drywell atmosphere into a shared ventilation line. With both atmospheres communicating, the Primary Containment is not operable. However, Primary Containment is not required to be operable with the unit in Mode 4.

When the maintenance was completed in the Drywell, Control Room personnel resumed preparations for starting up the reactor. At 23:47 EDT, the reactor mode was changed from Mode 4 to Mode 2. In Mode 2,

the Primary Containment is required to be operable. Since it was still being ventilated as described above, it was not operable. Therefore, this mode change was not allowed per TS 3.0.4.

On April 14, 2017, at 00:15 EDT (i.e., 28 minutes later), a licensed operator was performing a routine survey of Control Room panels to verify expected plant condition and valve alignments during reactor startup. He observed the Drywell and Suppression Chamber atmospheres being simultaneously vented. He immediately notified other shift personnel, and by 00:30 EDT on April 14, 2017, the ventilation paths were closed, terminating the event. The total time during which Primary Containment was inoperable while in Mode 2 was 43 minutes.

Event Cause

This event occurred because Control Room personnel did not issue an LCO for tracking (i.e., "tracking LCO") primary containment inoperability in preparation for eventual plant mode change and startup. Procedure 0OI-01.01, "BNP Conduct of Operations Supplement," provides instructions for initiating a tracking LCO when a structure, system, or component (SSC) is removed from service while the plant is in a mode where that SSC is not required. In this instance, Unit 2 was in Mode 4 when the Drywell and Suppression Chamber were simultaneously vented, rendering the primary containment inoperable. Since the primary containment is not required in Mode 4, a tracking LCO should have been initiated to ensure it was restored to operable status before entering Mode 2. This step was not performed, so the condition was not identified during preparations for changing the plant mode.

Safety Assessment

The function of the primary containment is to isolate and contain fission products released from the Reactor Primary System following a design basis Loss of Coolant Accident (LOCA) and to confine the postulated release of radioactive material. The primary containment consists of two volumes, a Drywell and a Suppression Chamber. Steam and water piping for the nuclear process is located within the Drywell. A large volume of water is located in the Suppression Chamber for the rapid suppression of steam. The atmospheres of these two volumes are normally isolated from each other. In the event of a LOCA, steam released into the Drywell passes through downcomers into the Suppression Chamber below the water level where it is quenched. Should a LOCA occur while the Drywell and Suppression Chamber atmospheres are communicating, released steam could bypass the downcomers, potentially pressurizing both volumes of the containment. The containment would be susceptible to being pressurized beyond its capability, potentially causing containment to fail.

In this event, the two atmospheres of the primary containment were allowed to communicate via a shared ventilation line as described previously. During this time, the plant was emerging from a refueling outage, and the reactor coolant was still well below 212 degrees F as determined by the inlet temperature of the Residual Heat Removal [BO] heat exchanger and by the loop temperatures of the Reactor Recirculation [AD] system. If a LOCA had occurred during this time, the result would have been loss of cold water into the otherwise intact primary containment. No pressurization of the containment could have resulted. It

should be noted that the ventilation valve alignment was identified promptly by a routine inspection of Control Room panels and was corrected within 15 minutes of discovery (i.e., 43 minutes from changing from Mode 2 to Mode 4).

This event did not result in any adverse impact on the health and safety of the public. This analysis applies to the plant condition that existed at the time with reactor coolant below 212 degrees F.

Corrective Actions

The primary containment was restored to operable status at 00:30 on April 14, 2017.

A remediation plan was developed and implemented to assess the Shift Manager and Control Room Supervisor for watchstanding and being reinstated as appropriate. This action is complete.

Previous Similar Events

No events were identified in the past three years in which the primary containment was made inoperable when it was required to be operable.

Commitments

This report contains no new regulatory commitments.