



William R. Gideon
Vice President
Brunswick Nuclear Plant
P.O. Box 10429
Southport, NC 28461
o: 910.457.3698

10 CFR 50.73

May 3, 2017

Serial: BSEP 17-0030

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 1-2016-006, Revision 1

Reference: LER 1-2016-006 for Brunswick, Unit Nos. 1 and 2, "Control Room Air Conditioning Units Inoperable due to Corroded Supports," Revision 0, dated February 13, 2017, ADAMS Accession Number ML17044A235

In accordance with the Code of Federal Regulations, Title 10, Part 50.73, Duke Energy Progress, Inc., submits the enclosed Revision 1 to Licensee Event Report (LER) 1-2016-006. This report provides results of the completed cause evaluation.

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

Sincerely,

A handwritten signature in black ink, appearing to read "WRG", written in a cursive style.

William R. Gideon

SWR/swr

Enclosure: Licensee Event Report 1-2016-006, Revision 1

cc (with enclosure):

U. S. Nuclear Regulatory Commission, Region II
ATTN: Ms. Catherine Haney, 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. Andrew Hon (Mail Stop OWFN 8G9A) **(Electronic Copy Only)**
11555 Rockville Pike
Rockville, MD 20852-2738
Andrew.Hon@nrc.gov

Chair - North Carolina Utilities Commission **(Electronic Copy Only)**
4325 Mail Service Center
Raleigh, NC 27699-4300
swatson@ncuc.net



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/nureqs/staff/sr1022/r3/>)

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, 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.

1. FACILITY NAME Brunswick Steam Electric Plant (BSEP) Unit 1	2. DOCKET NUMBER 05000325	3. PAGE 1 OF 4
---	-------------------------------------	--------------------------

4. TITLE
Control Room Air Conditioning Units Inoperable due to Corroded Supports

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
12	13	2016	2016	006	01	05	03	2017	Brunswick Unit 2	05000324
									FACILITY NAME	DOCKET NUMBER
										05000

9. OPERATING MODE	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)			
1	<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)
10. POWER LEVEL 098	<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 checked="" 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
--	--

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 December 13, 2016, Units 1 and 2 were in Mode 1 (i.e., Run mode) at 98 percent and 97 percent of rated thermal power, respectively. At that time, shift personnel were notified that structural supports for the 2D Control Room air conditioning system condenser were corroded. An operability assessment found the affected air conditioning system inoperable due to the effect on its seismic qualification. Technical Specifications (TS) 3.7.4, Condition A, was entered. On January 30, 2017, the 1D air conditioning system was found with similar conditions. The duration of the condition and the fact that more than one air conditioning system was inoperable simultaneously resulted in the plant operating in a condition prohibited by the TS and in a loss of the safety function. This event resulted from a lack, in some cases, of station personnel being cognizant of risks related to resolving complex, long-standing issues that continue to degrade over time. All affected support steel was replaced by February 2, 2017. The remaining air conditioner was inspected and found acceptable. Administrative actions will be taken to identify high consequence plant issues and periodically reassess priorities.



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

(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/>)

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, 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.

1. FACILITY NAME	2. DOCKET NUMBER	3. LER NUMBER		
		YEAR	SEQUENTIAL NUMBER	REV NO.
Brunswick Steam Electric Plant (BSEP) Unit 1	05000-325	2016	- 006	- 001

NARRATIVE

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

Background

Initial Conditions

On December 13, 2016, at 16:27 Eastern Standard Time (EST), Unit 1 was in Mode 1 at approximately 98 percent of rated thermal power. Unit 2 was in Mode 1 at approximately 97 percent of rated thermal power. Other than the components specifically named in this report, 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 which is prohibited by the Technical Specifications (TS). Specifically, air conditioning units 1D and 2D for the Main Control Room [NA] were inoperable on account of seismically-qualified structural supports being degraded due to corrosion. The duration of the inoperability could not be conclusively determined. Therefore, the air conditioners are conservatively concluded to have been inoperable for longer than the 30 days allowed by TS 3.7.4, Condition A (i.e., one Control Room Air Conditioning subsystem inoperable) and the 72 hours allowed by TS 3.7.4, Condition B (i.e., two Control Room Air Conditioning subsystems inoperable). Since these times were exceeded, the plant was in a condition prohibited by the TS. The condition applies to both units because the air conditioning system serves the shared Control Room.

The event is also reportable per 10 CFR 50.73(a)(2)(v)(D) as an event or condition that could have prevented the fulfillment of the safety function of structures or systems that are needed to mitigate the consequences of an accident. With two air conditioning units inoperable, the safety function of maintaining Control Room habitability could not be assured. The condition applies to both units because the air conditioning system serves the shared Control Room.

Event Description

On December 13, 2016, a periodic inspection was being performed on the Control Building [NA] air conditioner compressors and condensing coils of air conditioner 2D. During the inspection, seismically qualified support members were found to be degraded due to corrosion. This condition was reported to shift personnel in the Main Control Room, and further assessment was initiated. On December 14, 2016, it was determined that the air conditioning unit supported by the corroded members could not be reasonably assured of meeting its seismic qualifications. Therefore, air conditioner 2D was declared inoperable and TS 3.7.4, Condition A was entered. The affected support members for air conditioning unit 2D were replaced under Work Order 20132955 on December 22, 2016, and the TS condition was exited.



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

(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/>)

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 Infocollections.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.

1. FACILITY NAME	2. DOCKET NUMBER	3. LER NUMBER		
		YEAR	SEQUENTIAL NUMBER	REV NO.
Brunswick Steam Electric Plant (BSEP) Unit 1	05000-325	2016	- 006	- 001

NARRATIVE

Additionally, on January 30, 2017, an inspection, as part of the extent of condition, determined that significant corrosion existed on support members for the 1D air conditioner. Therefore, the 1D air conditioner was declared inoperable, and TS 3.7.4, Condition A was entered.

On both air conditioners, the duration of the corroded condition could not be established with certainty. The periodic maintenance activity which resulted in identifying the corrosion is performed approximately every six months. The last inspection for the 2D air conditioner took place on May 18, 2016, and was completed satisfactorily at that time. The last inspection for the 1D air conditioner took place on December 1, 2016, and was completed satisfactorily at that time. Since corrosion is typically a slow-acting phenomenon, it is concluded that the affected structural members had degraded to the point of becoming inoperable more than 30 days before discovery (i.e., for longer than the TS allowable out-of-service time). Therefore, the 1D air conditioner should have been recognized as inoperable on December 1, 2016, but was not.

Review of plant history revealed that the only remaining Control Room air conditioning unit, the 2E, had been removed from service during the period when the 2D and 1D are believed to have been inoperable due to compromised seismic qualifications. This occurred on October 18, 2016, from 04:42 EST until 11:54 EST for a total of 7 hours, 12 minutes. During this time, only the two seismically unqualified air conditioning unit units remained in operation.

Event Causes

The corrosion of steel supports for the two air conditioning units resulted from exposure to a marine environment coupled with trapped moisture. This degraded the protective phenolic coating and then the underlying metal.

The apparent cause of the event was determined to be that, in some cases, the station is not cognizant of risks related to resolving complex, long-standing issues that continue to degrade with time.

Safety Assessment

Three 50 percent capacity Control Room air conditioning units provide temperature and humidity control for the Control Room during normal and accident conditions. Two units are normally required to maintain the designed environmental conditions.

Since the air conditioning system is required to be seismically qualified, it was declared inoperable until the corroded support members were replaced or repaired. However, during this event, the affected air conditioning system remained capable of performing its function under all but seismic conditions. Per normal operating practices, at least two air conditioning units were always operating, including those times when safety function could not be credited due to compromised seismic qualifications.

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



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

(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/>)

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, 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.

1. FACILITY NAME	2. DOCKET NUMBER	3. LER NUMBER		
		YEAR	SEQUENTIAL NUMBER	REV NO.
Brunswick Steam Electric Plant (BSEP) Unit 1	05000-325	2016	- 006	- 001

NARRATIVE

Corrective Actions

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

The affected support members for air conditioning unit 2D were replaced under Work Order 20132955 on December 22, 2016. This action is complete.

The affected support members for air conditioning unit 1D were replaced under Work Order 20139332 on February 2, 2017. This action is complete.

The support members for the 2E air conditioner were inspected by engineers on January 30, 2017, and were found to be acceptable.

The model work order for the air conditioning unit inspection task will be revised to specify initiation of a Work Request (WR) if corrosion is identified which might weaken the structural integrity of supports. Site procedure AD-WC-ALL-210, "Work Request Initiation, Screening, Prioritization and Classification," already requires a WR to be written for plant material deficiencies. The revision to the model work order will strengthen that existing guidance. This action is scheduled to be completed by May 1, 2017.

To address the causes of this event, the following actions are planned:

- An administrative process will be developed for tracking longstanding, high-consequence plant issues that require additional focus and attention for resolution. This action will be in place by June 29, 2017.
- Project sponsor ownership and engagement criteria will be revised to drive projects to predictability. This action will be in place by June 29, 2017.

Previous Similar Events

No events have occurred in the past three years in which a plant structure, system, or component was found to be inoperable due to general environmental corrosion or similar degradation mechanisms.

Commitments

This report contains no new regulatory commitments.