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April 5, 2011
GO2-11-074

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

Subject: **COLUMBIA GENERATING STATION, DOCKET NO. 50-397**
LICENSE RENEWAL APPLICATION SECOND ANNUAL UPDATE

References:
1) Letter, GO2-10-011, dated January 19, 2010, WS Oxenford (Energy Northwest) to NRC, "License Renewal Application"

2) Letter, GO2-10-094, dated July 16, 2010, SK Gambhir (Energy Northwest), "License Renewal Application First Annual Update"

3) Letter, GO2-11-011, dated January 14, 2011, SK Gambhir (Energy Northwest), "Response to Request for Additional Information License Renewal Application"

4) Letter dated May 27, 2010, NRC to JV Parrish (Energy Northwest), "Issuance of Amendment Re: Changes to Technical Specifications Related to Diesel Generator Fuel Oil Storage and Testing (TAC NO. ME2121)

Dear Sir or Madam:

By Reference 1, Energy Northwest requested the renewal of the Columbia Generating Station (Columbia) operating license. The first annual update was provided to the Nuclear Regulatory Commission (NRC) in Reference 2. The License Renewal Rule, 10 CFR 54.21(b), requires that each year following submittal of a license renewal application (LRA), and at least 3 months before scheduled completion of the NRC review, an amendment to the renewal application must be submitted that identifies any change to the current licensing basis (CLB) of the facility that materially affects the content of the LRA.

A143
NRR

In accordance with this requirement, Energy Northwest performed a review of CLB changes after the LRA First Annual Update reference freeze date of January 2010 that formed the basis for the submittal of Reference 2 to determine if the LRA was affected by these changes. The reference freeze date for this review was November 1, 2010. This update also includes a review of applicable industry and plant specific operating experience for the same time frame. No changes in the CLB were found that necessitated an amendment to the LRA.

During the reviews, the Energy Northwest discovered several administrative or editorial changes that have been incorporated into Amendment 29 and provided as the enclosure to this letter. The attachment provides a brief explanation of the changes made.

No new commitments are included in this response. However, there are commitments that are changed for consistency or clarification.

If you have any questions or require additional information, please contact Abbas Mostala at (509) 377-4197.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the date of this letter.

Respectfully,

4/4/11

SK Gambhir
Vice President, Engineering

Enclosure: License Renewal Application Amendment 29

Attachment: Summary of LRA Changes

cc: NRC Region IV Administrator
NRC NRR Project Manager
NRC Senior Resident Inspector/988C
EFSEC Manager
RN Sherman – BPA/1399
WA Horin - Winston & Strawn
AD Cunanan - NRC NRR (w/a)
BE Holian - NRC NRR
RR Cowley - WDOH

AMMENDMENT 29
Summary of LRA Changes

LRA Section	LRA Page	Summary	Type
A.1.2.32	A-18a	Indicated reference information for document added in Amendment 16	Editorial
A.1.4	A-41		
A.1.2.47	A-24	Change 10-year period to no earlier than 5 years prior to the period of extended operation for consistency with Section B.2.47	Editorial
Table A-1, # 47	A-60		
A.1.2.54	A-26a	Update to reflect complete response provided in Amendment 20 cover letter (Reference 3)	Consistency
Table A-1, #65	A-68c	Added the program name to the item column	Consistency
Table A-1, #68 & 69	A-68d		
Table A-1, #65, 66, 67,	A-68c	Corrected or removed incorrect FSAR supplement locations	Consistency
Table A-1, #68 & 69	A-68d		
Table A-1, #69	A-68d	Clarified that the "subject welds" were portions of the reactor pressure vessel welds BG and BM	Editorial
B.2.29	B-122	Revised "Exceptions to NUREG-1801" for "Parameters Monitored and Inspected" and "Detection of Aging Effects" to reflect Technical Specification Amendment 215 (Reference 4)	Consistency
B.2.54	B-208b	Update to reflect complete response provided in Amendment 20 cover letter	Consistency

Insert A

(≥ 400 V)

Power

power

The Inaccessible ~~Medium-Voltage~~ Cables Not Subject to 10 CFR 50.49 EQ Requirements Program will manage the aging of in-scope, ~~medium-voltage~~ cables exposed to significant moisture ~~and significant voltage~~. First tests or first inspections for license renewal will be completed before the period ~~of extended~~ operation. These cables will be tested at least once every ~~10~~ 6 years to provide an indication of the condition of the conductor insulation. The specific type of test performed will be determined prior to the initial test, and is to be a proven test for detecting deterioration of the insulation system due to wetting, such as power factor, partial discharge, or polarization index, as described in EPRI TR -103834-P1~~-2~~ (Reference A.1.4-3), or other testing that is state-of-the-art at the time the test is performed. Significant moisture is defined as periodic exposures that last more than a few days (e.g., cable in standing water). Periodic exposures that last less than a few days (e.g., normal rain and drain) are not significant. ~~Significant voltage exposure is defined as being subjected to system voltage for more than 25% of the time. The moisture and voltage exposures described as significant in these definitions are not significant for medium-voltage cables that are designed for these conditions (e.g., continuous wetting and continuous energization are not significant for submarine cables).~~ In addition, inspection for water collection in electrical manholes will be performed based on actual plant experience with water accumulation in the manholes. However, the inspection frequency will be at least ~~once every two years~~ annually.

Manhole inspections will also be performed periodically, in response to event-driven occurrences (such as heavy rain or flooding).

A.1.3.7.3 Main Steam Flow Restrictor Erosion Analyses

The main steam line flow restrictors are designed to limit coolant flow rate from the reactor vessel (before the MSIVs are closed) to less than 200 percent of normal flow in the event of a main steam line break outside the containment. Erosion of a flow restrictor is a safety concern since it could impair the ability of the flow restrictor to limit vessel blowdown following a main steam line break. Since erosion is a time-related phenomenon, the analysis for the effect it has on the flow restrictors over the life of the plant is a TLAA. Cast stainless steel (SA351, Type CF8) was selected for the steam flow restrictor material because it has excellent resistance to erosion-corrosion from high velocity steam.

The erosion of the main steam flow restrictors has been projected for the period of extended operation. The projection concludes that after 60 years of erosion on the main steam flow restrictors, the choked flow will still be less than 200 percent of normal flow. Therefore, the main steam flow restrictors will continue to perform their intended function and the existing accident radiological release analysis will remain valid for the period of extended operation.

Disposition

The TLAA for erosion of the main steam line flow restrictors has been projected to the end of the period of extended operation.

A.1.4 References

A.1.4-1 BWROG Report GE-NE-523-A71-0594-A, Rev 1, "Alternate BWR Feedwater Nozzle Inspection Requirements," May 2000

A.1.4-2 EPRI Report No. 1011838, "Recommendations for An Effective Flow Accelerated Corrosion Program (NSAC-202L-R3)," May 2006

A.1.4-3 EPRI TR-103834-P1-2, "Effects of Moisture on the Life of Power Plant Cables," August 1994

A.1.5 License Renewal Commitment List

A listing of commitments identified in association with Columbia license renewal is provided in Table A-1. These commitments will be tracked within the Columbia regulatory commitment management program. Any other actions discussed in the LRA represent intended or planned actions. They are described to the NRC for information and are not regulatory commitments.

Energy Northwest follows the requirements of the BWRVIP ISP and applies the ISP data to Columbia. The NRC has approved the use of the BWRVIP ISP in place of a unique plant program for Columbia.

The provisions of 10 CFR 50 Appendix G require Columbia to operate within the currently licensed pressure-temperature (P-T) limit curves, and to update these curves as necessary. The P-T limit curves, as contained in plant technical specifications, will be updated as necessary through the period of extended operation as part of the Reactor Vessel Surveillance Program. Reactor vessel P-T limits will thus be managed for the period of extended operation.

A.1.2.47 Selective Leaching Inspection

The Selective Leaching Inspection detects and characterizes the conditions on internal and external surfaces of subject components exposed to raw water, treated water, fuel oil, soil, and moist air (including condensation) environments. The inspection provides direct evidence through a combination of visual examination and hardness testing, or NRC-approved alternative, as to whether, and to what extent, a loss of material due to selective leaching has occurred.

The Selective Leaching Inspection is a new one-time inspection that will be implemented prior to the period of extended operation. The inspection activities will be conducted ~~within the 10-year period~~ prior to the period of extended operation.

no earlier than 5 years

A.1.2.48 Service Air System Inspection

Program

Insert B from Page A-24a

~~The Service Air System Inspection detects and characterizes the material condition of steel piping and valve bodies exposed to an "air (internal)" (i.e., compressed air) environment within the license renewal boundary of the Service Air System. The inspection provides direct evidence as to whether, and to what extent, a loss of material due to corrosion has occurred.~~

~~The Service Air System Inspection is a new one-time inspection that will be implemented prior to the period of extended operation. The inspection activities will be conducted within the 10-year period prior to the period of extended operation.~~

Program

A.1.2.49 Small Bore Class 1 Piping ~~Inspection~~

Insert A from Page A-24a

~~The Small Bore Class 1 Piping Inspection will detect and characterize the conditions on the internal surfaces of small bore Class 1 piping components that are exposed to reactor coolant. The Small Bore Class 1 Piping Inspection will provide physical evidence as to whether, and to what extent, cracking due to SCC or to thermal or mechanical loading has occurred in small bore Class 1 piping components. The Small Bore Class 1 Piping Inspection will also verify, by inspections for cracking, that~~

Table A-1
Columbia License Renewal Commitments

Item Number	Commitment	FSAR Supplement Location (LRA App. A)	Enhancement or Implementation Schedule
47) Selective Leaching Inspection	The Selective Leaching Inspection is a new activity. The Selective Leaching Inspection detects and characterizes the conditions on internal and external surfaces of subject components exposed to raw water, treated water, fuel oil, soil, and moist air (including condensation) environments. The inspection provides direct evidence through a combination of visual examination and hardness testing, or NRC-approved alternative, as to whether, and to what extent, the relevant effects of aging have occurred.	A.1.2.47	~~Within the 10-year period~~ prior to the period of extended operation.
48) Service Air System Inspection Program	~~The Service Air System Inspection is a new activity.~~ ~~The Service Air System Inspection detects and characterizes the material condition of steel piping and valve bodies exposed to an "air (internal)" (i.e., compressed air) environment within the license renewal boundary of the Service Air System. The inspection provides direct evidence as to whether, and to what extent, the relevant effects of aging have occurred.~~	A.1.2.48	~~Within the 10-year period prior to the period of extended operation.~~

No earlier than 5 years

Replace with Insert A on page A-60a

Replace with Insert B on page A-60a

Insert A to Page A-26

A.1.2.54 Boron Carbide Monitoring Program

The Boron Carbide Monitoring Program detects degradation of Boron Carbide (B_4C) neutron absorbers in the spent fuel storage racks by monitoring spent fuel racks for potential off-gassing ~~and B_4C coupon inspection.~~ From the monitoring data, the stability and integrity of Boron Carbide in the storage cells are assessed. Periodic monitoring of B_4C ~~samples~~ permits early determination of aging degradation.

coupons

, by in situ testing of the spent fuel racks, or by inspecting the B_4C coupons.

but may be discontinued based on in situ testing results

Insert A into Page A-68b

Item Number	Commitment	FSAR Supplement Location (LRA App. A)	Enhancement or Implementation Schedule
65) ~~ISI~~ Inservice Inspection (ISI) Program	Columbia will prepare and submit the ISI Program Plan for the fourth 10-year interval no later than 2015. (The third 10-year ISI interval extends from December 2005 until December, 2015.) The small bore piping program will be included in the fourth 10-year interval ISI program plan as an augmented inspection. The locations to be inspected, the sample size, the inspection methodology will be included in the program plan.	~~LRA Appendix B~~ A.1.2.33	Upon submittal of the ISI Program Plan for the fourth 10-year interval
66) Structures Monitoring Program	Perform a one-time internal inspection of the spent fuel pool tell tale drain lines prior to the period of extended operation to confirm the drain lines are free of obstructions. Unexpected inspection result of clogged lines will require a condition report be documented and further engineering evaluation of adverse impacts to the spent fuel pool structure and to identify the periodicity of drain cleaning and maintenance process.	A.1.2.50	Prior to the period of extended operation.
67) Structures Monitoring Program	Perform a one-time boroscope inspection of the containment sand pocket drain lines to confirm the absence of clogged drain lines and that a flow path exists for identification of any potential leakage into the sand pocket region. Unexpected inspection results (clogged drain lines) will be documented under corrective action process.	A.1.2.50	Prior to 12/31/15

Insert new row 68 from page A-68d

Insert new rows 69 and 70 from page A-68d

~~Amendment 22~~ → ~~Amendment 18~~

~~Amendment 26~~ → ~~Amendment 22~~

~~Amendment 28~~ → ~~Amendment 22~~

Amendment 29 → ~~Amendment 28~~

Insert into page A-68c

Item Number	Commitment	FSAR Supplement Location (LRA App. A)	Enhancement or Implementation Schedule
68) Flow-Accelerated Corrosion (FAC) Program	Ensure that the condenstate (COND) and reactor feedwater (RFW) systems are screened and evaluated for cavitation prior to entering the period of extended operation (PEO). If the in-scope portion of either system is determined to be susceptible to loss of material due to cavitation erosion, then a program(s) will be modified or created to manage the loss of material	A.1.2.28	Prior to the period of extended operation.
69) Inservice Inspection (ISI) Program	Re-evaluate the ~~subject flaws~~ portions of the reactor pressure vessel beltline welds BG and BM for the period of extended operation (54 EFPY), in accordance with the requirements of the ASME Code, Section XI, IWB-3600 based on the results of 2015 inservice inspection.	A.1.2.33	Prior to the period of extended operation.
70) TLAA - Embrittlement of reactor vessel	Perform a 54 EFPY equivalent margin analysis for the embrittlement (upper shelf energy) of the reactor vessel N12 (instrumentation) nozzle forgings.	A.1.3.1.2	Prior to the period of extended operation

combination of ensuring the specified physical and chemical properties of new fuel oil, and periodic cleaning and draining of the storage tanks mitigates corrosion inside the tanks.

- **Parameters Monitored and Inspected –**

  The program does not include testing of the fuel oil used for the diesel-driven fire pumps for particulates. Sampling in accordance with ASTM standards ~~D1796~~ D2709 and D4057 has proven adequate, based on the absence of related problems reported through the corrective action program.

- **Detection of Aging Effects –**

  Multi-level sampling of the fuel oil storage tanks is not performed; rather, a representative fuel stream sample is drawn from the ~~flushing line during~~ lowest point in the tank from the recirculation ~~and transfer, consistent with ASTM D2276-93, step 4.3, laboratory filtration method.~~ line sample point.

Required Enhancements

None.

Operating Experience

The Fuel Oil Chemistry Program is an ongoing program that effectively incorporates the best practices and industry experience in controlling contaminant levels in fuel oil to minimize degradation. No instances of fuel oil system component failure due to contamination have been identified at Columbia.

With respect to the fuel oil tanks for the emergency diesel generators, review of Columbia operating experience reveals that the Fuel Oil Chemistry Program is adequately preventing a loss of component function of subject components that contain fuel oil. Fuel oil delivered to the site is sampled and analyzed prior to addition to the fuel oil storage tanks for the emergency diesel generators. Stored fuel oil is periodically sampled and analyzed for both the emergency and fire protection diesel generators. Water is removed from the stored fuel oil and particulates are filtered. In addition, visual and ultrasonic inspection of an emergency diesel generator fuel oil storage tank, as listed in FSAR Section 9.5.4.4.a, revealed acceptable conditions for the tank internal surfaces; that is, only light corrosion in previously identified areas with no material loss or obvious changes to the condition of the tank.

The fuel oil tanks for the diesel-driven fire pumps are also periodically sampled and analyzed. Water is removed and particulates are filtered based on condition (e.g., when unacceptable levels during periodic sampling necessitate cleaning of the fuel oil). Review of Columbia operating experience reveals that the Fuel Oil Chemistry Program is adequately preventing a loss of component function of subject components that

operating experience. A visual examination of the B_4C sample coupons is made to evaluate surface appearance, size, shape and color. Mechanical testing of B_4C samples is done on a periodic basis to determine if physical degradation is occurring in the plate material. In addition, chemical testing will take place on a periodic basis to determine if leaching of the boron content is occurring.

The B_4C coupon testing will be discontinued if the in situ testing interval is reduced to 6 years or less.

Detection of Aging Effects:

The amount of boron loss from the B_4C panels is determined through measurement of the boron areal density in the coupons. Visual inspections and measurements, as appropriate, are used to determine and assess the extent of degradation in the Boron Carbide before there is a loss of intended function. This can be supplemented with verification of boron loss in the spent fuel racks through areal density measurement techniques such as the (Boron-10 Areal Density Gage for Evaluating Racks) BADGER device.

Monitoring and Trending:

The periodic inspection measurements and analysis are to be compared to values of previous measurements and analysis to provide a continuing level of data for trend analysis. Also, studies by other utilities using similar B_4C material for high density spent fuel racks will be monitored for information.

Acceptance Criteria:

The 5% subcriticality margin of the spent fuel racks is to be maintained for the period of extended operation. Corrective actions are initiated if the test results find that the 5% subcriticality margin cannot be maintained because of the current or projected future degradation. The fuel rack loading pattern will be determined by Reactor Engineering and one or more samples will be analyzed for B-10 content. If data continues to suggest less than 5% subcriticality, then blackness testing such as BADGER testing may be performed on the racks as a result of corrective action performed.

Corrective Actions:

This element is common to Columbia programs and activities that are credited with aging management during the period of extended operation and is discussed in LRA Section B.1.3.

Initial in situ testing of the Spent Fuel Rack neutron absorbing material will be performed prior to the period of extended operation to determine the current state of the racks. Additional in situ testing will be based on the results of this initial testing, but at an interval not to exceed ten years.