ENERGY NORTHWEST

Sudesh K. Gambhir
Vice President, Engineering
P.O. Box 968, Mail Drop PE04
Richland, WA 99352-0968
Ph. 509-377-8313 F. 509-377-2354
sgambhir@energy-northwest.com

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GO2-11-078

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

Subject: **COLUMBIA GENERATING STATION, DOCKET NO. 50-397**
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION
LICENSE RENEWAL APPLICATION

References: 1) Letter, GO2-10-11, dated January 19, 2010, WS Oxenford (Energy Northwest) to NRC, "License Renewal Application"

2) Letter dated March 18, 2011, NRC to SK Gambhir (Energy Northwest), "Request for Additional Information for the Review of the Columbia Generating Station, License Renewal Application," (ADAMS Accession No. ML110680670)

Dear Sir or Madam:

By Reference 1, Energy Northwest requested the renewal of the Columbia Generating Station (Columbia) operating license. Via Reference 2, the Nuclear Regulatory Commission (NRC) requested additional information related to the Energy Northwest submittal.

Transmitted herewith in the Attachment is the Energy Northwest response to the Request for Additional Information (RAI) contained in Reference 2. Enclosure 1 contains Amendment 30 to the Columbia License Renewal Application. No new or revised commitments are included in this response.

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

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NRR

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

Respectfully,

SK Gambhir
Vice President, Engineering

Attachment: Response to Request for Additional Information

Enclosure: License Renewal Application Amendment 30

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

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

"Request for Additional Information for the Review of the Columbia Generating Station, License Renewal Application,"
(ADAMS Accession No. ML110680670)

RAI 3.5.2.2.1.4-02

Background:

License renewal application (LRA) Section 3.5.2.2.1.4 discusses Loss of Material due to General, Pitting, and Crevice Corrosion and states that the drywell floor peripheral seal is made of stainless steel, which is welded to the primary containment vessel and to the underside of the circular closure girder, both of which are made of carbon structural steel. It further states in LRA Table 3.5.2-1, "Aging Management Review Results - Primary Containment," that the seal has no aging effects and verification is credited by the ISI Program - IWE and the Appendix J Program.

Issue:

The FSAR provides a detailed description of the seal and its function. The drywell floor seal peripheral assembly is made from a portion of an open pipe and plates capable of carrying loads. The seal contains drywell area leaks and seals the over-under portions of the primary containment vessel.

The drywell floor peripheral seal is welded to dissimilar metals (stainless to carbon steel) and can be exposed to moisture and possible loss of material. Fabrication residual stresses combined with the prevalent thermal environment, imposed loads, and possible aggressive environment may exacerbate the potential for stress corrosion cracking (SCC).

GALL Report line item II.B4-2 discusses the possible susceptibility of stainless steel components and dissimilar metal welds to SCC. The LRA does not clearly describe how the stainless steel drywell floor seal will be managed for SCC during the period of extended operation. The staff believes that because of the difficulty of inspecting the drywell floor peripheral seal, increasing the frequency of inspections beyond the recommendations of the ISI Program - IWE and the Appendix J Program is reasonable.

Requests:

1. Describe the environment and applied loads (e.g., thermal, seismic, etc.), to which the drywell floor peripheral seal is exposed and justify the component's capacity to perform its intended function(s) for the period of extended operation.

2. Explain how the drywell floor peripheral seal will be managed for SCC during the period of extended operation. If a visual examination is applied, explain what method of visual examination is used and how the interior of the seal is inspected.

3. State when the drywell floor peripheral seal was last inspected and the outcome of the inspection. Provide the inspection frequency for the component and explain why the selected frequency is appropriate.

Energy Northwest Response:

1. The drywell floor peripheral seal is designed to accommodate the maximum vertical and radial differential thermal movements which may occur during plant startup, normal operation, and shutdown. The seal is also designed to withstand, in an elastic manner, the effects associated with a loss of coolant accident (LOCA), including temperature changes and pressure differentials ranging from +25 psig to -6.4 psig, and seismic loads. No other loads are applied to this seal. Jet deflectors are provided at the seal to prevent the direct impingement of a fluid jet force on the seal due to any pipe break. To prevent differential lateral and torsional movements, shear lugs are furnished along the outer periphery of the drywell floor to ensure that movements of the interfacing drywell floor, floor seal, and primary containment vessel are in unison during seismic events.

   The seal is exposed to an air-indoor environment. The source of the air-indoor environment at the interior surface of the seal is the drywell portion of Columbia's primary containment and the source of the air-indoor environment at the exterior surface of the seal is the suppression chamber (wetwell) portion of Columbia's primary containment. Both the drywell and wetwell are inerted with nitrogen during normal plant operation. Energy Northwest (EN) evaluated this seal using the guidance of the Structural Tools. Initiation and propagation of SCC requires the combined actions of stress (both applied and residual), a corrosive environment, and a susceptible material. As noted in Table 3.0-2 of the LRA, Columbia is located in an in-land high desert environment and is not near major industrial plants which could raise the possibility of exposure to an aggressive environment for an air-outdoor environment. Additionally, the plant takes its cooling water from a fresh water source, Columbia River, and is not exposed to a salt water environment. Based on this, the air-indoor environment of Columbia's drywell and wetwell which the drywell floor peripheral seal is located in is considered non-aggressive (non-corrosive). Also, see similar discussion in LRA section 3.5.2.2.1.7. Therefore, SCC of the drywell floor peripheral seal is not an aging effect requiring management at Columbia because the conditions necessary for SCC of both high temperature and exposure to an aggressive or corrosive environment do not exist simultaneously. The drywell floor peripheral seal will maintain its structural integrity and be capable of performing its design function related to pressure suppression through the period of extended operation.

2. As noted in response to (1.) above, SCC is not an aging effect requiring management for the drywell floor peripheral seal at Columbia. However, line item 5

3.5.2-1, notes that the ISI-IWE and Appendix J programs will be used to confirm the absence of significant aging effects for the period of extended operation for this component. The ISI-IWE program utilizes a general visual inspection. This visual inspection is performed on the exterior (suppression chamber) side of the seal from a platform just below the seal which allows the inspector access to the full length of the seal. Due to the configuration of the seal the interior of the seal can not be visually inspected during this ISI-IWE general inspection.

The pressure suppression function of primary containment is maintained by limiting the leakage from the drywell to the wetwell. Bypass leak rate testing (BLRT) is performed at Columbia in accordance with plant Technical Specifications to ensure that any potential leakage paths that would bypass the suppression pool are within allowable limits. The drywell floor peripheral seal could be one such potential leak path. However, BLRT is not formally part of the Appendix J program at Columbia. Therefore, LRA table 3.5.2-1, line item 5 will be amended to credit the Technical Specifications rather than Appendix J for confirming the absence of significant aging effects for the drywell floor peripheral seal.

3. The drywell floor peripheral seal was last inspected under the ISI-IWE program during Columbia's R-18 refueling outage in 2007. There were no unacceptable indications found for the accessible portions inspected. The inspection frequency is once per every ISI-IWE inspection period which is three times every ten year inspection interval. This is based on ASME Section XI, IWE, 2001 Edition through 2003 Addenda code requirements.

   The last BLRT was performed in 2005 and the bypass leakage between the drywell and wetwell was well within the acceptance criteria limit (approximately 17% of the limit). The frequency for BLRT is at least once every ten years based on Technical Specification requirements.

LICENSE RENEWAL APPLICATION AMENDENT 30

Section Number	Page Number	RAI Number
Table 3.5.2-1 Line Item 5	3.5-80	3.5.2.2.1.4-02

Table 3.5.2-1 Aging Management Review Results - Primary Containment

Row No.	Component / Commodity	Intended Function[1]	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
1	Downcomer Bracing and Supports	SSR	Carbon Steel	Air - indoor	Loss of material	Inservice Inspection Program-IWF Structures Monitoring Program	III.B1.2-10 III.A4-5	3.5.1-53 3.5.1-25	A A
2	Downcomer Bracing and Supports	SSR	Carbon Steel	Treated water	Loss of material	Inservice Inspection Program-IWF BWR Water Chemistry Program	III.B1.1-11	3.5.1-49	C 0509
3	Downcomer Jet Deflectors	HELB, SSR	Carbon Steel	Air - indoor	Loss of material	Structures Monitoring Program	III.A4-5	3.5.1-25	A
4	Drywell Floor Decking	SSR	Galvanized Steel	Air - indoor	None	None	III.B1.1-7	3.5.1-58	C
5	Drywell Floor Peripheral Seal Assembly	DF, EN, EXP, SPB, SSR	Stainless Steel	Air - indoor	None	Inservice Inspection Program-IWE ~~Appendix J Program~~	N/A	N/A	I 0501, 0502
6	Drywell Floor Peripheral Seal Jet Deflectors	HELB, SSR	Carbon Steel	Air - indoor	Loss of material	Structures Monitoring Program	III.A4-5	3.5.1-25	A
7	Drywell Floor Shear Lugs	SSR	Carbon Steel	Air - indoor	Loss of material	Inservice Inspection Program-IWE Appendix J Program	II.B2.1-1	3.5.1-05	A 0502

Plant Technical Specification