Exelon Generation

Order No. EA-13-109

RS-17-068

June 30, 2017

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: Sixth Six-Month Status Report For Phases 1 and 2 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-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", Revision 0, dated November 14, 2013
3. NRC Interim Staff Guidance JLD-ISG-2015-01, "Compliance with Phase 2 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
4. NEI 13-02, "Industry Guidance for Compliance With 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. 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
6. 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)
7. 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)
8. Exelon Generation Company, LLC Second 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 June 30, 2015 (RS-15-151)

9. Exelon Generation Company, LLC Phase 1 (Updated) and Phase 2 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 15, 2015 (RS-15-303)
10. Exelon Generation Company, LLC Fourth Six-Month Status Report For Phases 1 and 2 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, 2016 (RS-16-109)
11. Exelon Generation Company, LLC Fifth Six-Month Status Report For Phases 1 and 2 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 15, 2016 (RS-16-235)
12. 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
13. 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 2 of Order EA-13-109 (Severe Accident Capable Hardened Vents) (TAC Nos. MF4416 and MF4417), dated August 2, 2016

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 an Overall Integrated Plan (OIP) by June 30, 2014 for Phase 1 of the Order, and an OIP by December 31, 2015 for Phase 2 of the Order. The interim staff guidance (References 2 and 3) provide direction regarding the content of the OIP for Phase 1 and Phase 2. Reference 3 endorses industry guidance document NEI 13-02, Revision 1 (Reference 4) with clarifications and exceptions identified in References 2 and 3. Reference 5 provided the EGC initial response regarding reliable hardened containment vents capable of operation under severe accident conditions. Reference 6 provided the Peach Bottom Atomic Power Station, Units 2 and 3, Phase 1 OIP pursuant to Section IV, Condition D.1 of Reference 1. References 7 and 8 provided the first and second six-month status reports pursuant to Section IV, Condition D.3 of Reference 1 for Peach Bottom Atomic Power Station. Reference 9 provided the Peach Bottom Atomic Power Station, Units 2 and 3, Phase 1 updated and Phase 2 OIP pursuant to Section IV, Conditions D.2 and D.3 of Reference 1. References 10 and 11 provided the fourth and fifth six-month status reports pursuant to Section IV, Condition D.3 of Reference 1 for Peach Bottom Atomic Power Station.

The purpose of this letter is to provide the sixth six-month update report for Phases 1 and 2, pursuant to Section IV, Condition D.3 of Reference 1, that delineates progress made in implementing the requirements of Reference 1 for Peach Bottom Atomic Power Station, Units 2 and 3. 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 References 12 and 13.

This letter contains no new regulatory commitments. If you have any questions regarding this report, please contact David J. Distel at 610-765-5517.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 30th day of June 2017.

Respectfully submitted,

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

Enclosure:

Peach Bottom Atomic Power Station, Units 2 and 3 Sixth Six-Month Status Report for Phases 1 and 2 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
NRC Project Manager, NRR - Peach Bottom Atomic Power Station
Mr. Raj Auluck, NRR/JLD/TSD/JCBB, NRC
Mr. Brian E. Lee, NRR/JLD/JCBB, NRC
Mr. Peter Bamford, NRR/JLD/JOMB, NRC
Director, Bureau of Radiation Protection – Pennsylvania Department of Environmental Resources
R. R. Janati, Chief, Division of Nuclear Safety, Pennsylvania Department of Environmental Protection, Bureau of Radiation Protection
S. T. Gray, State of Maryland

Enclosure

Peach Bottom Atomic Power Station, Units 2 and 3

Sixth Six-Month Status Report for Phases 1 and 2 Implementation of Order EA-13-109, Order Modifying Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation Under Severe Accident Conditions

(15 pages)

Enclosure

Peach Bottom Atomic Power Station, Units 2 and 3
Sixth Six-Month Status Report for Phases 1 and 2 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 (PBAPS) 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 2. This is the sixth six-month status report updating milestone accomplishments based on the combined Phases 1 and 2 Overall Integrated Plan dated December 15, 2015.

PBAPS developed an updated and combined Phases 1 and 2 Overall Integrated Plan (Reference 6 in Section 8), documenting:

1. 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 2.

2. An alternative venting strategy that makes it unlikely that a drywell vent is needed to protect the containment from overpressure related failure under severe accident conditions, including those that involve a breach of the reactor vessel by molten core debris, in response to Reference 2

This enclosure provides an update of milestone accomplishments since submittal of the Fifth Six-Month Status Report for Phase 1 and Phase 2 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 milestone(s) have been completed since the development of the combined Phases 1 and 2 Overall Integrated Plan (Reference 6), and are current as of June 1, 2017:

- Sixth Six-Month Update (complete with this submittal)
- Completed Unit 3 HCVS Phase 1 detailed design
- Began Unit 3 HCVS Phase 1 installation

3 Milestone Schedule Status

The following provides an update to Attachment 2 of the combined Phases 1 and 2 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.

Milestone	Target Completion Date	Activity Status	Comments
Phases 1 and 2 HCVS Milestone Table			
Submit Overall Integrated Plan	Jun. 2014	Complete	
Submit 6 Month Updates			
Update 1	Dec. 2014	Complete	
Update 2	Jun. 2015	Complete	
Update 3 [Simultaneous with Phase 2 OIP]	Dec. 2015	Complete	
Update 4	Jun. 2016	Complete	
Update 5	Dec. 2016	Complete	
Update 6	Jun. 2017	Complete with this submittal	
Update 7	Dec. 2017	Not Started	
Update 8	Jun. 2018	Not Started	
Update 9	Dec. 2018	Not Started	
Phase 1 Specific Milestones			
Phase 1 Unit 2 Modifications			
Begin Conceptual Design	Apr. 2014	Complete	
Complete Conceptual Design	Jun. 2015	Complete	
Begin Detailed Design	Jun. 2015	Complete	
Complete Detailed Design and Issue Modification Package	Jun. 2016	Complete	
Begin Online Portion of the Installation	Jun. 2016	Complete	
Complete Online Installation	Oct. 2016	Complete	
Begin Outage Portion of the Installation	Oct. 2016	Complete	
Complete Outage Installation	Nov. 2016	Complete	
Phase 1 Procedure Changes Active			
Operations Procedure Changes Developed	Nov. 2016	Complete	

Milestone	Target Completion Date	Activity Status	Comments
Phases 1 and 2 HCVS Milestone Table			
Site Specific Maintenance Procedure Developed	Nov. 2016	Complete	
Procedure Changes Active	Nov. 2016	Complete	
Phase 1 Training			
Training Complete	Nov. 2016	Complete	
Phase 1 Completion			
Unit 2 Phase 1 HCVS Implementation	Nov. 2016	Complete	
Phase 1 Unit 3 Modifications			
Begin Conceptual Design	N/A	N/A	
Complete Conceptual Design	N/A	N/A	
Begin Detailed Design	May 2016	Complete	
Complete Detailed Design and Issue Modification Package	Feb. 2017	Complete	
Begin Online Portion of the Installation	Mar. 2017	Complete	
Complete Online Installation	Oct. 2017	Started	
Begin Outage Portion of the Installation	Oct. 2017	Not Started	
Complete Outage Installation	Nov. 2017	Not Started	
Phase 1 Procedure Changes Active			
Operations Procedure Changes Developed	Nov. 2017	Started	
Site Specific Maintenance Procedure Developed	Nov. 2017	Started	
Procedure Changes Active	Nov. 2017	Started	
Phase 1 Training			
Training Complete	Nov. 2017	Started	
Phase 1 Completion			
Unit 3 Phase 1 HCVS Implementation	Nov. 2017	Started	
Phase 2 Specific Milestones			

Milestone	Target Completion Date	Activity Status	Comments
Phases 1 and 2 HCVS Milestone Table			
Phase 2 Unit 3 Modifications			
Begin Conceptual Design	May 2016	Complete	
Complete Conceptual Design	Nov. 2016	Complete	
Begin Detailed Design	Dec. 2016	Complete	
Complete Detailed Design and Issue Modification Package	Jul. 2017	Started	Date Change: Previously Feb. 2017
Begin Online Portion of the Installation	Sep. 2017	Not Started	Date Change: Previously Mar. 2017
Complete Online Installation	Oct. 2017	Not Started	
Begin Outage Portion of the Installation	Oct. 2017	Not Started	
Complete Outage Installation	Nov. 2017	Not Started	
Phase 2 Procedure Changes Active			
Operations Procedure Changes Developed	Nov. 2017	Started	
Site Specific Maintenance Procedure Developed	Nov. 2017	Started	
Procedure Changes Active	Nov. 2017	Not Started	
Phase 2 Training			
Training Complete	Nov. 2017	Not Started	
Phase 2 Completion			
Unit 3 Phase 2 HCVS Implementation	Nov. 2017	Not Started	
Submit Full Compliance Report for Phase 1 & Phase 2 for Unit 3	Jan. 2018	Not Started	
Phase 2 Unit 2 Modifications			
Begin Conceptual Design	N/A	N/A	
Complete Conceptual Design	N/A	N/A	

Milestone	Target Completion Date	Activity Status	Comments
Phases 1 and 2 HCVS Milestone Table			
Begin Detailed Design	Jun. 2017	Complete	Date Change: Previously Mar. 2017
Complete Detailed Design and Issue Modification Package	Sep. 2017	Not Started	
Begin Online Portion of the Installation	Feb. 2018	Not Started	
Complete Online Installation	Oct. 2018	Not Started	
Begin Outage Portion of the Installation	Oct. 2018	Not Started	
Complete Outage Installation	Nov. 2018	Not Started	
Phase 2 Procedure Changes Active			
Operations Procedure Changes Developed	Nov. 2018	Not Started	
Site Specific Maintenance Procedure Developed	Nov. 2018	Not Started	
Procedure Changes Active	Nov. 2018	Not Started	
Phase 2 Training			
Training Complete	Nov. 2018	Not Started	
Phase 2 Completion			
Unit 2 Phase 2 HCVS Implementation	Nov. 2018	Not Started	
Submit Full Compliance Report for Phase 1 & Phase 2 for Unit 2	Jan. 2019	Not Started	

4 Changes to Compliance Method

It was previously communicated in the combined Phases 1 and 2 Overall Integrated Plan (Reference 6) that Instruments PR/TR-4805 and PR/TR-5805 would be used to obtain containment pressure readings for Unit 2 and Unit 3, respectively, and that the instruments are Regulatory Guide (RG) 1.97 qualified. While the PR/TR-4805 and PR/TR-5805 instruments are RG 1.97 qualified, not all components that are either in the associated instrument loop or that may affect the loop are RG 1.97 qualified. These components include PT-4805, PT-5805, 2DC834 and 3DC834 and are evaluated for dose, thermal and humidity effects considering severe accident environmental conditions. The evaluation concluded that the PR/TR-4805 and PR/TR-5805 instrument loop will function during severe

accident conditions satisfactorily. Details of the evaluation are contained in EC 618957, Attachment 9A. EC 618957, Attachment 9A will be provided in the eportal when EC 618957 is issued.

Based on the above evaluation, PT-4805 and PT-5805 are qualified for the radiological, thermal and humidity conditions expected during a severe accident, and failure of 2DC834 and 3DC834 does not affect the PR/TR-4805 and PR/TR-5805 instrument loop. Therefore, it is acceptable to use recorders PR/TR-4805 and PR/TR-5805 for containment pressure indication during a severe accident.

The SAWA/SAWM PBAPS – Specific Datum was also previously communicated in Attachment 2.1.C of the combined Phases 1 and 2 Overall Integrated Plan (Reference 6) which contained erroneous values. The normal torus level was previously communicated as 15'-6"; however, the correct value is 14.7' (Reference 9). Additionally, the bottom of the vent pipe was previously communicated as 30'-3 ½"; however, the correct value is 29.5' (Reference 9). The correction of these values changes the freeboard height and additional freeboard height values, previously communicated as 15'-6" to 21' and 9'-3 ½", respectively, to 14.7' to 21' and 8.5', respectively. The correction of these values does not affect the successful performance of SAWA/SAWM (Reference 10).

There are no other changes to the compliance method outlined in Reference 6.

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

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

6 Open Items from Combined Phases 1 and 2 Overall Integrated Plan and Interim Staff Evaluations

The following tables provide a summary of the open items documented in the combined Phases 1 and 2 Overall Integrated Plan or the Interim Staff Evaluation (ISE) for Phase 1 and Phase 2 and the status of each item. Phase 1 open item responses were discussed with the NRC on May 18, 2017, and all items were adequately addressed and resolved. All additional information has been provided, and the Phase 1 open items are considered closed based on NRC review.

Combined Phases 1 and 2 OIP Open Item	Status
Phase 1 Open Items	
OI-1. Confirm that the Remote Operating Station (ROS) will be in an accessible area following a Severe Accident (SA).	Deleted. Closed to ISE Open Item number 09.
OI-2. Provide procedures for HCVS Operation	Deleted. Closed to ISE Open Item number 01.
OI-3. Identify site specific controlling document for HCVS out of service and compensatory measures	Deleted. Closed to ISE Open Item number 02.

Combined Phases 1 and 2 OIP Open Item	Status
OI-4. Determine the approach for combustible gases.	Deleted. Closed to ISE Open Item number 08.
OI-5. Perform radiological evaluation for Phase 1 vent line impact on ERO response actions.	Complete Completion support information is contained in the fifth six month update dated December 15, 2016 (Reference 8).

Phase 1 Interim Staff Evaluation Open Item	Status
ISE-1. Make available for NRC staff audit guidelines and procedures for HCVS operation. (Section 3.2.3.1)	Complete Completion support information is contained in the fifth six month update dated December 15, 2016 (Reference 8).
ISE-2. Make available for the NRC staff audit the site specific controlling document for HCVS out of service and compensatory measures. (Section 3.4.1)	Complete Completion support information is contained in the fifth six month update dated December 15, 2016 (Reference 8).
ISE-3. Make available for NRC staff audit a technical justification for use of jumpers in the HCVS strategy. (Section 3.1.3)	Complete Completion support information is contained in the fifth six month update dated December 15, 2016 (Reference 8).
ISE-4. 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)	Complete Completion support information is contained in the fifth six month update dated December 15, 2016 (Reference 8).
ISE-5. 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)	Complete Completion support information is contained in the fifth six month update dated December 15, 2016 (Reference 8).
ISE-6. 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)	Complete Completion support information is contained in the fifth six month update dated December 15, 2016 (Reference 8).
ISE-7. 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 condition. (Section 3.2.2.5)	Complete Completion support information is contained in the fifth six month update dated December 15, 2016 (Reference 8).
ISE-8. Provide a description of the final design of the HCVS to address hydrogen detonation and deflagration. (Section 3.2.2.6)	Complete Completion support information is contained in the fifth six month update dated December 15, 2016 (Reference 8).
ISE-9. 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)	Complete Completion support information is contained in the fifth six month update dated December 15, 2016 (Reference 8).

Phase 1 Interim Staff Evaluation Open Item	Status
ISE-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)	Complete Completion support information is contained in the fifth six month update dated December 15, 2016 (Reference 8).
ISE-11. Make available for NRC staff audit the final sizing evaluation for HCVS batteries/battery 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)	Complete Completion support information is contained in the fifth six month update dated December 15, 2016 (Reference 8).
ISE-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)	Complete Completion support information is contained in the fifth six month update dated December 15, 2016 (Reference 8).
ISE-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)	Complete Completion support information is contained in the fifth six month update dated December 15, 2016 (Reference 8).
ISE-14. 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. (Section 3.2.2.6 and 3.2.2.7)	Complete Completion support information is contained in the fifth six month update dated December 15, 2016 (Reference 8).
ISE-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)	Complete Completion support information is contained in the fifth six month update dated December 15, 2016 (Reference 8).

Phase 2 Interim Staff Evaluation Open Item	Status
ISE-1. Licensee to demonstrate the SAWA equipment and controls, as well as ingress and egress paths for the expected severe accident conditions (temperature, humidity, radiation) remain operational throughout the sustained operating period. (Section 3.3.2.3)	Complete <u>Equipment and Controls</u> Plant instrumentation for SAWM that is qualified to RG 1.97 or equivalent is considered qualified for the sustained operating period without further evaluation. The following plant instruments are qualified to RG 1.97: PR/TR-4805 (Unit 2) PR/TR-5805 (Unit 3) LI-8123A (Unit 2) LI-9123A (Unit3) Not all components that are either in the PR/TR-4(5)805 instrument loops or that may affect the loops are RG 1.97 qualified. These components include PT-4805, PT-5805, 2DC834 and 3DC834, and are evaluated in EC 618957, Attachment 9A for the radiological, thermal and humidity conditions expected during a severe accident. These components are determined to be either acceptable or have no adverse effect on the PR/TR-4805 and PR/TR-5805 instrument loops if failure occurred. Passive components that do not need to change state after initially establishing SAWA flow do not require evaluation beyond the first 8 hours, at which time they are expected to be installed and ready for use to support SAWA/SAWM. The following additional equipment performing an active SAWA/SAWM function is considered: SAWA/SAWM flow instrument. SAWA/SAWM pump (FLEX pump) SAWA/SAWM generator (FLEX generator) Active valves in SAWA flow path <u>Ingress and Egress</u> A quantitative evaluation of expected dose rates has been performed per HCVS-WP-02 in Calculation PM-1207 and found the dose rates at deployment locations including ingress/egress paths are acceptable. Calculation PM-1207 has been posted to the ePortal. Unit 3 EC 618957 will be posted to the ePortal upon approval of the EC.

Phase 2 Interim Staff Evaluation Open Item	Status
ISE-2. Licensee to demonstrate that instrumentation and equipment being used for SAWA and supporting equipment is capable to perform for the sustained operating period under the expected temperature and radioloqical conditions. (Section 3.3.2.3)	Complete Equipment and Controls Plant instrumentation for SAWM that is qualified to RG 1.97 or equivalent is considered qualified for the sustained operating period without further evaluation. The following plant instruments are qualified to RG 1.97: PR/TR-4805 (Unit 2) PR/TR-5805 (Unit 3) LI-8123A (Unit 2) LI-9123A (Unit3) See response to Phase 2 ISE-1 for discussion on components that are associated with the PR/TR-4(5)805 instrument loops that are not RG 1.97 qualified. Passive components that do not need to change state after initially establishing SAWA flow do not require evaluation beyond the first 8 hours, at which time they are expected to be installed and ready for use to support SAWA/SAWM. The following additional equipment performing an active SAWA/SAWM function is considered for temperature and radiation effects: SAWA/SAWM flow instrument SAWA/SAWM pump (FLEX pump) SAWA/SAWM generator (FLEX generator) Active valves in SAWA flow path Temperature The location of SAWA equipment and controls are the same or similar as FLEX with the exceptions noted below. The areas/rooms of PBAPS that require operator actions or passage to implement the SAWA/SAWM strategy are evaluated. The evaluation concluded that the expected thermal conditions associated with a severe accident are considered to be acceptable to accomplish the required SAWA/SAWM actions for HCVS Phase 2. Details of the evaluation are contained in EC 618957, Attachment 9B. The SAWA/SAWM action time line is the same as the FLEX action time line with the exception of performing procedure FSG-043 "Defeating RCIC Interlocks" and FSG-032 "Establishing HPCI/RCIC/Sump Room Ventilation, Lighting and Water Removal". These procedures are not required to be performed as part of the SAWA/SAWM strategy since the actions performed in these procedures are to support RCIC/HPCI operation and RCIC and HPCI are assumed to fail for SAWA/SAWM. Technical Evaluation 2493544-28 established a temperature profile for areas of PBAPS during an ELAP that require operator actions or passage to implement the FLEX strategy. This evaluation considered loss of ventilation (until FLEX generators are deployed) combined with decay heat from the reactor and various subsystems and heat from plant equipment fed by station batteries such as relays, emergency lighting and other electrical components credited in the FLEX strategy. Active plant calculations involving loss of HVAC were evaluated to identify calculations where area temperatures would be bounding when compared to those temperatures anticipated during an ELAP. The following rooms were evaluated for FLEX in Technical Evaluation 2493544-28; however, they are not required to be accessed as part of the SAWA/SAWM strategy: RCIC Pump Room and HPCI Pump Room Since RCIC and HPCI are assumed to fail immediately for SAWA/SAWM, there is no requirement to access the RCIC or HPCI pump rooms; however, operators will likely open the RCIC and HPCI pump room doors per procedure SE-11 and determine if the RCIC or

Phase 2 Interim Staff Evaluation Open Item	Status
	HPCI pumps can be started. The temperatures listed for these rooms in Technical Evaluation 2493544-28 would remain bounding for the relatively short time operators would spend determining if the RCIC or HPCI pumps can be started since the heat load from the RCIC or HPCI pump operation would not contribute to the overall heat load of the room. Reactor Building Sump Room and Core Spray Pump Room The reactor building sump room and core spray pump room are required to be accessed as part of the FLEX strategy per procedure FSG-032; however, these rooms are not required to be accessed as part of the SAWA/SAWM strategy since FSG-032 is not required to be performed as stated above. South Isolation Valve Room (SIVR) Procedure FSG-044 aligns the backup instrument nitrogen bottles to the ADS valves as part of the FLEX and SAWA/SAWM strategy. This is achieved by bypassing the A and B backup instrument nitrogen solenoid valves via a local bypass line. The B backup instrument nitrogen solenoid valve is located in the SIVR and cannot be bypassed using the local bypass line since the Unit 3 SIVR is uninhabitable during a Severe Accident. Therefore, the Engineering Change associated with SAWA/SAWM provides a new bypass line which is routed outside of the SIVR into the Control Rod Drive (CRD) Equipment Area which is evaluated below. The remaining areas identified in Technical Evaluation 2493544-28 are required to be accessed as part of the SAWA/SAWM strategy. The temperatures listed for the Stairwells, Reactor Building Closed Cooling Water (RBCCW) Rooms, CRD Equipment Areas, Corridors, and Operating Area are associated with a Loss of Coolant Accident (LOCA). As stated in Technical Evaluation 2493544-28, these area temperatures are greater than those anticipated in an ELAP. These LOCA temperatures are considered to be acceptable for application to SAWA/SAWM actions under a severe accident since these temperatures are conservative in nature under an ELAP, the SAWA/SAWM actions will be completed within 7 hours into the event where containment heat up is restricted to core damage prior to vessel breach, and the drywell shield wall provides restrictive heat transfer which will mitigate the propagation of the higher drywell temperature. The temperatures listed for the Cable Spreading Room and Computer Room are from calculation PM-1034; these area temperatures are reasonable and would not be expected to have any notable increase due to location/proximity to primary containment. The Refuel Floor Area temperature is determined by calculation PM-1174, Rev. 0 and this temperature is also not expected to increase since the inputs and assumptions of the calculation remain the same. Per HCVS-FAQ-01, no evaluation is required for use of the MCR as the primary control station. Actions to open Reactor Building Railroad Doors and Refuel Floor Roof Hatch to establish natural circulation of the Secondary Containment atmosphere and establish MCR, Battery Room and Switchgear Room ventilation per FSG-030, FSG-031 and FSG-033 are maintained as part of the SAWA/SAWM strategy. Technical Evaluation 2493544-28 established area/room temperatures during an ELAP for PBAPS and determined that these temperatures are acceptable to implement FLEX actions. Based on the determination that the temperatures listed in Technical Evaluation 2493544-28 can be applied to SAWA/SAWM actions and that these temperatures are acceptable to accomplish the required FLEX actions, the expected thermal conditions associated with SAWA/SAWM are considered to be acceptable to accomplish the required SAWA/SAWM actions for HCVS Phase 2. Radiation For equipment locations within the Reactor Building, a quantitative evaluation of expected normal operation and containment shine (vent line shine) total integrated dose has been performed per HCVS-FAQ-12 (HCVS-WP-02) in Calculation PM-1207 and found the total integrated dose at deployment locations is acceptable.

<table>
<tr><th>Phase 2 Interim Staff Evaluation Open Item</th><th>Status</th></tr>
<tr><td></td><td>For locations outside the Reactor Building between 7 hours and 7 days when SAWA is being utilized, a quantitative evaluation of expected dose rates has been performed per HCVS-WP-02 in Calculation PM-1207 and found the dose rates at deployment locations are acceptable.

Calculation PM-1207 and Procedures FSG-030, FSG-031, FSG-032, FSG-033 and FSG-043 have been posted to the ePortal. The revised Procedure FSG-044 will be posted to the ePortal upon approval of the procedure revision. Unit 3 EC 618957 will be posted to the ePortal upon approval of the EC.</td></tr>
<tr><td>ISE-3 Licensee to demonstrate that containment failure as a result of overpressure can be prevented without a drywell vent during severe accident conditions. (Section 3.3.3)</td><td>Complete

The wetwell vent has been designed and installed to meet NEI 13-02, Rev. 1 guidance which will ensure that it is adequately sized to prevent containment overpressure under severe accident conditions.

The SAWM strategy will ensure that the wetwell vent remains functional for the period of sustained operation. PBAPS will follow the guidance (flow rate and timing) for SAWA/SAWM described in BWROG-TP-15-008 and BWROG-TP-15-011. These documents have been posted to the ePortal for NRC staff review. The wetwell vent will be opened prior to exceeding the PCPL value of 60 psig. Therefore, containment over pressurization is prevented without the need for a drywell vent.</td></tr>
<tr><td>ISE-4 Licensee shall demonstrate whether a site specific MAAP evaluation will be used to determine an initial SAWA flow rate. If the evaluations performed in BWROG TP-15-011 is considered, provide a description of how the plant is bounded by the reference plant analysis that shows the SAWM strategy is successful in making it unlikely that a drywell vent is needed. (Section 3.3.3.1)</td><td>Complete

Peach Bottom will implement the initial SAWA flow rate of 500 GPM used in the reference plant evaluation. A site specific MAAP evaluation for determining an appropriate site specific initial SAWA flow rate is not required.

Using Figure 2.1.C from the combined Phases 1 and 2 OIP, compare the reference plant parameters to the plant specific parameters.

<table>
<tr><th>Reference Plant</th><th>Peach Bottom</th></tr>
<tr><td>Torus freeboard volume is 525,000[1] gallons</td><td>Torus freeboard volume is 525,000[1] gallons</td></tr>
<tr><td>SAWA flow is 500 GPM at 8 hours followed by 100 GPM from 12 hours to 168 hours</td><td>SAWA flow is 500 GPM at 8 hours followed by 100 GPM from 12 hours to 168 hours</td></tr>
<tr><td colspan="2">The above parameters for Peach Bottom compared to the reference plant that determine success of the SAWM strategy demonstrate that the reference plant values are bounding. Therefore, the SAWM strategy implemented at Peach Bottom makes it unlikely that a DW vent is needed to prevent containment overpressure related failure.</td></tr>
</table></td></tr>
<tr><td>ISE-5 Licensee to demonstrate that there is adequate communication between the MCR and the Intake Structure operator at the FLEX manual valve during severe accident conditions. (Section 3.3.3.4)</td><td>Complete

The SAWA/SAWM pump (FLEX pump) and SAWA manual valve location is adjacent to the 3 Startup Switchgear Building north of the Unit 3 Reactor Building. This location is shown in EC 618957, Attachment 12. Unit 3 EC 618957 will be posted to the ePortal upon approval of the EC.

PBAPS utilizes radio communications to communicate between the MCR and the operator at the SAWA flow control location. This communication method is the same as accepted in Order EA-12-049. These items will be powered and remain powered using the same methods as evaluated under EA-12-049 for the period of sustained operation, which may be longer than identified for EA-12-049.</td></tr>
</table>

[1] Peach Bottom available freeboard volume in gallons is estimated from nominal water level of 14.7 feet to 21 feet. 21 feet is the upper range of the wide range torus level instrument and the assumed loss of wetwell vent function. The Peach Bottom torus is 31 feet in diameter.

<table>
<tr><th>Phase 2 Interim Staff Evaluation Open Item</th><th>Status</th></tr>
<tr><td>ISE-6 Licensee to demonstrate the SAWM flow instrumentation qualification for the expected environmental conditions. (Section 3.3.3.4)</td><td>Complete

For locations outside the Reactor Building between 7 hours and 7 days when SAWA is being utilized, a quantitative evaluation of expected dose rates has been performed per HCVS-WP-02 in Calculation PM-1207 and found the dose rates at deployment locations are acceptable. The selected instrument is designed for the expected flow rate, temperature and pressure for SAWA over the period of sustained operation.

<table>
<tr><th>SAWA Flow Instrument Qualification</th><th>Expected SAWA Parameter Range</th></tr>
<tr><td>3.3 to 1100 GPM</td><td>100 to 500 GPM</td></tr>
<tr><td>-4 to 140 °F</td><td>10 to 95 °F</td></tr>
<tr><td>740 PSI</td><td>300 PSI</td></tr>
</table>

The SAWA flow instrument qualifications are contained in EC 618957, Attachment 4. Unit 3 EC 618957 will be posted to the ePortal upon approval of the EC.</td></tr>
</table>

7 Interim Staff Evaluation Impacts

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

8 References

The following references support the updates to the combined Phases 1 and 2 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. 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.

3. NEI 13-02, "Industry Guidance for Compliance with NRC Order EA-13-109, 'To Modify Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation Under Severe Accident Conditions," Revision 1, dated April 2015.

4. 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," Revision 0, dated November 2013 (Accession No. ML13304B836).

5. NRC Endorsement of Industry "Hardened Containment Venting System (HCVS) Phase 1 Overall Integrated Plan Template (EA-13-109) Rev 0" (Accession No. ML14128A219).

6. Peach Bottom Atomic Power Station, Units 2 and 3, Combined Phases 1 and 2 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 15, 2015.

7. NRC Interim Staff Guidance JLD-ISG-2015-01, "Compliance with Phase 2 of 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).

8. Peach Bottom Atomic Power Station, Units 2 and 3, Fifth Six-Month Status Report for Phase 1 and Phase 2 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 15, 2016 (RS-16-235).

9. Peach Bottom TSG 1.3, Rev. 3, "Peach Bottom RPV and Containment Flooding Diagram".

10. PB-MISC-023, Rev. 1, MAAP Analysis to Support HCVS Design, dated December 2, 2016.