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

July 9, 2008
GO2-08-105

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

10 CFR 50.55a

Subject: **COLUMBIA GENERATING STATION, DOCKET NO. 50-397 RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION REGARDING REQUEST 3ISI-08**

References: 1) Letter GO2-07-178, dated December 13, 2007, SK Gambhir (Energy Northwest) to NRC, "Columbia Generating Station, Docket No. 50-397 Request 3ISI-08 for Approval of Alternate Risk-Informed Inservice Inspection (RI-ISI) Requirements for the Third Ten-Year Interval Inservice Inspection Program Plan"

2) Letter dated May 15, 2008, CF Lyon (NRC) to Mr. JV Parrish (Energy Northwest), "Columbia Generating Station – Request for Additional Information Related to Request for Relief 3ISI-08 (TAC No. MD7507)"

Dear Sir or Madam:

Transmitted herewith in Attachment 1 is the Energy Northwest response to a Request for Additional Information (Reference 2). This response provides additional justification for Request 3ISI-08 (Reference 1).

There are no new commitments included in this response. If you have any questions or require additional information, please contact Mike Humphreys, Licensing Supervisor at (509) 377-4025.

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, Technical Services

Attachments: 1) Response to Request for Additional Information
2) Revised pages for Reference 1

cc: EE Collins, Jr. – NRC RIV
CF Lyon – NRC NRR
NRC Senior Resident Inspector/988C
RN Sherman – BPA/1399
WA Horin – Winston & Strawn

A047
NRR

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

Question 1

On page 4 of 5 of Attachment 1, a table showing the number of locations inspected by system during the second 10-year ISI interval and the number of locations proposed for the third 10-year ISI interval is presented. Please summarize what is causing the relatively large changes in the number of inspections in the various systems shown on this table.

Response

The differences in the number of locations inspected are a result of changes in the risk rankings due to updated consequence rankings. The second 10-year ISI interval consequence analysis was based on revision 4.0 of the Probabilistic Risk Assessment (PRA) model for Columbia Generating Station. The consequence rankings for the third 10-year ISI interval were revised to reflect revision 6.0 of the updated plant PRA model.

Question 2

Section 3.6, Additional Examinations, of Attachment 2, states "Additional examinations will be performed on these elements up to a number equivalent to the number of elements initially required to be inspected on the segment or segments. If unacceptable flaws determined to be service related or if relevant conditions are again found similar to the initial problem, the remaining identified as susceptible will be examined." Please clarify that these additional examinations will be done during the current outage, consistent with ASME Code, Section XI, IWB-2430.

Response

The additional examinations will be performed during the current outage consistent with ASME Code, Section XI, IWB-2430. The paragraph in section 3.6 is revised to read:

> Additional examinations will be performed during the current outage on these elements up to a number equivalent to the number of elements initially required to be inspected on the segment or segments.

A revised page for Reference 1 is included in Attachment 2.

Question 3

Please clarify that the second paragraph of Section 3.7, Program Relief Requests, was intended to say that the process outlined in Electric Power Research Institute Technical Report (EPRI TR) 112657 will be followed for locations found at the time of examination that do not exceed the 90 percent coverage.

Response

The paragraph in section 3.7 is revised to read:

> At this time, all the risk-informed examination locations that have been selected are estimated to exceed 90% volume coverage. When a location is found that does not exceed 90% coverage at the time of the examination, the process outlined in EPRI TR 112657, will be followed."

A revised page for Reference 1 is included in Attachment 2.

Question 4

Per Table 3.5-1 in Attachment 2, there are 27 welds in the High Risk (HR) population, with 20 in the Reactor Core Isolation Cooling (RCIC) system. The EPRI method directs that 25 percent of HR welds be selected for inspection. Twenty five percent of 27, rounded up, is 7 welds, yet only 5 are selected for inspection, and none of these in the RCIC system.

a. Please clarify why less than 25 percent of the HR welds are apparently being inspected and, if the selection deviates from the 25 percent required by the methodology, please justify the deviation.

b. Please explain why no HR welds in the RCIC system are included in the inspection population.

Response to 4.a

Twenty (20) of the 27 HR welds in the RI-ISI are in the RCIC piping. These 20 welds are in sections of RCIC piping that are susceptible to the Flow Accelerated Corrosion (FAC) damage mechanism and accordingly, are inspected under the FAC inspection program. For this reason, they are not candidates for inspection under the RI-ISI program. In compliance with the EPRI methodology, seventy one percent (5 out of 7) of the remaining HR welds contained in Table 3.5-1 are inspected under the RI-ISI program.

Response to 4.b

As stated above, the 20 HR RCIC welds contained in Table 3.5-1 are in sections of piping inspected under the FAC program. They were placed in the HR category because they are subject to waterhammer and susceptible to the FAC damage mechanism. They are not selected for RI-ISI inspection because the RI-ISI inspection methods are not amenable to detecting flaws due to water hammer. The FAC damage mechanism is managed through the FAC program.

A revised page that includes a clarifying note (4) for Reference 1 is included in Attachment 2.

Revised pages for Reference 1

locations are determined from predictive models, plant specific trending data, operating experience, industry experience, and engineering judgment. Since this is a living program (i.e., continuously updated to reflect inspection results) actual inspection locations may vary from outage to outage. Therefore, no FAC inspections have been credited toward the RI-ISI program scope.

The IGSCC locations are being monitored by the GL 88-01 program. No GL 88-01 inspections are being credited toward the RI-ISI program.

The Standby Liquid Control system (SLC) has only two medium-risk (risk category 4) 1-1/2 inch butt welds. There were no active degradation mechanisms identified at these welds. The remainder of the SLC welds are socket welds and are outside the scope of this application. Since these welds are in the immediate vicinity of the branch connection to the HPCS system piping, the RI-ISI inspections performed on the HPCS piping are considered adequate defense-in-depth for these two SLC welds. Therefore, no SLC welds are selected for RI-ISI.

Finally, all Class 1 piping components, regardless of risk classification, will continue to receive Code required pressure testing, as part of the current ASME Section XI program. Visual VT-2 examinations are scheduled in accordance with the existing pressure test program, which remains unaffected by the RI-ISI.

3.6 Additional Examinations

Since the RI-ISI program may require examinations on a number of elements constructed to lesser pre-service inspection requirements, the program requires engineering evaluation to determine the cause of any unacceptable flaws that are service related (e.g., fatigue, wall loss, IGSCC). The evaluation will include the applicable service conditions and degradation mechanisms to establish that the element(s) will still perform their intended safety function during subsequent operation. Elements not meeting this requirement will be repaired or replaced.

The evaluation will determine if other elements on the segment or segments are subject to the same root cause and degradation mechanism. Additional examinations will be performed during the current outage on these elements up to a number equivalent to the number of elements initially required to be inspected on the segment or segments. If unacceptable flaws determined to be service related or if relevant conditions are again found similar to the initial problem, the remaining elements identified as susceptible will be examined. No additional examinations will be performed if there are no additional elements identified as being susceptible to the same service related root cause conditions or degradation mechanism.

3.7 Program Relief Requests

Greater than 90% volume coverage (per Code Case N-460) will be provided, when possible, when performing the risk-informed examinations. However, some limitations will not be known until the examination is performed, since some locations may be examined for the first time by the specified techniques.

At this time, all the risk-informed examination locations that have been selected are estimated to exceed 90% volume coverage. When a location is found that does not exceed 90% coverage at the time of the examination, the process outlined in EPRI TR 112657, will be followed.

All existing relief requests are unaffected and remain in place.

3.8 Change in Risk

The RI-ISI program has been conducted in accordance with Regulatory Guide 1.174 and the risk from implementation of this program is expected to remain neutral or decrease when compared to that from current requirements.

This evaluation allocated piping segments into High, Medium, and Low risk regions of the EPRI TR-112657 risk ranking matrix, and then determined for each of these risk classes what inspection changes are proposed for each of the locations in each segment. The changes include changing the number and location of inspections within the segment and in many cases improving the effectiveness of the inspection to account for the findings of the RI-ISI degradation mechanism assessment. For example, for locations subject to thermal fatigue, inspection locations have an expanded volume and the examination is focused to enhance the probability of detection during the inspection process.

A comprehensive risk impact evaluation was performed in accordance with Section 3.7 of EPRI TR-112657. The risk impact evaluation followed the decision process and evaluation criteria in EPRI TR-112657, Figure 3-6 and included the following elements:

- A qualitative evaluation of the potential for risk impacts for each pipe segment due to increases and decreases in the number of exams and for expected enhancements to the inspection detection probability due to the implementation of expanded weld inspection volumes prescribed in Section 4.0 of EPRI TR-112567.

- A conservative quantitative evaluation of the risk impacts for all pipe segments using rupture frequencies from Table A-11 in EPRI TR-111880 (Reference 6). No credit was taken for the inspection effectiveness (e.g.,

Table 3.5-1 Number of Welds and Inspections by Risk Category without FAC and IGSCC

System	Risk Category 1		Risk Category 2		Risk Category 3		Risk Category 4		Risk Category 5		Risk Category 6		Risk Category 7	
	Pop.	Insp.	Pop.	Insp.	Pop.	Insp.	Pop.	Insp.	Pop.	Insp.	Pop.	Insp.	Pop.	Insp.
HPCS	0	0	0	0	0	0	18	5	3	3	8	0	0	0
LPCS	0	0	0	0	0	0	6	3	3	3	19	0	0	0
MS	0	0	0	0	0	0	0	0	8	3	147	0	0	0
RCIC	0	0	0	0	20 (4)	0	16	4	9	4	47	0	2	0
RFW (2)	0	0	0	0	0	0	0	0	34	21	94	0	0	0
RHR (1) (2)	0	0	7	5	0	0	36	13	23	12	60	0	2	0
RPV	0	0	0	0	0	0	0	0	0	0	3	0	0	0
RRC (3)	0	0	0	0	0	0	0	0	18	8	184	0	6	0
RWCU	0	0	0	0	0	0	0	0	0	0	24	0	33	0
SLC	0	0	0	0	0	0	2	0	0	0	0	0	0	0

Pop. - Population, the number of welds in each risk category
Insp. - Inspected, the number of welds in each risk category selected for inclusion in the RI-ISI program
(1) Inspections in RI-ISI program are in addition to IGSCC augmented program examinations
(2) Inspections in RI-ISI program are in addition to FAC augmented program examinations
(3) Inspections in RI-ISI program are credited from IGSCC augmented inspection program
(4) These welds are placed in risk category 3 because they are subject to waterhammer and susceptible to the FAC damage mechanism. Inspections for these risk category 3 welds are performed under the FAC program