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January 31, 2018
GO2-18-005

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

Subject: **COLUMBIA GENERATING STATION, DOCKET NO. 50-397**
REQUEST FOR CLARIFICATION OF AST SER

Reference: Letter from B. J. Benney (NRC) to J. V. Parrish (Energy Northwest), "Columbia Generating Station – Issuance of Amendment RE: Alternative Source Term (TAC No. MC4570)", dated November 27, 2006

Dear Sir or Madam:

As discussed during a telephone call on August 15, 2017, Energy Northwest would like to request a clarification to Columbia Generating Station's Alternate Source Term Safety Evaluation Report. During a 2016 inspection, two issues were brought up concerning the verbiage in the evaluation and how the actions are implemented at Columbia Generating Station.

There are no commitments being made to the Nuclear Regulatory Commission herein. If you have any questions, or require additional information, please contact Ms. D. M. Wolfgramm, Regulatory Compliance Supervisor, at (509) 377-4792.

Executed on this 31ST day of January, 2018

Respectfully,

W. G. Hettel
Vice President, Operations

Enclosure: Columbia Generating Station Safety Evaluation Clarification Request

cc: NRC Region IV Administrator
NRC NRR Project Manager
NRC Senior Resident Inspector/988C
CD Sonoda – BPA/1399
WA Horin – Winston & Strawn

Columbia Generating Station Safety Evaluation Clarification Request

During the 2016 Component Design Basis Inspection, wording in a safety evaluation received by the station in 2006 in response to the Alternate Source Term License Amendment Request was questioned, as wording used in the evaluation could be interpreted differently than intended. Specifically, language regarding activation of the Standby Liquid Control (SLC) System for buffering suppression pool pH, and continuous spray versus intermittent spray for aerosol removal was heavily discussed.

Activation of SLC During an Event

Amendment No. 199 to Columbia's Facility Operating License replaced the accident source term used in design basis radiological analyses with an alternative source term. Specific to this license amendment was a change to support the use of the SLC System for buffering suppression pool pH, as outlined on page 3 of Reference 1. The design basis source term loss of coolant accident (LOCA) requires the addition of sodium pentaborate solution post-accident to maintain the suppression pool pH equal to, or greater than, 7.0, which will minimize the re-evolution of gaseous iodine.

Based on Energy Northwest's submittal, the NRC staff documented their conclusions in Reference 2, which was revised via Reference 3 due to errors. One error, which was not corrected at the time, is located in Item 6 under Section 4.3, which states,

> *Emergency Operating Procedures (EOPs) direct the activation of SLC following a LOCA when reactor water level cannot be maintained above the top of active fuel. Manual initiation of SLC is also directed in the severe accident management guidelines (SAMGs), which are entered when adequate core cooling cannot be maintained.*

This statement could be interpreted to mean that the SLC system will always be activated during the use of the EOPs whenever reactor water level cannot be maintained above the top of active fuel; however, Subsection (b) on page 72 of Reference 1 provides detail that activation of SLC may not occur until the SAMGs are entered.

During a recent NRC inspection, the verbiage in Item 6 of Section 4.3 of Reference 2 was challenged when Energy Northwest could not demonstrate that EOPs would direct activation of SLC in every instance that the reactor water level could not be maintained above the top of active fuel. Activation of SLC while in EOPs is not required for every scenario; therefore, Energy Northwest is requesting clarification of Amendment No. 199 to remove reference to the EOP directing activation of SLC.

Energy Northwest proposes the following clarification of the safety evaluation:

> *Emergency Operating Procedures (EOPs) allow activation of SLC following a LOCA as an alternate injection source for reactor water inventory control. Manual initiation of SLC is directed in the severe accident management guidelines (SAMGs), which are entered when adequate core cooling cannot be maintained.*

Containment Spray: Continuous vs Intermittent
Page 5 of Reference 2 specifies that,

> *EN assumes that a portion of the fission products released from the reactor pressure vessel will be removed by drywell sprays. The sprays are assumed to be initiated at 15 minutes and turned off after 1 day.*

Although the term “continuous” is not explicitly stated in the amendment, a recent NRC inspection demonstrated that the potential exists for misinterpretation of the use of drywell spray for aerosol removal (scrubbing). Reference 2 does not specify continuous spray versus intermittent spray; however, page 23 of Reference 2 affirms the statements of the LOCA analysis submitted for approval with Alternative Source Term.

The EOPs and SAMGs operate the plant in a more conservative manner than the analytical assumption because shorter, intermittent spray duration results in lower LOCA dose consequences due to the bounding assumptions of the LOCA analysis.

Assuming worst case, design basis conditions, the drywell sprays are able to reduce the peak LOCA pressure to less than 5 psig within 24 hours. This allows credit for a 50% reduction in containment leakage after 24 hours. The EOPs/SAMGs utilize the sprays to reduce pressure to a conservative 0 – 2 psig. Actual spray performance and peak pressure are expected to be better than design basis; therefore, the EOP/SAMG is written to allow Operators to secure drywell sprays based upon containment pressure, which may be prior to 24 hours.

Page 36 of Attachment 1 of Reference 1 shows that the LOCA analysis credits the drywell sprays for aerosol removal (scrubbing). Using a conservative spray removal rate, 98% of the aerosol activity is removed within a time period of 2 hours, 11 minutes (15 minutes to 2.44 hours after the event). The removal rate then drops by a factor of 10 for the remainder of the 24 hours. Securing the drywell sprays prior to 24 hours does not impact the aerosol removal rates assumed in the LOCA analysis.

A separate aerosol removal sensitivity analysis considered the effect of securing drywell sprays during the 24 hour period. The resulting spray removal rates were better than those using the bounding aerosol removal model of the LOCA analysis. The aerosol removal sensitivity analysis was submitted under Enclosure 3 of Reference 4, in response to Items 6.e, 6.h, and 9 of Reference 5.

The EOP/SAMG direction to secure drywell sprays based upon containment pressure is consistent with, and bounded by the design basis LOCA analysis and its assumption regarding drywell sprays. Therefore, Energy Northwest is requesting a revision to the Amendment No. 199 safety evaluation to clearly state that intermittent drywell spray is utilized within the first 24 hours after an event.

Energy Northwest proposes the following clarification of the safety evaluation:

EN assumes that a portion of the fission products released from the reactor pressure vessel will be removed by drywell sprays. Fission product removal by drywell sprays is credited from 15 minutes through 24 hours based upon the approved methodology. The sprays are operated as directed by the EOP/SAMG procedures.

References

1. Letter from D. K. Atkinson (Energy Northwest) to NRC, "Columbia Generating Station, Docket No. 50-397, License Amendment Request – Alternative Source Term", dated September 30, 2004

2. Letter from B. J. Benney (NRC) to J. V. Parrish (Energy Northwest), "Columbia Generating Station – Issuance of Amendment RE: Alternative Source Term (TAC No. MC4570)", dated November 27, 2006

3. Letter from C. F. Lyon (NRC) to J. V. Parrish (Energy Northwest), "Columbia Generating Station – Correction to Safety Evaluation for Amendment No. 199, Alternative Source Term (TAC NO. MC4570)", dated March 27, 2007

4. Letter from W. S. Oxenford (Energy Northwest) to NRC, "Columbia Generating Station, Docket No. 50-397, Response to Request for Additional Information Related to Alternative Source Term License Amendment Request", dated March 21, 2006

5. Letter from B. J. Benney (NRC) to J. V. Parrish (Energy Northwest), "Columbia Generating Station – Request for Additional Information (TAC No. MC4570)", dated February 9, 2006