



George T. Hamrick
Vice President
Brunswick Nuclear Plant
P.O. Box 10429
Southport, NC 28461
o: 910.457.3698

10 CFR 50.4

August 28, 2014

Serial: BSEP 14-0085

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

Subject: Brunswick Steam Electric Plant, Unit Nos. 1 and 2
Docket Nos. 50-325 and 50-324
Renewed License Nos. DPR-71 and DPR-62
Third Six-Month Status Report in Response to March 12, 2012, Commission
Order Modifying Licenses with Regard to Requirements for Mitigation Strategies
for Beyond-Design-Basis External Events (Order Number EA-12-049)

References:

1. Nuclear Regulatory Commission (NRC) Order Number EA-12-049, *Issuance of Order to Modify Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events*, dated March 12, 2012, Agencywide Documents Access and Management System (ADAMS) Accession Number ML12054A735
2. NRC Interim Staff Guidance JLD-ISG-2012-01, *Compliance with Order EA-12-049, Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events*, Revision 0, dated August 29, 2012, ADAMS Accession Number ML12229A174
3. NEI 12-06, *Diverse and Flexible Coping Strategies (FLEX) Implementation Guide*, Revision 0, dated August 2012, ADAMS Accession Number ML12242A378
4. Duke Energy Letter, *Carolina Power & Light Company and Florida Power Corporation's Initial Status Report in Response to March 12, 2012, Commission Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (Order Number EA-12-049)*, dated October 29, 2012, ADAMS Accession Number ML12307A021
5. Duke Energy Letter, *Overall Integrated Plan in Response to March 12, 2012, Commission Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (Order Number EA-12-049)*, dated February 28, 2013, ADAMS Accession Number ML13071A559
6. Duke Energy Letter, *First Six-Month Status Report in Response to March 12, 2012, Commission Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (Order Number EA-12-049)*, dated August 20, 2013, ADAMS Accession Number ML13248A447

A151
MLL

7. Duke Energy Letter, *Second Six-Month Status Report in Response to March 12, 2012, Commission Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (Order Number EA-12-049)*, dated February 28, 2014, ADAMS Accession Number ML14073A451

Ladies and Gentlemen,

On March 12, 2012, the Nuclear Regulatory Commission (NRC) issued Order EA-12-049 (i.e., Reference 1) to Duke Energy. Reference 1 was immediately effective and directs Duke Energy to develop, implement, and maintain guidance and strategies to maintain or restore core cooling, containment, and spent fuel pool cooling capabilities in the event of a beyond-design-basis external event. Specific requirements are outlined in Attachment 2 of Reference 1.

Reference 1 required submission of an initial status report 60 days following issuance of the final interim staff guidance (i.e., Reference 2) and an Overall Integrated Plan (OIP) pursuant to Section IV, Condition C. Reference 2 endorses industry guidance document NEI 12-06, Revision 0 (i.e., Reference 3) with clarifications and exceptions identified in Reference 2. Reference 4 provided the initial status report regarding mitigation strategies at the Brunswick, Robinson, and Shearon Harris Nuclear Power Plants. Reference 5 provided the OIP for the Brunswick Steam Electric Plant (BSEP), Unit Nos. 1 and 2.

Reference 1 requires submission of a status report at six-month intervals following submittal of the OIP. Reference 3 provides direction regarding the content of the status reports. Reference 6 and 7 provided the first and second six-month status reports respectively, for BSEP.

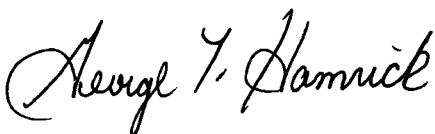
The purpose of this letter is to provide the third six-month status report pursuant to Section IV, Condition C.2, of Reference 1. The attached report provides an update of milestone accomplishments since the last status report, including any changes to the compliance method, schedule, or need for relief and the basis, if any.

This letter contains no new regulatory commitments.

If you have any questions regarding this submittal, please contact Mr. Lee Grzeck, Manager Regulatory Affairs, at (910) 457-2487.

I declare under penalty of perjury that the foregoing is true and correct, executed on August 28, 2014.

Sincerely,



George T. Hamrick

Enclosure: Third Six-Month Status Report for the Implementation of Order EA-12-049, Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events, Brunswick Steam Electric Plant (BSEP), Unit Nos. 1 and 2

cc (with enclosures):

U. S. Nuclear Regulatory Commission, Region II
ATTN: Mr. Victor M. McCree, 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

Chair - North Carolina Utilities Commission
P.O. Box 29510
Raleigh, NC 27626-0510

ENCLOSURE

**THIRD SIX-MONTH STATUS REPORT FOR THE IMPLEMENTATION OF ORDER
EA-12-049, ORDER MODIFYING LICENSES WITH REGARD TO REQUIREMENTS FOR
MITIGATION STRATEGIES FOR BEYOND-DESIGN-BASIS EXTERNAL EVENTS**

BRUNSWICK STEAM ELECTRIC PLANT (BSEP), UNIT NOS. 1 AND 2

DOCKET NOS. 50-325 AND 50-324

RENEWED LICENSE NOS. DPR-71 AND DPR-62

BSEP Third Six-Month Status Report for the Implementation of Order EA-12-049, Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events

1 Introduction

Brunswick Steam Electric Plant (BSEP) developed an Overall Integrated Plan (OIP) (i.e., Reference 1 of this enclosure), documenting the diverse and flexible strategies (FLEX), in response to NRC Order EA-12-049. The OIP was submitted to the NRC on February 28, 2013. The first six-month update was submitted to the NRC on August 20, 2013 (i.e., Reference 2 of this enclosure). The second six-month update was submitted to the NRC on February 28, 2014 (i.e., Reference 3 of this enclosure). This enclosure provides an update of milestone accomplishments including any changes to the compliance method, schedule, or need for relief/relaxation and the basis, if any, that occurred during the period between January 28, 2014, and July 31, 2014, hereafter referred to as the “update period.”

2 Milestone Accomplishments

The following milestones were completed during the update period:

- Completed and submitted Second Six-Month Status Report.

3 Milestone Schedule Status

The following provides an update to Attachment 2 of the OIP. It provides the activity status of each item, and whether the expected completion date has changed. The dates are planning dates, and subject to change, as design and implementation details are developed.

The revised milestone target completion dates are not expected to impact the Order implementation date.

Milestone	Target Completion Date	Activity Status	Revised Completion Date
Submit 60 Day Status Report	10/29/12	Complete	Date Not Revised
Submit Overall Integrated Implementation Plan	2/28/13	Complete	Date Not Revised
Submit 6 Month Status Report	8/30/13	Complete	Date Not Revised

Milestone	Target Completion Date	Activity Status	Revised Completion Date
Perform Staffing Analysis Phase 1 of NEI12-01	11/29/13	Complete	Date Not Revised
Submit 6 Month Status Report	2/28/14	*Complete	Date Not Revised
Develop Unit 2 Modification Engineering Change (EC) packages, including Storage Facility	3/27/14	Started	3/30/15 Unit 2 Modifications will be completed and ready to exit RFO B222R1
Perform Station-specific analysis following generic BWROG FLEX implementation analysis review (Open Item 19)	3/30/14	Started	*10/15/14 Analysis to be completed
Develop Strategies/Contract with Regional Response Center (RRC)	4/1/14	Started	*12/03/14 Final RRC playbook due to AREVA on 12/03/14
Submit 6 Month Status Report	8/29/14	*Started	Date Not Revised
SAT Process for Training (Unit 2)	1/27/14	Started	*10/31/14
SAT Process for Training (Unit 1)	1/26/15	Not Started	Date Not Revised
Develop Training Plan (Unit 2)	7/27/14	Started	*10/31/14 Unit 2 Training Plan continues to be revised due to large amount of Operator training in 2014.
Develop Training Plan (Unit 1)	7/26/15	Not Started	Date Not Revised
Procure Equipment (Unit 2)	11/27/14	Started	*2/26/15 Permanent Storage Building not available until middle of January 2015

Milestone	Target Completion Date	Activity Status	Revised Completion Date
Procure Equipment (Unit 1)	11/26/15	Started	Date Not Revised
Create Maintenance Procedures (Unit 2)	1/27/15	Not Started	Date Not Revised
Create Maintenance Procedures (Unit 1)	1/26/16	Not Started	Date Not Revised
Procedure Changes Incorporating Response Strategies (Unit 2)	1/27/15	*Started	Date Not Revised
Procedure Changes Incorporating Response Strategies (Unit 1)	1/26/16	Not Started	Date Not Revised
Implement Training (Unit 2)	2/27/15	Started	Date Not Revised
Submit 6 Month Status Report	2/27/15	Not Started	Date Not Revised
Unit 2 Implementation Outage	March 2015	Not Started	*Outage Start Date moved up to February 2015
Implement Modifications (Unit 2)	April 2015	Not Started	Date Not Revised
Submit Completion Report (Unit 2)	April 2015	Not Started	Date Not Revised
Develop Unit 1 Modification EC Packages	3/26/15	Not Started	Date Not Revised
Submit 6 Month Status Report	8/31/15	Not Started	Date Not Revised
Implement Training (Unit 1)	2/26/16	Not Started	Date Not Revised
Submit 6 Month Status Report	2/29/16	Not Started	Date Not Revised
Unit 1 Implementation Outage	March 2016	Not Started	Date Not Revised
Implement Modifications (Unit 1)	April 2016	Not Started	Date Not Revised

Milestone	Target Completion Date	Activity Status	Revised Completion Date
Submit Completion Report (Unit 1)	April 2016	Not Started	Date Not Revised
Submit 6 Month Status Report	8/31/16	Not Started	Date Not Revised

*Indicates a change since last 6 month update.

4 Changes to Compliance Method

The following summarizes changes that were made during the second update period to the strategies as documented in the OIP (i.e., Reference 1 of this enclosure) or the changes that were provided by Reference 2 of this enclosure. These changes do not impact BSEP’s compliance with NEI 12-06.

- 1) **Change:** The OIP identified a modification to build a new Clean Water Storage Tank (CWST). This storage tank will no longer be used in BSEP’s FLEX strategy. Instead, justifications will be provided showing the Condensate Storage Tank (CST) is robust from applicable hazards and will be available following a Beyond-Design-Basis External Event (BDBEE). FLEX strategies, within the OIP, indicating use of the CWST will be modified to reflect use of the CST.

Justification: Preliminary evaluations indicate the availability of both CSTs following a BDBEE. These evaluations include plant stack stability during a tornado, and all applicable screened in hazards per NEI 12-06. Additional protection from wind-borne missiles will be required. Evaluations to determine modifications specifications to ensure appropriate protection are ongoing.

Documentation: Open Item 23 will track completion of this item.

- 2) **Change:** The CST will be modified to provide a water supply to the FLEX pump for injection into the Reactor Pressure Vessel (RPV) and the Spent Fuel Pool (SFP).

Justification: Due to the revision identified in change 1, a new suction connection point will be required on the CST. This connection point will be protected from all applicable hazards as identified in NEI 12-06.

Documentation: Open Item 10 will track completion of this item, and Open Item 1 will track demonstration of deployment path acceptability.

- 3) **Change:** The second six-month update identified a change to the OIP Attachment 1A, Action Item 4. The specific action in the OIP stated “SAMA diesel generator started and loaded” with a time constraint of 5.0 hours. This action was changed in the second six-month update to “FLEX diesel generator started and loaded” with a time constraint of 1 hour. In this third six-month update, the time constraint is changed from 1 hour to 2 hours based on the updated battery coping analysis.

Justification: An evaluation is in progress to ensure BSEP’s battery coping analysis satisfied the guidance of IEEE-485. Preliminary results indicate a coping time of 2 hours and 10 minutes before the Division II battery voltages drop below 105 VDC. The selection of 2 hours as the time constraint for FLEX diesel generators being started and loaded provides an approximate 8% margin to the coping time of 2 hours and 10 minutes.

Documentation: Open Item 24 will track completion of this item, and Open Item 1 will track demonstration of implementation capability.

5 Need for Relief/Relaxation and Basis for the Relief/Relaxation

BSEP expects to comply with the order implementation date and no relief/relaxation is required at this time.

6 Open Items

Generic Concerns

Duke Energy confirms that the FLEX strategy station battery run-time was calculated in accordance with the IEEE-485 methodology using manufacturer discharge test data applicable to the licensee’s FLEX strategy as outlined in the NEI white paper on Extended Battery Duty Cycles. The detailed licensee calculations, supporting vendor discharge test data, FLEX strategy battery load profile, and other inputs/initial conditions required by IEEE-485 will be available on the licensee’s web portal for documents and calculations. The time margin between the calculated station battery run-time for the FLEX strategy and the expected deployment time for FLEX equipment to supply the DC loads is 0.5 hours.

Plan Open Items

The following tables provide a summary status of the Open Items. The table under Section 6.a. provides the open items that were previously identified in the original OIP submitted on February 28, 2013, and in the first & second six-month status report, submitted in Reference 2 and 3 respectively, of this enclosure. The table under Section 6.b. provides a list of open items that were added after February 28, 2014.

Table 6.a. Open Items Documented in the Overall Integrated Plan.

Overall Integrated Plan Open Item	Status
1. Perform a formal validation of FLEX deployment, connection, and action timelines after the procedural guidance is developed and related staffing study is completed.	Not Started
2. Implement programmatic controls.	Started

Overall Integrated Plan Open Item	Status
3. Develop plant equipment control guidelines, in accordance with NEI 12-06 Section 11.5, to manage the unavailability of equipment and applicable connections that directly perform a FLEX mitigation strategy.	Started
4. Establish programs and process to assure personnel proficiency in the mitigation of beyond-design-basis events is developed and maintained in accordance with NEI 12-06 Section 11.6.	Started
5. Maintain FLEX strategies in overall FLEX basis documents.	Started
6. Modify existing plant configuration control procedures to ensure that changes to the plant design, physical plant layouts, roads, buildings, and miscellaneous structures will not adversely impact the approved FLEX strategies in accordance with NEI 12-06 Section 11.8.	Started
7. Complete applicable training prior to the implementation of FLEX.	Started
8. Complete construction of FLEX Equipment Storage Building prior to the implementation of FLEX.	Started
9. Develop BSEP procedures and programs to address storage structure requirements, deployment path requirements, and FLEX equipment requirements relative to the hazards applicable to BSEP.	Started
10. Design FLEX equipment connection points (e.g. mechanical, pneumatic, and electrical) to withstand the applicable external hazards.	Started
11. Perform study to validate Suppression Pool temperatures exceeding 220°F.	Started

Overall Integrated Plan Open Item	Status
12. Develop site specific procedures or guidelines, utilizing the industry developed guidance from the Owners' Groups, EPRI, and NEI Task team, to address the criteria in NEI12-06.	Started
13. Deleted	Deleted
14. Complete SFP level instrumentation modifications per NRC Order EA-12-051, <i>Issuance of Order to Modify Licenses With Regard to Reliable Spent Fuel Pool Instrumentation</i> .	Started
15. Develop deep load-shedding procedures to extend coping time for station batteries.	Started
16. Modify procedures such that operator manual actions, in areas where habitability is a concern, occur early in the FLEX timeline, to the extent practical.	Started
17. Revise procedures to open Reactor Building doors to provide a natural air circulation path.	Started
18. Provide transportation equipment to move large skids/trailer-mounted equipment provided from off-site.	Started
19. Review generic BWROG analysis of FLEX implementation and perform station-specific analysis (NEDC 33771P, Revision 1)	Started
20. Develop a process/methodology to rupture the Wetwell Vent Disc with Containment pressure below 55 psi.	Not Started
21. Develop a process/methodology to provide Clean Water Makeup to the CST during Phase 3 response.	Started

Overall Integrated Plan Open Item	Status
22. Develop guidance for obtaining local vital indications during a loss of DC in conjunction with an ELAP. This strategy will be available for appropriate plant personnel use in response to these failures.	Started

Table 6.b. Open Items added after February 28, 2014

Overall Integrated Plan Open Item	Status
23. Provide justification showing the Unit 1 CST & Unit 2 CST are robust from applicable external hazards.	Started
24. Develop a DC power coping analysis IAW IEEE- 485 and establish an appropriate coping time for FLEX response.	Started

7 References

The following references support updates to the Overall Integrated Plan as described in this attachment.

1. Duke Energy Letter, *Overall Integrated Plan in Response to March 12, 2012, Commission Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond- Design-Basis External Events (Order Number EA-12-049)*, dated February 28, 2013, Agencywide Documents Access and Management System (ADAMS) Accession Number ML13071A559.
2. Duke Energy Letter, *First Six-Month Status Report in Response to March 12, 2012, Commission Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (Order Number EA-12-049)*, dated August 20, 2013, ADAMS Accession No. ML13248A447.
3. Duke Energy Letter, *Second Six-Month Status Report in Response to March 12, 2012, Commission Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (Order Number EA-12-049)*, dated February, 28, 2014, ADAMS Accession No. ML14073A451.
4. Nuclear Regulatory Commission (NRC) Order Number EA-12-049, *"Issuance of Order to Modify Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events,"* dated March 12, 2012, ADAMS accession No. ML12054A735.
5. NRC Interim Staff Guidance JLD-ISG-2012-01, *Compliance with Order EA-12-049, Order Modifying Licenses with Regard to Requirements for Mitigation strategies for Beyond-Design-Basis External Events*, Revision 0, dated August 29, 2012, ADAMS Accession No. ML12229A174.

U.S. Nuclear Regulatory Commission

Serial: BSEP 14-0085

Enclosure

6. NEI 12-06, *Diverse and Flexible Coping Strategies (FLEX) Implementation Guide*, Revision 0, dated August 2012, ADAMS Accession No. ML12242A378.
7. Duke Energy Letter, *Carolina Power & Light Company and Florida Power Corporation's Initial Status Report in Response to March 12, 2012, Commission Order Modifying Licenses with Regard To Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (Order EA-12-049)*, dated October 29, 2012, ADAMS Accession No. ML12307A021.
8. NRC letter from Jack R. Davis, Director Mitigating Strategies Directorate Office of Nuclear Reactor Regulation, to Nuclear Energy Institute, Mr. Joseph E. Pollock, Vice President Nuclear Operations, dated September 16, 2013, ADAMS Accession No. ML13241A188.
9. NRC Order Number EA-12-050, *Issuance of Order to Modify Licenses with Regard to Reliable Hardened Containment Vents*, dated March 12, 2012, ADAMS Accession No. ML12054A694.
10. NRC Order Number EA-13-109, *Issuance of Order to Modify Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation Under Severe Accident Conditions*, dated June 6, 2013, ADAMS Accession No. ML13143A321.