March 9, 2001

Mr. J. V. Parrish
Chief Executive Officer
Energy Northwest
P.O. Box 968 (Mail Drop 1023)
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SUBJECT: SAFETY EVALUATION OF THE RISK-INFORMED INSERVICE INSPECTION (RI-ISI) PROGRAM FOR THE COLUMBIA GENERATING STATION, ENERGY NORTHWEST (TAC NO. MA9827)

Dear Mr. Parrish:

By letter dated August 16, 2000, Energy Northwest requested approval of a risk-informed inservice inspection (RI-ISI) program as an alternative to the current ISI program at the Columbia Generating Station (formerly known as WNP-2) for a subset of Class 1 piping welds, the Category B-J welds in Subarticle IWB-2500 and Table IWB-2500-1, excluding socket welds and piping one inch and smaller. Energy Northwest provided additional clarifying information in their December 1, 2000, letter and amended the August 16, 2000, submittal in their December 7, 2000 letter.

The Columbia Generating Station's RI-ISI program was developed in accordance with the methodology contained in the Electric Power Research Institute (EPRI) report EPRI-TR 112657 Revision B-A, which has been approved by the NRC staff. This relief request was made pursuant to 10 CFR 50.55a(a)(3)(i) for the second 10-year ISI interval.

The staff's review of the proposed RI-ISI program concludes that the program is an acceptable alternative to the current ISI program based on the American Society of Mechanical Engineers Boiler and Pressure Vessel Code, Section XI requirements for Class 1, nonsocket Category B-J welds, and therefore, the licensee's request for relief is authorized pursuant to 10 CFR 50.55a(a)(3)(i) on the basis that the licensee's alternative provides an acceptable level of quality and safety.

The recent event at the V.C. Summer facility in which through-wall cracking was discovered in a 34-inch main coolant loop hot leg to a reactor pressure vessel nozzle weld may call into question the conclusions that have been made regarding the frequency of large-bore piping examination. The NRC staff will evaluate the results of the V.C. Summer root cause analysis to determine whether any generic conclusions apply to this evaluation, for example to the frequency of large-bore piping examination. If generic implications are found, the NRC staff will take actions, as appropriate.

The enclosed safety evaluation authorizes implementation of the proposed RI-ISI program for the second ten-year ISI interval, which begins in May 2001. If you have any comments on this matter, please contact Jack Cushing, Project Manager, at (301) 415-1424.

Sincerely,

/RA/

Stephen Dembek, Chief, Section 2
Project Directorate IV & Decommissioning
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-397

Enclosure: Safety Evaluation

cc w/encl: See next page

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RISK-INFORMED INSERVICE TESTING PROGRAM RELIEF REQUEST

ENERGY NORTHWEST

COLUMBIA GENERATING STATION

DOCKET NO. 50-397

1.0 INTRODUCTION

Current inservice inspection (ISI) requirements for the Columbia Generating Station are contained in the 1989 Edition of Section XI, Division 1 of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, entitled *Rules for Inservice Inspection of Nuclear Power Plant Components* (hereinafter referred to as the ASME Code). In a submittal dated August 16, 2000, (Reference 1), Energy Northwest (licensee), proposed a new risk-informed inservice inspection (RI-ISI) program as an alternative to a portion of their current inservice inspection (ISI) program. Additional clarifying information was provided in a letter from the licensee dated December 1, 2000 (Reference 2). By letter dated December 7, 2000 (Reference 3), Energy Northwest amended their August 16, 2000, submittal.

The RI-ISI program is limited to ASME Class 1 Category B-J welds, excluding socket welds and piping one inch and smaller. The program was developed in accordance with the Electric Power Research Institute (EPRI) methodology contained in the NRC approved EPRI Topical Report EPRI TR-112657, Revision B-A (EPRI TR-112657) (Reference 4).

In the proposed RI-ISI program, piping failure potential estimates were determined using the EPRI TR-112657 guidance, which utilizes industry piping failure history, plant-specific piping failure history, and other relevant information. Using the failure potential and supporting insights on piping failure consequences from the licensee’s probabilistic risk assessment (PRA), safety ranking of piping segments was established for determination of new inspection locations. The proposed program maintains the fundamental requirements of the ASME Code, such as the examination technology, examination frequency, and acceptance criteria. However, the proposed program reduces the required examination locations significantly while demonstrating that an acceptable level of quality and safety is maintained. Thus, the proposed alternative approach is based on the conclusion that it provides an acceptable level of quality and safety and, therefore, is in conformance with Title 10, Code of Federal Regulations (10 CFR), Part 50.55a(a)(3)(i).

Enclosure

2.0 SUMMARY OF PROPOSED APPROACH

The licensee is required to perform ISI of ASME Code Category B-F, B-J, and C-F piping welds during successive 10-year intervals. Currently, all Category B-F welds and 25 percent of all Category B-J piping welds in ASME Class 1 piping greater than 1-inch in nominal diameter are selected for volumetric and/or surface examination based on existing stress analyses and cumulative usage factors. For Category C-F piping welds, 7.5 percent of non-exempt welds are selected for surface and/or volumetric examination.

The licensee submitted the application as an RI-ISI "template" application. Template applications are short overview submittals intended to expedite preparation and review of RI-ISI submittals that comply with a pre-approved methodology. The licensee proposed to implement the staff-approved RI-ISI methodology delineated in EPRI TR-112657. In accordance with the guidance in EPRI TR-112657, some elements inspected under the augmented inspection programs are credited as RI-ISI inspections but none of the augmented inspections were changed as a result of the selections.

The licensee requested approval of this alternative for implementation during the next refueling outage, currently scheduled for May 2001. According to the information provided in Reference 2, Columbia Generating Station is currently in the second 10-year interval that started on February 10, 1995, and ends on December 12, 2005. The current period (i.e., the second period of the interval) started on December 13, 1998, and ends on December 12, 2001.

The implementation of an RI-ISI program for piping should be initiated at the start of a plant's 10-year inservice inspection interval consistent with the requirements of the ASME Code and Addenda committed to by the licensee in accordance with 10 CFR 50.55a. However, the implementation may begin at any point in an existing interval as long as the examinations are scheduled and distributed consistent with the ASME Code requirements (e.g., the minimum examinations completed at the end of the three inspection intervals under ASME Code Program B should be 16 percent, 50 percent, and 100 percent, respectively, and the maximum examinations credited at the end of the respective periods should be 34 percent, 67 percent, and 100 percent). In Reference 2, the licensee stated that the ASME Code minimum and maximum inspection requirements will be met.

It is also the staff's view that the inspections for the RI-ISI program and for the balance of the ISI program should be on the same interval start and end dates. This can be accomplished by either implementing the RI-ISI program at the beginning of the interval or merging the RI-ISI program into the ISI program for the balance of the inspections if the RI-ISI program is to begin during an existing ISI interval. One reason for this view is that it eliminates the problem of having different Codes of record for the RI-ISI program and for the balance of the ISI program. A potential problem with using two different interval start dates and hence two different Codes of record would be having two sets of repair/replacement rules depending upon which program identified the need for repair (e.g., a weld inspection versus a pressure test). In Reference 2, the licensee stated that it will merge the RI-ISI program into the existing ISI program and that RI-ISI program inspections and the balance of the ISI program inspections will be on the same interval start and end dates.

Reference 3 also stated that the licensee would continue to submit its 10-year interval ISI program, including the RI-ISI program, and would submit the revised RI-ISI program prior to the end of the interval if significant impact on the RI-ISI program occurred due to any new risk insights, plant changes, industry information, or if changes to the basis for NRC's approval of the program were discovered. The licensee also stated that changes to the RI-ISI program would not take place without prior NRC approval.

The staff finds that the Columbia Generating Station RI-ISI program meets the ASME Code and 10 CFR 50.55a requirements for minimum and maximum inspections during inspection periods and intervals and for program submittal to the NRC.

3.0 EVALUATION

The licensee's submittal was reviewed with respect to the methodology and criteria contained in EPRI TR-112657. Further guidance in defining acceptable methods for implementing an RI-ISI program is also provided in Regulatory Guide (RG) 1.174, RG 1.178, and Standard Review Plan (SRP) Chapter 3.9.8 (References 5, 6, and 7).

3.1 Proposed Changes to ISI Program

Pursuant to 10 CFR 50.55a(a)(3)(i), the licensee has proposed to implement an RI-ISI program in accordance with the methodology contained in EPRI TR-112657 as an alternative to the ASME Code examination requirements for ASME Class 1 piping for Columbia Generating Station. A general description of the proposed changes to the ISI program was provided in Section 3 of the licensee's submittal.

3.2 Engineering Analysis

In accordance with the guidance provided in RGs 1.174 and 1.178, an engineering analysis of the proposed changes is required using a combination of traditional engineering analysis and supporting insights from the PRA. The licensee elaborated as to how the engineering analyses conducted for the Columbia Generating Station RI-ISI program ensures that the proposed changes are consistent with the principles of defense-in-depth and that adequate safety margins will be maintained. This is accomplished by evaluating a location's susceptibility to a particular degradation mechanism and then performing an independent assessment of the consequence of a failure at that location.

The licensee's RI-ISI program at Columbia Generating Station is limited to ASME Class 1 Category B-J piping welds, excluding socket welds and piping one inch or smaller. The licensee stated in its submittal that other non-related portions of the ASME Code will be unaffected by this program. Piping systems defined by the scope of the RI-ISI program were divided into piping segments. Pipe segments are defined as lengths of pipe whose failure leads to similar consequences and are exposed to the same degradation mechanisms. That is, some lengths of pipe whose failure would lead to the same consequences may be split into two or more segments when two or more regions are exposed to different degradation mechanisms.

The submittal states that failure potential categories were generated utilizing industry failure history, plant-specific failure history, and other relevant information using the guidance provided in EPRI TR-112657. The degradation mechanisms identified in the submittal include thermal fatigue, intergrannular stress corrosion cracking (IGSCC), local corrosion, and flow accelerated corrosion (FAC). In accordance with the selection guidelines in Section 3.6.4.1 of EPRI TR-112657, less than 50 percent of the proposed RI-ISI elements selected for inspection were credited from the current IGSCC augmented inspection program. The licensee stated in Section 3.5 that the FAC inspection locations are determined from predictive models, plant-specific trending data, operating experience, industry experience, and engineering judgement. The submittal also states that since FAC is a living program for which the actual inspection locations may vary from outage to outage, no FAC inspections have been credited toward the RI-ISI program scope.

The licensee stated that the consequences of pressure boundary failure were evaluated and ranked based on their impact on core damage and containment performance (i.e., isolation, bypass, and large early release). The consequence evaluation included the potential impacts during at-power conditions, shutdown operations, and external events (e.g., fires and seismic). The licensee used their PRA models to directly support their estimation of the consequences of pressure boundary failure for each piping element in the evaluation. The impact due to both direct and indirect effects was also considered using the guidance provided in EPRI TR-112657. For ASME Class 1 piping outside containment, a system walkdown was conducted to identify indirect effects associated with the rupture of the affected piping. The licensee reviewed the Columbia Generating Station Final Safety Analysis Report (FSAR) to determine the indirect/spatial effects associated with pipe ruptures inside containment, including pipe whip, jet impingement, pressurization, and temperature effects. There are no indirect/spatial effects associated with flooding caused by pipe ruptures inside containment. The licensee reported no deviations from the segment definition, incorporation of augment programs, and consequence characterization approved by the staff in EPRI TR-112657 and their analyses are acceptable.

3.3 Probabilistic Risk Assessment

To support this RI-ISI submittal, the licensee used the Revision 4, March 2000, version of its Level 1 and Level 2 PRA. The current estimates of core damage frequency (CDF) and large early release frequency (LERF) are about 2.3E-5/year and 1.3E-6/year, respectively. The staff evaluation report (SER) on the individual plant examination (IPE) was issued in April 1997 and concluded that the IPE satisfied the intent of Generic Letter 88-20 but noted several weaknesses in the licensee’s evaluation of human errors. As discussed in Reference 3, the latest version of the Columbia Generating Station PRA (Revision 4, March 2000) has addressed each of the weaknesses noted in the SER. The licensee also reported that the Columbia Generating Station PRA models and documentation have been periodically updated to ensure that the results are based on the current plant configuration, operating and maintenance practices with associated human error modeling, and plant-specific systems and component failure rate data. In addition, Revision 3 of the Columbia Generating Station PRA underwent the Boiling Water Reactor Owners Group (BWROG) peer review certification process.

The approved EPRI TR-112657 topical requires that functions relied upon to mitigate external events and to mitigate transients during operation modes outside the scope of the PRA also be systematically included in the categorization. In Reference 3, the licensee indicated that they conducted a qualitative assessment for the consequence evaluation for shutdown operations and a semi-quantitative assessment for external events.

The staff did not review the PRA analysis to assess the accuracy of the quantitative estimates. Quantitative results of the PRA are used, in combination with a quantitative characterization of the pipe segment failure likelihood, to support the assignment of segments into broad safety significance categories reflecting the relative importance of pipe segment failures on CDF and LERF and to provide an illustrative estimate of the change in risk. Inaccuracies in the models or assumptions large enough to invalidate the analyses developed to support RI-ISI should have been identified in the licensee's or the staff's reviews. Minor errors or inappropriate assumptions will only affect the consequence categorization of a few segments and will not invalidate the general results or conclusions. The staff finds that the quality of the Columbia Generating Station PRA is sufficient to support this submittal.

As required by Section 3.7 of EPRI TR-112657, the licensee evaluated the change in risk expected from replacing the current ISI program with the RI-ISI program. The analysis estimates the net change in risk due to the positive and negative influence of adding and removing locations from the inspection program. The licensee used the failure frequencies developed in EPRI TR-111880 (Reference 8) to estimate the change in risk. The non-proprietary version of EPRI TR-11880 (Reference 9) illustrates the characteristics and format of the information used, but does not include the calculated parameters. Reference 8 provides failure frequency estimates according to system type and exposure to a degradation mechanism. The method used to develop the frequencies in Reference 8 was reviewed and approved during the approval of EPRI TR-112657 although the process to select and to adapt the frequencies from the report for use in the change in risk calculations was not specified. In this submittal, the licensee stated that they used Table A-11 in Reference 9. This table was developed for a variety of systems of a General Electric boiling water reactor (BWR). Columbia Generating Station is a General Electric BWR and the staff finds the use of these values reasonable and acceptable for this submittal.

The licensee used Table A-11 (Reference 9) to estimate the failure frequency of individual welds. Welds exposed to no degradation mechanism are assigned the "Design and Construction Defects" (D&C) frequency. The failure frequency for welds exposed to one or more degradation mechanisms (excluding FAC) is calculated by summing the failure frequency for each mechanism with the D&C failure frequency. The failure frequency of any weld exposed to FAC is multiplied by a factor of three. The failure frequency of any weld exposed to IGSCC and another degradation mechanism is multiplied by a factor of three. The factor of three for a weld exposed to FAC is used to reflect the increased likelihood of weld failure, even when no other degradation mechanisms are present. The factor of three is also used to reflect the increased likelihood of weld failure when the weld is simultaneously exposed to IGSCC and another degradation mechanism.

The staff finds the addition of the failure frequencies for individual degradation mechanisms is internally consistent and logically compelling and therefore an acceptable refinement of the EPRI methodology. The multiplicative factor of three will increase the estimated risk at all welds exposed to FAC. It will also increase the estimated risk at welds exposed to IGSCC and another degradation mechanism. Increased estimated risk at any weld will increase the likelihood that the weld will be inspected. The staff finds that the increased likelihood of inspections at welds exposed to FAC, or exposed to IGSCC and another degradation mechanism, is consistent with the intent of RI-ISI. The change in risk calculation is only intended to illustrate that the potential change in risk is small and acceptable. Therefore, the staff accepts the use of a factor of three in this submittal.

The licensee reported a total change in CDF and LERF of 6.3E-8/yr and 9.6E-10/yr, respectively. For one category of segments in the reactor recirculation system exposed only to IGSCC, the licensee credited an increase of 22 inspections in the change in risk calculation when, in fact, there was no change in the number of inspections. Table 3.8-1 in the submittal and a discussion in Reference 3, indicate that the licensee is currently inspecting 36 locations in these segments under the IGSCC program. Fourteen of these inspections are also credited as inspection locations in the Section XI inspection program. The licensee inspects all 36 of these locations in the RI-ISI program and credits a net increase of 22 inspections for the change in risk estimate. The approved methodology recognizes that the risk of failures caused by the IGSCC damage mechanism is adequately controlled by the IGSCC program inspections and allows crediting IGSCC inspections toward the total number of inspections required by the RI-ISI program. However, the net increase of 22 inspections credited in the change in risk calculation reflects only a change in classification and not a change in actual operational practices. The staff finds this evaluation inconsistent with RG 1.174's "over-riding requirement" that risk evaluations should realistically reflect the actual operational practices of the plant and its owner and does not accept this evaluation.

Based on the information in the submittal and in Reference 3 the staff was able to estimate the impact of this evaluation. The licensee credits a total of 36 IGSCC inspection locations in the RI-ISI program. Therefore, the 36 locations discussed above represent the total population of IGSCC inspections credited, and no other locations that are currently inspected under the IGSCC program could have been credited through a change in classification. Table 3.8-1 of the submittal reports that the "increase" of 22 inspections in these segments results in an estimated change in CDF and LERF of -1.3E-7/yr and -1E-9/yr, respectively. Assigning the change in CDF and LERF in these segments to zero results in a total estimated change in CDF and LERF due to implementation of the RI-ISI program of 1.9E-7/yr and 2.0E-9/yr, respectively. The estimated change in LERF of 2E-9/yr is below the EPRI guideline value of 1E-8/yr. The estimated change in CDF of 1.9E-7/yr is slightly above the EPRI guideline value of 1E-7/yr. The licensee did not include any credit in the change in risk calculation for the improved inspection techniques that they will apply to some welds as part of the RI-ISI program. Credit for the improved inspection techniques would reduce the estimated change in risk. The staff finds that the magnitude with which the estimated change in CDF exceeds the guideline value is inconsequential, and that the change in risk is consistent with the intent of the guidance.

Aside from the inappropriate risk reduction based on the reclassification of inspections discussed above, the staff finds the licensee’s process to evaluate the potential change in risk is reasonable because it accounts for the change in the number and location of elements inspected, recognizes the difference in degradation mechanism related to failure likelihood, and considers the synergistic effects of multiple degradation mechanisms within the same piping segment. The staff finds that redistributing the welds to be inspected with consideration of the safety-significance of the segments provides assurance that segments whose failures have a significant impact on plant risk receive an acceptable and often improved level of inspection.

Therefore, the staff concludes that the implementation of the RI-ISI program as described in the application is acceptable and, based on the reported quantitative results, any increase in risk associated with the implementation of the RI-ISI program is small and is consistent with the intent of the Commission's Policy Statement and therefore is consistent with RG 1.178.

3.4 Integrated Decision Making

As described in the Columbia Generating Station submittal, an integrated approach is utilized in defining the proposed RI-ISI program by considering in concert the traditional engineering analysis, risk evaluation, and the implementation and performance monitoring of piping under the program. This is in compliance with the guidelines of RG 1.178.

The selection of pipe segments to be inspected is described in Section 3.5 of the submittal using the results of the risk category rankings and other operational considerations. The licensee stated that a multi-discipline review team was established in accordance with Section 3.6.5 of EPRI TR-112657 to support the RI-ISI application. The objectives of this team were to make sure that all relevant factors had been considered in the consequence assessment, degradation mechanism assessment, and risk-ranking processes; to address comments resulting from the review; to select elements for inspection; and to focus the selection on those elements that are most likely to experience inservice problems.

Table 3.5-1 of the submittal provides the number of locations and inspections by risk category for the various systems. Table 5-1 of the submittal provides a summary table comparing the number of inspections required under the existing ASME Code ISI program with the alternative RI-ISI program. Table 3.8-1 identifies on a per system basis each applicable risk category, number of welds in each risk category, consequence rank, damage mechanism, locations inspected under the ASME Code and under RI-ISI, number of locations addressed in the identified augmented programs, and quantitative risk change. The licensee used the methodology described in EPRI TR-112657 to guide the selection of examination elements within high and medium ranked piping segments. The EPRI report describes targeted examination volumes (typically associated with welds) and methods of examination based on the type(s) of degradation expected. The staff has reviewed these guidelines and has determined that, if implemented as described, the RI-ISI examinations should result in improved detection of service-related discontinuities over that currently required by the ASME Code.

The staff finds the location selection process to be acceptable since it is consistent with the process approved in EPRI TR-112657, takes into account defense-in-depth, and includes coverage of welds subjected to degradation mechanisms in addition to those covered by augmented inspection programs.

The objective of ISI required by the ASME Code is to identify conditions (i.e., flaw indications) that are precursors to leaks and ruptures in the pressure boundary that may impact plant safety. Therefore, the RI-ISI program must meet this objective to be found acceptable for use. Further, since the risk-informed program is based on inspection for cause, element selection should target specific degradation mechanisms. Chapter 4 of EPRI TR-112657 provides guidelines for the areas and/or volumes to be inspected as well as the examination method, acceptance standard, and evaluation standard for each degradation mechanism. Based on the review of the cited portion of the EPRI report, the staff concludes that the examination methods are appropriate since they are selected based on specific degradation mechanisms, pipe sizes, and materials of concern.

3.5 Implementation and Monitoring

Implementation and performance monitoring strategies require careful consideration by the licensee and are addressed in Element 3 of RG 1.178 and SRP 3.9.8. The objective of Element 3 is to assess the performance of the affected piping systems under the proposed RI-ISI program by implementing monitoring strategies that confirm the assumptions and analyses used in the development of the RI-ISI program. To approve an alternative pursuant to 10 CFR 50.55a(a)(3)(i), implementation of the RI-ISI program, including inspection scope, examination methods, and methods of evaluation of examination results, must provide an adequate level of quality and safety.

In the December 7, 2000, submittal, the licensee stated that upon approval of the RI-ISI program, procedures that comply with the EPRI TR-112657 guidelines will be prepared to implement and monitor the RI-ISI program. The licensee confirmed that the applicable portions of the ASME Code not affected by the change, such as inspection methods, acceptance guidelines, pressure testing, corrective measures, documentation requirements, and quality control requirements would be retained.

The licensee stated in Section 4 of the submittal that the RI-ISI program is a living program and its implementation will require feedback of new relevant information to ensure the appropriate identification of high safety significant piping locations. The submittal also states that as a minimum, risk ranking of piping segments will be reviewed and adjusted on an ASME-period basis and that significant changes may require more frequent adjustment as directed by NRC bulletin or generic letter requirements or by industry or plant-specific feedback.

The proposed periodic reporting requirements meet existing ASME Code requirements and applicable regulations and, therefore, are considered acceptable. The proposed process for RI-ISI program updates meets the guidelines of RG 1.174 that risk-informed applications must include performance monitoring and feedback provisions; therefore, the process for program updates is considered acceptable.

4.0 CONCLUSIONS

In accordance with 10 CFR 50.55a(a)(3)(i), proposed alternatives to regulatory requirements may be used when authorized by the NRC when the applicant demonstrates that the alternative provides an acceptable level of quality and safety. In this case, the licensee's proposed alternative is to use the risk-informed process described in the NRC-approved EPRI TR-112657. The staff concludes that the licensee's proposed RI-ISI program which is consistent with the methodology described in EPRI TR-112657, will provide an acceptable level of quality and safety pursuant to 10 CFR 50.55a for the proposed alternative to the piping ISI requirements with regard to the number of inspections, locations of inspections, and methods of inspection.

The staff finds that the results of the different elements of the engineering analysis are considered in an integrated decision-making process. The impact of the proposed change in the ISI program is founded on the adequacy of the engineering analysis and acceptable change in plant risk in accordance with RG 1.174 and RG 1.178 guidelines.

The Columbia Generating Station methodology also considers implementation and performance monitoring strategies. Inspection strategies ensure that failure mechanisms of concern have been addressed and there is adequate assurance of detecting damage before structural integrity is affected. The risk significance of piping segments is taken into account in defining the inspection scope for the RI-ISI program.

System pressure tests and visual examination of piping structural elements will continue to be performed on all ASME Class 1, 2, and 3 systems in accordance with the ASME Code program. The RI-ISI program applies the same performance measurement strategies as existing ASME Code requirements and, in addition, increases the inspection volumes at weld locations.

The Columbia Generating Station methodology provides for conducting an engineering analysis of the proposed changes using a combination of engineering analysis with supporting insights from a PRA. Defense-in-depth and quality are not degraded in that the methodology provides reasonable confidence that any reduction in existing inspections will not lead to degraded piping performance when compared to existing performance levels. Inspections are focused on locations with active degradation mechanisms as well as selected locations that monitor the performance of piping systems.

The licensee has stated that the ASME Code minimum and maximum inspection requirements for Program B will be met and that the RI-ISI inspections and the balance of the inspections will be on the same interval start and end dates. The licensee has also stated that the Columbia Generating Station would continue to submit its 10-year interval ISI program including the RI-ISI program every 10 years. The licensee has also stated in Reference 3 that the Columbia Generating Station would submit the revised RI-ISI program prior to the end of the interval if significant impact on the RI-ISI program occurred due to any new risk insights, plant changes, industry information, or changes to the basis for NRC's approval of the program were discovered. The licensee also stated that changes to the RI-ISI program would not take place without prior NRC approval. The staff finds that the Columbia Generating Station RI-ISI program meets the ASME Code requirements for minimum and maximum inspections during inspection periods and intervals. The staff also finds that the Columbia Generating Station's RI-ISI program meets the 10 CFR 50.55a requirements for program submittal to the NRC.

The recent event at the V.C. Summer facility in which through-wall cracking was discovered in a 34-inch main coolant loop hot leg to reactor pressure vessel nozzle weld may call into question the conclusions that have been made regarding the frequency of large-bore piping examination. The NRC staff will evaluate the results of the V.C. Summer root cause analysis to determine whether any generic conclusions apply to this evaluation, for example to the frequency of large-bore piping examination. If generic implications are found, the NRC staff will take actions, as appropriate.

5.0 REFERENCES

1. Letter, R. L. Webring (Energy Northwest), to U.S. Nuclear Regulatory Commission, *WNP-2, Operating License NPF-21 Request for Approval of Alternate Risk-Informed Inservice Inspection (RI-ISI) Requirements*, dated August 16, 2000.

2. Letter, R. L. Webring (Energy Northwest), to U.S. Nuclear Regulatory Commission, *WNP-2, Operating License NPF-21 Request for Approval of Alternate Risk-Informed Inservice Inspection (RI-ISI) Requirements (Additional Information)*,dated December 1, 2000.

3. Letter, D. W. Coleman (Energy Northwest), to U.S. Nuclear Regulatory Commission, *WNP-2, Operating License NPF-21 Amended Request for Approval of Alternate Risk-Informed Inservice Inspection (RI-ISI) Requirements*, dated December 7, 2000.

4. Electric Power Research Institute, *Revised Risk-Informed Inservice Inspection Evaluation Procedure*, EPRI TR-112657, Revision B-A, January 2000.

5. U.S. Nuclear Regulatory Commission, *An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis*, Regulatory Guide 1.174, July 1998.

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