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December 28, 2017
GO2-17-204

10 CFR 50.54(f)

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

Subject: **COLUMBIA GENERATING STATION, DOCKET NO. 50-397
ENERGY NORTHWEST'S SUBMITTAL OF THE SPENT FUEL POOL
EVALUATION SUPPLEMENTAL REPORT, RESPONSE TO NRC
REQUEST FOR INFORMATION PURSUANT TO 10 CFR 50.54(F)
REGARDING RECOMMENDATION 2.1 OF THE NEAR-TERM TASK
FORCE REVIEW OF INSIGHTS FROM THE FUKUSHIMA DAI-ICHI
ACCIDENT**

- References
1. Letter from E. J. Leeds (NRC) and M. R. Johnson (NRC) to All Power Reactor Licensees and Holders of Construction Permits in Active or Deferred Status, "Request for Information Pursuant to Title 10 of the Code of Federal Regulations 50.54(f) Regarding Recommendations 2.1, 2.3, and 9.3, of the Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident," dated March 12, 2012 (ADAMS No. ML12053A340)
 2. Letter from W. M. Dean (NRC) to the Power Reactor Licensees on the Enclosed List, "Final Determination of Licensee Seismic Probabilistic Risk Assessments Under the Request for Information Pursuant to Title 10 of the *Code of Federal Regulations* 50.54(f) Regarding Recommendation 2.1 "Seismic" of the Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident," dated October 27, 2015 (ADAMS No. ML15194A015)
 3. Letter from A. N. Mauer (NEI) to M. X. Franovich (NRC), "Request for Endorsement of Seismic Evaluation Guidance: Spent Fuel Pool Integrity Evaluation (EPRI 3002009564)," dated January 31, 2017 (ADAMS No. ML17031A171)
 4. EPRI 3002009564, Seismic Evaluation Guidance Spent Fuel Pool Integrity Evaluation, dated January 2017
 5. Letter from M. X. Franovich (NRC) to A. N. Mauer (NEI) "Endorsement of EPRI Report 3002009564, 'Seismic Evaluation Guidance: Spent Fuel Pool Integrity Evaluation'," dated February 28, 2017 (ADAMS No. ML17034A408)

6. Letter GO2-15-045 from D. A. Swank (Energy Northwest) to the NRC, "Seismic Hazard and Screening Report, Response to NRC Request for Information Pursuant to 10 CFR 50.54(F) Regarding Recommendation 2.1 of the Near Term Task Force Review of Insights from the Fukushima Dai-Ichi Accident," dated March 12, 2015 (ADAMS No. ML16204A060)
7. Letter from F. Vega (NRC) to M. E. Reddemann (Energy Northwest), "Columbia Generating Station - Staff Assessment of Information provided under Title 10 of the Code of Federal Regulations Part 50, Section 50.54(f), Seismic Hazard Reevaluations for Recommendation 2.1 of the Near-Term Task Force Review of Insights from the Fukushima DAI-ICHI Accident (CAC No. MF5274)," dated November 4, 2016 (ADAMS No. ML16285A410)

Dear Sir or Madam,

On March 12, 2012, the Nuclear Regulatory Commission (NRC) issued a Request for Information per 10CFR 50.54(f) (Reference 1) to all power reactor licensees. By letter dated October 27, 2015 (Reference 2), the NRC transmitted final seismic information request tables which identified that Columbia Generating Station (Columbia) is to conduct a limited scope Spent Fuel Pool Evaluation. By Reference 3, Nuclear Energy Institute (NEI) submitted an Electric Power Research Institute (EPRI) report entitled, Seismic Evaluation Guidance Spent Fuel Pool Integrity Evaluation (EPRI 3002009564) (Reference 4) for NRC review and endorsement. NRC endorsement was provided by Reference 5.

Reference 4 provides criteria for evaluating the seismic adequacy of a spent fuel pool (SFP) to the reevaluated ground motion response spectrum (GMRS) hazard levels. Section 4.3 of Reference 4 lists the parameters to be verified to confirm that the results of the report are applicable to Columbia, and that Columbia's SFP is seismically adequate in accordance with the Near Term Task Force (NTTF) seismic evaluation criteria.

The attachment to this letter provides the data for Columbia that confirms applicability of the EPRI 3002009564 criteria and confirms that the SFP is seismically adequate in accordance with NTTF 2.1 Seismic evaluation criteria.

No new commitments are identified in this letter.

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.

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Executed on the 29th day of December, 2017

Respectfully,



A. L. Javorik
Vice President, Engineering

Attachments 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

**Energy Northwest
Columbia Generating Station
Docket No. 50-397
Renewed License Number NPF-21
Site-Specific Spent Fuel Pool Criteria for Columbia
Generating Station**

The 50.54(f) letter requested that, in conjunction with the response to Near Term Task Force (NTTF) Recommendation 2.1 (Reference 1), a seismic evaluation be made of the spent fuel pool (SFP). More specifically, plants were asked to consider “all seismically induced failures that can lead to draining of the SFP.” Such an evaluation would be needed for any plant in which the ground motion response spectrum (GMRS) exceeds the safe shutdown earthquake (SSE) in the 1 to 10 Hz frequency range. The staff confirmed through References 2 and 7 that the GMRS exceeds the SSE and concluded that a SFP evaluation is merited for the Columbia Generating Station (Columbia). By Reference 5, the NRC staff determined that EPRI 3002009564 (Reference 4) was an acceptable approach for performing SFP evaluations considering the GMRS hazard levels.

The table below lists the criteria from Section 4.3 of EPRI 3002009564 along with data for Columbia that confirms applicability of the EPRI 3002009564 criteria and confirms that the SFP is seismically adequate in accordance with the NTTF 2.1 seismic evaluation criteria.

SFP Criteria from EPRI 3002009564	Site-Specific Data
Site Parameters	
1. The site-specific GMRS should be the same as that submitted to the NRC between March 2014 and July 2015, which the NRC has found acceptable for responding to the NRC 50.54(f) letter (Reference 7).	The Columbia GMRS peak of 1.45g spectral acceleration is the same as that submitted in Reference 6 and accepted by the NRC in Reference 7.
Structural Parameters	
2. Site-specific calculations, performed in accordance with Section 4.1 of EPRI 3002009564 should demonstrate that the limiting SFP high confidence of low probability of failure (HCLPF) is greater than the site-specific GMRS in the frequency range of interest (e.g., 10-20 Hz).	Site-specific calculations (Reference 9), performed in accordance with Section 4.1 of EPRI 3002009564, demonstrate that the limiting SFP HCLPF is 0.28g, which exceeds the GMRS 0.25g. Therefore, this criterion is met for Columbia.
3. The SFP structure should be included in the Civil Inspection Program performed in accordance with Maintenance Rule.	Energy Northwest currently performs structural inspections of the accessible exterior concrete surfaces of the spent fuel pool every four years as part of the maintenance rule structural inspections required under 10 CFR 50.65. Energy Northwest has committed to continue these inspections as part of the Structures Monitoring Program through the period of extended operation under Columbia’s renewed license (NUREG-2123, Appendix A, item 50)

SFP Criteria from EPRI 3002009564	Site-Specific Data
Non-Structural Parameters	
4. To confirm applicability of the piping evaluation in Section 4.2 of EPRI 3002009564, piping attached to the SFP should have penetrations no more than 6 ft below water surface.	There are no piping penetrations or connections that allow the SFP water to be drained, as documented in Sections 3.8.4.1.1.6 and 9.1.2.3.3 of the FSAR (Reference 8); therefore, this criterion is met for Columbia.
5. To confirm ductile behavior under increased seismic demands, SFP gates should be constructed from either aluminum or stainless steel alloys.	The SFP gate is constructed from an aluminum alloy as documented on plant drawings. Therefore, this criterion is met for Columbia.
6. Anti-siphoning devices should be installed on any piping that could lead to siphoning water from the SFP. In addition, for any cases where active anti-siphoning devices are attached to 2-inch or smaller piping and have extremely large extended operators, the valves should be walked down to confirm adequate lateral support.	<p>Only two 8-inch discharge lines enter the SFP from the top and extend below the design water level. Each pipe is equipped with a check valve designed to prevent siphoning backflow, as documented in Sections 9.1.2.3.3 and 9.1.2.3.5 of the FSAR (Reference 8). As described, anti-siphoning devices are installed on all SFP piping that can lead to siphoning; therefore, this criterion is met for Columbia.</p> <p>Based on review of Figures 9.1-6.1 and 9.1-6.2 of the FSAR (Reference 8), no 2-inch or smaller piping exits the SFP, i.e., no active anti-siphoning devices are attached to 2-inch or smaller piping with extremely large extended operators; therefore, this criterion is met for Columbia.</p>
7. To confirm applicability of the sloshing evaluation in Section 4.2 of EPRI 3002009564, the maximum SFP horizontal dimension (length or width) should be less than 125 ft and the SFP depth should be greater than 36 ft.	The Columbia Generating Station SFP has a length of 40 ft, a width of 34 ft, and a depth of 38.75 ft based on Figure 3.8-31 of the FSAR (Reference 8); therefore, this criterion is met for Columbia Generating Station.
8. To confirm applicability of the evaporation loss evaluation in Section 4.2 of EPRI 3002009564, the SFP surface area should be greater than 500 ft ² and the licensed reactor core thermal power should be less than 4,000 MWt per unit.	The Columbia SFP has a surface area of 1,360 ft ² , which is greater than 500 ft ² and the licensed reactor thermal power for Columbia is 3,544 MWt which is less than 4,000 MWt ; therefore, this criterion is met for Columbia.

References 1. Letter from E. J. Leeds (NRC) and M. R. Johnson (NRC) to All Power Reactor Licensees and Holders of Construction Permits in Active or Deferred Status, "Request for Information Pursuant to Title 10 of the

Code of Federal Regulations 50.54(f) Regarding Recommendations 2.1, 2.3, and 9.3, of the Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident," dated March 12, 2012 (ADAMS No. ML12053A340)

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7. Letter from F. Vega (NRC) to M. E. Reddemann (Energy Northwest), "Columbia Generating Station - Staff Assessment of Information provided under Title 10 of the Code of Federal Regulations Part 50, Section 50.54(f), Seismic Hazard Reevaluations for Recommendation 2.1 of the Near-Term Task Force Review of Insights from the Fukushima DAI-ICHI Accident (CAC No. MF5274)," dated November 4, 2016 (ADAMS No. ML16285A410)
8. Energy Northwest's Columbia Generating Station *Final Safety Analysis Report*, Amendment 63, dated December 2015.
9. CVI 1266-00,1, Columbia Generating Station Spent Fuel Pool Seismic Integrity Evaluation