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10 CFR 50.90

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

Subject: **COLUMBIA GENERATING STATION, DOCKET NO. 50-397 RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION RELATED TO LICENSE AMENDMENT REQUEST FOR RECLASSIFYING QUALITY GROUP OF LOW TEMPERATURE PORTIONS OF REACTOR WATER CLEANUP SYSTEM**

References:
1. Letter from A.L. Javorik, Energy Northwest to NRC, "License Amendment Request for Reclassifying Quality Group of Low Temperature Portions of Reactor Water Cleanup System," dated August 30, 2016 (ML16243A515).

2. E-mail from NRC to Energy Northwest, "Columbia RWCU LAR, MF8318, formal release of RAIs," dated July, 12, 2017.

Dear Sir or Madam:

By Reference 1 Energy Northwest submitted a request to reclassify portions of the Reactor Water Cleanup system from Quality Group C to Quality Group D. By Reference 2 the Nuclear Regulatory Commission requested additional information related to the Energy Northwest submittal. The enclosure to this letter contains the requested information.

The information in this response does not impact the conclusions of the No Significant Hazards Consideration presented in Reference 1.

As a result of answers provided in Request for Additional Information (RAI) question 1, a change to the 120 day implementation period requested in Reference 1 is also being requested. The revised implementation period should be following Refueling Outage 24 (Spring 2019) as discussed in RAI 1.

No new commitments are being made by this letter or the enclosure. If there are any questions or if additional information is needed, please contact Ms. L. L. Williams, Licensing Supervisor, at 509-377-8148.

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

Executed this 20th day of November, 2017.

Respectfully,

AL 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
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RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

NRC REQUEST No. 1:

RG 1.26 establishes an acceptable method for complying with requirements of GDC 1 and 10 CFR 50.55a by classifying fluid systems and components important to safety and applying corresponding quality codes and standards to such systems and components. This RG describes an acceptable method for determining quality standards for Quality Group B, C, and D water- and steam-containing components important to safety of water-cooled nuclear power plants.

Columbia FSAR Section 3.2.2 states that the Quality Group classifications indicated in Tables 3.2-1 and 3.2-2 meet the requirements of 10 CFR 50.55a and Regulatory Guide 1.26, Revision 3. Table 3.2-2 shows that Quality Group C corresponds to ASME Section III, Class 3 equipment designed to Subsections NA and ND for piping, valves, and pressure vessels. Table 3.2-2 also shows that the design standards for Quality Group D components are ASME B31.1 for piping and valves, and ASME Boiler and Pressure Vessel Code, Section VIII, Division 1, for pressure vessels.

As specified in 10 CFR 50.55a(g)(4), components (including supports) that are classified as ASME Code Class 1, Class 2, and Class 3 must meet the requirements, except design and access provisions and preservice examination requirements, set forth in Section XI of the ASME Boiler and Pressure Vessel Code (BPVC) to the extent practical within the limitations of design, geometry, and materials of construction of the components. As stated in the Enclosure to the Energy Northwest letter dated February 4, 2016, (ADAMS Accession No.ML16035A405) the applicable ASME Section XI Code Edition and Addenda for Columbia's fourth ten-year inservice inspection interval ending December 12, 2025, is the 2007 Edition through the 2008 Addenda.

The applicable requirements of Section XI of the ASME BPVC include inservice examination and repair and replacement criteria. The repair and replacement criteria of Subsection IWA apply to all ASME Class 3 components. The examination requirements of Subsection IWD applied to all ASME Class 3 pressure retaining components and their integral attachments on Class 3 systems in support of certain functions, including emergency core cooling and containment heat removal. These requirements are not applicable to Quality Group D components and are not included in the ASME B31.1 code.

As stated in the license amendment request, Columbia's RWCU system was originally designed fully compliant with Regulatory Guide 1.26, Revision 3 guidance. Regulatory Position C.2.c of RG 1.26 specified that water-containing components not part of the reactor coolant pressure boundary or included in Quality Group B, but part of systems or portions of systems that are connected to the reactor coolant pressure boundary and are capable of being isolated from that boundary during all modes of normal reactor operation by two valves, each of which is either normally closed or capable of automatic

closure, should be designated Quality Group C.

The staff did not identify any discussion of the effect of the proposed quality group classification change on 10CFR50.55a implementation in the amendment request. As described above, the change in Quality Group could remove the requirement for inservice examination of pressure retaining components and their integral attachments and would remove the repair and replacement criteria currently required to be applied to Quality Group C components, thereby potentially increasing the probability of pressure boundary failure. Provide a discussion addressing changes in application of 10 CFR 50.55a(g)(4) requirements applicable to components classified Quality Class C that would result from the proposed reclassification as Quality Class D components. This discussion should address the following:

- Describe any adverse results of past required inservice examinations that resulted in repair or replacement activities. In the event that the Quality Group C RWCU system components have been excluded from inservice examination under Subsection IWD of the ASME BPVC, provide justification for the exclusion.
- Provide an appropriate administrative means of controlling future examination, repair, and replacement activities affecting the high-pressure portion of the RWCU system proposed for classification as Quality Group D, such as a license condition, or justify the relaxation based on an a risk-informed assessment if the potential for containment bypass. The voluntary process outlined in 10 CFR 50.69, “Risk-Informed Categorization and Treatment of Structures, Systems and Components for Nuclear Power Reactors,” provides an acceptable alternative for compliance with the requirements of 10 CFR50.55a(g).

ENERGY NORTHWEST RESPONSE TO RAI 1:

The Reactor Water Cleanup (RWCU) system has historically been exempted from the Inservice Inspection Program (ISI Program) in accordance with IWD-1210. The current ISI Program Plan notes that RWCU is exempt from ASME Section XI examination in that it does not directly support any of the following functions subject to IWD examination requirements:

a) Reactor shutdown
b) Emergency core cooling
c) Containment heat removal
d) Atmosphere cleanup
e) Reactor residual heat removal
f) Residual heat removal from spent fuel storage pool

As such, there is no net change in ISI applicability for the proposed reclassification of the low temperature portions of the RWCU system. Since the system has been exempted from ASME Section XI examination, repair and replacement of system components has not been a result of required inservice examinations. Normal

maintenance and operation of the system has identified the need for repairs and replacements. For the portion of the system proposed for reclassification, the repair and replacements necessary have been to correct issues such as packing leaks, seat leakage and other issues not representative of a gross component failure.

To reduce potential risks for containment bypass, additional defense in depth for isolation of breaks in the portion of the RWCU system proposed for reclassification is provided. A failure of the reclassified portion of the RWCU system, coincident with a failure to close of both inboard and outboard primary containment isolation valves (PCIVs), on inlet and return sides of the system, is mitigated by additional valves as specified below, which meet the intent of Regulatory Guide (RG) 1.26 Revision 3 footnote 6, which states:

> *Components in influent lines may be classified as Group D provided they are capable of being isolated from the reactor coolant pressure boundary by an additional valve which has high leak tight integrity.*

A range of detection instrumentation including area radiation, temperature, sump flows and differential flow is available to allow for operator identification of a break combined with a failure of PCIVs to terminate leakage through the break. These indications would drive operator actions to undertake additional break isolation actions including use of the defense in depth valves discussed in this response.

The RWCU system takes suction from the reactor pressure vessel (RPV) bottom head and the recirculation loops' suction lines and returns to the RPV via the feedwater lines.

On the inlet side, the additional isolation on the primary flowpath between the RPV and the RWCU system is provided by two valves – RWCU-V-5A and RWCU-V-5B. RWCU-V-5A and RWCU-V-5B conform with Regulatory Guide 1.26, Quality Group C classification and are located in the reactor building, near primary containment isolation valves RWCU-V-1 and RWCU-V-4. RWCU-V-5A and RWCU-V-5B provide the isolation function intended by the "additional valve" in the footnote. Valve RWCU-V-5A is the suction side isolation valve for RWCU-P-1A and valve RWCU-V-5B is the suction side isolation valve for RWCU-P-1B. The pumps are in a parallel arrangement such that either pump is capable of supplying the RWCU system. As such, both valves are required to close to isolate the RPV. These valves isolate the 4" RWCU suction lines to their respective pumps. These valves are motor operated valves capable of being closed from an easily accessible, local control panel outside of the RWCU pump room. The boundaries of the proposed reclassification are not impacted by the designation of these additional valves as defense in depth for isolation capability.

It should be noted that there is a small bore line that provides a continuous source of cooler water to the RWCU pump suction to ensure adequate net positive suction head available (NPSHa). This line taps off the discharge of the RWCU non-regenerative heat exchanger and directs water to the common RWCU pump suction. This line is not part

of the portion of the system that is being reclassified. Since this line effectively bypasses RWCU-V-5A and RWCU-V-5B, the two 3/4 inch diameter valves RWCU-V-768 and RWCU-V-769 provide defense in depth break isolation consistent with Regulatory Guide 1.26, Footnote 6. RWCU-V-768 is a Code Group D check valve inline for the small bore pump suction cooling line, while RWCU-V-769 is a Quality Group C manually operated valve downstream of the check valve along the normal cooling flow path (upstream in the postulated break with reverse flow through this line).

On the return line, the additional isolation is provided by RWCU-V-40. This valve is credited for long term leakage control which supplements the primary containment and reactor coolant pressure boundary isolation valves, RFW-V-10A, RFW-V-10B, RFW-V-32A, and RFW-V-32B. Valve RWCU-V-40 isolates the 6" RWCU return line to the feedwater system. This valve is a motor operated valve capable of being closed from the main control room. This valve is located in the Reactor building and is Quality Group A as required by RG 1.26.

The additional valves designated to meet the intent of RG 1.26 footnote 6 have high leak tight integrity and are designated Quality Group A, C or D as noted above. The defense in depth isolation valves are all normally open valves and tested as discussed below:

RWCU-V-40 is subject to local leak rate testing under Columbia's Appendix J Option B program. The results of the most recently performed test performed during Refueling Outage 22 (2015) indicated zero leakage. Testing of RWCU-V-40 will continue to be performed as required by the Inservice Testing (IST) program. The testing performed on this valve consists of a full stroke exercise, measurement of stroke time, leakage rate testing, and position verification. RWCU-V-40 and its associated motor operator are included in Columbia's Generic Letter (GL) 89-10 Motor Operated Valve (MOV) Program and are periodically tested. The last test was performed in 2009 and demonstrated an opening margin of 6.8% and a closing margin of 6.1%. With the available margin, RWCU-V-40 would be available for defense in depth break isolation if necessary.

The testing requirements for RWCU-V-5A and RWCU-V-5B are being developed consistent with the requirements of the IST program. These valves are being added to the IST Program as "augmented components". Energy Northwest is currently in the 4th ten-year IST interval with the applicable code version being the 2004 edition and the 2005 and 2006 addenda of the ASME Code for Operation and Maintenance of Nuclear Power Plants (OM Code). Since these valves are not automatic valves, the acceptance criteria for stroke time and leakage rate testing is based on sound engineering practices and set low enough to detect degradation in valve operation over time.

For RWCU-V-5A and RWCU-V-5B, Energy Northwest will perform a full stroke exercise consistent with ISTC-3500, measurement of stroke time consistent with ISTC-5120, leakage rate testing requirements consistent with ISTC-3600, and position verification

testing consistent with ISTC-3700. Valves RWCU-V-5A and RWCU-V-5B are not part of the GL 89-10 MOV program but have actuators sized with margin to required opening and closing thrust requirements. The opening margin is estimated to be greater than 50% and the closing margin is approximately 11%. As, such, RWCU-V-5A and RWCU-V-5B would be available for defense in depth break isolation if required.

RWCU-V-768 and RWCU-V-769 valves are less than 1" nominal pipe size. Valves of this size and shape that constitute part of an ASME Class 1 boundary would be exempt from ASME Section XI surface and volumetric examination per subsection IWB-1220 (b)(1). This exemption recognizes that flow through unisolated small bore piping does not challenge a station's ability to safely shutdown. The treatment of RWCU-V-768 and RWCU-V-769 in the current capacity as defense in depth isolation capability is modeled after the ASME code allowances afforded to similarly sized Class 1 boundary valves with regard to testing requirements. Namely, no specific leak tightness or other testing will be performed on these small bore valves.

Testing of RWCU valves is typically not performed during normal operation since the system is continuously in service. Testing these valves during power operations requires system shutdown which imposes thermal stresses on the pumps and heat exchangers, significantly increasing the potential for equipment damage. As such, baseline testing for RWCU-V-5A and RWCU-V-5B may not occur prior to Refueling Outage 24 (R24) (2019). Subsequent testing may also be performed during refueling outages due to the impracticality of testing online.

Successful demonstration of leak tightness for those defense in depth valves subject to testing as outlined above would be required prior to implementation of the proposed changes. As discussed in the preceding paragraph, testing may not occur until R24. Hence, Energy Northwest requests to revise the implementation period from 120 days post approval to upon restart from refueling outage 24.

NRC REQUEST No. 2:

Section 3.2 of the Columbia Final Safety Analysis Report (FSAR) states that Quality Class II+ corresponds to augmented quality and involves the assignment of qualities affecting activities as specifically committed. The staff identified no discussion of any augmented qualities applicable to the components proposed for downgrading to Quality Group D other than extension of the high energy line classification to RWCU piping in the radwaste building meeting the pressure criteria for high energy lines. Explain the effect of including the components proposed for reclassification as a high energy line with respect to the quality class designation of the components. As appropriate, describe the components and associated attributes that would be subject to augmented quality and designation as Quality Class II+, as described in Section 3.2 of the Columbia FSAR. Clarify the components of the RWCU system within the radwaste building that are currently designated Quality Class II+ (e.g., resin backwash line) and provide the

basis for the augmented quality class relative to the high pressure Quality Class II piping.

ENERGY NORTHWEST RESPONSE TO RAI 2:

As indicated in RWCU flow diagrams, Note 2e denotes Quality Class II+ piping and valves in the radwaste building. Quality Class II+ (QC II+) components for the RWCU system in the radwaste building are limited to pipes and valves in the resin backwash and associated backwash vent portion of the system. Specifically, portions of the system downstream from valves RWCU-V-207, RWCU-V-212, RWCU-V-208 and RWCU-V-242 are designated QC II+. The use of augmented quality (QC II+) is appropriate for these portions of the system as they are considered structures, systems and components required for radwaste management subject to Regulatory Guide 1.143. Classification of the aforementioned portions of RWCU as QC II+ is consistent with item 2 of FSAR Section 3.2.4.b (Quality Assurance Classification; Quality Class II+). The proposed changes will not change quality classification for any portions of the system since the overall system operation is unchanged.

The effect of including the components proposed for reclassification in the extension of the high energy line designation will be limited to the incorporation of those components into existing pipe break and missile analyses, consistent with Standard Review Plan (SRP) 3.6.1 and Branch Technical Position ASB 3-1. The new portions of RWCU redefined as high energy are not subject to Augmented High Energy Line Break Piping Examination as defined in the current ISI program in that they do not penetrate containment, nor do they result in unacceptable effects due to postulated pipe breaks.

NRC REQUEST NO. 3:

Section 4.1.10 of Attachment 1 to the LAR described that originally 39 valves (31 fully replaced and 8 with valve internal-only modifications) were changed from the original Quality Group C to Quality Group D. However, 2 of these fully-replaced valves were restored back to their original Quality Group C classification.

Please provide the technical basis for returning 2 valves back to the Quality Group C classification. If degradation or damage to the Quality Group D component contributed to returning the component to Quality Group C, describe the degraded condition and the cause of the degradation.

ENERGY NORTHWEST RESPONSE TO RAI 3:

In response to the 2013 NRC violation related to improper reclassification of portions of RWCU, the system was restored to a full ASME design on paper. In 2014, two valves were identified to be degraded and required corrective maintenance. Due to physical interferences and ALARA concerns, it was more efficient to replace the valves in lieu of

attempting a repair in situ. As such, the valves were replaced with ASME valves in accordance with the requirements of the (restored) ASME system design.