



# ENERGY NORTHWEST

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March 7, 2014  
GO2-14-033

10 CFR 50.55a

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

**Subject: COLUMBIA GENERATING STATION, DOCKET NO. 50-397;  
INSERVICE INSPECTION (ISI) PROGRAM REQUEST 3ISI-15**

Reference: Code Case N-805, "Alternative to Class 1 Extended Boundary End of Interval or Class 2 System Leakage Testing of the Reactor Vessel Head Flange O-Ring Leak-Detection System," approved by the American Society of Mechanical Engineers (ASME) on February 25, 2011

Dear Sir or Madam:

Pursuant to 10 CFR 50.55a(a)(3)(ii), Energy Northwest hereby requests NRC approval of the following relief request for the third ten-year inservice inspection (ISI) program interval at Columbia Generating Station ending December 12, 2015. Energy Northwest has determined that compliance with certain inspection requirements of ASME Section XI would result in unnecessary hardship or unusual difficulty without a compensating increase in the level of quality and safety. The details of the 10 CFR 50.55a request are enclosed as Attachment 1.

Energy Northwest requests approval by March 15, 2015 to accommodate application of the request during the next refueling outage.

There are no new commitments made in this submittal. If you have any questions or require additional information, please contact Lisa Williams at 509-377-8148.

Executed this 6<sup>th</sup> day of March, 2014

Respectfully,

A. L. Javorik  
Vice President, Engineering

Attachment: (1) 10 CFR 50.55a Request Number 3ISI-15

A047  
NRR

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cc: NRC RIV Regional Administrator  
CF Lyon, NRC NRR Project Manager  
NRC Sr. Resident Inspector - 988C  
MA Jones – BPA/1399 (email)  
WA Horin – Winston & Strawn (email)

# **INSERVICE INSPECTION (ISI) PROGRAM REQUEST 3ISI-15**

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10 CFR 50.55a Request Number 3ISI-15

Proposed Alternative In Accordance with 10 CFR 50.55a(a)(3)(ii)

Hardship or Unusual Difficulty without Compensating Increase in Level of Quality or Safety

## 1. ASME Code Component(s) Affected

Description: Reactor Pressure Vessel (RPV) head flange leak-off line originating from reactor vessel nozzle N-17

ASME Code Class: Class 1

Examination Category: B-P (all pressure retaining components)

Item Number: B15.10

Components Affected: NPS 1" carbon steel (SA-106, Gr B) leak off piping and fittings(SA-105, Gr II) from RPV nozzle N17 up to and including valves MS-V-14 and MS-V-13 and NPS ¾" (SA-106 Gr B) branch piping up to and including valve MS-V-753.

## 2. Applicable Code Edition and Addenda

Columbia Generating Station ASME Section XI Code is the 2001 Edition through the 2003 Addenda.

## 3. Applicable Code Requirement

System Leakage Test of Class 1 pressure retaining components per Table IWB-2500-1, Examination Category B-P, Item No. B15.10. As referenced in Table IWB-2500-1, IWB-5220, System Leakage Test, subparagraph IWB-5221(a) indicates that system leakage tests shall be conducted at a pressure not less than the pressure corresponding to 100% rated reactor power.

## 4. Reason for Request

The RPV flange seal leak detection piping is separated from the reactor pressure boundary by one passive membrane, which is an O-ring, located on the vessel flange. A second O-ring is located on the opposite side of the tap in the vessel flange (See Figure 1). This piping is required during plant operation in order to detect failure of the inner flange seal O-ring. Failure of the O-ring would result in the annunciation of an alarm in the Control Room (See Figure 2). Failure of the inner O-ring is the only condition under

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which this line is pressurized. Therefore, the line is not expected to be pressurized during the system pressure test following a refueling outage.

The configuration of this piping precludes system pressure testing while the vessel head is removed because the configuration of the vessel tap, coupled with the high test pressure requirement, prevents the tap in the flange from being temporarily plugged or connected to other piping. The opening in the flange is smooth walled, making the effectiveness of a temporary seal very limited. Failure of this seal could possibly cause ejection of the device used for plugging or connecting to the vessel.

The configuration also precludes pressure testing with the vessel head installed because the seal prevents complete filling of the piping, which has no vent available. The top head of the vessel contains two grooves that hold the O-rings. The O-rings are held in place by a series of retainer clips that are housed in recessed cavities in the flange face. If a pressure test was performed with the head on, the inner O-ring would be pressurized in a direction opposite to what it would see in normal operation. This test pressure would result in a net inward force on the inner O-ring that would tend to push it into the recessed cavities that house the retainer clips. The thin O-ring material would very likely be damaged by this inward force.

Purposely failing or not installing the inner O-ring in order to perform a pressure test would require replacing the new outer and possibly the new inner O-ring each time the test is conducted. This would result in additional time needed during the outage and additional radiation exposure to personnel associated with the removal and reinstallation of the RPV head.

### 5. Proposed Alternative and Basis for Use

In lieu of the pressure requirements of IWB-5221(a), Columbia proposes to perform a VT-2 visual examination during the next refueling outage in Spring 2015 on the accessible portions of the affected components. This is the last refueling outage in the third inservice inspection (ISI) program interval. The examination will be conducted with the affected components subject to static pressure head with the RPV head removed and the refueling cavity filled to its normal refueling water level for at least four (4) hours. The static head developed with the leak-off lines filled with water will allow for detection of pressure boundary failures.

This proposed test methodology is identical to that presented in Code Case N-805 (Reference 1). However, this Code Case has not yet been approved by the NRC and is not yet identified in the current revision of Regulatory Guide 1.147, "In-service Inspection Code Case Acceptability, ASME Section XI, Division 1" (Reference 2).

Should the inner O-ring leak during the operating cycle, it will be identified through the alarm of a pressure switch in the main control room. Upon receiving an alarm, operator actions will involve monitoring: (1) drywell floor drain leakage per site procedures; (2)

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drywell temperature and pressure per site procedures; (3) containment radiation monitors located in the control room; and (5) drywell fission products. If monitoring actions indicate a pressure boundary failure (outer seal failure), operators are directed per the annunciator response procedure to Technical Specification 3.4.5, RCS Operational Leakage. Similarly, should the inner O-ring leak during the operating cycle and a through wall leak of the reactor vessel flange leak-off piping exist, leakage will be detected in the same manner described above for leakage resulting from outer seal failure. Since there is reasonable assurance that the proposed alternate examination will detect gross indications of leakage should any exist from this piping, Columbia requests authorization to use the proposed alternative pursuant to 10 CFR 50.55a(a)(3)(ii) on the basis that compliance with the specified requirement would result in hardship or difficulty without a compensating increase in the level of quality and safety.

### 6. Duration of Proposed Alternative

The duration of this request is for the third inservice inspection interval ending December 12, 2015.

### 7. Precedents

*The following precedents pertain to approved relief requests for leak-off lines classified as ASME Code Class 1:*

(1) Millstone Power Station, Unit No. 3 - Issuance of Relief Request IR-3-11 Regarding Use of American Society of Mechanical Engineering Code, Section XI, 2004 Edition (TAC No. ME1263); April 29, 2010; Docket No. 50-423 [ADAMS Accession No. ML101040042]

(2) Limerick Generating Station, Units 1 and 2, Evaluation of Relief Requests RR-33, RR- 34 and RR-35, Associated with the Second In-service Inspection Interval (TAC Nos. MD8071, MD8073, MD8074, MD8075, and MD8076); January 27, 2009; Docket Nos. 50-352 and 50-353 [ADAMS Accession No. ML090060218]

(3) North Anna Power Station, Unit No's. 1 and 2 Re: ASME Code Third 10-year ISI Program. (TAC No's MC5588, MC5589, MC5590, MC5591, MC5592, MC5593, MC5594, MC5595, MC5599 and MC5600); February 9, 2006; Docket Nos. 50-338 and 50-339 [ADAMS Accession No. ML060450517]

*The following precedents pertain to approved relief requests for leak-off lines classified as ASME Code Class 2:*

(4) Vermont Yankee, Vermont Yankee Nuclear Power Station - Relief Request ISI-PT-02: Fourth 10-Year Inservice Inspection Interval, approved by the NRC in a letter dated March 1, 2013 [ADAMS Accession No. ML13055A009]

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(5) Dresden, Units 2 and 3, Dresden Nuclear Power Station, Units 2 and 3 – Safety Evaluation in Support of Request for Relief Associated with the Fifth 10-Year Inservice Inspection Interval Program”, Enclosure 3 approved by the NRC in a letter dated September 30, 2013 [ADAMS Accession 1\10. ML13258A003]

### **8. References**

- 1) Code Case N-805, "Alternative to Class 1 Extended Boundary End of Interval or Class 2 System Leakage Testing of the Reactor Vessel Head Flange O-Ring Leak-Detection System," approved by the American Society of Mechanical Engineers (ASME) on February 25, 2011
- 2) Regulatory Guide 1.147, "Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1," Revision 16 dated October 2010

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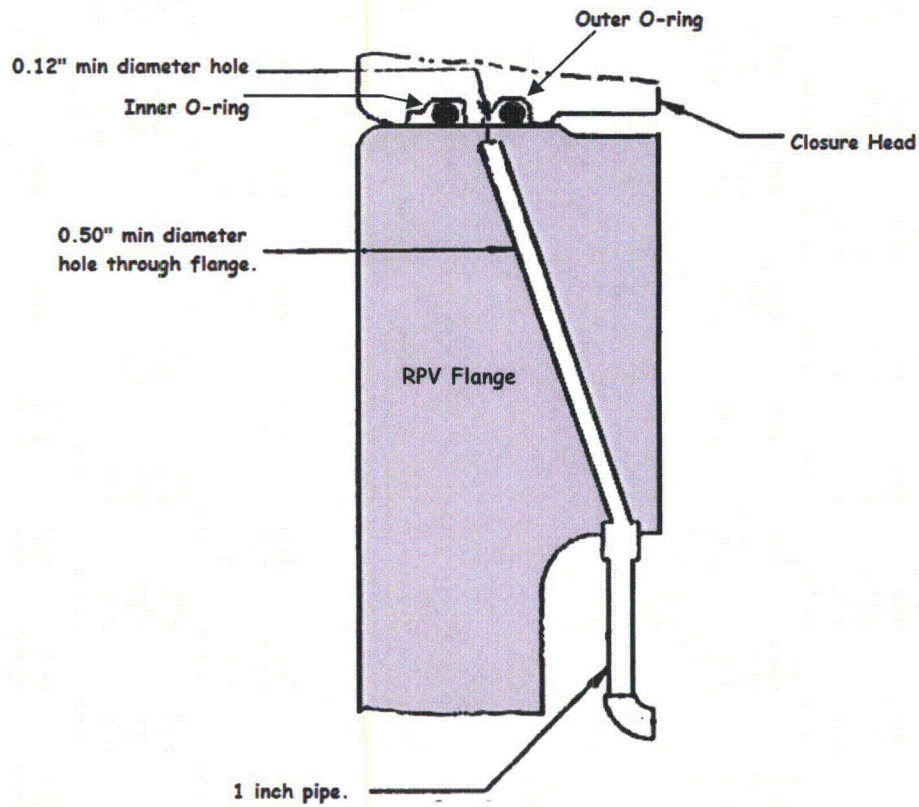


Figure 1 Detail of RPV Head Flange Leak Detection Tap

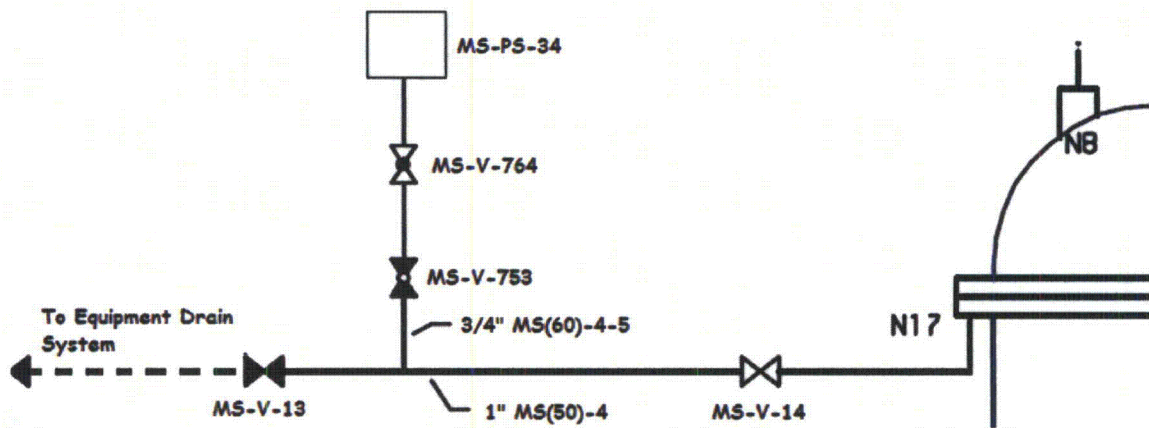


Figure 2 RPV Seal Leak-off Detection Line Schematic