ENERGY NORTHWEST

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GO2-11-192

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

Subject: **COLUMBIA GENERATING STATION, DOCKET NO. 50-397**
COMMENTS ON SAFETY EVALUATION REPORT FOR
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 August 30, 2011, NRC to DA Swank (Energy Northwest) Safety Evaluation Report Related To The License Renewal of Columbia Generating Stations (TAC NO, ME3058)"

Dear Sir or Madam:

By Reference 1, Energy Northwest requested the renewal of the Columbia Generating Station (Columbia) operating license.

By Reference 2, the Nuclear Regulatory Commission (NRC) provided Energy Northwest the Safety Evaluation Report (SER) with open items. The three attachments to this letter provide the Energy Northwest comments regarding the SER. The comments have been divided into three categories for your review. Attachment 1 contains comments regarding statements in the SER that Energy Northwest believes require revision. Energy Northwest believes these comments should be incorporated into the final SER. Attachment 2 addresses content in the SER that had not been updated to reflect Energy Northwest responses to requests for information (RAIs) from the NRC or amendments to the License Renewal Application (LRA) that Energy Northwest submitted to the NRC. Attachment 3 contains editorial comments.

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If you have any questions or require additional information, please contact John Twomey at (509) 377-4678.

Respectfully,

For

AL Javorik
Vice President, Engineering

Attachment 1: SER COMMENTS; Information in the SER Requiring Revision
Attachment 2: SER COMMENTS; Changes to Reflect LRA Amendments or RAI Responses
Attachment 3: SER COMMENTS; Editorial or Typographical Errors

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)
MA Galloway – NRC NRR
RR Cowley – WDOH

SER COMMENTS Information in the SER Requiring Revision			
No.	**Section**	**Page**	**Comment**
1	2.1.4.1.2	2-10	2nd Paragraph from bottom states: "The staff reviewed the applicant's response to RAI 2.1-1(A) and determined that the applicant had described the process used to evaluate the functions of components, identified as safety-related in the plant equipment (Passport) database and located in the turbine building, to determine whether nonsafety-related SSCs located in the turbine building could affect the performance of the safety-related SCs. These nonsafety-related SSCs were, therefore, included within the scope of license renewal in accordance with 10 CFR 54.4(a)(2)." However no nonsafety related SSCs in the TB were added to scope of LR in RAI 2.1-1(A). The components that were added to scope of LR are SR. See the last paragraph of GO2-10-095 RAI 2.1-1 (A) response.
2	2.1.4.2.3	2-18	The conclusion states that the methodology pursuant to 54.4(a)(1) is acceptable. However, the subject of section 2.1.4.2 is 54.4(a)(2).
3	2.3.3.32.1	2-74	This section states: "The failure of nonsafety-related SSCs in the primary containment system potentially could prevent the satisfactory accomplishment of a safety-related function; therefore, the primary containment system was determined to meet the scoping criteria of 10 CFR 54.4(a)(2)." However, LRA section 2.3.3.32 states the following: "The Primary Containment System does not contain NSR components that are attached to or located near safety-related SSCs, whose failure creates a potential for spatial interaction that could prevent the satisfactory accomplishment of any of the functions identified in 10 CFR 54.4(a)(1). Therefore, the Primary Containment System does not meet the scoping criteria of 10 CFR 54.4(a)(2)."
4	2.3.3.48.1 & 2.3.3.49.1 & 2.3.3.50.1	2-85 & 86	Discussion of 10 CFR 54.5(a)(1) should refer to 54.4 rather than 54.5
5			Left blank intentionally.

SER COMMENTS Information in the SER Requiring Revision			
No.	**Section**	**Page**	**Comment**
6	2.4.8.1	pg. 2-98	1st paragraph – uses the word 'radwaste' from in front of the words 'control room'. Columbia has two control rooms; the main control room and the radwaste control room. Only the main control room is in scope. Remove the word "radwaste". See last sentence on this SER page and LRA sect. 2.4.8 1st sentence.
7	2.4.12.1	pg. 2-102	3rd paragraph after bullets – First two sentences should be joined to read *"... the plant structures important to safety in the unlikely event of a tower collapse.'* Also, this paragraph should be discussing the cooling tower basins and there is no mention of the basins or why they are in-scope (feed-and-bleed mode of operation). See LRA sect. 2.4.12.3.
8	2.4.12.1	2-102	Suggest listing the purpose of the cooling tower basins. Add to the end of the cooling towers paragraph "The cooling towers are not within the scope of license renewal, but the cooling tower basins are within license renewal scope since they are part of the bleed path in the feed-and-bleed mode in the event that the spray pond spray headers are damaged by a tornado-generated missile."
9	2.4.12.1	2-102	Paragraph on HSSF, 2nd sentence. The HSSF facility is not a building. Suggest changing "The ~~building~~ foundation and anchorage are designed to remain in place for both design basis tornado characteristics and maximum probable flood." to "The HSSF liquid hydrogen storage tank, foundation and anchorage are designed to remain in place for both design basis tornado characteristics and maximum probable flood."
10	3.0.1.2	3-3	The first paragraph states, "For example, the ESF group has table's specific to the core spray system, high-pressure coolant injection system, and residual heat removal (RHR) system." However, Columbia's ECCS system includes HPCS, LPCS, and RHR (operating in the LPCI mode). Columbia does not have high-pressure coolant injection system.
11	3.0.3.1.1	pg. 3-12	The percentages provided in the 2nd paragraph are incorrectly used. The maximum allowable startup containment leakage rate is 0.6La which is different than 0.6 percent. See LRA B.2.3.

SER COMMENTS Information in the SER Requiring Revision			
No.	**Section**	**Page**	**Comment**
12	3.0.3.1.11	3-51	Operating Experience – Second sentence states – "The applicant stated that a review of plant-specific operating experience for the air receiver tanks indicated no loss of material." However, LRA section B.2.2 (Air Quality Sampling) under OE which states "With the exception of the DSA system there have been no failures or significant degradation of components …Also in 3rd paragraph "Degradation has been identified in the DSA System." The DSA air receivers are managed by the Air Quality Sampling Program.
13	3.0.3.1.25	3-103	Element 7, second sentence; there are three standby surveillance capsules in Columbia's reactor vessel RV vice two. (Ref. FSAR 5.3.1.6.1)
14	3.0.3.1.30	3-113	In the Staff Evaluation subsection, in the discussion of the applicant response to RAI B.2.52-2, the staff quotes the applicant as saying "…Article IWB-3500 does specify…" The sentence should be corrected to state that IWB does not specify
15	3.0.3.2.4	3-134	In the second paragraph under Exception 1, the SER states the following: "...the applicant's corrosion rate measurements within this AMP, combined with the one-time Chemistry Program Effectiveness Inspection Program, and the one-time Heat Exchangers Inspection Program will monitor the effects of corrosion and SCC..." However, LRA section B.2.13 states: "The Closed Cooling Water Chemistry Program is supplemented by the Chemistry Program Effectiveness Inspection for managing loss of material and cracking. The Closed Cooling Water Chemistry Program is supplemented by the Heat Exchangers Inspection for managing reduction in heat transfer." The Heat Exchangers Inspection manages reduction in heat transfer, not corrosion and SCC. See LRA section B.2.30 (Heat Exchangers Inspection).

SER COMMENTS Information in the SER Requiring Revision			
No.	**Section**	**Page**	**Comment**
16	3.2.2 (Table 3.2-1)	3-328	For the GALL Item No. 3.2.1-10 row, the SER states that this item is not applicable to Columbia, and refers to SER Section 3.2.2.2.4. SER Section 3.2.2.2.4 (2) states the following: "The applicant stated that this item is not applicable because, other than the RHR system, Columbia has no in-scope stainless steel heat exchanger tubes exposed to treated water in the ESF systems, and the stainless steel heat exchanger components in the RHR system have been evaluated with the closed-cycle cooling water system components in LRA Table 3.3.1, Item 3.3.1-3." However, the LRA (Table 3.2.1 and Section 3.2.2.2.4.2) indicates that GALL Item No. 3.2.1-10 is applicable, and credits the BWR Water Chemistry Program and the Heat Exchangers Inspection.
17	3.3.2.3.7	3-429	Second paragraph on this page states: The staff reviewed the applicant's Selective Leaching Inspection Program, and its evaluation is documented in SER Section 3.0.3.1.26. The staff reviewed Table IX.C of the GALL Report that states that copper alloys (greater than 15 percent zinc) are susceptible to aging effects, such as SCC, selective leaching, pitting, and crevice corrosion. Thus, the applicant's use of the reduction in heat transfer aging effect is appropriate. The staff finds that the applicant's proposal to manage aging using the Selective Leaching Inspection Program is acceptable because the program uses visual inspections as well as testing of water chemistry in order to... Bolded sentence seems out of context with discussion in this paragraph and the preceding 2 paragraphs in the SER. All the copper alloy > 15% Zn components in a condensation (external) environment with a Note G in LRA Tables 3.3.2-7, 3.3.2-29, and 3.3.2-32, list loss of material as the aging effect, not reduction in heat transfer.

SER COMMENTS Information in the SER Requiring Revision			
No.	**Section**	**Page**	**Comment**
18	3.3.2.3.9	3-429	The 1st paragraph of this SER section 3.3.2.3.9 states: "The staff reviewed LRA Table 3.3.2-9, which summarizes the results of AMR evaluations for the equipment and floor drainage system component groups." LRA Table 3.3.2-9 is the AMR Results Table for the Containment Vacuum Breaker system. The Equipment Drains Radioactive is LRA Table 3.3.2-21, the Floor Drain System is LRA Table 3.3.2-23, and the Floor Drain Radioactive System is LRA Table 3.3.2-24. Therefore, SER section 3.3.2.3.9, first paragraph, should state containment vacuum breaker component groups instead of equipment and floor drainage system component groups.
19	3.3.2.3.14	3-434	The 6th paragraph states: The staff reviewed the applicant's Open-Cycle Cooling Water Program, and its evaluation is documented in SER Section 3.0.3.2.17. The staff reviewed Table IX.C of the GALL Report that states that copper alloys (less than 15 percent zinc) are generally resistant to other aging effects, such as SCC, selective leaching, pitting, and crevice corrosion. However, the components are part of a heat exchanger where the potential for contaminant build up is possible. Thus, the applicant's use of the loss of material aging effect is appropriate. The staff finds that the applicant's proposal to manage aging using the Open-Cycle Cooling Water Program is acceptable because the program uses visual inspections, surveillance activities, and testing of water chemistry in order to detect aging effects that could result in a loss of component intended function due to reduction in heat transfer. The bolded sentence is out of context with the rest of the paragraph and the discussion in the two preceding SER paragraphs which is focused on the reduction in heat transfer of copper alloy heat exchanger tubes in a condensation (external) environment.

SER COMMENTS Information in the SER Requiring Revision			
No.	**Section**	**Page**	**Comment**
20	3.3.2.3.18 3.3.2.3.7	3-445 3-429	This section states: The staff finds that the applicant's proposal to manage aging using the Selective Leaching Inspection Program is acceptable because the program uses visual inspections as well as testing of water chemistry in order to detect aging effects that could result in a loss of component intended function due to loss of material. The Selective Leaching Inspection Program performs visual and hardness testing for detecting selective leaching. The Selective Leaching Program does not perform water chemistry testing. See LRA section B.2.47.
21	3.3.2.3.45	3-469	This section states: In LRA Table 3.3.2-45, the applicant stated that the copper alloy heat exchanger tubes, strainer (body), and valve body exposed to steam (internal) are being managed for cracking and loss of material by the BWR Water Chemistry and Chemistry Program Effectiveness Inspection Programs. The AMR line items cite Generic Note G. This statement is incorrect. However, loss of material has been identified as the only aging effect for copper alloy components in steam environment in LRA Table 3.3.2-45 (Ref. Go2-10-094). Cracking was identified for stainless steel heat exchanger tubes and tubing exposed to a steam environment in the HS System.
22	3.5.2.2.1	3-526	Section Cracking Due to Expansion and Reaction with Aggregate and Increase in Porosity and Permeability Due to Leaching of Calcium Hydroxide. The 1st paragraph last sentence states "The applicant stated in the LRA that cracking due to expansion and reaction of aggregate, and increase in porosity and permeability due to leaching of calcium hydroxide, are AERMs for the primary containment related concrete." However, LRA Section 3.5.2.2.1.10, associated with LRA Table 3.5.1, Item 3.5.1-15 states these are not aging effects requiring management for the Primary Containment concrete components. However, the absence of concrete aging effects is confirmed under the Structures Monitoring Program. See LRA section 3.5.2.2.1.10.

SER COMMENTS Information in the SER Requiring Revision			
No.	**Section**	**Page**	**Comment**
23	3.6.2.3.1	3-571	Oxidation subsection, 3rd paragraph. "The staff finds the applicant' response acceptable., 8th line "...because they are used in control circuits that operate at low current..." From RAI 3.6-3 letter GO2-10-139 "With respect to electrical transients and ohmic heating, these fuses are not heavily loaded and do not experience frequent electrical and thermal cycling." During walk downs with the staff (spring of 2010) the fuse panels for the in-scope battery systems were pointed out. Therefore the sentence should read "...because they are used in circuits that are not heavily loaded..."
24	4.1.2.7	4-5	This section states "The staff noted that SRP-LR Section 3.1.2.2.5 states that RV underclad cracking is only applicable to RVs whose designs include SA-508 Class 2 or 3 forging shells or forging nozzles that were welded to the vessel using a high heat input welding process." However, it is not the weld of the nozzle/forging to the vessel that is of concern; it is the high temperature welding of the cladding to the SA-508 low alloy steel. This occurs at least twice in this section. Near the bottom of the page it states "This analysis is not a TLAA in accordance with 10 CFR 54.21(c)(1) because the applicant's RV design does not include SA-508 Class 2 or 3 forging shells or forging nozzles that were welded to the vessel clad using a high heat input welding process.
25	4.6.2.2	4-72	The last sentence in the first paragraph says "The CUF for the main steam penetrations is significantly less than the 1.0 limit." It should say "downcomers" rather than "main steam penetrations." See SER section 4.5.2 Downcomers.

SER COMMENTS Changes to Reflect LRA Amendments or RAI Responses			
No.	**Section**	**Page**	**Comment**
1	2.3.4	2-86	First set of bullets – add "LRA Section 2.3.4.8, "Sealing Steam (SS) System. " Reference LRA page 2.3-163.
2	2.4.4.1	2-95	Discussion refers to a "3-hour, fire-rated masonry wall." This was changed in the LRA to a 2-hour wall. See LRA section 2.4.4.
3	3.0 Table 3.0.3-1	3-7, 3-8, 3-9	Change "consistent" to "plant specific" for the following programs that went from a onetime to a plant specific or delete the duplication from the table and the SER sections referenced with "consistent": Cooling Units Inspection Program Diesel Systems Inspection Program Diesel-Drive Fire Pumps Inspection Program Monitoring and Collection Systems Inspection Program Service Air Inspection Program Flexible Connection Inspection Program Small Bore Class 1 Piping Program See LRA Amendment 21 for the change to these programs from a onetime inspection to a plant specific program.
4	3.0 Table 3.0.3-1	3-8	Buried Piping and Tanks Inspection Program - add "exceptions" in addition to "enhancements". See LRA Table B-2 from Amendment 25.
5	3.0.3.1.18	3-65 to 71	The SER should be revised to reflect the correct name of the program, "Inaccessible Power Cables…" rather than "Inaccessible Medium-Voltage Cables…" See LRA section B.2.32.
6	3.0.3.2	3-116	'Material Handling System Inspection' should be moved from this section back to 3.0.3.1 based on amendment 21 to the LRA.
7	3.0.3.2	3-116	Bulleted list of programs – remove Flexible Connections Inspection Program. This is a new plant specific program. See LRA Amendment 21.

SER COMMENTS Changes to Reflect LRA Amendments or RAI Responses			
No.	**Section**	**Page**	**Comment**
8	3.0.3.2.3	3-126	To avoid possible confusion, the summary should be clarified that AMP XI.M34 was consistent with GALL rev 1 and the AMP XI.M41 is from GALL rev 2. See LRA section B.2.5.
9			Left intentionally blank.
10	3.0.3.2.6	3-138 and 139	For the second bullet – remove "and stainless steel." This item was removed in Amendment 1. Cracking of stainless steel occurs at >140 deg F. Radwaste building temperatures are < 120 deg F. Also applicable on page 3-139 under Enhancement 2 and page 3-142 second bullet on page. Reference GO2-10-094
11	3.0.3.2.6	3-138	For the third bullet – remove "flexible connections." This item was removed in Amendment 21. The flexible connections are covered in the flexible connection inspection. Reference GO2-11-025. Also applicable under Enhancement 3 and page 3-142 fourth bullet.
12	3.0.3.2.6	3-139	Last paragraph of NRC discussion on Enhancement 1 conflicts with the corresponding statements in GO2-11-73, but conclude the enhancement is acceptable: SER states - "These surfaces will produce oxide by-products that are readily identified for visual inspections to identify general corrosion of these materials." Statement is referring to copper alloy and copper alloy (> 15% Zn) exposed to air-indoor uncontrolled or air outdoor. However, Copper alloys are not susceptible to general corrosion in those environments.
13	3.0.3.2.12	3-174	For Exception 3 – Change applicant use of ASTM standard D1796 to D2709. Reference LRA page B-122, Amendment 29

SER COMMENTS Changes to Reflect LRA Amendments or RAI Responses			
No.	**Section**	**Page**	**Comment**
14	3.0.3.2.16	3-188	The 3rd paragraph fourth sentence states, "These actions include installing thermography windows at all link locations so that bus temperatures can be monitored; revising the configuration of the link connections to use Belleville washers in place of split lock washers and a heavy flat washer in place of the standard flat washer; ..." This statement is no longer true because all link bolted connections were replaced with welded connections during R20. This was discussed with the Project Team lead and Letter G02-11-125 dated 7/29/2011 was issued informing the Regulator that all bolted connections used in the in-scope MEB are now welded link connections.
15	3.0.3.3.2	pg. 3-216 - 220	This section (specifically the UFSAR supplement subsection) does not discuss the exception for discontinuing the B4C coupon testing if the in situ testing is scheduled for a frequency of less than or equal to 6 years between tests as was stated in the LRA A.1.2.54, Amendment 29.
16	3.0.3.3.5	3-229	1st paragraph in Section 3.0.3.3.5 states: The applicant stated that the program will consist of inspections of the interior of the exhaust piping for the Division 1, 2, and 3 diesels in the diesel engine exhaust system, including the loop seal drains from the exhaust piping and the drain pans and drain piping associated with air-handling units of the diesel building HVAC systems. However, drain pans and drain piping associated with the AHU of the Diesel Building HVAC systems are managed by the Cooling Units Inspection Program, not the Diesel Systems Inspection Program. LRA Amendment 1 (GO2-10-094) revised LRA page B-77 to correct the program description for initial One-Time program. Also the subsequent Columbia response to change from a one-time to periodic program in LRA Amendment 21 (GO2-11-025) does not include drain pans and piping in the program description (LRA Page B-77) of the Diesel Systems Inspection Program.

SER COMMENTS Changes to Reflect LRA Amendments or RAI Responses			
No.	**Section**	**Page**	**Comment**
17	3.0.3.3.5	3-230	Parameters monitored subsection states: LRA Section B.2.17, as amended by letter dated January 28, 2011, states that the program will monitor wall thickness or visual evidence of internal surface degradation of the diesel exhaust piping and the drain pans and drain piping as measures of loss of material. However, Columbia's response in GO2-11-025 does not include drain pans and drain piping in the scope Diesel Systems Inspection Program. Refer to LRA Amendment 21, pages B-78 and B-78a.
18	3.0.3.3.13	3-265	1st paragraph in Section 3.0.3.3.13 states: "The applicant further stated that the program will verify, by inspections for cracking, that reduction of fracture toughness due to thermal embrittlement requires no additional aging management for small bore Class 1 CASS valve bodies." However, this statement was deleted from the program description in LRA Amendment 35 (GO2-11-098) because Columbia confirmed it has no CASS valve bodies < 4"NPS in the RCPB.
19	3.0.3.3.13	3-263	Detection of Aging effects subsection needs to be updated to Columbia's Amendment 18. Specifically the sample size is done per NUREG-1801, Rev 2.
20	3.1.2.1.2	3-294	First paragraph states that "LRA Table 3.1.1, Item 3.1.1-55 addresses CASS Class 1 valve bodies (less than or equal to 4 in.)" ..... in the Discussion column. However, letter GO2-11-098 stated that there are no ASME III Class 1 CASS valves less than 4 inches installed at Columbia. This discussion was removed in LRA Amendment 31.
21	3.2.2.2.5	3-338	Referring to LRA Section 3.2.2.2.5, the first paragraph in this section states that: "The applicant addressed the further evaluation criteria of the SRP-LR by stating that elastomer flexible connections subject to hardening and loss of strength are managed by the Flexible Connection Inspection Program, a plant-specific AMP." However, LRA Section 3.2.2.2.5 refers to the Flexible Connection Inspection Program as a one-time inspection. Deleted this comment because amendment 21 deleted the OTI discussion.

SER COMMENTS Changes to Reflect LRA Amendments or RAI Responses			
No.	**Section**	**Page**	**Comment**
22	3.3.2.2.10	3-415	Item (7) states: LRA Section 3.3.2.2.10.7 associated with LRA Table 3.3.1, Item 3.3.1-29, addresses pitting and crevice corrosion in stainless steel piping, piping components, and piping elements exposed to soil. The applicant stated that this line item is not applicable because there are no stainless steel piping, piping components, and piping elements in the auxiliary systems that are exposed to soil. The staff reviewed LRA Sections 2.3.3 and 3.3 and the UFSAR and confirmed that no in-scope stainless steel piping, piping components, and piping elements exposed to soil are present in the auxiliary systems; therefore, the staff finds the applicant's determination acceptable. In LRA Amendment 1 (GO2-10-094), Energy Northwest amended LRA Section 3.3.2.2.10.7 and Table 3.3.1 Item 3.3.1-29 to state: The Buried Piping Tanks Inspection Program, with enhancement, manages loss of material due to pitting and crevice corrosion and microbiologically influenced corrosion (MIC) for stainless steel piping and piping components buried in soil.

SER COMMENTS Changes to Reflect LRA Amendments or RAI Responses			
No.	**Section**	**Page**	**Comment**
23	3.3.2.2.11	3-417	1st paragraph in this section states: The applicant stated that this line item is not applicable because there are no copper alloy piping, piping components, or piping elements in the auxiliary system that are exposed to treated water. The staff reviewed LRA Sections 2.3.3 and 3.3 and the UFSAR and confirmed that no in-scope copper alloy piping, piping components, and piping elements exposed to treated water are present in the auxiliary systems; therefore, it finds the applicant's determination acceptable In LRA Amendment 1 (GO2-10-094), LRA Section 3.3.2.2.11 was amended to state: Loss of material due to pitting, crevice, and galvanic corrosion for copper alloy piping, piping components, or piping elements exposed to treated water is managed by the BWR Water Chemistry Program. The BWR Water Chemistry Program manages aging effects through periodic monitoring and control of contaminants. The Chemistry Program Effectiveness Inspection will provide a verification of the effectiveness of the BWR Water Chemistry Program to manage loss of material due to pitting, crevice, and galvanic corrosion through examination of copper alloy piping and piping components exposed to treated water. Copper tubing in a treated water environment was added in LRA Amendment 1 to the HCO system (LRA Table 3.3.2-46, pg. 3.3-397k, rows 35 & 36)

SER COMMENTS Changes to Reflect LRA Amendments or RAI Responses			
No.	**Section**	**Page**	**Comment**
24	3.3.2.3.14	3-433	1st three paragraphs contain staff's evaluation of aluminum alloy components exposed to condensation. 3rd paragraph states the following: The staff reviewed the GALL Report, and the cracking aging effect was not identified in combination with aluminum. However, certain aluminum alloys may be subject to SCC if the temperature regime is sufficient. Thus, the applicant's use of the cracking aging effect is appropriate. Aluminum alloys are also subject to loss of material, which was covered by the applicant in another line item. The staff finds that the applicant's proposal to manage aging using the Open-Cycle Cooling Water, External Surfaces Monitoring, and Cooling Units Inspection Programs acceptable because the programs use inspections and surveillance activities as well as chemical testing of the fluid to detect contaminants. In LRA Amendment 1 (Go2-10-094), aluminum heat exchanger components in a condensation environment with the aging effect of cracking were removed from LRA Tables 3.3.2-14 (row 24), 3.3.2-34 (rows 36 and 45), 3.3.2-36 (row 41), and 3.3.2-37 (row 36) because it was determined that aluminum alloy material not susceptible to cracking. As these were the only subject LRA rows that credited the Open Cycle Cooling Water Program, the Open Cycle Cooling Water Program was amended to eliminate cracking from the AMP scope (see SER pg. 3-188).

SER COMMENTS Changes to Reflect LRA Amendments or RAI Responses			
No.	**Section**	**Page**	**Comment**
25	3.3.2.3.22	3-451	Update SER: 2nd Paragraph from the bottom states: In LRA Tables 3.3.2-22 and 3.3.2-32, the applicant stated that the copper alloy (greater than 15 percent zinc) heat exchanger shell, spray nozzle, strainer, and valve bodies exposed to raw water (internal) are being managed for cracking due to SCC by the Diesel Driven Fire Pumps Inspection, Fire Water, and Open-Cycle Cooling Water Programs. In the LRA there were only two rows that credited either the Diesel-Driven Fire Pumps Inspection or Open-Cycle Cooling Water for managing cracking of copper alloy>15%Zn components in a raw water environment: LRA Table 3.3.2-22 row 19 and LRA Table 3.3.2-32 row 16. SER page 452 – second paragraph from top states:: The staff finds that the applicant's proposal to manage aging using the Diesel Driven Fire Pumps Inspection program is acceptable because the program uses a one-time visual inspection, wall thickness, and NDE inspection techniques to determine the effect of aging. The Fire Water Program performs periodic inspection and testing of water based fire suppression systems in order to detect aging effects. The Open-Cycle Cooling Water Program uses visual inspections, surveillance activities, and testing of water chemistry to detect aging effects that could result in a loss of component intended function. The Diesel Driven Fire Pump Inspection is no longer a one-time inspection (Ref. GO2-11-025), it is a plant specific program. LRA Table 3.3.2-32 row 16 was revised by LRA Amendment 1 (Ref. GO2-10-094) to credit Monitoring and Collection System Inspection Program in lieu of the Open-Cycle Cooling Water Program for managing cracking of copper alloy > 15% Zn components in Amendment 1 (GO2-10-094). Refer to SER pg. 3-191 for Staff's evaluation of the Open-Cycle Cooling Water Program for managing cracking. Also the OCCW Program does not credit testing of water chemistry (it does thermal performance testing or NDE testing).

SER COMMENTS Changes to Reflect LRA Amendments or RAI Responses			
No.	**Section**	**Page**	**Comment**
26	3.3.2.3.22	3-452	Next to last paragraph states: The staff finds that the applicant's proposal to manage aging using the Diesel Driven Fire Pumps Inspection program is acceptable because the program uses a one-time visual inspection, wall thickness, and NDE inspection techniques to determine the effect of aging. The Fire Water Program performs periodic inspection and testing of water based fire suppression systems in order to detect aging effects. The Open-Cycle Cooling Water Program uses visual inspections, surveillance activities, and testing of water chemistry to detect aging effects that could result in a loss of component intended function. The Diesel Driven Fire Pump Inspection is no longer a one-time inspection (Ref. GO2-11-025), it is a periodic program. LRA Table 3.3.2-32 row 16 was revised by LRA Amendment 1 (Ref. GO2-10-094) to credit Monitoring and Collection System Inspection Program was credited in lieu of the Open-Cycle Cooling Water Program for managing cracking of copper alloy > 15% Zn components in Amendment 1 (GO2-10-094). Refer to SER pg. 3-191 for Staff's evaluation of the Open-Cycle Cooling Water Program for managing cracking. Also the OCCW Program does not credit testing of water chemistry (it does thermal performance testing or NDE testing).

SER COMMENTS Changes to Reflect LRA Amendments or RAI Responses			
No.	**Section**	**Page**	**Comment**
27	3.3.2.3.29	3-454	1st paragraph states: The staff's evaluation for aluminum alloy heat exchanger fins, tank shell, and end caps exposed to external condensation that are being managed for cracking by the Open-Cycle Cooling Water, External Surfaces Monitoring, and Cooling Units Inspection Programs with a Generic Note H is documented in SER Section 3.3.2.3.14 LRA Table 3.3.2-29 row 19 was the only AMR row in the Potable Cold Water System which credited External Surfaces Monitoring Program for managing cracking of aluminum in a condensation (external) environment. This row was deleted from LRA Table 3.3.2-29 in LRA Amendment 1 (GO2-10-094). Note - the External Surfaces Monitoring Program is still credited for managing cracking in the same material/environment combination in the Containment Nitrogen System (LRA Table 3.3.2-7 rows 15 and 19).
28	3.3.2.3.32	3-456	Last paragraph states: The staff's evaluation for copper alloy (greater than 15 percent zinc) valve bodies exposed to raw water (internal) that are being managed for cracking due to SCC by the Open-Cycle Cooling Water Program with a Generic Note H is documented in SER Section 3.3.2.3.22. The subject component credited the Monitoring Collection System Inspection, in lieu of the Open-Cycle Cooling Water Program, for managing cracking in LRA Amendment 1 (GO2-10-094)
29	3.3.2.3.34	3-457	1st paragraph in the section states; The staff's evaluation for aluminum alloy heat exchanger fins, tank shell, and end caps exposed to external condensation are being managed for cracking by the Open-Cycle Cooling Water, External Surfaces Monitoring, and Cooling Units Inspection Programs with a Generic Note H is documented in SER Section 3.3.2.3.14. LRA Amendment 1 eliminated cracking as AERM for the subject components and the OCCW AMP no longer manages cracking.

SER COMMENTS Changes to Reflect LRA Amendments or RAI Responses			
No.	**Section**	**Page**	**Comment**
30	3.3.2.3.36	3-459	Update SER: 2nd paragraph in the section states; The staff's evaluation for aluminum alloy heat exchanger fins, tank shell, and end caps exposed to external condensation are being managed for cracking by the Open-Cycle Cooling Water, External Surfaces Monitoring, and Cooling Units Inspection Programs with a Generic Note H is documented in SER Section 3.3.2.3.14. LRA Amendment 1 eliminated cracking as AERM for the subject components and the OCCW AMP no longer manages cracking.
31	3.3.2.3.36	3-460	In paragraphs 4 through 7, the staff evaluates cracking of stainless steel exposed to condensation. In paragraph 6 it states: The staff finds the applicant's proposal to manage aging using the External Surfaces Monitoring Program acceptable because cracking in stainless steel components exposed to condensation (external), though unlikely can be detected by periodic visual inspections. However, LRA Amendment 1 (GO2-10-094) deleted LRA Table 3.3.2-36 row 66 and therefore eliminated cracking as an AERM for stainless steel in condensation environment. For cracking to occur the temperature must be greater than 140F which is not expected for the subject component in the Radwaste Building HVAC System (condensation would not be occurring if the temperature was that high)
32	3.3.2.3.37	3-461	3rd paragraph in the section states; The staff's evaluation for aluminum alloy heat exchanger fins, tank shell, and end caps exposed to external condensation are being managed for cracking by the Open-Cycle Cooling Water, External Surfaces Monitoring, and Cooling Units Inspection Programs with a Generic Note H is documented in SER Section 3.3.2.3.14. LRA Amendment 1 eliminated cracking as AERM for the subject components and the OCCW AMP no longer manages cracking.

SER COMMENTS Changes to Reflect LRA Amendments or RAI Responses			
No.	**Section**	**Page**	**Comment**
33	3.3.2.3.46	3-463	Update SER: 2nd to last paragraph in this section states: The staff's evaluation for copper alloy heat exchanger tubes, strainer (body), and valve body exposed to steam (internal) that are being managed for cracking and loss of material, by the BWR Water Chemistry and Chemistry Program Effectiveness Inspection Programs with a Generic Note G is documented in SER Section 3.3.2.3.45. LRA Table 3.3.2-46, which was added by LRA Amendment 1 (GO2-10-094), never identified cracking as an aging effect for any copper alloy component exposed to steam (only the loss of material aging effect has been identified for the subject material/environment combination).
34	3.4, 3.4.2.3.7	3-471 & 3-501	Sealing Steam was added as a steam and power conversion system in LRA Amendment 1 (GO2-10-094) but it is not listed in Section 3.4 nor is there a section after Section 3.4.2.3.7 that summarizes the staff's evaluation.
35	3.6.2.3.1	3-569	In the middle of the 2nd paragraph within this section the following statement is made: ...The applicant further stated that it has reviewed industry technical information regarding material aging and has determined that there are AERMs at Columbia for copper grounding materials... However, RAI 3.6-2 response contained in letter GO2-10-166 states the following: Energy Northwest reviewed industry technical information regarding material aging and has determined that there are no aging effects at Columbia requiring management for copper grounding materials. In addition, Energy Northwest reviewed industry and plant operating experience and did not identify any failures of copper ground systems due to aging effects. A review of the Columbia plant-specific operating experience showed no failures of the plant grounding system.

SER COMMENTS Changes to Reflect LRA Amendments or RAI Responses			
No.	**Section**	**Page**	**Comment**
36	4.1.2 & 4.1.2.1	4-2 4-3	Section 4.1.2 bulleted list, first bullet. The first bullet says that LRA tables 4.1-1 and 4.1-2 identify Reactor Vessel (RV) Neutron Embrittlement Analysis – Neutron Fluence as not meeting the definition of a TLAA. Section 4.1.2.1 makes a similar statement. Amendments 18 and 28 added neutron fluence as a TLAA. This was in response to RAI 4.2.1-2 in the letter to the NRC dated January 27, 2011. Refer to section 4.2.1.2 of the SER on page 4-19.

SER COMMENTS Editorial or Typographical Comments (that could affect meaning)			
No.	**Section**	**Page**	**Comment**
1	2.1.3	2-2	This section should also mention §54.4(a)(3)
2	2.1.4.1.2 And General	2-9	Indents indicate a quotation, however the response to RAI 2.1-1(A) in GO2-10-095 states "Because the ..." Not "The..." This is a general comment. There are many instances of words changed or deleted with indication of the change. Example include, but are not limited to: Page 2-10 1st full paragraph (GO2-10-095) Page 2-16 3rd and 4th indented paragraphs (GO2-10-095) Page 2-19 LRA section 2.1.1.3 Page 2-19 LRA 2.1.1.3.1 1st indented paragraph Page 2-19 LRA 2.1.1.3.2 2nd indented paragraph Page 2-20 LRA 2.1.1.3.5 both indented paragraphs Page 2-22 Section 2.1.4.4.1 2nd and 4th indented paragraphs (LRA 2.1.1 page 2.1-2 and 2.1-3) Page 2-23 LRA Section 2.1.1.4.1 indented paragraph
3	2.1.4.2.3	2-18	The conclusion statement should end with "...pursuant to 10 CFR 54.4(a)(2) is acceptable."
4	2.3.2.1.1	2-41	Last bullet "RHR and CS pumps" – there are no CS pumps associated with the RHR systems. The RHR pumps can provide containment spray, but they are not referred to as CS pumps. This presentation could be misunderstood if not changed. Reference LRA 2.3.2.1
5	2.3.3.1.1	2-46	Last sentence of 2nd paragraph – suggest rewording to state "...aligned to bleed thru the CW system." Feed-and-bleed mode does not really bleed the CW system. Reference LRA 2.3.3.1

SER COMMENTS Editorial or Typographical Comments (that could affect meaning)			
No.	**Section**	**Page**	**Comment**
6	2.4.1.1	2-92	The last sentence in the first paragraph is confusing. "The primary containment is part of the reactor building and the pressure vessel,..." However, the rest of the sentence should be another sentence so that it does not read that the primary containment is part of the pressure vessel. Suggestion: "The primary containment vessel is part of the reactor building. All equipment and structures within the primary containment are supported on a concrete foundation mat."
7	2.3.3.22.2	2-66	The Last bullet on the page states: "All hose stations in the plant have a wye gate to convert the 2 Y2" outlet of the angle hose valve to two 1 Y2" hoses." It should instead read" "All hose stations in the plant have a wye gate to convert the 2 1/2" outlet of the angle hose valve to two 1 1/2" hoses."
8	2.3.3.23.1	2-68	2nd paragraph says: FDs in the service building are collected in a single pump containing two sump pumps. It should state instead: "FDs in the service building are collected in a single sump containing two sump pumps."
9	2.3.3.34.2	2-75	The third paragraph in this section states the following: "...the applicant identified the five seismic anchors or anchored components between the safety and nonsafety interfaces." They are actually beyond the safety nonsafety interfaces. See also 2.3.3.39.2, 2.3.3.41.2.

SER COMMENTS Editorial or Typographical Comments (that could affect meaning)			
No.	**Section**	**Page**	**Comment**
10	2.3.3.40.1	2-79	Referring to the Reactor Protection System, the last paragraph in this section states the following: "LRA Table 2.3.3-40 lists the component types that require AMR and their intended functions." For the Reactor Protection System, the LRA concludes that there are no mechanical component types that are subject to AMR (LRA 2.3.3.40 "Components Subject to AMR). Therefore there is no LRA section 2.3.3 table for the Reactor Protection System. LRA Table 2.3.3-40 lists the component types in the Service Air System that are subject to AMR.
11	2.3.3.41.1	2-80	Referring to the Reactor Water Cleanup System, the last paragraph in this section states the following: "LRA Table 2.3.3-41 lists the component types that require AMR and their intended functions." This should be LRA Table 2.3.3-39.
12	2.3.3.43.1	2-82	Referring to the Standby Liquid Control System, the last paragraph in this section states the following: "LRA Table 2.3.3-43 lists the component types that require AMR and their intended functions." This should be LRA Table 2.3.3-41.
13	2.4.1.1	2-92	End of 1st paragraph – recommend noting that this foundation mat is a common mat shared by the PCV and the reactor building as stated in LRA sect. 2.4.1
14	2.4.1.1	2-92	Paragraph following the bulleted list makes the content confusing. LRA Section 2.3.3.32 states that primary containment does not have (a)(2) or (a)(3) as discussed following the colon (:)
15	2.4.7.1	2-98	Nowhere in this section is the construction (reinforced concrete) of this structure discussed. All other sections have such discussion. Recommend providing that info in 1st paragraph as shown in LRA sect. 2.4.7.

SER COMMENTS Editorial or Typographical Comments (that could affect meaning)			
No.	**Section**	**Page**	**Comment**
16	2.4.7.1	2-98	2nd and 3rd paragraphs – at the end of these discussions add '*and for the feed-and-bleed mode of operation.*' This is an important in-scope function for this structure.
17			Left intentionally blank
18	2.4.8.3	2-99	Last sentence "...radwaste control room SCs..." should be "...radwaste control building SCs..."
19	2.4.9.1	2-100	4th paragraph – change 4th word to 'meets' and at end of paragraph add 'and because it is a seismic category II structure adjacent to a seismic category I structure (reactor building)'
20	2.4.10.1	2-100	SER Paragraph 2.4.10.1 states – "The purpose of the non-Seismic Category 1 turbine ...". Should state –"The purpose of the modified non-Seismic Category 1 turbine ...". Refer to LRA section 2.4.10 Structure Description.
21	2.4.12.1	2-102	4th paragraph – no clear statement of why the filter polisher building was in scope. See LRA sect. 2.4.12.4
22	2.4.12.1	2-102	6th paragraph – recommend last sentence be revised to replace 'building' with 'facility' as there is no building. The last sentence should also note that the HSSF foundations are also designed for seismic category I loads and ground motion per RG 1.60 (LRA sect. 2.4.12.6)
23	2.4.12.1	2-102	8th paragraph –add '... *and includes the Ashe relay house to the SBO path*' The Ashe relay house is listed later in tables, but never mentioned elsewhere. See LRA sect. 2.4.12.8.
24	2.4.12.1	2-102	10th paragraph on Duct banks, cable trenches, manholes, valve pits, and electrical towers. 2nd sentence says "They provide physical support and shelter to safety-related equipment." In addition to (a)(1) components, they also provide support and shelter to (a)(2) and (a)(3) components.
25	2.5	2-105	In the third paragraph, the words "in-scope" are missing, when describing passive, long-lived electrical components (for the closing sentence).

SER COMMENTS Editorial or Typographical Comments (that could affect meaning)			
No.	**Section**	**Page**	**Comment**
26	3.0	Various	General comment for Section 3.0: For every program described in Section 3.0 of the SER, the following statement, or a similar statement, is made in the UFSAR Supplement discussion: "The staff reviewed this UFSAR supplement description of the program and notes that it conforms to the recommended description for this type of program, as described in SRP-LR Tables 3.2-2, 3.3-2, and 3.4-2." However, there is no program description in SRP-LR Tables 3.1-2, 3.2-2, 3.3-2, 3.4-2, 3.5-2, or 3.6-2. These tables list the programs rather than described. Program descriptions are in SRP-LR Table 3.0-1.
27	3.0.1.2	3-3	Last two bullets indicate that for the NUREG-1801 Vol. 2 Item and Table 1 Item that the column was left blank if no match to GALL was found. In the LRA N/A was indicated if no match was found. Reference LRA Page 3.0-4
28	3.0.3.1.1	3-11	The last sentence of the first paragraph for Section 3.0.3.1.1 references "NEI 94-10" whereas it should read "NEI 94-01."
29	3.0.3.1.3	3-22	In 2nd paragraph; "...weld 20 reactor recirculation cooling (RRC)(6)-8 in 1991" is incorrect. The number 20 refers to the pipe size recommend replacing with the actual weld reference "weld 20RRC(6)-8 in 1991."
30	3.0.3.1.5	3-28	3rd paragraph in Staff evaluation references ASME IWB-4000 and IWB-7000 currently there are no such sections in the Code. This may be a reference to a much older version of the ASME Code. Recommend removing the specific section references and simply state in accordance with ASME Code, Section XI.
31	3.0.3.1.6	3-30	The fourth paragraph states Columbia detects and sizes cracks per ASME Code 2001 Edition, 2003 Addenda. This is true for the current interval but was not true for the previous interval or the next when a different Code Year and addenda will be approved. Suggest eliminating the specific year and addenda reference.
32	3.0.3.1.10	3-47	The Staff evaluation subsection second paragraph states Columbia inspects per ASME Code 2001 Edition, 2003 Addenda. The LRA did not specify Code Year and addenda. Suggest eliminating the specific year and addenda reference.

SER COMMENTS Editorial or Typographical Comments (that could affect meaning)			
No.	**Section**	**Page**	**Comment**
33	3.0.3.1.14	3-58	In Staff evaluation, 3rd paragraph, 6th line "The applicant also stated that this program is credited with detecting EQ cable…" should be "The applicant also stated that this program is credited with detecting non EQ cable…"
34	3.0.3.1.18	3-66	The summary of technical information and staff evaluation section does not specifically address the testing frequency for the power cables was reduced from 10 years to 6 years – it merely states that Columbia changed the frequency. Unless one is familiar with the issues involved in the power cable and electrical manhole issues, this section of the SER is difficult to understand.
35	3.0.3.1.25	3-100	The last sentence in the first paragraph of Element 1 has a typographical error (stray comma) in 1x1017 n/cm2. In addition, the superscripting is not correct - and is not correct throughout the draft. Also see page 3-114 for similar typo, last paragraph.
36	3.0.3.1.25	3-102	Element 5 and Element 6; reference to LRA section should be B.2.46 vice B.2.6
37	3.0.3.1.27	3-107	Last bullet on 107: There are no steel components exposed to outdoor air in the Service Air System Inspection Program. They are all exposed to an "Air" environment
38	3.0.3.1.28	3-109	In the second paragraph; it appears the second GALL section reference should be XI.M35 not XI.M32
39	3.0.3.1.30	3-112	4th paragraph says "NUREG/Condition Report (CR)-4513." CR stands for contractor reports, not condition reports
40	3.0.3.1.30	3-113	There is a "not" missing in the last paragraph. "Article IWB-3500 does not specify flaw acceptance criteria…" It appears correctly later in the discussion.
41	3.0.3.1.30	3-115	Second, third and fourth paragraphs; the ENW response to the NRC RAI letter dated July 13, 2010, included responses B.2.52-1 through B.2.52-4. There was no response identified as B.2.52-5. Response B.2.52-4 addressed the NRC request concerning the implementation schedule. The referenced response in the three noted paragraphs should be to B.2.52-4 vice B.2.52-5.

SER COMMENTS Editorial or Typographical Comments (that could affect meaning)			
No.	**Section**	**Page**	**Comment**
42	3.0.3.2.2	3-120	Summary of technical information in the application should indicate that "The applicant also stated that the program consists of the periodic inspections of bolting performed under its ISI Program (IWF), Structures Monitoring Program, and External Surfaces Monitoring Program. ISI (IWF) and structures monitoring are applicable to structural bolting, whereas ISI and external surfaces monitoring are applicable to mechanical component bolting. The ISI Program should be added to the list.
43	3.0.3.2.15	3-184	Material Handling System Inspection. In the enhancement 1 sentence states "The staff finds the enhancement acceptable because it is consistent with the GALL AMP XI.M26, "Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems Program." The GALL AMP number should be XI.M23.
44	3.0.3.3.12	3-259	In Scope of Program, 1st paragraph, the last sentence should reference ASTM D3911 not AST D3911
45	3.0.3.3.13	3-268	Section under Acceptance Criteria references IWB-3400 for sample sizing. Sample sizing is directed under IWB-2400. Eliminate specific section references
46	3.2.2 (Table 3.2-1)	3-331	For the GALL Item No. 3.2.1-31 row, the "AMP in LRA" column should also list the Supplemental Piping/Tank Inspection.
47			Intentionally blank
48	3.3.2 (Table 3.3-1)	3-359	For the GALL Item No. 3.3.1-11 row, the "AMP in LRA" column should include the External Surfaces Monitoring Program.
49	3.3.2 (Table 3.3-1)	3-360	For the GALL Item No. 3.3.1-17 row, the "AMP in LRA" column should include the Monitoring and Collection Systems Inspection.
50	3.3.2 (Table 3.3-1)	3-361	For the GALL Item No. 3.3.1-23 row, the "AMP in LRA" column should not include the Monitoring and Collection Systems Inspection. It is correct to include it for item 3.3.1-24.

SER COMMENTS Editorial or Typographical Comments (that could affect meaning)			
No.	**Section**	**Page**	**Comment**
51	3.3.2 (Table 3.3-1)	3-364	For the GALL Item No. 3.3.1-40 row, the "AMP in LRA" column should say External Surfaces Monitoring instead of Aboveground Steel Tanks.
52	3.3.2 (Table 3.3-1)	3-367	For the GALL Item No. 3.3.1-62 row, the "AMP in LRA" column should say Potable Water Monitoring instead of Fire Protection.
53	3.3.2 (Table 3.3-1)	3-368	For the GALL Item No. 3.3.1-68 row, the "AMP in LRA" column should include the Monitoring and Collection Systems Inspection.
54	3.3.2 (Table 3.3-1)	3-370	For the GALL Item No. 3.3.1-75 row, the "AMP in LRA" column should say "Not applicable."
55	3.4.2 (Table 3.4-1)	3-476	For the GALL Item No. 3.4.1-28 row, the "AMP in LRA" column should include the Buried Piping and Tanks Inspection, the Supplemental Piping/Tank Inspection, and the Bolting Integrity Program.
56	3.4.2.1.2	3-480	There is no discussion in this SER section regarding the use of the Bolting Integrity Program to manage loss of material for steel bolting exposed to external condensation.
57			Intentionally blank
58	3.6.2.2	3-564	Should add bullets for: electrical equipment subject to EQ Quality Assurance for Aging Management of Non-safety Related Components
59	4.1.2	4-2	Statement at the bottom of the page, after the bulleted and numbered list of possible TLAA, says "For each of these TLAAs, the staff reviewed the applicant basis for claiming the analysis was not a TLAA and compared it to the applicant's CLB and the six criteria for TLAAs." The NRC agrees in the subsequent discussion that most of these analyses are <u>not</u> TLAA, so the sentence should be revised to say: "For each of these ANALYSES...."