



November 11, 2010

SERIAL: BSEP 10-0127

10 CFR 50.73

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 1-2010-004

Ladies and Gentlemen:

In accordance with the Code of Federal Regulations, Title 10, Part 50.73, Carolina Power & Light Company, now doing business as Progress Energy Carolinas, Inc., 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, Acting Supervisor - Licensing/Regulatory Programs, at (910) 457-2487.

Sincerely,

A handwritten signature in black ink, appearing to read 'Edward L. Wills, Jr.', written in a cursive style.

Edward L. Wills, Jr.
Plant General Manager
Brunswick Steam Electric Plant

LJG/ljg

Enclosure:

Licensee Event Report

Progress Energy Carolinas, Inc.
Brunswick Nuclear Plant
PO Box 10429
Southport, NC 28461

IE22
NR

cc (with enclosure):

U. S. Nuclear Regulatory Commission, Region II
ATTN: Mr. Luis A. Reyes, Regional Administrator
245 Peachtree Center Ave. N.E., Suite 1200
Atlanta, GA 30303-1257

U. S. Nuclear Regulatory Commission
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U. S. Nuclear Regulatory Commission **(Electronic Copy Only)**
ATTN: Mrs. Farideh E. Saba (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 1

2. DOCKET NUMBER

05000325

3. PAGE

1 of 5

4. TITLE

Emergency Diesel Generator Inoperable for Greater than Technical Specification Completion Time

5. EVENT DATE

MONTH	DAY	YEAR
09	13	2010

6. LER NUMBER

YEAR	SEQUENTIAL NUMBER	REV NO.
2010	004	00

7. REPORT DATE

MONTH	DAY	YEAR
11	11	2010

8. OTHER FACILITIES INVOLVED

FACILITY NAME	DOCKET NUMBER
BSEP, Unit 2	05000324
FACILITY NAME	DOCKET NUMBER

9. OPERATING MODE

1

10. POWER LEVEL

100

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) |
| <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

Lee Grzeck, Senior Engineer - Licensing

TELEPHONE NUMBER (Include Area Code)

(910) 457-2487

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

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 September 12, 2010, at approximately 2100 hours Eastern Daylight Time (EDT), a routine monthly surveillance, 0PT-12.2D, "No. 4 Diesel Generator Monthly Load Test," was started on Emergency Diesel Generator No. 4 (EDG4). During the performance of the surveillance test, sparking was observed coming from the diesel generator inner ring brushes. The maximum sparking began approximately 45 minutes after EDG4 started, and remained for the duration of the diesel run. Following performance of the surveillance test, collector ring brush measurements identified abnormal wear on the inner ring brushes. Engineering determined that, due to the brush wear and excessive sparking, EDG4 would not have been able to run for its mission time. At 0430 hours on September 13, 2010, EDG4 was declared inoperable. This condition is being reported as an operation prohibited by Technical Specifications (TS), due to EDG4 inoperable greater than the TS completion time.

The safety consequences of this event were minimal. The three remaining Emergency Diesel Generators were operable and available to provide emergency AC power if needed. The root cause was determined to be untimely implementation of corrective actions to a long-standing concern. The corrective actions include replacing the collector rings with an upgraded design that is not subject to corrosion.

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		2010 -- 004 -- 00			

NARRATIVE

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

Introduction*Initial Conditions*

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

Reportability Criteria

This event is being reported in accordance with 10 CFR 50.73(a)(2)(i)(B), as an operation or condition prohibited by Technical Specifications (TSs).

Event Description

On September 12, 2010, at approximately 2100 hours Eastern Daylight Time (EDT), a routine monthly surveillance, OPT-12.2D, "No. 4 Diesel Generator Monthly Load Test," was started on Emergency Diesel Generator No. 4 (EDG4) [EK]. During the performance of the surveillance test, sparking was observed coming from the diesel generator inner ring brushes. The maximum sparking began approximately 45 minutes after EDG4 started, and remained for the duration of the diesel run. Following performance of the surveillance test, collector ring brush measurements identified abnormal wear on the inner ring brushes. The generator field collector ring brush wear on two of the four inner ring brushes was significant, in comparison to historical brush wear rates.

Sparking has been observed historically on the Brunswick Emergency Diesel Generators (EDGs) and is an understood phenomenon associated with corrosion build-up on the surface of the carbon steel collector rings. Corrective actions had been established to resolve this issue, scheduled in 2011, via a project to upgrade the collector rings to a non-ferrous material and to improve the rigidity of the brush rigging design. In the interim, a quarterly Preventive Maintenance (PM) task had proven effective, since 2005, at significantly reducing sparking events in an effort to prevent excessive dust formation from causing low insulation resistance for this equipment. The PM scope includes cleaning of the rings and brush rigging, and resetting or replacing the brushes to ensure correct brush spring pressure and adequate brush length remain. In previous diesel runs when sparking was observed, the sparking has self-corrected in full, or was diminished to the point that self-correction could be assured. It has been observed in the past that once sparking arrests, the brush wear rate also reduces to an acceptable value. Since sparking was not observed to subside for this event, it is assumed that the wear rate would continue to the point of EDG failure.

Based on the observed wear rate, and assuming there would be no reduction in that wear rate, Engineering determined that EDG4 would not have been able run for its mission time. The observed brush wear rate would most probably have resulted in a flash-over event (i.e., either ring to ground, or ring to ring) due to the sparking increasing as the spring pressures continued to reduce on the two overloaded brushes. This is

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Event Description (continued)

expected to have occurred in less than the Probabilistic Safety Assessment (PSA) defined twenty four hour mission time. Based on this assessment, Operations declared EDG4 inoperable at 0430 hours on September 13, 2010.

Brunswick TSs Limiting Condition of Operation (LCO) 3.8.1 Required Action D.4 Completion Time requires an inoperable diesel to be restored to operable status within seven days. With EDG4 declared inoperable, and the last successful performance of OPT-12.2D completed more than seven days prior to September 13, 2010 (i.e., on August 15, 2010), this condition is being reported as an operation prohibited by TSs, due to EDG4 being inoperable greater than the TS completion time.

On September 14, 2010, at 0128 hours, after replacement of all four inner ring brushes and successful re-performance of OPT-12.2D, EDG4 was declared operable.

Event Cause

The primary cause of the event was that there was untimely implementation of corrective actions to a long-standing concern identified for the EDG collector rings. A contributing cause was that there was no process in place for determining the effectiveness of long-term interim actions. The quarterly PM associated with the collector rings became ineffective after a long period of time, prior to the long-term actions being implemented.

Safety Assessment

The safety significance of this event is considered minimal. The three remaining EDGs were operable and available to provide emergency AC power if needed. In addition, EDG4 did not fail to start or run, and successfully ran for the duration of the surveillance test.

Corrective Actions

The following corrective actions to prevent recurrence will be taken.

- Replace collector rings with upgraded design that is not subject to corrosion (i.e., as previously tracked per Nuclear Condition report (NCR) 246046, Engineering Change (EC) 74453, and Project No. 894048). This action is scheduled to be complete by December 31, 2011.
- Establish a diesel major projects design and implementation team. This action is complete.
- Establish a Plant Health Process which adequately prioritizes and schedules equipment improvement items for the site. This action is complete.

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NARRATIVECorrective Actions (continued)

The following additional corrective actions will be taken.

- A process will be established that periodically determines the effectiveness of ongoing or long-term interim actions. This action is scheduled to be complete by December 14, 2010.
- The PM frequency for the EDG collector ring cleaning on all four EDGs will be revised to bi-monthly during the months of July to November (i.e., the time when EDG collector rings are most susceptible to dust accumulation) until the upgrade project is implemented. This action is scheduled to be complete by February 10, 2011.
- The collector ring PM procedures, OPM-GEN005 and OPM-GEN005A, will be revised to allow cleaning of the normal brush path on the ring surface if abnormal corrosion is noted. This action is scheduled to be complete by March 10, 2011.
- Re-surface the EDG4 collector ring, or perform an equivalent interim measure, to preclude the potential for a repeat failure event until the ring material can be replaced with the upgraded design. This action is scheduled to be complete by March 1, 2011.

Previous Similar Events

A review of LERs and corrective action program condition reports for the past three years identified the following similar previous occurrences.

NCR 245313, dated September 4, 2007, DG#2 Generator Arcing and Sparking.
NCR 245783, dated September 7, 2007, DG3 – As-found Megger Readings on Collector Rings (Outside Desired Values).
NCR 245808, dated September 7, 2007, DG3 Collector Ring Sparking/Arcing During PT-12.2C Run.
NCR 246046, dated September 10, 2007, EDG Collector Rings – Adverse Trend.
NCR 247907, dated September 25, 2007, EDG#2 Sparking and Arcing on Inner Collector Ring Brushes.
NCR 253183, dated November 2, 2007, DG4 Brush Sparking During OPT-12.2D.
NCR 254280, dated November 12, 2007, DG3 Brush Inspection Meg Readings (Outside Desired Values).
NCR 355003, dated September 14, 2009, DG#4 Outer Collector Ring Brush Arcing.
NCR 409543, dated July 11, 2010, DG#3 Inner Collector Ring Brushes (Arcing and Brush Wear).
NCR 419863, dated September 2, 2010, DG 2 Auto Voltage Regulator Not Working Properly (Heavy Sparking from Collector Ring Brushes).

Although there have been a number of similar events in the past, as noted above, none of these events caused inoperability of the EDGs. An interim correction action was in place to inspect and clean the collector ring and brushes (i.e., a quarterly PM task). A longer-term corrective action had also been established to replace the collector ring. Thus, the previous occurrences could not have reasonably been expected to prevent the condition reported in this LER.

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Commitments

No regulatory commitments are contained in this report.