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SEP 6 2016

10 CFR 50.73

Serial: BSEP 16-0071

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

Subject: Brunswick Steam Electric Plant, Unit Nos. 1 and 2  
Renewed Facility Operating License Nos. DPR-71 and DPR-62  
Docket Nos. 50-325 and 50-324  
Licensee Event Report 1-2016-004

In accordance with the Code of Federal Regulations, Title 10, Part 50.73, Duke Energy Progress, Inc., 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 1-2016-004

IE22  
NRR

cc (with enclosure):

U. S. Nuclear Regulatory Commission, Region II  
ATTN: Ms. Catherine Haney, Regional Administrator  
245 Peachtree Center Ave, NE, Suite 1200  
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ATTN: Ms. Michelle P. Catts, NRC Senior Resident Inspector  
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**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  
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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 FOIA, Privacy and Information Collections Branch (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to [Infocollects.Resource@nrc.gov](mailto: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.

<b>1. FACILITY NAME</b> Brunswick Steam Electric Plant (BSEP) Unit 1	<b>2. DOCKET NUMBER</b> 05000325	<b>3. PAGE</b> 1 OF 4
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**4. TITLE**  
Tornado Missile Vulnerability Results in Condition Prohibited by Technical Specifications

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	21	2016	2016	- 004	- 00	09	XX	2016	Brunswick Unit 2	05000324
									FACILITY NAME	DOCKET NUMBER
										05000

**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)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)
<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(ii)(B)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)
<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)(A)
<input type="checkbox"/> 20.2203(a)(2)(i)	<input type="checkbox"/> 50.36(c)(1)(i)(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)(ii)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(A)	<input type="checkbox"/> 73.71(a)(4)
<input type="checkbox"/> 20.2203(a)(2)(iii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(v)(B)	<input type="checkbox"/> 73.71(a)(5)
<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.46(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(v)(C)	<input type="checkbox"/> 73.77(a)(1)
<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)(D)	<input type="checkbox"/> 73.77(a)(2)(i)
<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)(vii)	<input type="checkbox"/> 73.77(a)(2)(ii)
		<input type="checkbox"/> 50.73(a)(2)(i)(C)	<input type="checkbox"/> OTHER Specify in Abstract below or in NRC Form 366A

**12. LICENSEE CONTACT FOR THIS LER**

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

<b>14. SUPPLEMENTAL REPORT EXPECTED</b> <input type="checkbox"/> YES (If yes, complete 15. EXPECTED SUBMISSION DATE) <input checked="" type="checkbox"/> NO	<b>15. EXPECTED SUBMISSION DATE</b> MONTH: _____ DAY: _____ YEAR: _____
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**ABSTRACT** (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)

On July 21, 2016, Units 1 and 2 were in Mode 1 (i.e., Run mode) at 100 percent of rated thermal power. At that time, Engineering personnel determined that a conduit in the Emergency Diesel Generator building was vulnerable to a tornado missile. The conduit contains cables associated with Unit 2 Nuclear Service Water (NSW) pump "B". If the cables were disabled by a tornado missile, NSW pump 2B would be inoperable. The plants' Technical Specifications (TS) require three of the site's four NSW pumps to be operable. Thus, any of the other NSW pumps removed from service for longer than the TS-allowed out of service time would be a condition prohibited by the TS. It has been found that this condition occurred. Enforcement Guidance Memorandum (EGM) 15-002 was implemented, and NSW pump 2B was considered operable but nonconforming. The tornado missile vulnerability has existed since original plant construction. Immediate compensatory measures included verifying that station procedures address tornadoes, high winds, and potential loss of vulnerable equipment, and confirming or receiving training on procedures to be used if a tornado watch or warning is issued. Planned corrective actions include implementing more comprehensive compensatory actions and permanently eliminating the vulnerability to a tornado missile.



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

(See NUREG-1022, R.3 for instruction and guidance for completing this form  
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1. FACILITY NAME	2. DOCKET NUMBER	3. LER NUMBER		
		YEAR	SEQUENTIAL NUMBER	REV NO.
Brunswick Steam Electric Plant (BSEP) Unit 1	05000-325	2016	- 004	- 000

**NARRATIVE**

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

Background

*Initial Conditions*

On July 21, 2016, Unit 1 and Unit 2 were both in Mode 1 (i.e., Run mode) at 100 percent of rated thermal power. Except as described below, no out-of-service equipment contributed to, or affected the course of, this event.

*Reportability Criteria*

This event is being reported in accordance with 10 CFR 50.73(a)(2)(i)(B) because Units 1 and 2 were operated in a condition prohibited by the Technical Specifications (TS). Specifically, the Unit 2 "B" Nuclear Service Water (NSW) [BI] pump was inoperable because some of its control cables were vulnerable to a postulated tornado missile. Both units' TS require at least three of four site NSW pumps to be operable when the units are at power. Therefore, inoperability of the Unit 2 "B" NSW pump alone did not require entry into a TS condition.

Inoperability of a second NSW pump constitutes a loss of one required pump. In both units' TS, Limiting Condition for Operation (LCO) 3.7.2, Condition B, says that with one NSW subsystem inoperable for reasons other than Condition A (i.e., one required NSW pump inoperable due to header inoperable on the opposite unit), the system must be restored within seven days or be in Mode 3 (i.e., Hot Shutdown) within the following 12 hours.

When the affected Unit 2 NSW pump was considered inoperable due to tornado missile vulnerability, and an additional site NSW pump became unavailable, then the plant entered Condition B as described above. In the past three years, two instances were identified in which the plant entered this condition, and the time to restore compliance with the LCO exceeded seven days, twelve hours. Therefore, the plant was operated in a condition prohibited by the TS. The two instances occurred as shown below.

Pumps Out of Service	Beginning of Condition	End of Condition	Duration
2B and 1B NSW	Jul 8, 2013 at 2:05 EDT	Jul 19, 2013 at 1:00 EDT	10.95 days
2B and 1B NSW	Aug. 26, 2013 at 1:39 EDT	Sep 5, 2013 at 5:43 EDT	10.17 days

This event did not result in the safety function of NSW being lost because sufficient NSW capacity remained available in the two pumps that remained unaffected on each occasion. Additional cooling capacity available via Conventional Service Water (CSW) [KG] pumps which can be aligned to supply the NSW header.



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Brunswick Steam Electric Plant (BSEP) Unit 1	05000-325	2016	- 004	- 000

**NARRATIVE**

Event Description

On July 21, 2016, Engineering personnel determined that a conduit associated with Unit 2 NSW pump "B" was vulnerable to a tornado missile. The affected pump was declared to be inoperable. Immediate compensatory actions were implemented in order to satisfy the conditions for enforcement discretion as set forth in Enforcement Guidance Memorandum (EGM) 15-002 and Interim Staff Guidance (ISG) DSS-ISG-2016-01, Appendix A. With these actions in place, NSW pump 2B was then declared to be operable but nonconforming.

Event Causes

The vulnerability of the control cables for Unit 2 NSW pump "B" to a tornado missile has existed since original plant construction.

Safety Assessment

The purpose of the NSW system is to provide cooling water for safety-related plant equipment such as the Emergency Diesel Generators [EK] and Emergency Core Cooling System pump seals and room coolers, and to serve as the Ultimate Heat Sink for the plant. Two occasions in the past three years were identified in which a required NSW pump was inoperable for greater than seven days, twelve hours. During this time, at least one NSW pump remained operable on each unit, ensuring the safety function was met. CSW pumps were also available and can be used to supply NSW headers on both units.

Per EGM 15-002, the NRC has analyzed risk generically for tornado-generated missiles. The analysis supports the characterization of the risk as of low significance.

Based on this analysis, this event had no adverse impact on the health and safety of the public.

Corrective Actions

In accordance with EGM 15-002 and Regulatory Issue Summary (RIS) 2015-06, the following compensatory measures have been implemented:

- Procedures were verified to be in place that address high winds, tornadoes, and the potential loss of equipment found to be vulnerable to a tornado missile.
- Procedures were verified to be in place, and training either received or planned, for responding in the event that a tornado watch or warning is issued.
- Procedures and equipment were verified to be in place supporting Diverse and Flexible Coping Strategies (FLEX).
- The level of awareness by shift personnel was heightened by referencing the 2B NSW pump in shift turnover notes and the discussion of non-conforming conditions.

More comprehensive measures will be implemented within the 60-day period specified by EGM 15-002. These actions will be in place by September 19, 2016.



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**NARRATIVE**

The above compensatory actions will remain in place until the tornado missile vulnerability is permanently eliminated. This will be completed within the time period specified by EGM 15-002 for plants designated as being in a region of higher tornado missile risk.

Previous Similar Events

No previous events have occurred in which a structure, system, or component has been found to be vulnerable to a tornado missile.

Commitments

This report contains no new regulatory commitments.