

April 16, 2001  
GO2-01-058

Docket No. 50-397

U.S. Nuclear Regulatory Commission  
Document Control Desk  
Washington, D.C. 20555

Gentlemen:

**Subject: COLUMBIA GENERATING STATION, OPERATING LICENSE NPF-21  
REQUEST FOR AMENDMENT  
UNISOLABLE PIPING RUN BETWEEN CONTROL ROD DRIVE AND  
REACTOR CORE ISOLATION COOLING PUMP ROOMS**

- References:
- 1) Letter, dated June 27, 2000, LJ Smith (NRC), to JV Parrish (Energy Northwest), "WNP-2 Inspection Report No. 50-397/00-10"
  - 2) Letter, dated November 11, 1987, GW Knighton (NRC), to GC Sorensen (Supply System), "WNP-2 FSAR Amendment 37 (TAC NO. 63528)"

In accordance with the Code of Federal Regulations, Title 10, Parts 50.59, 50.90, and 2.101 Energy Northwest hereby submits a request for amendment to the Columbia Generating Station Operating License. We are requesting NRC approval for a change to the facility as described in the Final Safety Analysis Report (FSAR). The change allows for an unisolable drain line between the reactor core isolation cooling (RCIC) and control rod drive/condensate (CRD/COND) pump rooms. The NRC concluded (Reference 1) that the change constituted an unreviewed safety question (USQ) because the unisolable drain line represented a departure from commitments in the FSAR to have water-resistant compartments, and could result in the malfunction of additional equipment important to safety during a flooding event.

Energy Northwest is requesting modification of the requirement that the RCIC and CRD/COND pump rooms be water-resistant (or watertight) and connected by an isolable drain line. Analysis has shown that sufficient safe shutdown equipment remains unaffected by a flood affecting both the RCIC and CRD/COND pump rooms, thus preserving the ability to safely shutdown the plant. In addition, doors and penetrations in Emergency Core Cooling System, RCIC and CRD/COND pump rooms are provided with seals that help minimize leakage and the effects of flooding.

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For piping system failures outside containment, the analysis methodology used at Energy Northwest ensures that adequate safety systems remain unaffected by flooding to assure safe plant shutdown in the event of such a failure. The methodology is consistent with Branch Technical Position (BTP) ASB 3-1, "Protection Against Postulated Piping Failures in Fluid Systems Outside Containment," as endorsed by NUREG-0800, "Standard Review Plan," Section 3.6.1, "Plant Design for Protection Against Postulated Piping Failures in Fluid Systems Outside Containment." BTP ASB 3-1 notes that, "It is the intent of this design approach that postulated piping failures in fluid systems should not cause a loss of function of essential safety-related systems and that nuclear plants should be able to withstand postulated failures of any fluid system piping outside containment, taking into account the direct results of such failure and the further failure of any single active component, with acceptable offsite consequences." BTP ASB 3-1 defines essential systems as those "required to shut down the reactor and mitigate the consequences of a postulated piping failure, without offsite power."

The Energy Northwest flooding safe shutdown analysis identifies safety-related equipment that is available for mitigating piping system failures outside containment. The specific equipment available varies with break location. However, the specific equipment available includes at least, if not more than (i.e. excess redundancy), the minimum equipment credited for safe shutdown. As identified by the NRC in Reference 1, there was no minimum level of acceptable equipment specified in the Columbia Generating Station licensing basis for flood protection. As such, the NRC indicated that the change to the facility did not constitute the removal of excess redundancy specified in the licensing basis. Energy Northwest intends to change our FSAR to specify the minimum features credited for achieving safe shutdown of the plant following a high or moderate energy pipe break/crack, and assuming a worst-case single active component failure. These features are shown in Attachment 4, and constitute the licensing basis acceptance limit for meeting the design criteria of BTP ASB 3-1 for essential safety-related systems.

The additional equipment noted in Reference 1 to be affected by simultaneous flooding in the RCIC and CRD/COND pump rooms, is not the equipment credited for achieving and maintaining safe shutdown during the flooding event. Had our licensing basis clearly established the minimum set of equipment necessary for safe shutdown following a high or moderate energy pipe break/crack, the identified change to the facility associated with the unisolable drainline between the RCIC and CRD/COND would be acceptable and may not have required NRC approval (i.e. not a USQ). This position is consistent with Nuclear Energy Institute (NEI) 96-07, Revision 1, "Guidelines for 10CFR50.59 Implementation," which is endorsed by Regulatory Guide 1-187, "Guidance for Implementation of 10CFR50.59, Changes, Tests, and Experiments." NEI 96-07, Revision 1, specifies that "the term 'malfunction of an SSC important to safety' refers to the failure of structures, systems, and components (SSCs) *to perform their intended design functions*—including both nonsafety-related and safety-related SSCs" [emphasis added]. Any future identification of a similar loss of equipment due to a high or moderate energy pipe break/crack and the associated flooding will be evaluated against this clarified licensing basis. If the loss of equipment does not include any of the equipment credited for safe shutdown (for this event), no license amendment will be required.

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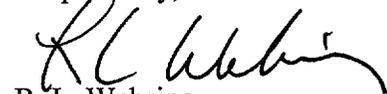
Additional information has been attached to this letter to complete the amendment request. Attachment 1 provides a detailed description and basis for acceptability of the proposed change. Attachment 2 describes an evaluation of the proposed change in accordance with 10CFR50.92(c) and concludes that the change does not result in a significant hazards consideration. Attachment 3 provides the environmental assessment applicability review and notes that the proposed change meets the eligibility criteria for a categorical exclusion as set forth in 10CFR51.22(c)(9). Therefore, in accordance with 10CFR51.22(b), an environmental assessment of the change is not required. Attachment 4 shows the minimum features credited for achieving safe shutdown of the plant following a high or moderate energy pipe break/crack, assuming a worst-case single active component failure.

Upon NRC approval of this amendment request, Energy Northwest will revise our FSAR accordingly to clarify the existence of the unisolable drain line. We will also document that sufficient safe shutdown equipment remains unaffected by a flood affecting both the RCIC and CRD/COND pump rooms, thus preserving the ability to safely shutdown the plant. The terms "watertight" and "water-resistant" in the FSAR will also be replaced with discussions that more clearly state that during flooding events these barriers exhibit a minimal amount of water leakage and serve to minimize the effects of flooding. In addition, we will revise our FSAR to specify the minimum features necessary to achieve safe shutdown of the plant following a high or moderate energy pipe break/crack, assuming a worst-case single active component failure.

This request for an amendment has been reviewed and approved by the Columbia Generating Station Plant Operations Committee and reviewed by the Energy Northwest Corporate Nuclear Safety Review Board. In accordance with 10CFR50.91, the State of Washington has been provided a copy of this letter.

Should you have any questions or desire additional information regarding this matter, please contact me or P.J. Inserra at (509) 377-4147.

Respectfully,



R. L. Webring  
Vice President, Operations Support/PIO  
Mail Drop PE08

**Attachments**

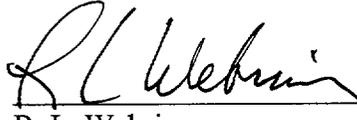
cc: EW Merschoff - NRC RIV  
JS Cushing - NRC NRR  
NRC Sr. Resident Inspector - 988C  
DL Williams - BPA/1399  
DJ Ross - EFSEC  
TC Poindexter - Winston & Strawn

STATE OF WASHINGTON )  
 )  
COUNTY OF BENTON )

Subject: Request for Amendment  
Unisolable Drain Line

I, R.L. WEBRING, being duly sworn, subscribe to and say that I am the Vice President, Operations Support/PIO for ENERGY NORTHWEST, the applicant herein; that I have the full authority to execute this oath; that I have reviewed the foregoing; and that to the best of my knowledge, information, and belief the statements made in it are true.

DATE 4/16/01, 2001

  
\_\_\_\_\_  
R. L. Webring  
Vice President, Operations Support/PIO

On this date personally appeared before me R. L. Webring, to me known to be the individual who executed the foregoing instrument, and acknowledged that he signed the same as his free act and deed for the uses and purposes herein mentioned.

GIVEN under my hand and seal this 16 day of April 2001.

  
\_\_\_\_\_  
Notary Public in and for the  
STATE OF WASHINGTON

Residing at Kennecook, WA

My Commission Expires 4/28/02



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**Attachment 1**

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**Description of Proposed Change**

**Summary of Proposed Change**

Energy Northwest is requesting NRC approval to modify the requirement that the reactor core isolation cooling (RCIC) and control rod drive/condensate (CRD/COND) pump rooms be water-resistant and connected by an isolable drain line. The NRC recently concluded that the existence of an unisolable drain line between the RCIC and CRD/COND pump rooms was an unreviewed safety question (USQ). The NRC concluded that the line represented a departure from commitments in the Final Safety Analysis Report (FSAR) to have water-resistant compartments, and could result in the malfunction of additional pieces of equipment important to safety during a flooding event. However, the NRC did acknowledge in Reference 1 that the change to the facility was of very low risk significance. Energy Northwest has concluded, based on revisions to our flooding safe shutdown analysis, that sufficient safe shutdown equipment remains unaffected by a flood affecting both the RCIC and CRD/COND pump rooms, thus preserving the ability to safely shutdown the plant. In addition, doors and penetrations in Emergency Core Cooling System (ECCS), RCIC and CRD/COND pump rooms are not required to be water-resistant or watertight, but are provided with seals that help minimize leakage and the effects of flooding.

**Basis for the Proposed Change**

The drain line connection between the RCIC and CRD/COND pump rooms is shown in FSAR Figure 9.3-9. Since the drain line does not contain an isolation valve, a pipe break in either room results in flooding both rooms simultaneously. A conservative revision to the flooding safe shutdown analysis shows that even with a worst case single failure (loss of all Division 1 or 2 equipment), sufficient safe shutdown equipment remains and safe shutdown can be accomplished. Important systems remaining are Divisions 1 or 2 of the Automatic Depressurization System (ADS) and either Division 1 or 2 of the Residual Heat Removal (RHR) System. The combination of safety relief valves and an RHR System with a heat exchanger can be used in the alternate shutdown cooling mode of RHR operation to maintain core cooling (low pressure coolant injection), provide suppression pool cooling, and provide long term decay heat removal. These remaining systems are the same as the equipment providing the safe shutdown path approved by the NRC in Reference 2 for Appendix R post-fire safe shutdown.

A flooding analysis shows that the effects of the postulated flood from a pipe crack plus other normal leakage spread over the large floor area of the combined RCIC and CRD/COND pump rooms results in a flood event that develops slowly. Safety-related leak detection sensing instrumentation is available in the RCIC pump room to monitor for leaks, thus allowing plant operators time to terminate the flood and limit the amount of equipment potentially lost from the event. With consideration of operator action and mitigation, the flood should be terminated quickly with very few components affected. Plant procedures provide direction for operator actions to mitigate floods.

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The terms "water-resistant" and "watertight," as used in the FSAR to describe barriers such as pump room penetrations and doors located in the Reactor Building, 422 foot elevation, are not an accurate description of the performance of these components during a flooding event. Reactor Building pump room penetrations and doors have seals that can exhibit a minimal amount of water leakage (approximately 4 gpm) yet minimize flooding between rooms even with significant hydrostatic pressure generated from flooding water levels. The minimal water leakage past these seals is consistent with and documented in existing flooding analysis assumptions.

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**Evaluation of Significant Hazards Consideration**

**Summary of Proposed Change**

Energy Northwest is requesting modification of the requirement that the reactor core isolation cooling (RCIC) and control rod drive/condensate (CRD/COND) pump rooms be water-resistant or watertight, and connected by an isolable drain line. Analysis has shown that sufficient safe shutdown equipment remains unaffected by a flood affecting both the RCIC and CRD/COND pump rooms, thus preserving the ability to safely shutdown the plant. In addition, doors and penetrations in the Emergency Core Cooling System (ECCS), RCIC and CRD/COND pump rooms are provided with seals that help minimize leakage and the effects of flooding. The minimal water leakage past these seals is consistent with and documented in existing flooding analysis assumptions.

**No Significant Hazards Consideration Determination**

Energy Northwest has evaluated the proposed change to the facility as described in the Final Safety Analysis Report (FSAR) using criteria established in 10CFR50.92(c) and has determined that it does not represent a significant hazards consideration as described below:

- **The operation of Columbia Generating Station in accordance with the proposed amendment will not involve a significant increase in the probability or consequences of an accident previously evaluated.**

The proposed change to allow operation of the plant with an open drain line between the RCIC and CRD/COND pump rooms does not increase the chances of a flooding event occurring in the RCIC or CRD/COND pump rooms. Also, operating the plant with an open drain line between the RCIC and CRD/COND pump rooms does not increase the radiological consequences of any previously evaluated accidents. A conservative revision to the flooding safe shutdown analysis, which combines the effects on equipment of both rooms flooding simultaneously, shows that sufficient safe shutdown equipment remains available and safe plant shutdown can be accomplished. Remaining systems are the same as the equipment providing the safe shutdown path approved by the NRC for Appendix R post-fire safe shutdown scenarios. Furthermore, the effects of the postulated flood from a pipe crack plus other normal leakage spread over the large floor area of the combined RCIC and CRD/COND rooms results in a flood event that develops slowly. If credited, safety-related leak detection instrumentation is available to provide plant operators more time to terminate the flood and limit the amount of equipment potentially lost from the event. With consideration of operator action and mitigation, the flood could be terminated quickly with minimal components affected. Plant procedures provide direction for operators to take actions to mitigate floods.

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The proposed change to remove the requirement that pump room wall penetrations and doors located in the Reactor Building be "water-resistant" or "watertight" does not contribute to the likelihood that a flooding event will occur, nor does it increase the radiological dose received in any previously evaluated accidents. Reactor Building pump room doors and penetrations will exhibit a minimal amount of leakage during a flooding event, and have seals that can leak yet still minimize flooding between rooms even with significant hydrostatic pressure generated from flooding water levels. The minimal water leakage past these seals is consistent with assumptions documented in the existing flooding analysis.

Therefore, operation of Columbia Generating Station in accordance with the proposed amendment will not involve a significant increase in the probability or consequences of an accident previously evaluated.

- **The operation of Columbia Generating Station in accordance with the proposed amendment will not create the possibility of a new or different kind of accident from any accident previously evaluated.**

The proposed change to allow an unisolable drain line between the RCIC and CRD/COND pump rooms is accounted for in a revised and conservative flooding safe shutdown analysis. The flooding safe shutdown analysis documents the impact of flooding on equipment in the pump rooms, and on electrical circuits routed through, but not terminated in, the RCIC and CRD/COND pump rooms. From this analysis no link could be established between affected systems and mechanisms that could create a new or different kind of accident. The analysis also concluded that the effects of the unisolable drain line and subsequent flood would not cause a transient that would be imposed on the current analysis that assumes a flood with a single active failure. Therefore, the unisolable line between the RCIC and CRD/COND rooms will not create the possibility of a new or different kind of accident.

The proposed change to allow minimal water leakage past ECCS, RCIC and CRD/COND pump room doors and penetrations is consistent with and documented in existing flooding analysis assumptions. These rooms do not need to be water-resistant or watertight.

Therefore, operation of Columbia Generating Station in accordance with the proposed amendment will not create the possibility of a new or different kind of accident from any accident previously evaluated.

- **The operation of Columbia Generating Station in accordance with the proposed amendment will not involve a significant reduction in the margin of safety.**

The proposed change to allow an unisolable drain line between the RCIC and CRD/COND pump rooms does not result in a significant reduction in the margin of safety. The change is of very low risk significance, with an increase in core damage frequency of less than  $1E-10$ . Furthermore, a revised and conservative flooding safe shutdown analysis has concluded, as with previous flooding analysis for the ECCS, RCIC and CRD/COND pump rooms, that the ability to safely shutdown the

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plant has been preserved when considering a flooding scenario which impacts both the RCIC and CRD/COND pump rooms. In addition, safety-related leak detection instrumentation is available and could be credited to provide plant operators more time to terminate the flood and limit the amount of equipment potentially lost from the event. With consideration of operator action and mitigation, the flood could be terminated quickly with minimal components affected. Plant procedures provide direction for operators to take actions to mitigate flooding in ECCS, RCIC and CRD/COND pump rooms.

The proposed change to allow minimal water leakage past ECCS, RCIC and CRD/COND pump room doors and penetrations does not result in a significant reduction in the margin of safety because it does not prevent the plant from achieving safe shutdown during a flooding event. Minimal water leakage is consistent with and documented in existing flooding analysis assumptions.

Therefore, the operation of Columbia Generating Station in accordance with the proposed amendment will not involve a significant reduction in the margin of safety.

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**Environmental Assessment Applicability Review**

Energy Northwest has evaluated the proposed amendment against the criteria for identification of licensing and regulatory actions requiring environmental assessment in accordance with 10CFR51.21.

The proposed change meets the criteria for categorical exclusion as provided under 10CFR51.22(c)(9) because the change does not pose a significant hazards considerations nor does it involve a significant increase in the amounts, or a change in the types of any effluent that may be released off-site.

Additionally, this request does not involve a significant increase in individual or cumulative occupational radiation exposure.

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Results of Columbia Generating Station's flooding safe shutdown analysis for high and moderate-energy line breaks outside containment shows that, as a minimum, the following features remain available, assuming a worst-case single active component failure. This list constitutes the Licensing Basis Acceptance Limit for meeting the acceptance criteria of Branch Technical Position (BTP) ASB 3-1, "Protection Against Postulated Piping Failures in Fluid Systems Outside Containment."

- Pipe break/crack detection.
- Automatic, high-energy line break isolation equipment.
- Reactor Protection System for scram function.
- Main Steam Isolation Valves.
- Five (5) Safety Relief Valves for reactor vessel depressurization.
- A single Residual Heat Removal loop with a heat exchanger (loop A or B), in the alternate shutdown cooling mode providing reactor vessel inventory makeup (short term cooling) and reactor vessel and suppression pool inventory cooling (long term cooling).
- Supporting Service Water.
- Supporting Heating, Ventilation, and Air Conditioning.
- Supporting electrical power sources.