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

December 7, 2016

Mr. Mark E. Reddemann
Chief Executive Officer
Energy Northwest
MD 1023
76 North Power Plant Loop
P.O. Box 968
Richland, WA 99352

SUBJECT: COLUMBIA GENERATING STATION – INTERIM STAFF RESPONSE TO REEVALUATED FLOOD HAZARDS SUBMITTED IN RESPONSE TO 10 CFR 50.54(f) INFORMATION REQUEST – FLOOD-CAUSING MECHANISM REEVALUATION (CAC NO. MF3039)

Dear Mr. Reddemann:

The purpose of this letter is to provide a summary of the U.S. Nuclear Regulatory Commission (NRC) staff's assessment of the reevaluated flood-causing mechanisms described in the October 6, 2016 (Agencywide Document Access and Management System (ADAMS) Accession No. ML16286A309), flood hazard reevaluation report (FHRR) submitted by Energy Northwest (the licensee) for Columbia Generating Station.

By letter dated March 12, 2012, the NRC issued a request for information pursuant to Title 10 of the *Code of Federal Regulations*, Section 50.54(f) (hereafter referred to as the 50.54(f) letter) (ADAMS Accession No. ML12053A340). The request was issued as part of implementing lessons learned from the accident at the Fukushima Dai-ichi nuclear power plant. Enclosure 2 to the 50.54(f) letter requested that licensees reevaluate flood-causing mechanisms using present-day methodologies and guidance. Concurrent with the reevaluation of flooding hazards, licensees were required to develop and implement mitigating strategies in accordance with NRC Order EA-12-049, "Requirements for Mitigation Strategies for Beyond-Design-Basis External Events" (ADAMS Accession No. ML12054A735). On March 30, 2015, the Commission provided the staff requirements memorandum (SRM) (ADAMS Accession No. ML15089A236) to COMSECY-14-0037, "Integration of Mitigating Strategies for Beyond-Design-Basis External Events and the Reevaluation of Flooding Hazards," dated November 21, 2014 (ADAMS Accession No. ML14309A256), affirming that licensees need to address the reevaluated flooding hazards within their mitigating strategies for beyond-design-basis external events.

The NRC staff has reviewed the information submitted by the licensee in its FHRR and has summarized the results of the review in the tables provided as Enclosure 1 to this letter. Table 1 provides the current design-basis flood hazard mechanisms. Table 2 provides reevaluated flood hazard mechanisms; however, reevaluated hazard mechanisms bounded by the current design basis (Table 1) are not included.

The NRC staff has concluded that the licensee's reevaluated flood hazard information, as summarized in the enclosure, is suitable for the assessment of mitigating strategies developed in response to Order EA-12-049 (i.e., defines the mitigating strategies flood hazard information described in Nuclear Energy Institute (NEI) guidance document NEI 12-06, "Diverse and Flexible Coping Strategies (FLEX) Implementation Guide") for Columbia Generating Station. Further, the NRC staff has concluded that the licensee's reevaluated flood hazard information is a suitable input for other assessments associated with Near-Term Task Force Recommendation 2.1, "Flooding." The NRC staff plans to issue a staff assessment documenting the basis for these conclusions at a later time.

Revision 2 of NEI 12-06 includes a methodology to perform a mitigating strategies assessment (MSA) with respect to the reevaluated flood hazards. On February 29, 2016, the NRC staff published Japan Lessons-Learned Division (JLD) Interim Staff Guidance (ISG) JLD-ISG-2012-01, Revision 1, "Compliance with Order EA-12-049, 'Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events'" (ADAMS Accession No. ML15357A142) in the *Federal Register* (81 FR 10283). This ISG endorses Revision 2 of NEI 12-06 (ADAMS Accession No. ML16005A625), dated December 2015. Based on the guidance provided in Revision 2 of NEI 12-06, flood event duration parameters and applicable flood associated effects should be considered as part of the MSA. The NRC staff will evaluate the flood event duration parameters (including warning time and period of inundation) and flood-related associated effects developed by the licensee during the NRC staff's review of the MSA.

As stated above, Table 2 of the enclosure to this letter describes the reevaluated flood hazards that exceed the current design basis. In order to complete its response to the information requested by Enclosure 2 to the 50.54(f) letter, the licensee is expected to submit an integrated assessment or a focused evaluation, as appropriate, to address these reevaluated flood hazards, as described in the NRC letter, "Coordination of Request for Information Regarding Flooding Hazard Reevaluation and Mitigating Strategies for Beyond-Design-Basis External Events" (ADAMS Accession No. ML15174A257). This letter describes the changes in the NRC's approach to the flood hazard reevaluations that were approved by the Commission in its SRM to COMSECY-15-0019, "Closure Plan for the Reevaluation of Flooding Hazards for Operating Nuclear Power Plants" (ADAMS Accession No. ML15209A682).

If you have any questions, please contact me at (301) 415-1056 or e-mail at Lauren.Gibson@nrc.gov.

Sincerely,

Lauren Kate Gibson

Lauren K. Gibson, Project Manager
Hazards Management Branch
Japan Lessons-Learned Division
Office of Nuclear Reactor Regulation

Docket No. 50-397

Enclosure:
Summary of Results of Flooding
Hazard Re-Evaluation Report

cc w/encl: Distribution via Listserv

ENCLOSURE 1:

SUMMARY TABLES OF
REEVALUATED FLOOD HAZARD LEVELS

Table 1. Current Design Basis Flood Hazards for Use in the MSA[1]

Mechanism	Stillwater Elevation	Waves/ Runup	Design Basis Hazard Elevation	Reference
Local Intense Precipitation	Not included in DB	Not included in DB	Not included in DB	FHRR Table 3
Streams and Rivers				
Columbia River[2]	390.0 ft MSL	Minimal	390.0 ft MSL	FHRR Table 3
Local Drainage (Combined Effect)	431.1 ft MSL	2.2 ft	433.3 ft MSL	FHRR Table 3
Failure of Dams and Onsite Water Control/Storage Structures[2]				
Combined Effect	422.0 ft MSL	2 ft	424.0 ft MSL	FHRR Table 3
Storm Surge	No Impact on the Site Identified	No Impact on the Site Identified	No Impact on the Site Identified	FHRR Table 3
Seiche	No Impact on the Site Identified	No Impact on the Site Identified	No Impact on the Site Identified	FHRR Table 3
Tsunami	No Impact on the Site Identified	No Impact on the Site Identified	No Impact on the Site Identified	FHRR Table 3
Ice-Induced Flooding	No Impact on the Site Identified	No Impact on the Site Identified	No Impact on the Site Identified	FHRR Table 3

Table 1. Current Design Basis Flood Hazards for Use in the MSA[1]

Mechanism	Stillwater Elevation	Waves/ Runup	Design Basis Hazard Elevation	Reference
Channel Migrations/Diversions	No Impact on the SIte Identified	No Impact on the Site Identified	No Impact on the Site Identified	FHRR Table 3

Note 1: Reported values are rounded to the nearest one-tenth of a foot.

Note 2: These hazards remain within the Columbia River Basin, a separate sub-basin away from CGS. CGS is not exposed to these hazards due to intervening topography. This remains true for the re-evaluated hazards.

Table 2. Reevaluated Flood Hazards for Flood-Causing Mechanisms for Use in the MSA[1,2]

Mechanism	Stillwater Elevation	Waves/ Runup	Reevaluated Hazard Elevation	Reference
Local Intense Precipitation				
High point near Radwaste Building truck ramp	441.2 ft MSL	Minimal	441.2 ft MSL	FHRR Table 1
DG Building Exterior Door (DG2)	440.9 ft MSL	Minimal	440.9 ft MSL	FHRR Table 1
DG Building Exterior Door (DG1)	440.9 ft MSL	Minimal	440.9 ft MSL	FHRR Table 1
DG Building Exterior Door (HPCS DG)	440.9 ft MSL	Minimal	440.9 ft MSL	FHRR Table 1
Reactor Building railroad bay door	441.1 ft MSL	Minimal	441.1 ft MSL	FHRR Table 1
Service Water B pump house personnel door	441.0 ft MSL	Minimal	441.0 ft MSL	FHRR Table 1
Service Water B spray pond wall	435.2 ft MSL	Minimal	435.2 ft MSL	FHRR Table 1
Service Water A pump house personnel door	439.0 ft MSL	Minimal	439.0 ft MSL	FHRR Table 1
Service Water A spray pond wall	435.1 ft MSL	Minimal	435.1 ft MSL	FHRR Table 1
Roof drain (storm sewer) header manhole MH-S5	440.3 ft MSL	Minimal	440.3 ft MSL	FHRR Table 1
Vehicle Barrier System high point	438.0 ft MSL	Minimal	438.0 ft MSL	FHRR Table 1

Table 2. Reevaluated Flood Hazards for Flood-Causing Mechanisms for Use in the MSA[1,2]

Mechanism	Stillwater Elevation	Waves/ Runup	Reevaluated Hazard Elevation	Reference
Benchmark infront of TSC entrance	440.6 ft MSL	Minimal	440.6 ft MSL	FHRR Table 1
Benchmark in by NW remote air intake	441.0 ft MSL	Minimal	441.0 ft MSL	FHRR Table 1
Benchmark infront of GSB entrance	440.9 ft MSL	Minimal	440.9 ft MSL	FHRR Table 1
Benchmark infront of Building 88	440.6 ft MSL	Minimal	440.6 ft MSL	FHRR Table 1
North Side of Flex Building 82	440.6 ft MSL	Minimal	440.6 ft MSL	FHRR Table 1
North Side of Flex Building 600	437.8 ft MSL	Minimal	437.8 ft MSL	FHRR Table 1
South Side of Flex Building 600	438.0 ft MSL	Minimal	438.0 ft MSL	FHRR Table 1
ISFSI Pad (North)	443.3 ft MSL	Minimal	443.3 ft MSL	FHRR Table 1
ISFSI Pad (South)	443.3 ft MSL	Minimal	443.3 ft MSL	FHRR Table 1
Facilities Fuel Station	440.6 ft MSL	Minimal	440.6 ft MSL	FHRR Table 1
Diesel Generator Tank Access	442.1 ft MSL	Minimal	442.1 ft MSL	FHRR Table 1
Flex Gasoline Storgae Module	440.8 ft MSL	Minimal	440.8 ft MSL	FHRR Table 1

Table 2. Reevaluated Flood Hazards for Flood-Causing Mechanisms for Use in the MSA[1,2]

Mechanism	Stillwater Elevation	Waves/ Runup	Reevaluated Hazard Elevation	Reference
Streams and Rivers				
Local Drainage	432.0 ft MSL	Minimal	432.0 ft MSL	FHRR Table 3

Note 1: Reevaluated hazard mechanisms bounded by the current design basis (see Table 1) are not included in this table

Note 2: Reported values are rounded to the nearest one-tenth of a foot.

If you have any questions, please contact me at (301) 415-1056 or e-mail at Lauren.Gibson@nrc.gov.

Sincerely,

/RA/

Lauren K. Gibson, Project Manager
Hazards Management Branch
Japan Lessons-Learned Division
Office of Nuclear Reactor Regulation

Docket No. 50-397

Enclosure:
Summary of Results of Flooding
Hazard Re-Evaluation Report

cc w/encl: Distribution via Listserv

DISTRIBUTION:

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ADAMS Accession Nos.: PKG ML16337A111; LTR: ML16337A109; ENCL: ML16333A094 *via email

OFFICE	NRR/JLD/JHMB/PM	NRR/JLD/LA	NRO/DSEA/RHM2/TR*	NRO/DSEA/RHM1/BC*
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OFFICE	NRR/JLD/JHMB/BC (A)	NRR/JLD/JHMB/PM		
NAME	GBowman	LKGibson		
DATE	12 / 6 /16	12 /7/16		

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