



Order No. EA-13-109

RS-15-151

June 30, 2015

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

Peach Bottom Atomic Power Station, Units 2 and 3
Renewed Facility Operating License Nos. DPR-44 and DPR-56
NRC Docket Nos. 50-277 and 50-278

Subject: Second Six-Month Status Report For 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)

References:

1. 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
2. NRC Interim Staff Guidance JLD-ISG-2015-01, "Compliance with Order EA-13-109, Order Modifying Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation Under Severe Accident Conditions," Revision 0, dated April 2015
3. NEI 13-02, "Industry Guidance for Compliance with NRC Order EA-13-109, BWR Mark I & II Reliable Hardened Containment Vents Capable of Operation Under Severe Accident Conditions," Revision 1, dated April 2015
4. Exelon Generation Company, LLC's Answer 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, 2013
5. Exelon Generation Company, LLC 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 30, 2014 (RS-14-062)
6. Exelon Generation Company, LLC First Six-Month Status Report 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 December 19, 2014 (RS-14-305)
7. NRC letter to Exelon Generation Company, LLC, Peach Bottom Atomic Power Station, Units 2 and 3 – 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. MF4416 and MF4417), dated February 12, 2015

On June 6, 2013, the Nuclear Regulatory Commission (“NRC” or “Commission”) issued an order (Reference 1) to Exelon Generation Company, LLC (EGC). Reference 1 was immediately effective and directs EGC to require their BWRs with Mark I and Mark II containments to take certain actions to ensure that these facilities have a hardened containment vent system (HCVS) to remove decay heat from the containment, and maintain control of containment pressure within acceptable limits following events that result in loss of active containment heat removal capability while maintaining the capability to operate under severe accident (SA) conditions resulting from an Extended Loss of AC Power (ELAP). Specific requirements are outlined in Attachment 2 of Reference 1.

Reference 1 required submission of a Phase 1 Overall Integrated Plan pursuant to Section IV, Condition D by June 30, 2014. Reference 2 endorses industry guidance document NEI 13-02, Revision 1 (Reference 3) with clarifications and exceptions identified in Reference 2. Reference 4 provided the EGC initial answer to the Order regarding reliable hardened containment vents capable of operation under severe accident conditions. Reference 5 provided the Peach Bottom Atomic Power Station, Units 2 and 3 Phase 1 Overall Integrated Plan.

Reference 1 requires submission of a status report at six-month intervals following submittal of the Phase 1 overall integrated plan. Reference 3 provides direction regarding the content of the status reports. Reference 6 provided the first six-month status report pursuant to Section IV, Condition D.3 of Reference 1 for Peach Bottom Station. The purpose of this letter is to provide the second six-month status report for Phase 1 pursuant to Section IV, Condition D.3, 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 last status report, including any changes to the compliance method, schedule, or need for relief and the basis, if any. The enclosed report also addresses the NRC Interim Staff Evaluation open items contained in Reference 7.

This letter contains no new regulatory commitments. If you have any questions regarding this report, please contact David P. Helker at 610-765-5525.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 30th day of June 2015.

Respectfully submitted,



James Barstow
Director - Licensing & Regulatory Affairs
Exelon Generation Company, LLC

Enclosure:

Peach Bottom Atomic Power Station, Units 2 and 3 Second Six-Month Status Report for Phase 1 Implementation of Order EA-13-109, Order Modifying Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation Under Severe Accident Conditions

cc: Director, Office of Nuclear Reactor Regulation
NRC Regional Administrator - Region I
NRC Senior Resident Inspector – Peach Bottom Atomic Power Station, Units 2 and 3
NRC Project Manager, NRR – Peach Bottom Atomic Power Station, Units 2 and 3
Mr. Charles H. Norton, NRR/JLD/PPSD/JOMB, NRC
Mr. Peter Bamford, NRR/JLD/JOMB, NRC
Director, Bureau of Radiation Protection – Pennsylvania Department of Environmental
Resources
S. T. Gray, State of Maryland
R. R. Janati, Chief, Division of Nuclear Safety, Pennsylvania Department of Environmental
Protection, Bureau of Radiation Protection

Enclosure

Peach Bottom Atomic Power Station, Units 2 and 3

**Second Six-Month Status Report for Phase 1 Implementation of Order EA-13-109, Order
Modifying Licenses with Regard to Reliable Hardened Containment Vents Capable of
Operation Under Severe Accident Conditions**

(7 pages)

Enclosure

Peach Bottom Atomic Power Station, Units 2 and 3 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”

1 Introduction

Peach Bottom Atomic Power Station, Units 2 and 3 developed an Overall Integrated Plan (Reference 1 in Section 8), 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 Reference 3. This enclosure provides an update of milestone accomplishments since submittal of the Phase 1 Overall Integrated Plan (OIP), including any changes to the compliance method, schedule, or need for relief/relaxation and the basis, if any.

2 Milestone Accomplishments

The following milestone(s) have been completed since the development of the Overall Integrated Plan (Reference 1), and are current as of June 2, 2015:

- Second Six-Month Update (complete with this submittal)

3 Milestone Schedule Status

The following provides an update to Part 5 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
Submit Overall Integrated Plan	June 2014	Complete	
<u>Submit 6 Month Updates:</u>			
Update 1	December 2014	Complete	
Update 2	June 2015	Complete with this submittal	

PBAPS Second Six Month Status Report for the Implementation of HCVS Phase 1
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Milestone	Target Completion Date	Activity Status	Comments
Update 3 [simultaneous with Phase 2 OIP]	December 2015	Not Started	
Update 4	June 2016	Not Started	
Update 5	December 2016	Not Started	
Update 6	June 2017	Not Started	
Update 7	December 2017	Not Started	
Update 8	June 2018	Not Started	
Submit Completion Report	December 2018	Not Started	
<u>Modifications:</u>			
Hold preliminary/conceptual design meeting	April 2014	Complete	
U2 Design Engineering for Wetwell Vent Approved	September 2015	Started	
U3 Design Engineering for Wetwell Vent Approved	September 2016	Not Started	
<u>Procedures:</u>			
U2 Wetwell Operations Procedure Changes Developed	September 2016	Not Started	
U2 Wetwell Maintenance Procedure Changes Developed	September 2016	Not Started	
U2 Wetwell Procedure Changes Active	November 2016	Not Started	
U3 Wetwell Operations Procedure Changes Developed	September 2017	Not Started	
U3 Wetwell Maintenance Procedure Changes Developed	September 2017	Not Started	
U3 Wetwell Procedure Changes Active	October 2017	Not Started	
<u>Training:</u>			
U2 Wetwell Training Complete	September 2016	Not Started	

Milestone	Target Completion Date	Activity Status	Comments
U3 Wetwell Training Complete	September 2017	Not Started	
<u>Completion:</u>			
U2 Wetwell Implementation Outage	November 2016	Not Started	
U2 Wetwell Walk-Through Demonstration/ Functional Test	November 2016	Not Started	
Submit U2 Wetwell Completion Report	January 2017	Not Started	
U3 Wetwell Implementation Outage	October 2017	Not Started	
U3 Wetwell Walk-Through Demonstration/ Functional Test	October 2017	Not Started	
Submit U3 Wetwell Completion Report	December 2017	Not Started	

4 Changes to Compliance Method

In the Phase 1 Overall Integrated Plan (Reference 1), a secondary containment isolation valve (SCIV) was being considered as a replacement to the present rupture disc which prevents secondary containment leakage during design basis accidents. The decision was made to retain the rupture disc. The purge system that will be added for preventing hydrogen deflagration and detonation also will be used to rupture the disc to allow anticipatory venting. There are no other changes to the compliance method outlined in Reference 1.

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

Peach Bottom Atomic Power Station, Units 2 and 3 expects to comply with the order implementation date; therefore, 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) and the status of each item.

PBAPS Second Six Month Status Report for the Implementation of HCVS Phase 1
June 30, 2015

Overall Integrated Plan Phase 1 Open Item	Status
1. Confirm that the Remote Operating Station (ROS) will be in an accessible area following a Severe Accident (SA).	SUPERSEDED BY NRC ISE OPEN ITEM # 09.
2. Provide procedures for HCVS Operation.	SUPERSEDED BY NRC ISE OPEN ITEM # 01.
3. Identify Site Specific Controlling Document for HCVS out of service and compensatory measures.	SUPERSEDED BY NRC ISE OPEN ITEM # 02.
4. Determine the design approach for combustible gas.	SUPERSEDED BY NRC ISE OPEN ITEM # 08.

Interim Staff Evaluation Open Item	Status
01. Make available for NRC staff audit guidelines and procedures for HCVS operation. (Section 3.2.3.1)	Not Started
02. Make available for NRC staff audit the site specific controlling document for HCVS out of service and compensatory measures. (Section 3.4.1)	Not Started
03. Make available for NRC staff audit a technical justification for use of jumpers in the HCVS strategy. (Section 3.1.3)	Not Started
04. Make available for NRC staff audit analyses demonstrating that the HCVS has the capacity to vent the steam/energy equivalent of one percent of licensed/rated thermal power (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. (Sections 3.2.2.1 and 3.2.2.2)	<p>Started – Existing Calculation PM-0546, Torus Hardened Vent-Flow Calculation, demonstrates that the HCVS has the capacity to vent the steam/energy equivalent of one percent licensed/rated thermal power.</p> <p>The primary containment design pressure is 56 psig (UFSAR 5.2.3.1). The primary containment pressure limit is 60 psig (UFSAR 5.2.3.6). PM-0546 shows that the HCVS capacity exceeds one percent of licensed/rated thermal power at the lower of these values, and capacity exceeds one percent power at significantly lower pressure values, down to approximately 20 psig.</p>

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<p>05. Make available for NRC staff audit descriptions or diagrams of reactor building ventilation including exhaust dampers failure modes to support licensee justification for the HVAC release point being below and 150 feet from the reactor building ventilation release point. (Section 3.2.2.3)</p>	<p>Complete – Reference drawing M-395: The Reactor Building Exhaust System. The Reactor Building Exhaust System Fans, including the Refuel Floor Exhaust Fans, Reactor Building Exhaust Fans, and Reactor Building Equipment Exhaust Fans, have Fail-Close dampers in exhaust ducts to prevent uncontrolled or unmonitored release from the Reactor Building in the event of loss of power to the fan’s solenoid valves. Fail-Close dampers will eliminate pathway into the Reactor Building in the event of use of the HCVS in an ELAP.</p>
<p>06. Make available for NRC staff audit details to justify the deviation from tornado protection standards provided in NEI 13-02 or make available a description of how the HCVS will comply with the tornado protection standards provided in NEI-13-02. (Section 3.2.2.3)</p>	<p>Started – Exelon is preparing an analysis to demonstrate that the location of the existing external piping already provides reasonable protection from tornado generated missiles.</p>
<p>07. Make available for NRC staff audit documentation that demonstrates adequate communication between the remote HCVS operation locations and HCVS decision makers during ELAP and severe accident conditions. (Section 3.2.2.5)</p>	<p>Started – Engineering Change Request 15-00126 enhances plant internal communications capability in the event of an ELAP.</p>
<p>08. Provide a description of the final design of the HCVS to address hydrogen detonation and deflagration. (Section 3.2.2.6)</p>	<p>Started – HCVS preliminary design has selected Argon purging to prevent hydrogen detonation and deflagration.</p>
<p>09. Make available for NRC staff audit an evaluation of temperature and radiological conditions to ensure that operating personnel can safely access and operate controls and support equipment. (Sections 3.2.1, 3.2.2.3, 3.2.2.4, 3.2.2.5, 3.2.2.10, 3.2.4.1, 3.2.4.2, 3.2.5.2, and 3.2.6)</p>	<p>Started</p>
<p>10. Make available for NRC staff audit descriptions of all instrumentation and controls (existing and planned) necessary to implement this order including qualification methods. (Sections 3.2.2.9 and 3.2.2.10)</p>	<p>Started</p>
<p>11. Make available for NRC staff audit the final sizing evaluation for HCVS batteries/battery</p>	<p>Not Started</p>

<p>charger including incorporation into FLEX DG loading calculation. (Sections 3.2.2.4, 3.2.3.1, 3.2.3.2, 3.2.4.1, 3.2.4.2, 3.2.5.1, 3.2.5.2, and 3.2.6)</p>	
<p>12. 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. (Sections 3.2.2.3, 3.2.2.5, 3.2.2.9, and 3.2.2.10)</p>	<p>Started</p>
<p>13. 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. (Section 3.2.2.9)</p>	<p>Started – Isolation valve analysis in progress.</p>
<p>14. Provide a description of the strategies for hydrogen control that minimizes the potential for hydrogen gas migration and ingress into the reactor buildings or other buildings. (Section 3.2.2.6 and 3.2.2.7)</p>	<p>Not started</p>
<p>15. Make available for NRC audit documentation confirming that HCVS will remain isolated from standby gas treatment system during ELAP and severe accident conditions. (Section 3.2.2.7)</p>	<p>Started – Isolation valve analysis in progress.</p>

7 Interim Staff Evaluation Impacts

There are no potential impacts to the Interim Staff Evaluation identified at this time.

8 References

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

1. Peach Bottom Atomic Power Station, Units 2 and 3, 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 30, 2014.
2. Peach Bottom Atomic Power Station, Units 2 and 3, First Six-Month Status Report 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 December 19, 2014.
3. NRC Order Number EA-13-109, "Order Modifying Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation under Severe Accident Conditions" dated June 6, 2013.
4. NEI 13-02, "Industry Guidance for Compliance with NRC Order EA-13-109, 'BWR Mark I & II Reliable Hardened Containment Vents Capable of Operation under Severe Accident Conditions,' Revision 1, dated April 2015.
5. NRC Interim Staff Guidance JLD-ISG-2015-01, "Compliance with Order EA-13-109, Order Modifying Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation Under Severe Accident Conditions," Revision 0, dated April 2015 (Accession No. ML15104A118).
6. NRC Endorsement of Industry Hardened Containment Venting System (HCVS) Phase 1 Overall Integrated Plan Template (EA-13-109) Rev. 0, dated May 14, 2014 (Accession No. ML14128A219).
7. Peach Bottom Atomic Power Station Units 2 and 3 - Interim Staff Evaluation Relating to Overall Integrated Plan in Response to Phase 1 Order EA-13-109 (Severe Accident Capable Hardened Vents) (TAC Nos. MF4416 and MF4417), dated February 12, 2015 (Accession No. ML15026A469).