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June 25, 2015

Serial: BSEP 15-0044

U.S. Nuclear Regulatory Commission  
Attention: Document Control Desk  
Washington, D. C. 20555-0001

Subject: Brunswick Steam Electric Plant (BSEP), Unit Nos. 1 and 2  
Renewed Facility Operating License Nos. DPR-71 and DPR-62  
Docket Nos. 50-325 and 50-324  
Second Six Month Status Report in Response to June 6, 2013, Commission Order  
Modifying Licenses with Regard to Reliable Hardened Containment Vents Capable  
of Operation Under Severe Accident Conditions (Order Number EA-13-109)

References:

1. Nuclear Regulatory Commission (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, Agencywide Documents Access and Management System (ADAMS) Accession Number ML13143A321.
2. NRC Interim Staff Guidance JLD-ISG-2013-02, *Compliance with Order EA-13-109, Order Modifying Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation under Severe Accident Conditions*, dated November 14, 2013, ADAMS Accession Number ML13304B836.
3. Duke Energy Letter, BSEP, Unit Nos. 1 and 2, *Phase 1 Overall Integrated Plan in Response to June 6, 2013, Commission Order Modifying Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation Under Severe Accident Conditions (Order Number EA-13-109)*, dated June 26, 2014, ADAMS Accession Number ML14191A687.
4. Duke Energy Letter, BSEP, Unit Nos. 1 and 2, *First Six Month Status Report in Response to June 6, 2013, Commission Order Modifying Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation Under Severe Accident Conditions (Order Number EA-13-109)*, dated December 17, 2014, ADAMS Accession Number ML14364A029.
5. NRC Letter, *Brunswick Steam Electric Plant, Units 1 and 2 – Interim Staff Evaluation Relating to Overall Integrated Plan in Response to Phase 1 of Order EA-13-109 (Severe Accident Capable Hardened Vents) (TAC Nos. MF4467 and MF4468)*, dated March 10, 2015, ADAMS Accession Number ML15049A266.
6. NEI 13-02, *Industry Guidance for Compliance with Order EA-13-109, Revision 0*, November 12, 2013, ADAMS Accession Number ML13316A853.

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Ladies and Gentlemen:

On June 6, 2013, the Nuclear Regulatory Commission (NRC) issued an order (i.e., Reference 1) to Brunswick Steam Electric Plant (BSEP), Unit Nos. 1 and 2. Reference 1 was immediately effective and directed BSEP to install a reliable hardened venting capability for pre-core damage and under severe accident conditions, including those involving a breach of the reactor vessel by molten core debris. Specific requirements are outlined in Attachment 2 of Reference 1.

Reference 1 required submission of an Overall Integrated Plan (OIP) pursuant to Section IV, Condition D. Reference 2 endorsed industry guidance document NEI 13-02, Revision 0 (i.e., Reference 6) with clarifications and exceptions. Reference 3 provided the Brunswick Steam Electric Plant OIP.

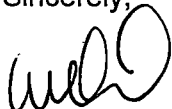
References 1 and 6 required submission of a status report at six-month intervals following submittal of the OIP. Reference 6 also provided direction regarding the content of the status reports. The purpose of this letter is to provide the second six-month status report pursuant to Section IV, Condition D, of Reference 1, that delineates progress made in implementing the requirements of Reference 1. The enclosed report provides an update of milestone accomplishments since the submittal of the first six-month status report (i.e., Reference 4), 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 June 25, 2015.

Sincerely,



William R. Gideon

Enclosure:  
Brunswick Steam Electric Plant (BSEP), Second Six-Month Status Report for the Implementation of Order EA-13-109, Order Modifying Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation Under Severe Accident Conditions

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cc (with enclosure):

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## ENCLOSURE

Brunswick Steam Electric Plant (BSEP),  
Second Six-Month Status Report for the Implementation of Order EA-13-109,  
Order to Modify Licenses with Regard to Reliable Hardened Containment Vents Capable of  
Operation Under Severe Accident Conditions

### 1 Introduction

Brunswick Steam Electric Plant (BSEP) developed an Overall Integrated Plan (i.e., Reference 2 to this enclosure) documenting the installation of a Hardened Containment Vent System (HCVS) that provides a reliable hardened venting capability for pre-core damage and under severe accident conditions, including those involving a breach of the reactor vessel by molten core debris, in response to Order Number EA-13-109 (i.e. Reference 1 to this enclosure). This enclosure provides the second update of milestone accomplishments since submittal of the Phase 1 Overall Integrated Plan including any changes to the compliance method, schedule, or need for relief/relaxation, and the basis, if any.

### 2 Milestone Accomplishments

The following milestones have been completed since the development of the Overall Integrated Plan, and is current as of June 1, 2015.

- Submit Overall Integrated Plan.
- Submit 6-Month Status Report (i.e., December 2014).

### 3 Milestone Schedule Status

The following provides an update to the Milestone Schedule of the Overall Integrated Plan. It provides the activity status of each item, and whether the expected completion date has changed. The dates are planning dates subject to change as design and implementation details are developed. The revised milestone target completion dates do not impact the order implementation date.

Milestone	Target Completion Date	Activity Status	Comments (Include date changes)
<b>*Indicates a change since last 6 month update.</b>			
Hold preliminary/conceptual design meeting.	Jun. 2014	Complete.	Date not revised.
Submit Overall Integrated Plan.	Jun. 2014	Complete.	Date not revised.
Submit 6 Month Status Report.	Dec. 2014	<b>*Complete.</b>	Date not revised.
Submit 6 Month Status Report.	Jun. 2015	<b>*Started.</b>	Date not revised.
Storage Plan.	TBD	Not started.	Date not revised.
Staffing analysis completion.	TBD	Not started.	Date not revised.

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Milestone	Target Completion Date	Activity Status	Comments (Include date changes)
<b>*Indicates a change since last 6 month update.</b>			
Long term use equipment acquisition timeline.	TBD	Not started.	Date not revised.
Submit 6 Month Status Report.	Dec. 2015	Not started.	Simultaneous with Phase 2 OIP.
Unit 2 Design Engineering On-site/Complete.	Mar. 2016	Not started.	Date not revised.
Submit 6 Month Status Report.	Jun. 2016	Not started.	Date not revised.
Operations Procedure Changes Developed.	Dec. 2016	Not started.	Date not revised.
Site Specific Maintenance Procedure Developed.	Dec. 2016	Not started.	Date not revised.
Submit 6 Month Status Report.	Dec. 2016	Not started.	Date not revised.
Training Complete.	Feb. 2017	Not started.	Outage start date moved up to February 2017.
Unit 2 Implementation Outage.	Feb. 2017	Not started.	Outage start date moved up to February 2017.
Procedure Changes Active.	Mar. 2017	Not started.	Date not revised.
Unit 2 Walk Through Demonstration/Functional Test.	Mar. 2017	Not started.	Date not revised.
Unit 1 Design Engineering On-site/Complete.	Mar. 2017	Not started.	Date not revised.
Submit 6 Month Status Report.	Jun. 2017	Not started.	Date not revised.
Submit 6 Month Status Report.	Dec. 2017	Not started.	Date not revised.
Unit 1 Implementation Outage.	Feb. 2018	Not started.	Outage start date moved up to February 2018.

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Milestone	Target Completion Date	Activity Status	Comments (Include date changes)
<b>*Indicates a change since last 6 month update.</b>			
Unit 1 Walk Through Demonstration/Functional Test.	Mar. 2018	Not started.	Date not revised.
Submit Completion Report.	May 2018	Not started.	Date not revised.

**4 Changes to Compliance Method**

There are no changes to the compliance method as documented in the Phase 1 Overall Integrated Plan (i.e., Reference 2 to this enclosure).

**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 from Overall Integrated Plan and Interim Staff Evaluation**

The following tables provide a summary of the open items documented in the Phase 1 Overall Integrated Plan or the Interim Staff Evaluation (ISE) (i.e., Reference 3 to this enclosure) and the status of each item.

Overall Integrated Plan Phase 1 Open Items		Status
<b>*Indicates a change since last 6 month update.</b>		
1	Evaluate, design, and implement missile protection as required for the HCVS piping external to the reactor building.	<b>*Complete.</b>
2	Finalize location of the Remote Operating Station (ROS).	Started.
3	Finalize and design means to address flammable gases in the HCVS.	Started.
4	Evaluate location of FLEX Diesel Generator (DG) for accessibility under Severe Accident conditions.	Started.

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Overall Integrated Plan Phase 1 Open Items		Status
<b>*Indicates a change since last 6 month update.</b>		
5	Develop procedures for beyond-design-basis external event (BDBEE) and Severe Accident vent operation (load shedding, power supply transfer, and vent valve operation from the main control room and ROS), vent support functions for sustained operation and portable equipment deployment (FLEX DG supply to the 24/48VDC battery system, and makeup to the nitrogen backup system).	Not started.
6	Confirm suppression pool heat capacity. Initial results from GE report 0000-0165-0656-R0 for BSEP indicate the suppression pool reaches the heat capacity temperature limit (HCTL) in 2.11 hours.	<b>*Complete.</b>
7	Finalize location of supplemental N2 bottle connection.	Not started.
8	Establish programs and processes for control of HCVS equipment functionality, out-of-service time, and testing.	<b>*Started.</b>
9	Confirm Wetwell vent capacity is sufficient at the containment design pressure (62 psig). Existing calculation 0D12-0009 calculates a wetwell vent capacity at the primary containment pressure limit (PCPL, 70 psig).	Started.

Interim Staff Evaluation (ISE) Phase 1 Open Items		Status
<b>*Indicates a change since last 6 month update.</b>		
1	Make available for NRC staff audit the site specific controlling document for HCVS out of service and compensatory measures.	<b>*Add ISE Open Item. Not started.</b>

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Interim Staff Evaluation (ISE) Phase 1 Open Items		Status
<b>*Indicates a change since last 6 month update.</b>		
2	Make available for NRC staff audit analyses demonstrating that HCVS has the capacity to vent the steam/energy equivalent of one percent of licensed/rated thermal power (i.e., unless a lower value is justified), and that the suppression pool and the HCVS together are able to absorb and reject decay heat, such that following a reactor shutdown from full power containment pressure is restored and then maintained below the primary containment design pressure and the primary containment pressure limit.	<b>*Add ISE Open Item. Not started.</b>
3	Make available for NRC staff audit confirmation of the time it takes the suppression pool to reach the heat capacity temperature limit during extended loss of AC power (ELAP) with RCIC in operation.	<b>*Add ISE Open Item. Not started.</b>
4	Make available for NRC staff audit a description of the final ROS location.	<b>*Add ISE Open Item. Not started.</b>
5	Make available for NRC staff audit documentation that demonstrates adequate communication between the remote HCVS operation locations and the HCVS decision makers during ELAP and severe accident conditions.	<b>*Add ISE Open Item. Not started.</b>
6	Provide a description of the final design of the HCVS to address hydrogen detonation/deflagration.	<b>*Add ISE Open Item. Not started.</b>
7	Make available for NRC staff audit seismic and tornado missile final design criteria for the HCVS stack.	<b>*Add ISE Open Item. Not started.</b>
8	Make available for NRC staff audit documentation of the HCVS nitrogen pneumatic system design including sizing and location.	<b>*Add ISE Open Item. Not started.</b>
9	Make available for NRC staff audit documentation of HCVS incorporation into the FLEX diesel generator loading calculation.	<b>*Add ISE Open Item. Not started.</b>
10	Make available for NRC staff audit an evaluation of temperature and radiological conditions to ensure that operating personnel can safely access and operate control and support equipment.	<b>*Add ISE Open Item. Not started.</b>



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Interim Staff Evaluation (ISE) Phase 1 Open Items		Status
<b>*Indicates a change since last 6 month update.</b>		
11	Make available for NRC staff audit descriptions of all instrumentation and controls (existing and planned) necessary to implement this order including qualification methods.	<b>* Add ISE Open Item. Not started.</b>
12	Clarify whether the seismic reliability demonstration of instruments, including valve position indication, vent pipe temperature instrumentation, radiation monitoring, and support system monitoring will (be) via methods that predict performance described in IEEE-344-2004 or provide justification for using a different revision of the standard.	<b>* Add ISE Open Item. Not started.</b>
13	Make available for NRC staff audit a justification for not monitoring HCVS system pressure as described in NEI 13-02.	<b>* Add ISE Open Item. Not started.</b>
14	Make available for NRC staff audit the descriptions of local conditions (temperature, radiation and humidity) anticipated during ELAP and severe accident for the components (valves, instrumentation, sensors, transmitters, indicators, electronics, control devices, etc.) required for HCVS venting including confirmation that the components are capable of performing their functions during ELAP and severe accident conditions.	<b>* Add ISE Open Item. Not started.</b>
15	Make available for NRC staff audit documentation of an evaluation verifying the existing containment isolation valves, relied upon for the HCVS, will open under the maximum expected differential pressure during BDBEE and severe accident wetwell venting.	<b>* Add ISE Open Item. Not started.</b>
16	Provide a description of the strategies for hydrogen control that minimizes the potential for hydrogen gas migration and ingress into the reactor building or other buildings.	<b>* Add ISE Open Item. Not started.</b>

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### 7 References

The following references support the updates to the Phase 1 Overall Integrated Plan described in this enclosure.

1. Nuclear Regulatory Commission (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, Agencywide Documents Access and Management System (ADAMS) Accession Number ML13143A321.
2. Duke Energy Letter, BSEP, Unit Nos. 1 and 2, *Phase 1 Overall Integrated Plan in Response to June 6, 2013, Commission Order Modifying Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation Under Severe Accident Conditions (Order Number EA-13-109)*, dated June 26, 2014, ADAMS Accession Number ML14191A687.
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