



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

December 3, 2008

Mr. J. V. Parrish
Chief Executive Officer
Energy Northwest
P.O. Box 968 (Mail Drop 1023)
Richland, WA 99352-0968

SUBJECT: COLUMBIA GENERATING STATION - REQUEST FOR RELIEF NO. 3ISI-08
FOR THE THIRD 10-YEAR INSERVICE INSPECTION PROGRAM INTERVAL
(TAC NO. MD7507)

Dear Mr. Parrish:

By letter dated December 13, 2007, as supplemented by letters dated July 9 and October 20, 2008, Energy Northwest (the licensee) submitted a request to the U.S. Nuclear Regulatory Commission (NRC), for relief No. 3ISI-08 from certain requirements of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (Code), for the third 10-year inservice inspection (ISI) program interval at Columbia Generating Station (CGS). Specifically, the licensee requested approval of a partial scope Risk-Informed ISI (RI-ISI) program as an alternative to current ASME Code Section XI inspection requirements for all pressure retaining Class 1 ASME Code Section XI Examination Category B-J welds in Subarticle IWB-2500 and Table IWB-2500-1, excluding socket welds, dissimilar metal welds, and piping smaller than 1-inch Nominal Pipe Size. The ASME Code for the third 10-year ISI program interval at CGS is the 2001 Edition with 2003 Addenda. The third 10-year ISI program interval at CGS began on December 13, 2005, and ends on December 12, 2015.

Based on the information provided by the licensee in request for relief No. 3ISI-08, the NRC staff has determined that the proposed alternative provides an acceptable level of quality and safety; therefore, the proposed alternative is authorized pursuant to Title 10 of the *Code of Federal Regulations* Section 50.55a(a)(3)(i) for the third 10-year ISI inspection interval at CGS.

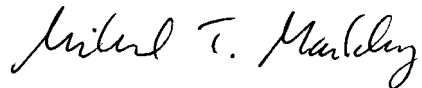
All other ASME Code, Section XI, requirements for which relief was not specifically requested and approved in this relief request remain applicable, including third-party review by the Authorized Nuclear Inservice Inspector.

J. V. Parish

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The detailed results of the NRC staff review are provided in the enclosed safety evaluation. If you have any questions concerning this matter, please call Mr. F. Lyon of my staff at (301) 415-2296 or by electronic mail at fred.lyon@nrc.gov.

Sincerely,

A handwritten signature in cursive script that reads "Michael T. Markley".

Michael T. Markley, Chief
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-397

Enclosure:
As stated

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

THIRD 10-YEAR INSERVICE INSPECTION PROGRAM INTERVAL

REQUEST FOR RELIEF NO. 3ISI-08

ENERGY NORTHWEST

COLUMBIA GENERATING STATION

DOCKET NO. 50-397

1.0 INTRODUCTION

By letter dated December 13, 2007 (Reference 1), as supplemented by letters dated July 9, 2008 (Reference 2), and October 20, 2008 (Reference 3), Energy Northwest (the licensee) requested U.S. Nuclear Regulatory Commission (NRC) authorization to extend the risk-informed inservice inspection (RI-ISI) program plan for Columbia Generating Station (CGS) to the third 10-year inservice inspection (ISI) interval. The CGS RI-ISI program for the second 10-year ISI interval was submitted to the NRC in a letter dated August 16, 2000 (Reference 4), and supplemented in letters dated December 1, 2000 (Reference 5), and December 7, 2000 (Reference 6). The CGS RI-ISI program was reviewed and approved by the NRC for use in the second 10-year ISI interval in a letter dated March 9, 2001 (Reference 7).

The licensee considered relevant information since the development of the program implemented during the second 10-year ISI interval and reviewed and updated the RI-ISI program. In its letter dated December 13, 2007, the licensee requested authorization to extend the RI-ISI program for the third 10-year ISI interval. Specifically, the licensee requested approval of a partial scope RI-ISI program as an alternative to the current American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (Code) Section XI inspection requirements for all pressure retaining Class 1 ASME Section XI Examination Category B-J welds in Subarticle IWB-2500 and Table IWB-2500-1, excluding socket welds, dissimilar metal welds, and piping smaller than 1-inch Nominal Pipe Size (NPS).

2.0 REGULATORY EVALUATION

Paragraph 50.55a(g) of Title 10 of the *Code of Federal Regulations* (10 CFR) specifies that ISI of nuclear power plant components shall be performed in accordance with the requirements of the ASME Code, Section XI, except where specific written relief has been granted by the Commission pursuant to 10 CFR 50.55a(g)(6)(i). The regulations in 10 CFR 50.55a(a)(3) state that alternatives to the requirements of paragraph (g) may be used, when authorized by the NRC, if (i) the proposed alternatives would provide an acceptable level of quality and safety, or (ii) compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

Enclosure

Pursuant to 10 CFR 50.55a(g)(4), ASME Code Class 1, 2, and 3 components (including supports) must meet the requirements, except the design and access provisions and the pre-service examination requirements, set forth in the ASME Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," to the extent practical within the limitations of design, geometry, and materials of construction of components. The regulations require that inservice examination of components and system pressure tests conducted during the first 10-year interval and subsequent intervals comply with the requirements of the latest edition and addenda of Section XI of the ASME Code incorporated by reference in 10 CFR 50.55a(b) 12 months prior to the start of the 120-month interval, subject to the limitations and modifications listed therein. The applicable code of record for the third 10-year ISI interval for CGS is the ASME Code, Section XI, 2001 Edition through the 2003 Addenda.

The licensee's RI-ISI program, as outlined in References 4, 5, and 6, was developed in accordance with the methodology contained in the Electric Power Research Institute's (EPRI's) topical report (TR) EPRI TR-112657, Rev. B-A, "Revised Risk-Informed Inservice Inspection Evaluation Procedure, Final Report" (Reference 8), which was reviewed and approved by the NRC staff. The CGS RI-ISI program is an alternative pursuant to 10 CFR 50.55a(a)(3)(i). In Reference 1, the licensee requests NRC authorization to extend the RI-ISI program, previously approved for use in the second ISI interval, to the third ISI interval at CGS. The scope of the RI-ISI program is limited to the inspection of ASME Code Class 1, Examination Category B-J piping welds (excluding socket welds, dissimilar metal welds, and piping 1-inch NPS and smaller). The proposed relief is sought for the third 10-year ISI interval which began on December 13, 2005, and ends on December 12, 2015.

The information provided by the licensee in support of the request has been evaluated and the basis for disposition is documented below.

2.1 Component Identification

Code Class:	1
Examination Category:	B-J
Item Number:	B9.11, excluding socket welds, dissimilar metal welds, and piping smaller than 1-inch NPS
Component Number:	Pressure Retaining Welds

2.2 Code Requirement for which Relief is Requested

Table IWB-2500-1, Examination Category B-J, requires volumetric and surface examination on a sample of welds for Item Number B9.11.

2.3 Licensee's Basis for Relief

Pursuant to 10 CFR 50.55a(a)(3)(i) relief is requested on the basis that the proposed alternative to the current ASME Code Section XI inspection requirements for all pressure retaining Class 1 ASME Code, Section XI Examination Category B-J welds in Subarticle IWB-2500 and Table IWB-2500-1 (excluding socket welds, dissimilar metal welds, and piping smaller than 1-inch NPS) will provide an acceptable level of quality and safety. The RI-ISI program has been developed in accordance with the NRC Safety Evaluation Report (Reference 8) of the EPRI

methodology contained in EPRI TR-112657, "Risk-Informed Inservice Inspection Evaluation Procedure," Revision B-A.

The initial CGS RI-ISI Program was submitted (References 4-6) and approved by the NRC staff (Reference 7) during the second period of the second 10-year ISI interval.

In its letter dated December 13, 2007, the licensee stated that it reviewed changes between the 1989 Edition of the ASME Code, Section XI and the 2001 Edition through the 2003 Addenda of the ASME Code, Section XI for applicability to this request. Since the initial RI-ISI program was approved, welds identified as Code Category B-F, Item Numbers B5.130, B5.140 and B5.150 were reclassified to Code Category B-J, Item Numbers B9.10 and B9.20. These dissimilar metal welds were not included in the previous second interval RI-ISI program and are not included in this third interval RI-ISI program. Therefore, these Code Category changes are not applicable to this request.

3.0 TECHNICAL EVALUATION

The licensee is requesting relief for continued use of the approved RI-ISI program plan in the third 10-year ISI interval as an alternative to the current ASME Code, Section XI, 2001 Edition through the 2003 Addenda, inspection requirements for Class 1 Examination Category B-J piping welds. The licensee's process used to develop the RI-ISI program is consistent with the methodology described in EPRI TR-112657; however, one deviation related to the additional screening criteria for assessing the thermal stratification, cycling and striping (TASCS) damage mechanism for CGS has been incorporated. Additional considerations for determining the potential for thermal fatigue as a result of the effects of TASCS provided the licensee an allowance for the consideration for cycle severity. The additional considerations include: TASCS resulting from turbulent penetration at branch piping connections, low flow TASCS, valve leakage TASCS and convection heating TASCS. The licensee stated in its letter dated October 20, 2008 (Reference 3), that the additional screening criteria used by the licensee were incorporated into the degradation mechanism assessment for TASCS. The methodology for assessing the susceptibility of piping to TASCS used by the licensee is consistent with the methodology provided by EPRI in letters dated February 28, 2001, and March 28, 2001 (Reference 9). The criteria are consistent with EPRI TR-1000701, "Interim Thermal Fatigue Management Guidelines" (MRP-24), which was published in January 2001. The NRC staff finds these considerations to be appropriate for determining the potential for TASCS and, thus, acceptable for use.

An acceptable RI-ISI program plan is expected to meet the five key principles of risk-informed decisionmaking, discussed in Regulatory Guide 1.178, "An Approach for Plant-Specific Risk-Informed Decisionmaking for Inservice Inspection of Piping" (Reference 10), NUREG-0800 Chapter 3.9.8 (Reference 11), NUREG-0800 Chapter 19 (Reference 12), and the EPRI TR 112657, Rev. B-A (Reference 8), as stated below.

1. The proposed change meets the current regulations unless it is explicitly related to a requested exemption or rule change.
2. The proposed change is consistent with the defense-in-depth philosophy.
3. The proposed change maintains sufficient safety margins.

4. When proposed changes result in an increase in core damage frequency (CDF) and/or large early release frequency (LERF), the increases should be small and consistent with the intent of the Commission's Safety Goal Policy Statement.
5. The impact of the proposed change should be monitored by using performance measurement strategies.

The first principle is met in this relief request because an alternative ISI program may be authorized pursuant to 10 CFR 50.55a(3)(i) and, therefore, an exemption request is not required.

The second and third principles require assurance that the alternative program is consistent with the defense-in-depth philosophy and that sufficient safety margins are maintained, respectively. The methodology used to develop the third 10-year RI-ISI program interval is unchanged from the methodology approved for use in the second 10-year RI-ISI interval program. Assurance that the second and third principles are met is based on the application of the approved methodology and not on the particular inspection locations selected. Therefore, the second and third principles are met.

The fourth principle requires an estimate of the change in risk between the proposed risk-informed program and the program the licensee would otherwise be required to implement. The topical report (EPRI TR-112657) requires that a change in risk measurement must consider the discontinuance of ASME Code required inspections, as well as any new inspections resulting from the application of its methodology. The NRC staff has previously determined that it is not necessary to develop a new deterministic ASME program for each new 10-year interval but, instead, it is acceptable to compare the new proposed RI-ISI program with the last deterministic ASME program. The licensee stated in Reference 1 that 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. The licensee further states that a comprehensive risk impact evaluation was performed in accordance with EPRI TR-112657. The results of the quantitative risk impact evaluation show that the total change in CDF and LERF associated with the proposed RI-ISI program satisfy the appropriate acceptance criteria. Thus, the NRC staff finds that the licensee's analysis provides assurance that the fourth key principle is met.

The fifth principle of risk-informed decision making requires that the impact of the proposed change be monitored by using performance measurement strategies. In its letter dated December 13, 2007, the licensee stated in its request for relief states that the CGS RI-ISI program was developed in accordance with the EPRI methodology contained in EPRI Topical Report TR-112657, Revision B-A. This program is a living program requiring feedback of new relevant information and is subject to review and adjustment on a periodic basis. The licensee stated that the RI-ISI program was revised to incorporate the latest probabilistic risk assessment (PRA) revision. In Reference 1, the licensee provided a summary of the changes that have occurred since the original implementation of the RI-ISI program. These include:

- The PRA models were updated and resulted in revised risk categories. The change to the consequence risk categories are summarized as:
 - 4 risk segments have increased consequences,
 - 78 risk segments have decreased consequences, and
 - 41 risk segments have the same consequences.

- Credit for Generic Letter (GL) 88-01 welds taken in the second 10-year interval is not being extended to the third 10-year interval RI-ISI program, except for Category A. Category A welds are subsumed by the RI-ISI program.
- Risk categories are determined without taking into account Flow Accelerated Corrosion (FAC) and Intergranular Stress Corrosion Cracking (IGSCC) degradation mechanisms since these degradation mechanisms are adequately monitored using the existing augmented examination programs for FAC and IGSCC.
- Incorporated one deviation to EPRI TR-112657 for failure potential assessment for Thermal Stratification, Cycling and Striping (TASCS).
- Recalculated change in risk between ASME Code Section XI program and RI-ISI program.
- Revised location selection based on revised risk categories.

The analyses and changes reported by the licensee in its submittals demonstrate that the RI-ISI program is a living program that is being periodically updated. Therefore, the NRC staff concludes that the fifth key principle which provides that risk-informed applications should include performance monitoring and feedback provisions is met.

Based on the above, the NRC staff concludes that the five key principles of risk-informed decision making are ensured by the licensee's proposed third 10-year RI-ISI program. Therefore, the proposed program for the third 10-year ISI interval is acceptable.

3.0 CONCLUSIONS

Based on the information provided in the licensee's submittals, the NRC staff has determined that the proposed alternative provides an acceptable level of quality and safety. Therefore, the proposed alternative is authorized pursuant to 10 CFR 50.55a(a)(3)(i) for the third 10-year ISI inspection interval at CGS.

All other ASME Code, Section XI, requirements for which relief was not specifically requested and approved in this relief request remain applicable, including third-party review by the Authorized Nuclear Inservice Inspector.

4.0 REFERENCES

1. Letter GO2-07-178 from SK Gambhir, Energy Northwest, to U.S. Nuclear Regulatory Commission, "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," dated December 13, 2007 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML073620366).

2. Letter GO2-08-105 from SK Gambhir, Energy Northwest, to U.S. Nuclear Regulatory Commission, "Columbia Generating Station, Docket No. 50-397 Response to Request for Additional Information Regarding Request 3ISI-08," dated July 9, 2008 (ADAMS Accession No. ML081980124).
3. Letter GO2-08-147 from SK Gambhir, Energy Northwest, to U.S. Nuclear Regulatory Commission, "Columbia Generating Station, Docket No. 50.397 Response to Request for Additional Information Regarding Request 3ISI-08," dated October 20, 2008 (ADAMS Accession No. ML083030047).
4. Letter GO2-00-141 from RL Webring, Energy Northwest, to U.S. Nuclear Regulatory Commission, "Request for Approval of Alternate Risk-Informed Inservice Inspection (RI-ISI) Requirements," dated August 16, 2000 (ADAMS Accession No. ML003743459).
5. Letter GO2-00-199 from RL Webring, Energy Northwest, to U.S. Nuclear Regulatory Commission, "Request for Approval of Alternate Risk-Informed Inservice Inspection (RI-ISI) Requirements (Additional Information)," dated December 1, 2000 (ADAMS Accession No. ML003776443).
6. Letter GO2-00-204 from D.W. Coleman, Energy Northwest, to U.S. Nuclear Regulatory Commission, "Amended Request for Approval of Alternate Risk-Informed Inservice Inspection (RI-ISI) Requirements," dated December 7, 2000 (ADAMS Accession No. ML003778072).
7. Letter from U.S. Nuclear Regulatory Commission to J. V. Parrish, Energy Northwest, "Safety Evaluation of the Risk-Informed Inservice Inspection (RI-ISI) Program for the Columbia Generating Station, Energy Northwest (TAC No. MA9827)," dated March 9, 2001 (ADAMS Accession No. ML010680136).
8. Electric Power Research Institute, Topical Report EPRI TR-112657, Revision B-A, "Revised Risk-Informed Inservice Inspection Evaluation Procedure, Final Report," December 1999 (ADAMS Accession No. ML013470102).
9. Letters from P.J. O'Regan, Electric Power Research Institute, to Dr. B. Sheron, U.S. Nuclear Regulatory Commission, "Extension of Risk-Informed Inservice Inspection Methodology," dated February 28, 2001, and March 28, 2001 (ADAMS Accession Nos. ML010650169 and ML011070238, respectively).
10. NRC Regulatory Guide 1.178, Revision 1, "An Approach for Plant-Specific Risk-Informed Decisionmaking for Inservice Inspection of Piping," September 2003 (ADAMS Accession No. ML032510128).
11. NRC NUREG-0800, Chapter 3.9.8, Revision 0, "Standard Review Plan For the Review of Risk-Informed Inservice Inspection of Piping," September 2003.
12. NRC NUREG-0800, Chapter 19, Revision 1, "Use of Probabilistic Risk Assessment in Plant-Specific, Risk-Informed Decisionmaking: General Guidance," November 2002.

Principal Contributors: C. Nove
S. Dinsmore

Date: December 3, 2008

December 3, 2008

J. V. Parish

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The detailed results of the NRC staff review are provided in the enclosed safety evaluation. If you have any questions concerning this matter, please call Mr. F. Lyon of my staff at (301) 415-2296 or by electronic mail at fred.lyon@nrc.gov.

Sincerely,

/RA/

Michael T. Markley, Chief
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-397

Enclosure:
As stated

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