UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

August 6, 2018

Mr. Bradley J. Sawatzke
Chief Executive Officer
Energy Northwest
MD 1023
76 North Power Plant Loop
P.O. Box 968
Richland, WA 99352

SUBJECT: COLUMBIA GENERATING STATION - REPORT FOR THE AUDIT OF LICENSEE RESPONSES TO INTERIM STAFF EVALUATIONS OPEN ITEMS RELATED TO NRC ORDER EA-13-109 TO MODIFY LICENSES WITH REGARD TO RELIABLE HARDENED CONTAINMENT VENTS CAPABLE OF OPERATION UNDER SEVERE ACCIDENT CONDITIONS (CAC NO. MF4383; EPID L-2014-JLD-0045)

Dear Mr. Sawatzke:

On June 6, 2013 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML13143A334), the U.S. Nuclear Regulatory Commission (NRC) issued Order EA-13-109, "Order to Modify Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation Under Severe Accident Conditions," to all Boiling-Water Reactor licensees with Mark I and Mark II primary containments. The order requirements are provided in Attachment 2 to the order and are divided into two parts to allow for a phased approach to implementation. The order required licensees to submit for review overall integrated plans (OIPs) that describe how compliance with the requirements for both phases of Order EA-13-109 will be achieved.

By letter dated June 30, 2014 (ADAMS Accession No. ML14191A688), Energy Northwest (the licensee) submitted its Phase 1 OIP for Columbia Generating Station (Columbia). By letters dated December 17, 2014, June 30, 2015, December 16, 2015 (which included the combined Phase 1 and Phase 2 OIP), June 30, 2016, December 29, 2016, June 27, 2017, December 28, 2017, and June 21, 2018 (ADAMS Accession Nos. ML14357A069, ML15181A436, ML15351A363, ML16182A080, ML16364A245, ML17178A276, ML18002A438, and ML18176A186 respectively), the licensee submitted its 6-month updates to the OIP. The NRC staff reviewed the information provided by the licensee and issued interim staff evaluations (ISEs) for Phase 1 and Phase 2 of Order EA-13-109 for Columbia by letters dated March 25, 2015 (ADAMS Accession No. ML14335A158), and September 29, 2016 (ADAMS Accession No. ML16266A233), respectively. When developing the ISEs, the staff identified open items where additional information was still needed to complete its review.

The NRC staff is using the audit process described in letters dated May 27, 2014 (ADAMS Accession No. ML14126A545), and August 10, 2017 (ADAMS Accession No. ML17220A328), to gain a better understanding of licensee activities being performed for compliance with the order. As part of the audit process, the staff reviewed the licensee's closeout of the ISE open

items. The NRC staff conducted a teleconference with the licensee on July 19, 2018. The enclosed audit report provides a summary of that aspect of the audit.

If you have any questions, please contact me at (301) 415-1025 or by e-mail at Rajender.Auluck@nrc.gov.

Sincerely,

Rajender Auluck, Senior Project Manager
Beyond-Design-Basis Engineering Branch
Division of Licensing Projects
Office of Nuclear Reactor Regulation

Docket No. 50-397

Enclosure:
Audit report

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
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AUDIT REPORT BY THE OFFICE OF NUCLEAR REACTOR REGULATION

AUDIT OF LICENSEE RESPONSES TO INTERIM STAFF EVALUATIONS OPEN ITEMS

RELATED TO ORDER EA-13-109 MODIFYING LICENSES

WITH REGARD TO RELIABLE HARDENED CONTAINMENT VENTS CAPABLE OF

OPERATION UNDER SEVERE ACCIDENT CONDITIONS

ENERGY NORTHWEST

COLUMBIA GENERATING STATION

DOCKET NO. 50-397

BACKGROUND

On June 6, 2013 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML13143A334), the U.S. Nuclear Regulatory Commission (NRC) issued Order EA-13-109, "Order to Modify Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation Under Severe Accident Condition," to all Boiling-Water Reactor (BWR) licensees with Mark I and Mark II primary containments. The order requirements are divided into two parts to allow for a phased approach to implementation.

Phase 1 of Order EA-13-109 requires license holders of BWRs with Mark I and Mark II primary containments to design and install a Hardened Containment Vent System (HCVS), using a vent path from the containment wetwell to remove decay heat, vent the containment atmosphere (including steam, hydrogen, carbon monoxide, non-condensable gases, aerosols, and fission products), and control containment pressure within acceptable limits. The HCVS shall be designed for those accident conditions (before and after core damage) for which containment venting is relied upon to reduce the probability of containment failure, including accident sequences that result in the loss of active containment heat removal capability or extended loss of alternating current (ac) power (ELAP). The order required all applicable licensees, by June 30, 2014, to submit to the Commission for review an overall integrated plan (OIP) that describes how compliance with the Phase 1 requirements described in Order EA-13-109 Attachment 2 will be achieved.

Phase 2 of Order EA-13-109 requires license holders of BWRs with Mark I and Mark II primary containments to design and install a system that provides venting capability from the containment drywell under severe accident conditions, or, alternatively, to develop and implement a reliable containment venting strategy that makes it unlikely that a licensee would need to vent from the containment drywell during severe accident conditions. The order required all applicable licensees, by December 31, 2015, to submit to the Commission for

review an OIP that describes how compliance with the Phase 2 requirements described in Order EA-13-109 Attachment 2 will be achieved.

By letter dated June 30, 2014 (ADAMS Accession No. ML14191A688), Energy Northwest (the licensee) submitted its Phase 1 OIP for Columbia Generating Station (Columbia). By letters dated December 17, 2014, June 30, 2015, December 16, 2015 (which included the combined Phase 1 and Phase 2 OIP), June 30, 2016, December 29, 2016, June 27, 2017, December 28, 2017, and June 21, 2018 (ADAMS Accession Nos. ML14357A069, ML15181A436, ML15351A363, ML16182A080, ML16364A245, ML17178A276, ML18002A438, and ML18176A186 respectively), the licensee submitted its 6-month updates to the OIP, as required by the order.

The NRC staff reviewed the information provided by the licensee and issued interim staff evaluations (ISEs) for Phase 1 and Phase 2 of Order EA-13-109 for Columbia by letters dated March 25, 2015 (ADAMS Accession No. ML14335A158), and September 29, 2016 (ADAMS Accession No. ML16266A233), respectively. When developing the ISEs, the staff identified open items where additional information was still needed to complete its review.

The NRC staff is using the audit process in accordance with the letters dated May 27, 2014 (ADAMS Accession No. ML14126A545), and August 10, 2017 (ADAMS Accession No. ML17220A328), to gain a better understanding of licensee activities as they come into compliance with the order. The staff reviews submitted information, licensee documents (via ePortals), and preliminary Overall Program Documents (OPDs)/OIPs, while identifying areas where additional information is needed. As part of this process, the staff reviewed the licensee closeout of the ISE open items.

AUDIT SUMMARY

As part of the audit, the NRC staff conducted a teleconference with the licensee on July 19, 2018. The purpose of this audit teleconference was to continue the audit review and provide the NRC staff the opportunity to engage with the licensee regarding the closure of open items from the ISEs. As part of the preparation for the audit call, the staff reviewed the information and/or references noted in the OIP updates to ensure that closure of ISE open items and the HCVS design are consistent with the guidance provided in Nuclear Energy Institute (NEI) 13-02, Revision 1, other related documents (e.g. white papers (ADAMS Accession Nos. ML14126A374, ML14358A040, ML15040A038 and ML15240A072, respectively) and frequently asked questions (FAQs), (ADAMS Accession No. ML15271A148)) that were developed and reviewed as part of overall guidance development. The NRC staff audit members are listed in Table 1. Table 2 is a list of documents reviewed by the staff. Table 3 provides the status of the ISE open item closeout for Columbia. The open items are taken from the Phase 1 and Phase 2 ISEs issued on March 25, 2015, and September 29, 2016, respectively.

FOLLOW UP ACTIVITY

The staff continues to audit the licensee's information as it becomes available. During the teleconference on July 19, 2018, the licensee stated that the responses to the Phase 2 ISE open items are still under development and will be included in the December 2018, six-month status update. In response, the NRC staff stated that the staff will review the information once it is available on the ePortal and will arrange for another teleconference call, if needed. The staff will issue further audit reports for Columbia, as appropriate.

Following the licensee's declarations of order compliance, the licensee will provide a final integrated plan (FIP) that describes how the order requirements are met. The NRC staff will evaluate the FIP, the resulting site-specific OPDs, as appropriate, and other licensee documents, prior to making a safety determination regarding order compliance.

CONCLUSION

This audit report documents the staff's understanding of the licensee's closeout of the ISE open items, based on the documents discussed above. The staff notes that several of these documents are still preliminary, and all documents are subject to change in accordance with the licensee's design process. In summary, the staff has no further questions on how the licensee has addressed the ISE open items, based on the preliminary information, but notes that some open items are designated by the staff to be open or pending as described in Table 3 below. The status of the NRC staff's review of these open items may change as additional information is provided to the staff, or if the licensee changes its plans as part of final implementation. Changes in the NRC staff review will be communicated in the ongoing audit process.

Attachments:
1. Table 1 – NRC Staff Audit and Teleconference Participants
2. Table 2 – Audit Documents Reviewed
3. Table 3 – ISE Open Item Status Table

Table 1 - NRC Staff Audit and Teleconference Participants

Title	Team Member	Organization
Team Lead/Sr. Project Manager	Rajender Auluck	NRR/DLP
Project Manager Support/Technical Support – Containment / Ventilation	Brian Lee	NRR/DLP
Technical Support – Containment / Ventilation	Bruce Heida	NRR/DLP
Technical Support – Electrical	Kerby Scales	NRR/DLP
Technical Support – Balance of Plant	Kevin Roche	NRR/DLP
Technical Support – I&C	Steve Wyman	NRR/DLP
Technical Support – Dose	John Parillo	NRR/DRA

Table 2 – Audit Documents Reviewed

Calculation NE-02-15-06, "Dose Rates from the Hardened Containment Vent (HCV) Outside the Reactor Building During a Postulated Beyond Design Basis (BDB) Severe Accident Following an Extended Loss of AC Power (ELAP)," Revision 1
Calculation TM-2195, "Remote Operating Station Access and Habitability During HCV Operation," Revision 0
Calculation ME-02-14-02, "General Technical Support for Fukushima Related Licensing Documents," Revision 1
Calculation ME-02-13-03, "Pipe Size and Pressure Drop Calculation for the Hardened Containment Vent System," Revision 2
Calculation ME-02-14-04, "Reactor Building Accessibility and Equipment Operability During an Extended Loss of AC Power (ELAP)," Revision 1
Calculation ME-02-14-17, "Hardened Containment Vent (HCV) Nitrogen Relief Valve Sizing (HCV-RV-101)," Revision 1
Calculation ME-02-15-08, "Evaluation of the Hardened Containment Vent (HCV) Compressed Nitrogen Supply System for HCV-RD-60, HCV-RD-54, HCV-AO-1&2," Revision 1
Calculation TM-2196, "Evaluation of Certain HCV Related Components Under Severe Accident ELAP Environment with HCV Use," Revision 0
Calculation E/I-02-13-03, "Battery Sizing Calculation for the Hardened Containment Vent (HCV) System," Revision 1
Calculation E/I-02-91-03, "Calculation for Division 1 and 2 and 3 Diesel Generator Loading," Revision 20
Engineering Change (EC) 11763, "New Hardened Containment Vent (HCV) System," Revison 1
OI-HCV-06 AR 25006-06 – Instrument Qualification
OI-HCV-09 Spreadsheet – Temperature and Dose for Component/Location
CVI 1260-00,1 – HCV-RIS-RAD/1
Procedure 5.6.1, "Station Blackout (SBO) and Extended Loss of AC Power ELAP," Revision 29
Procedure 5.6.2, "Station Blackout (SBO) and Extended Loss of AC Power ELAP Attachments," Revision 11
Procedure 5.2.1, "Primary Containment Control," Revision 27

Columbia Generating Station
Vent Order Interim Staff Evaluation Open Items:

Table 3 - ISE Open Item Status Table

ISE Open Item Number Requested Action	Licensee Response – Information provided in 6 month updates and on the ePortal	NRC Staff Close-out notes	Safety Evaluation (SE) status Closed; Pending; Open (need additional information from licensee)
Phase 1 ISE OI 1 Make available for NRC staff audit the location of the ROS.	Letter GO2-15-175. The location of the remote operating station is shown on Figure 1-1.	The NRC staff reviewed the information provided in the 6-month updates and on the ePortal. Referenced Figure 1-1 indicates the remote operating station (ROS) is located at the west end of the Diesel Generator Building. No follow-up questions.	Closed [Staff evaluation to be included in SE Section 3.1.2.4]
Phase 1 ISE OI 2 Make available for NRC staff audit the location of the portable air compressor.	Due to the dose rates expected during a severe accident, the use of the portable air compressor has been replaced by installing a spare nitrogen (N2) bottle in the instrument pneumatics rack.	The NRC staff reviewed the information provided in the 6-month updates and on the ePortal. As indicated in the licensee's revised strategy, a portable air compressor will not be utilized. Instead a spare N2 bottle in the instrument rack has been installed. No follow-up questions.	Closed [Staff evaluation to be included in SE Section 3.1.2.6]
Phase 1 ISE OI 3 Make available for NRC staff audit the location of the portable diesel generators.	DG5 is stored in FLEX Building 600 which is shown on Sketch 1 of letter GO2-14-031. The expected deployment location of DG5 is shown on Figure 1-1 of letter GO2-15-175. DG4 has not been moved	The NRC staff reviewed the information provided in the 6-month updates and on the ePortal.	Closed [Staff evaluation to be included in SE Section 3.1.2.6]

	and remains in its normal location approximately 69' south of the diesel generator (DG) building.	The location of the portable DGs was confirmed and discussed during the closure of the mitigating strategies order EA-12-049. No follow-up questions.	
Phase 1 ISE OI 4 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.	The hardened containment vent (HCV) is operated from the main control room or the remote operating station located in the diesel generator building. TM-2195 evaluated these locations under severe accident conditions and found both accessible and habitable. Therefore, both locations are also accessible and habitable to support early (anticipatory) venting. Additional evaluations of the areas used during severe accident for water addition and water management are being evaluated under Phase 2 RAIs 1 and 2 which remain Open.	The NRC staff reviewed the information provided in the 6-month updates and on the ePortal. Calculation TM-2195, "Remote Operating Station Access and Habitability during HCV Operation," predicts the Main Control Room (MCR) maximum temperature to be 117.2 degrees Fahrenheit (°F) (implementing actions in FLEX document TM-2187) and remains below the Licensee Controlled Specification limit of 120°F. The peak temperature in the ROS is determined to be 104°F. The licensee employs a toolbox approach where mitigating actions are taken within the skill of the craft based on symptoms to address radiological and thermal conditions. Calculation ME-02-14-04 Revision 1, determined environmental conditions in various rooms and also determined allowable stay times based on Wet Globe Temperature. Appendix H of this calculation discusses equipment	Closed [Staff evaluation to be included in SE Sections 3.1.1.2 and 3.1.1.3]

		operability under predicted conditions. Appendix I of this calculation provides reactor building instrumentation locations and directions for direct readings with Fluke meter. Calculation NE-02-15-06, "Dose Rates from the Hardened Containment Vent (HCV) Outside the Reactor Building During a Postulated Beyond Design Basis (BDB) Severe Accident Following an Extended Loss of AC Power (ELAP)," Revision 1 was performed to determine the integrated radiation dose due to HCVS operation. The NRC staff reviewed this calculation and determined that the licensee used conservative assumptions and followed the guidance outlined in NEI 13-02 Revision 1 and HCVS-WP-02 Revision 0. Based on the expected integrated whole body dose equivalent in the MCR and ROS and the expected integrated whole body dose equivalent for expected actions during the sustained operating period, the NRC staff believes that the order requirements are met. Based on the evaluations, the temperature and radiological conditions should not inhibit operator actions needed to initiate and operate the HCVS during an ELAP with severe accident conditions.	

		No follow-up questions.	
Phase 1 ISE OI 5 Make available for NRC staff audit analyses demonstrating that HCVS has the capacity to vent the steam/energy equivalent of one percent of uprated 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.	ME-02-13-03	The NRC staff reviewed the information provided in the 6-month updates and on the ePortal. Calculation ME-02-13-03, "Pipe Sizing and Pressure Drop Calculation for the Hardened Containment Vent System (HCVS)," Revision 2 used a thermal power of 3556 MWt [megawatt thermal]. The 1% thermal power flow equivalent at 45 per square inch gauge (psig) primary containment pressure is 132,514 lbm/hr. With 25% margin it is 165,643 lbm/hr. The calculated flow rate through the HCVS with primary containment pressure of 45 psig is 250,970 lbm/hr. Calculated total system loss at wetwell pressure of 14.5 psig is 3.36 with a 12" diameter stack (11.374" ID). No follow-up questions.	Closed [Staff evaluation to be included in SE Section 3.1.2.1]
Phase 1 ISE OI 6 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,	This information is available for NRC audit.	The NRC staff reviewed the information provided in the 6-month updates and on the ePortal. OI-HCV-09 Spreadsheet on eportal provides overview of temperature and dose for each component/location. OI-HCV-06 AR 25006-06 Instrument Qualification is a table	Closed [Staff evaluation to be included in SE Section 3.1.1.4]

etc.) required for HCVS venting including confirmation that the components are capable of performing their functions during ELAP and severe accident conditions.		that summarizes methods for qualification of specific components. CVI 1260-00, 1 provides data sheets and acceptance testing for RM1000 and other equipment. The staff's review indicated that the environmental qualifications meet the order requirements. No follow-up questions.	
Phase 1 ISE OI 7 Make available for NRC staff audit documentation of the HCVS nitrogen pneumatic system design including sizing and location	Calculations ME-02-15-08 and ME-02-14-17 were approved on 8/10/16. ME-02-15-08 confirms the adequate sizing and location of the nitrogen piping and ME-02-14-17 sizes the relief valve HCV-RV-101. The calculations are available for NRC audit.	The NRC staff reviewed the information provided in the 6-month updates and on the ePortal. Calculations ME-02-15-08, "Evaluation of the Hardened Containment Vent (HCV) Compressed Nitrogen Supply System for HCV-RD-60, HCV-RD-54, HCV-AO-1&2," Revision 1 and ME-02-14-17, "Hardened Containment Vent (HCV) Nitrogen Relief Valve Sizing (HCV-RV-101)," Revision 1, evaluates the HCVS pneumatic system design. The licensee determined through its evaluation that 3 nitrogen bottles, rated at 2900 psig each, will be sufficient to supply nitrogen for cycling valves of the HCVS system for 7 days. No follow-up questions.	Closed [Staff evaluation to be included in SE Section 3.1.2.6]
Phase 1 ISE OI 8	E/I-02-13-03	The NRC staff reviewed the information provided in the 6-	Closed

Make available for NRC staff audit the final sizing evaluation for HCVS batteries/battery charger including incorporation into FLEX DG loading calculation.		month updates and on the ePortal. The licensee stated that all electrical power required for operation of HCVS components is provided by the HCV battery/battery charger. The battery sizing requirements (in E/I-02-13-03) confirmed that the HCV batteries have a minimum capacity capable of providing power for 24 hours without recharging, and therefore is adequate. The licensee provided calculation E/I-02-91-03, "Calculation for Division 1 and 2 and 3 Diesel Generator Loading," Revision 20, which discusses re-powering of the HCV battery charger using a FLEX DG. No follow-up questions.	[Staff evaluation to be included in SE Section 3.1.2.6]
Phase 1 ISE OI 9 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.	See Section 4.0 of the Enclosure to this letter (December 29, 2016 GO2-16-171).	The NRC staff reviewed the information provided in the 6-month updates and on the ePortal. The communication methods are the same as accepted in Order EA-12-049. No follow-up questions.	Closed [Staff evaluation to be included in SE Section 3.1.1.1]
Phase 1 ISE OI 10 Provide a description of the strategies for hydrogen control	Energy Northwest will use Option number 5 of the NEI White Paper HCV-WP-03, Hydrogen/Carbon Monoxide Control Measures and add a check valve at the	The NRC staff reviewed the information provided in the 6-month updates and on the ePortal.	Closed

that minimizes the potential for hydrogen gas migration and ingress into the RB or other buildings.	discharge end of the vent pipe to address the flammability of combustible gases.	The licensee described that the HCVS design will include a check valve to support the HCVS in preventing hydrogen detonation. The licensee's design is consistent with Option 5 of the NRC-endorsed white paper HCVS-WP-03. The staff's review of the proposed system indicates that the licensee's design appears to minimize the potential for hydrogen gas migration and ingress into the reactor building or other buildings. No follow-up questions.	[Staff evaluation to be included in SE Section 3.1.2.12]
Phase 1 ISE OI 11 Make available for NRC staff audit descriptions of all instrumentation and controls (existing and planned) necessary to implement this order including qualification methods.	Energy Northwest has completed compiling the requested information and has make it available to the NRC staff. See OI-HCV-09 Spreadsheet and CVI 1260-00, 1.	The NRC staff reviewed the information provided in the 6-month updates and on the ePortal. The existing plant instruments required for HCVS (i.e. wetwell level instruments and drywell pressure instruments) meet the requirements of RG 1.97. OI-HCV-09 Spreadsheet, AR 25006-06, and CVI 1260-00 discusses the qualifications for new HCVS I&C components. The NRC staff's review indicated that the qualification met the order requirements. No follow-up questions.	Closed [Staff evaluation to be included in SE Section 3.1.2.8]

Phase 1 ISE OI 12 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.	Columbia will be using an unused containment penetration and will be installing new containment isolation valves.	The NRC staff reviewed the information provided in the 6-month updates and on the ePortal. Since the licensee is installing new containment isolation valves, this item is not applicable, assuming that the new valves are sufficient for opening under the maximum expected differential pressure during BDBEE and severe accident wetwell venting. No follow-up questions.	Closed [Staff evaluation to be included in SE Section 3.2.1]
Phase 1 ISE OI 13 Make available for NRC staff audit site specific details of the EOPs when available.	The following emergency operating procedures (EOPs) provide for containment venting during an ELAP event: PPM 5.6.1, SBO/ELAP PPM 5.6.2, SBO and ELAP Attachments PPM 5.2.1, Primary Containment Control.	The NRC staff reviewed the information provided in the 6-month updates and on the ePortal. The EOPs for HCVS operation have been developed and are consistent with the guidance in NEI 13-02. No follow-up questions.	Closed [Staff evaluation to be included in SE Section 5.1]
Phase 1 ISE OI 14 Provide justification for not leak testing the HCVS every three operating cycles and after restoration of any breach of system boundary within buildings.	Columbia has adopted the current NEI guidance on testing and inspection requirements as shown in Table 4-1.	The NRC staff reviewed the information provided in the 6-month updates and on the ePortal. The licensee has changed its strategy regarding planned testing and inspection criteria. The licensee has elected to adopt the guidance on testing and inspection requirements as described in Table 4-1 of NEI 13-02.	Closed [Staff evaluation to be included in SE Section 3.1.2.13]

		No follow-up questions.	
Phase 2 ISE OI 1 Licensee to determine the location of the FLEX hose-installed valves and flow elements, which will be used to control severe accident water addition/severe accident water management (SAWA/SAWM) flow.	Response to be documented in a future update.	This item will stay open since no information was provided either on the ePortal or in the six-month updates.	Open [Staff evaluation to be included in SE Sections 4.1 and 4.4]
Phase 2 ISE OI 2 Licensee to evaluate the SAWA equipment and controls, as well as ingress and egress paths for the expected severe accident conditions (temperature, humidity, radiation) for the sustained operating period.	Response to be documented in a future update.	This item will stay open since no information was provided either on the ePortal or in the six-month updates.	Open [Staff evaluation to be included in SE Section 4.5]
Phase 2 ISE OI 3 Licensee to demonstrate that containment failure as a result of overpressure can be prevented without a drywell vent during severe accident conditions.	Response to be documented in a future update.	This item will stay open since no information was provided either on the ePortal or in the six-month updates.	Open [Staff evaluation to be included in SE Sections 4.1 and 4.2]
Phase 2 ISE OI 4 Licensee shall demonstrate 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.	Response to be documented in a future update.	This item will stay open since no information was provided either on the ePortal or in the six-month updates.	Open [Staff evaluation to be included in SE Section 4.2]
Phase 2 ISE 5	Response to be documented in a future update.	This item will stay open since no information was provided either	Open

Licensee to demonstrate that there is adequate communication between Main Control Room and the SAWM control location during severe accident conditions.		on the ePortal or in the six-month updates.	[Staff evaluation to be included in SE Section 4.1]
Phase 2 ISE OI 6 Licensee to demonstrate the SAWM flow instrumentation qualification for the expected environmental conditions.	Response to be documented in a future update.	This item will stay open since no information was provided either on the ePortal or in the six-month updates.	Open [Staff evaluation to be included in SE Sections 4.1.1.3 and 4.2.1.3]

SUBJECT: COLUMBIA GENERATING STATION - REPORT FOR THE AUDIT OF LICENSEE RESPONSES TO INTERIM STAFF EVALUATIONS OPEN ITEMS RELATED TO NRC ORDER EA-13-109 TO MODIFY LICENSES WITH REGARD TO RELIABLE HARDENED CONTAINMENT VENTS CAPABLE OF OPERATION UNDER SEVERE ACCIDENT CONDITIONS DATED August 6, 2018

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