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EA-12-049
EA-13-109
10 CFR 50.54(f)

June 27, 2017
GO2-17-118

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

Subject: **COLUMBIA GENERATING STATION, DOCKET NO. 50-397
ENERGY NORTHWEST'S SECOND COMBINED SIX-MONTH STATUS
UPDATE REPORT FOR THE IMPLEMENTATION OF NUCLEAR
REGULATORY COMMISSION (NRC) ORDERS EA-12-049 AND EA-13-
109**

- References:
1. NRC Letter from E. J. Leeds (NRC) and M. R. Johnson (NRC) to Energy Northwest et.al, "Issuance of Order to Modify Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events," dated March 12, 2012
 2. NRC Letter from E. J. Leeds (NRC) to Licensees with Mark I and Mark II Containments, "Issuance of Order to Modify Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation under Severe Accident Conditions," dated June 6, 2013
 3. Letter GO2-16-171, from A. L. Javoik (Energy Northwest) to NRC, "Energy Northwest's Combined Six-Month Status Update Report for the Implementation of Nuclear Regulatory Commission (NRC) Orders EA-12-049 AND EA-13-109", dated December 29, 2016

Dear Sir or Madam,

This letter and its enclosure transmits the combined 6-month update report on the status of implementing Nuclear Regulatory Commission (NRC) issued Orders EA-12-049 and EA-13-109 as required by References 1 and 2 as of May 31, 2017. Reference 3 provided the previous combined 6-month update report.

This letter also provides the notification requested by the NRC staff in its February 5, 2015, letter endorsing NEI whitepaper "HCVS-WP-02: Sequences for HCVS Design and Method for Determining Radiological Dose from HCVS Piping".

No new commitments are being made by this letter or the enclosure. If you have any questions or require additional information, please contact Ms. L. L. Williams at (509) 377-8148

I declare under penalty of perjury that the foregoing is true and correct.

Executed on this 27th day of June, 2017.

Respectfully,



A. L. Javorik

Vice President, Engineering

Enclosure: As stated

cc: NRC RIV Regional Administrator
NRC NRR Project Manager
NRC Senior Resident Inspector/988C

CD Sonoda – BPA/1399 (email)
WA Horin – Winston & Strawn

1.0 Introduction

By References 1 and 2 to this enclosure, the Nuclear Regulatory Commission (NRC) issued Orders EA-12-049 and EA-13-109 to Columbia Generating Station (Columbia). The Orders contained requirements for mitigation strategies for beyond-design-basis external events and the installation of a reliable containment hardened vent capable of operation under severe accident conditions. References 1 and 2 also required submittal of an Overall Integrated Plan (OIP) describing how compliance with the requirements described in the Orders will be achieved and required the submittal of status reports at six month intervals. This enclosure provides Energy Northwest's combined six-month status report for these NRC Orders.

2.0 Milestone Accomplishments

All the Mitigation Milestones supporting restart from Refueling Outage 22 (mitigation implementation outage) with the exception of plant changes directly associated with the implementation of a reliable hardened containment vent (HCV) capable of operation under severe accident conditions were reported complete in Reference 4 of this enclosure. During the current refueling outage (Refueling Outage 23), Energy Northwest completed installation of the HCV system in accordance with Phase 1 of Reference 2. Reference 1 Section IV.C.3 requires notification of full compliance with NRC Order EA-12-049. Energy Northwest will submit this notification by August 18, 2017, 60-days from the completion of Refueling Outage 23.

3.0 Milestone Schedule Status

The following table provides a listing of the remaining reports associated with NRC Orders EA-12-049 and EA-13-109 as of May 31, 2017.

Correspondence and Reports

Milestone	Target Completion Date	Activity Status	Comments <i>(Include date changes in this column)</i>
Submit Overall Integrated Implementation Plan (Phase 1)	June 2014	Complete	GO2-14-107 6/30/2014
Submit Overall Integrated Implementation Plan (Phase 2) which included a Phase 1 6-month status update.	Dec. 2015	Complete	GO2-15-175 12/16/2015
Next Combined Status Update Report for the Mitigation Strategies and Reliable Hardened Containment Vent	June 2017	Complete	This Letter

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Enclosure

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Issuance of Energy Northwest's letter of full compliance with NRC Order EA-12-049, Section IV.C.3	Aug. 2017	Not Started	
6-month update for Order EA-13-109 Phase 2	Dec. 2017	Not Started	
6-month update for Order EA-13-109 Phase 2	June 2018	Not Started	
6-month update for Order EA-13-109 Phase 2	Dec. 2018	Not Started	
6-month update for Order EA-13-109 Phase 2	June 2019	Not Started	
Issuance of Energy Northwest's letter of compliance with NRC Order EA-13-109, Phase 2	Aug. 2019	Not Started	

The tables below provide the Milestone status for implementation of Phases 1 and 2 of Reference 2 last reported in Reference 3.

HCV Phase 1 Milestone Schedule:

Milestone	Target Completion Date	Activity Status	Comments <i>(Include date changes in this column)</i>
Hold preliminary/conceptual design meeting	June 2014	Complete	
WW Design Engineering Complete	May 2016	In Progress	This date is changed to June 2017
WW Operation Procedure Changes Developed	Mar 2017	In Progress	This date is changed to June 2017
WW Training Complete	Apr. 2017	In Progress	This date is changed to June 2017
WW Installation Complete	May 2017	In Progress	This date is changed to June 2017
WW Procedure Changes Active	May 2017	In Progress	This date is changed to June 2017
Site Specific WW Maintenance Procedure Developed	June 2017	In Progress	
WW Walk Through Demonstration/Functional Test	June 2017	In Progress	

HCV Phase 2 Milestone Schedule

Milestone	Target Completion Date	Activity Status	Comments <i>(Include date changes in this column)</i>
Hold preliminary/conceptual design meeting	July 2016		This date has been changed to Jul 2017
Design Engineering On-site/Complete	July 2018		
Operations Procedure Changes Developed	Jan. 2019		
Site Specific Maintenance Procedure Developed	Jan. 2019		
Training Complete	Apr. 2019		
Implementation Outage	May 2019		
Procedure Changes Active	May 2019		
Walk Through Demonstration/Functional Test	June 2019		

4.0 Changes to the Compliance Methods

Changes to the OIP for Reliable HCV Vents under Severe Accident Conditions (EA-13-109):

None

Changes to the Overall Integrated Plan for Mitigating Strategies (EA-12-049):

None

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

None

6.0 Open Items from Overall Integrated Plan, Interim Staff Evaluation, and Audits

The tables in Section 8 of this enclosure provide an update of the status of the remaining Licensee identified integrated plan open items for NRC Orders EA-12-049 and EA-13-109 as well as the open items identified in the NRC Interim Staff Evaluations dated March 25, 2015, and September 29, 2016, as of May 31, 2017.

As part of the response to provide the locations of the portable air compressor and diesel generator identified as items 02 and 03 in the table titled "Response to the Phase 1 Request for Additional Information," Energy Northwest completed the severe accident dose assessment using the NRC endorsed guidance in NEI whitepaper "HCVS-WP-02: Sequences for HCVS Design and Method for Determining Radiological Dose from

HCVS Piping." Although the dose levels identified using this method are elevated, Energy Northwest completed an assessment of the radiological consequences to address elements A.1.1.3, A.1.1.4, and A.1.2.10 of Order EA-13-109. It was determined that Energy Northwest will be able to control the overall dose to station personnel to within the limits of EPA Manual EPA-400-R-92-001, May 1992, "Manual of Protective Action Guidelines and Protective Actions for Nuclear Incidents" by:

- identifying lower dose areas to be used in stationing equipment,
- providing maps of the expected dose fields in the procedures and program document, and
- designing the HCV to withstand and remain functional during severe accident conditions,

Additionally, Energy Northwest has undertaken an optional site specific analysis utilizing NUREG-1465 and site characteristics using the guidance in Appendix A of HCVS-WP-02. When completed, this analysis is expected to produce lower dose levels and allow for more efficient and effective response planning for implementation of Phase 2 of NRC Order EA-13-109. Energy Northwest will provide the results to NRC for review upon completion of the analysis.

7.0 References

1. NRC Letter from E. J. Leeds (NRC) and M. R. Johnson (NRC) to Energy Northwest et.al, "Issuance of Order to Modify Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events," dated March 12, 2012
2. NRC Letter from E. J. Leeds to Licensees with Mark I and Mark II Containments, "Issuance of Order to Modify Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation under Severe Accident Conditions," dated June 6, 2013
3. Letter GO2-16-171, from A.L. Javoik (Energy Northwest) to NRC, "Energy Northwest's Combined Six-Month Status Update Report for the Implementation of Nuclear Regulatory Commission (NRC) Orders EA-12-049 AND EA-13-109", dated December 29, 2016
4. Letter GO2-15-124, from D. A. Swank (Energy Northwest) to NRC "Energy Northwest's Fifth Six-Month Status Update Report for the Implementation of Nuclear Regulatory Commission (NRC) Order EA-12-049 Mitigation Strategies for Beyond Design Basis External Events," dated August 25, 2015
5. Letter GO2-15-175, from A. L. Javorik (Energy Northwest) to NRC "Energy Northwest's Response to NRC Order EA-13-109 – Overall Integrated Plan for Reliable

Hardened Containment Vents under Severe Accident Conditions Phases 1 and 2, Revision 1," dated December 16, 2015

8.0 Tables

The following tables provide the status as of May 31, 2017. Items associated with NRC Order EA-12-049 or Phase 1 of NRC Order EA-13-109 will be updated as part of the notification of full compliance required by Section IV.C.3 of Reference 1.

List of Remaining FLEX Integrated Plan Open Items		
FLEX OIP Open Item	Action	Status
OI-FLEX-73	GOTHIC analyses will be confirmed, or revised, to bound the design of the hardened containment vent after the design is finalized. (This OI has been added to assure that the subject analyses reflect the design required by EA-13-109.)	CLOSED
OI-FLEX-43	The flooding hazards analysis will provide information about site water level associated with a probable maximum precipitation (PMP) event and a local intense precipitation (LIP) event. These water levels will be compared to elevations for the FLEX buildings as well as the deployment routes for the equipment. A LiDAR survey of the site was performed and a topographic plan of the site has been generated to assist in this evaluation. The flooding analysis is currently in progress. The results will be used to provide a response to this question in a future OIP update. (Response to NRC Audit Question 03) (This OI has been changed because the flooding analysis remains in progress and the OI was not closed in the February 2014 update.)	CLOSED The flooding hazard reevaluation was completed and the report was provided to the NRC in letter GO2-16-143, dated 10/6/16.
OI-FLEX-44	A future update to the OIP will address the applicability to Columbia of each of the nine considerations in NEI 12-06 Section 6.2.3.2, Deployment of FLEX Equipment. (Response to NRC Audit Question 04) (This OI has been changed because the flooding analysis remains in progress and the OI will be closed in a future update.)	CLOSED The Flooding Hazard Reevaluation Report (FHRR) shows the results are either bounded by the current design basis or available physical margin exists.
OI-FLEX-45	The flooding analysis will be used to determine if any of the external flooding procedures should be changed. (Response to NRC Audit Question 04)	CLOSED The Flooding Hazard Reevaluation Report (FHRR) shows the results are either bounded by the current design basis or available physical margin exists.

List of Overall HCV Integrated Plan Open Items			
HCV OIP Open Item	Action	Status	Comment
OI-HCV-01	Provide resolution of the potential secondary containment bypass leakage path in the first 6-month update of the HCVS OIP	CLOSED	Closed in Letter GO2-15-175. Columbia will use a rupture disk to prevent secondary containment bypass leakage.
OI-HCV-02	Evaluate the location of the ROS for accessibility.	CLOSED	
OI-HCV-03	Determine the location of the portable air compressor and evaluate for accessibility under Severe Accident HCVS use. Including connection point(s) Including refueling operations	OPEN	
OI-HCV-04	Evaluate the location of the FLEX DG for accessibility under Severe Accident HCVS use. Including connection point(s) Including refueling operations	OPEN	
OI-HCV-05	Confirm suppression pool heat capacity	CLOSED	Closed in Letter GO2-15-175. Calculation ME-02-14-02, Revision 0, Appendix C confirms that there is sufficient heat capacity in the suppression pool water when at a minimum Technical Specification level to control pressure in containment before venting commences.
OI-HCV-06	Determine the method of qualification for each instrument	CLOSED	
OI-HCV-07	Complete the evaluation to determine accessibility, habitability, staffing sufficiency, and communication capability of the ROS.	OPEN	
OI-HCV-08	Identify design codes after design is finalized.	CLOSED	

List of Overall HCV Integrated Plan Open Items			
HCV OIP Open Item	Action	Status	Comment
OI-HCV-09	Equipment qualifications will include temperature, pressure, radiation level, and total integrated dose radiation from the effluent vent pipe at local and remote locations.	OPEN	
OI-HCV-10	Provide site-specific details of the EOPs when available. Develop procedures for SAWA and SAWM	OPEN	Phase 1: No EOP procedure changes are required. Phase 2: in review.
OI-HCV-11	FLEX air compressors need to be credited to recharge air lines for HCVS components after 24 hours.	CLOSED	Closed in letter GO2-16-171. The HCV strategy will credit for the existing 300 CFM FLEX air compressor FLEX-C-3 staged in FLEX Building 82 and FLEX-C-4 in Building 600. The 300 CFM capacity of the air compressor is sufficient. A 4 th bottle (Spare) has been added to the HCV bottle rack.
OI-HCV-12	SAWA/SAWM flow is controlled using hose installed valves and mechanical flow elements (EA-12-049 actions). Location of these valves and flow elements will need to be considered per HCVS-FAQ-12.	OPEN	
OI-HCV-13	Reconcile the out-of-service provisions for HCVS/SAWA with the provisions documented in Columbia's PPM 1.5.18, Managing B.5.b and FLEX Equipment Unavailability.	OPEN	
OI-HCV-14	Complete the evaluation to determine accessibility, habitability, staffing sufficiency, and communication capability during SAWA/SAWM	OPEN	
OI-HCV-15	Perform MAPP analysis for NEI 13-02 figures C-2 through C-6 and determine the time sensitive SAWM actions	OPEN	
OI-HCV-16	Develop procedure for line-up and use of HCVS	OPEN	

List of Overall HCV Integrated Plan Open Items			
HCV OIP Open Item	Action	Status	Comment
OI-HCV-17	Add sound powered phone extension cable for instrument rack E-IR-85 to inventory procedure	CLOSED	Closed in letter GO2-16-171. Additional cable not need as each FLEX building has 5 sound powered phone kits
OI-HCV-18	Evaluate deployment pathways for severe accident capable criteria	OPEN	
OI-HCV-19	Develop required training and frequency IAW the SAT process	OPEN	
OI-HCV-20	Incorporate approved language of OIP Attachment 2.1.D into site SAMG procedure(s)	OPEN	

Response to the Phase 1 Request for Additional Information			
RAI Number ISE Report Section	Action	Status	Comment
01 Section 3.2.1	Make available for NRC staff audit the location of the ROSs.	CLOSED	Letter GO2-15-175 The location of the remote operating station is shown on Figure 1-1.
02 Section 3.2.1	Make available for NRC staff audit the location of the portable air compressor.	OPEN	
03 Section 3.2.1	Make available for NRC staff audit the location of the portable diesel generators.	CLOSED	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 and remains in its normal location approximately 69' south of the DG building.

Response to the Phase 1 Request for Additional Information			
RAI Number ISE Report Section	Action	Status	Comment
04 Section 3.2.1 Section 3.2.2.4 Section 3.2.2.5 Section 3.2.2.10 Section 3.2.4.1 Section 3.2.4.2 Section 3.2.5.2 Section 3.2.6	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.	OPEN	
05 Section 3.2.2.1 Section 3.2.2.2	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.	CLOSED	ME-02-13-03
06 Section 3.2.2.3 Section 3.2.2.5 Section 3.2.2.9 Section 3.2.2.10	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.	OPEN	

Response to the Phase 1 Request for Additional Information			
RAI Number ISE Report Section	Action	Status	Comment
07 Section 3.2.2.4 Section 3.2.6	Make available for N RC staff audit documentation of the HCVS nitrogen pneumatic system design including sizing and location.	CLOSED	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. This AR may be closed since the calculations are available for NRC audit. Copies of approved cover sheets are included in EDMS.
08 Section 3.2.2.4 Section 3.2.6	Make available for NRC staff audit the final sizing evaluation for HCVS batteries/battery charger including incorporation into FLEX DG loading calculation.	CLOSED	E/I-02-13-03
09 Section 3.2.2.5	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.	CLOSED	See Section 4.0 of the Enclosure to this letter.
10 Section 3.2.2.6	Provide a description of the strategies for hydrogen control that minimizes the potential for hydrogen gas migration and ingress into the RB or other buildings.	CLOSED	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 discharge end of the vent pipe to address the flammability of combustible gasses.

Response to the Phase 1 Request for Additional Information			
RAI Number ISE Report Section	Action	Status	Comment
11 Section 3.2.2.9	Make available for NRC staff audit descriptions of all instrumentation and controls (existing and planned) necessary to implement this order including qualification methods.	CLOSED	Energy Northwest has completed compiling the requested information and will make it available to the NRC staff.
12 Section 3.2.2.9	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.	CLOSED	Columbia will be using an unused containment penetration and will be installing new containment isolation valves.
13 Section 3.4.1	Make available for NRC staff audit site specific details of the EOPs when available.	CLOSED	The following 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
14 Section 3.4.4	Provide justification for not leak testing the HCVS every three operating cycles and after restoration of any breach of system boundary within buildings.	CLOSED	Columbia has adopted the current NEI guidance on testing and Inspection requirements as shown in Table 4-1 of Reference 5
15 Section 3.2.2.5	Add a discussion on communications between the CR, FLEX pump, and ROS operators to the December 6-month HCV update.	CLOSED	Discussed in Section 4.0 of the enclosure to letter GO2-16-171

Response to the Phase 2 Request for Additional Information			
RAI Number ISE Report Section	Action	Status	Comment
1 Section 3.2.1	Licensee to determine the location of the FLEX hose installed valves and flow elements, which will be used to control SAWA/SAWM flow.	OPEN	
2 Section 3.3.2.3	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.	OPEN	
3 Section 3.3.3	Licensee to demonstrate that containment failure as a result of overpressure can be prevented without a drywell vent during severe accident conditions.	OPEN	
4 Section 3.3.3.1	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.	OPEN	
5 Section 3.3.3.4	Licensee to demonstrate that there is adequate communication between the MCR and the operator at the FLEX pump during severe accident conditions.	OPEN	
6 Section 3.3.3.4	Licensee to demonstrate the SAWM flow instrumentation qualification for the expected environmental conditions.	OPEN	