ENERGY NORTHWEST
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August 17, 2005
GO2-05-145

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

Subject: **COLUMBIA GENERATING STATION, DOCKET NO. 50-397 LICENSE AMENDMENT REQUEST FOR ONE-TIME EXTENSION OF THE COMPLETION TIME FOR CONDITION B OF TECHNICAL SPECIFICATION 3.7.1 AND EXEMPTION FROM NOTE 1 OF REQUIRED ACTION B.1**

Dear Sir or Madam:

Pursuant to 10 CFR 50.90, Energy Northwest is submitting this request for a one-time extension of the 72-hour Completion Time for the Required Action of Condition B of Technical Specification (TS) 3.7.1, "Standby Service Water (SW) System and Ultimate Heat Sink (UHS)" and a one-time exemption from Note 1 of part B.1 of this Required Action. TS 3.7.1.B addresses the condition of one SW subsystem being inoperable. This one-time extension is for an additional 72 hours and will result in a 144 hour Completion Time for an inoperable SW subsystem.

As discussed in several conversations with the NRC, Energy Northwest has determined a need to perform extensive maintenance on the SW train B pump. This activity is expected to exceed the current 72-hour Completion Time of TS 3.7.1.B. Energy Northwest believes it is prudent to refurbish/replace this pump as soon as practicable and is currently procuring the necessary parts which have a delivery schedule of approximately 10 to 12 weeks. It is prudent to do this work on-line, in lieu of the next outage of sufficient duration, and to plan the work such that a plant shutdown transient is avoided. Therefore this one-time amendment request is made in the interest of minimizing risk. The need to perform this maintenance was identified as part of the extent of condition evaluation performed in response to the unexpected inoperability of the SW 1A pump on June 15, 2005.

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Energy Northwest has evaluated the proposed extension of this Completion Time based upon both a deterministic evaluation and a risk-informed assessment. As discussed in the enclosure:

- The proposed Completion Time extension complies with the applicable regulatory requirements and Energy Northwest commitments.

- Since a single failure is not considered while a plant is in a TS Action Statement, the operable redundant equipment is capable of performing the required safety functions and to maintain the plant design basis. Thus, the requested action will not alter the assumptions relative to the mitigation of a design basis accident or transient.

- Energy Northwest has evaluated the risk impacts of having one SW subsystem inoperable for an additional 72 hours. The resulting increase in core damage frequency and large early release frequency are small and consistent with the intent of the Commission's Safety Goal Policy Statement and the regulatory position contained in Regulatory Guides 1.174 and 1.177. In addition, Energy Northwest uses a proceduralized risk-based approach for scheduling and performing maintenance, which limits removal of risk sensitive equipment from service during SW subsystem outages.

When taken together, these risk-informed results provide a high degree of confidence that the public's health and safety will remain adequately protected.

This request for a one-time Completion Time extension has been closely modeled after a similar risk-informed request submitted by the Tennessee Valley Authority (TVA) for the Browns Ferry Plant on April 26, 2005 and approved by the NRC by letter dated May 9, 2005. This TVA amendment is slightly different in that the extension approved for TVA was for the Emergency Core Cooling System. A 72 hour extension for continuing operation with an inoperable SW subsystem condition was requested by First Energy for the Perry plant via the Notification of Enforcement Discretion (NOED) process. First Energy's request for this NOED was submitted on September 8, 2003 and approved by the NRC by letter dated September 10, 2003.

Attachment 1 provides a mark-up of the requested TS change and Attachment 2 provides a mark-up of the associated Bases change.

The Columbia Plant Operations Committee and Corporate Nuclear Safety Review Board have reviewed the proposed license amendment.

Energy Northwest is notifying the State of Washington of this request for a one-time license amendment by providing a copy of this letter and its Enclosure and Attachments.

Although this request does not meet the criteria for an exigent or emergency change, an expeditious approval is necessary to support the proposed maintenance schedule. Energy Northwest requests approval of this amendment by October 26, 2005 with an implementation period of 5 days. An expeditious approval would minimize risk and facilitate safe operation by allowing the performance of desirable maintenance at the earliest opportunity and minimizing the potential for an undesirable plant transient.

The commitments made in this submittal are delineated in Attachment 3. If there are any questions regarding this submittal, please contact Mike Brandon at (509) 377-4758.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on August 17, 2005.

Respectfully,

WS Oxenford
Vice President, Technical Services
Mail Drop PE04

Enclosure:
Evaluation of the Proposed Change

Attachments:
1. Proposed Technical Specifications Change (mark-up)
2. Changes to Technical Specifications Bases (mark-up)
3. List of Regulatory Commitments

cc: BS Mallett – NRC RIV
BJ Benney – NRC NRR
NRC Senior Resident Inspector/988C
RN Sherman – BPA/1399
WA Horin – Winston & Strawn
JO Luce – EFSEC
RR Cowley - WDOH

Evaluation of Proposed Change

1.0 DESCRIPTION

This submittal requests an amendment to Operating License NPF-21 for the Columbia Generating Station (Columbia). The proposed amendment would revise the Completion Time (CT) for the Required Action of Condition B of Technical Specification (TS) 3.7.1, "Standby Service Water (SW) System and Ultimate Heat Sink (UHS)," from 72 to 144 hours, on a one-time basis and allow a one-time exemption from Note 1 of the Required Action 3.7.1.B.1. This CT extension is being requested to allow the time necessary to refurbish/replace the Service Water (SW) subsystem B pump, shaft, and shaft couplings.

Although this request does not meet the criteria for an exigent or emergency change, an expeditious approval is needed. An expeditious approval would support our efforts to appropriately manage risk and to facilitate safe operation by allowing the performance of desirable maintenance at the earliest opportunity and minimizing the potential for an undesirable plant transient.

This request for a one-time CT extension has been closely modeled after a similar risk-informed request submitted by the Tennessee Valley Authority (TVA) for the Browns Ferry Plant on April 26, 2005 and approved by the NRC by letter dated May 9, 2005. This TVA amendment is slightly different in that the extension approved for TVA was for the Emergency Core Cooling System. Precedence for a 72 hour extension for a SW subsystem exists in the form of a Notification of Enforcement Discretion (NOED) granted to First Energy for the Perry plant. First Energy's NOED request was submitted on September 8, 2003 and approved by the NRC by letter dated September 10, 2003.

2.0 PROPOSED CHANGE

Energy Northwest proposes to extend, on a one-time basis, the CT of TS 3.7.1 Condition B by a period of 72 hours for a total CT of 144 hours and allow a one-time exemption from Note 1 of Required Action B.1. This change is proposed to be implemented by the addition of a footnote to TS 3.7.1 Condition B. The footnote would read as follows:

> "On a one-time basis, during the refurbishment/replacement of the 1B Service Water Pump during Cycle 18, the COMPLETION TIME for an inoperable service water subsystem is extended to 144 hours. During this extended COMPLETION TIME, the action specified in Note 1 of Required Action B.1 is waived based on the implementation of selected risk management compensatory measures. This one-time extension expires at the end of Cycle 18."

A marked-up copy of proposed change to the TS is provided in Attachment 1.

Upon approval of the proposed license amendment, Energy Northwest will implement a change to the applicable TS Bases to add the following information:

> "On a one-time basis, during the refurbishment/replacement of the 1B Service Water Pump during Cycle 18, the COMPLETION TIME for an inoperable service water subsystem is extended to 144 hours. The one-time extension is based upon a risk assessment performed in accordance with Regulatory Guides 1.174 and 1.177. During this extended COMPLETION TIME, administrative controls must be implemented to enhance the reliability of required electrical sources and to minimize plant activities that might challenge other safety-related equipment. This one-time extension expires at the end of Cycle 18."
>
> "During the one-time extended COMPLETION TIME, the action to enter LCO 3.8.1, as directed by Note 1, is waived based on the implementation of selected risk management compensatory measures and the verification that a loss of safety function does not exist."

A marked-up copy of proposed change to the TS Bases is provided in Attachment 2.

3.0 BACKGROUND

3.1 Reason for requesting change on an expeditious basis

On June 15, 2005, when Columbia was in cold shutdown, a step change in the flow rate and discharge pressure was observed during routine testing of the Service Water (SW) pump 1A in the SW A subsystem. Based on this unexpected change in performance, the 1A pump was declared inoperable and an investigation of the cause was initiated. Disassembly of the pump resulted in the discovery of two failed shaft end flanges. The results of the metallurgical examination indicate that shaft end flanges failed from Intergranular Stress Corrosion Cracking (IGSCC). The presence of heavy oxides in the cracks and irregular crack tip profile on the fracture surfaces were indicative of a slow crack growth mechanism. The pump, pump shafts, and shaft couplings were replaced and the 1A SW pump was restored to operable status.

During the replacement of the 1A SW pump, the plant tripped due to an unrelated event. Prior to restarting, an extent of condition evaluation concluded the 1B pump was susceptible to the same failure mechanism that caused the 1A pump to be declared inoperable. An operability evaluation was performed on the 1B SW pump. The 1B SW pump was determined operable based on no comparable indications of degraded pump performance. Current surveillance tests and other performance monitoring activities supported the conclusion that the 1B pump was operable. Based on this determination of operability, Columbia resumed power operations. Plant management also concluded it was prudent to inspect and refurbish the 1B pump at the earliest opportunity. In order to fully inspect the pump, the shaft couplings will be destroyed in the disassembly process. Therefore, the replacement parts must be procured to restore the pump to an operable status after the inspection. The required spare parts had been used during the

replacement of the 1A pump and the necessary replacement parts have been ordered with an expedited delivery date at the end of October 2005. The work planning package has determined the existing 72-hour TS Completion Time is an insufficient amount of time and an extended TS Completion Time is needed. The approval of this amendment request on a schedule that is comparable to the parts procurement schedule will allow this work to be performed on-line, soon after the replacement parts have been received, and will serve to minimize risk.

3.2 Reason for requesting an exemption from Note 1 of Required Action B.1

The one-time exemption from note 1 of Required Action B.1 is requested to avoid entering the Required Action of TS 3.8.1 "AC Sources Operating" for the diesel generator supported by the inoperable SW B subsystem. Since the CT of the supported DG is also 72 hours, the option of requesting an extension to Required Action B of TS 3.8.1 was considered. Energy Northwest currently has a CT extension request (a 14-day CT) for the Required Action B of TS 3.8.1 on the docket under Staff review. An additional request to amend TS 3.8.1.B would result in the undesirable condition of having two differing CT extension requests on the same TS action under staff review at the same time. The 14 day extension currently under staff review is for a significantly longer extension (14 days vice the 6 day total CT this request) and involves a more extensive justification and a more complex set of compensatory measures. Therefore, requesting an exemption from Note 1 of TS 3.7.1.B serves to minimize the complexity of this amendment request. Compliance with LCO 3.0.6 (see below discussion) coupled with the compensatory measures described in section 4.1.2 of this submittal, serve to ensure a level of safety commensurate with that provided by Note 1 of TS 3.7.1.B.

Consistent with the requirements of LCO 3.0.6, the safety function of the DG system will be maintained and provided by the division 1 DG. If this safety function was lost, then the appropriate TS action would be taken. The Columbia TS do include a Safety Function Determination Program (SFDP). The SFDP was added to the TS as a result of the conversion to the Improved TS (ITS). Training on the SFDP was provided to all licensed operations personnel prior to implementation of ITS. This program includes provisions for cross divisional verifications to ensure a loss of the capability to perform a safety function assumed in the accident analysis does not go undetected. TS LCO 3.0.6 establishes requirements regarding supported systems when support systems are inoperable. Upon entry into TS LCO 3.0.6, an evaluation is required to determine whether there has been a loss of safety function as implemented by Columbia Procedure SWP-OPS-02 "Safety Function Determination Program." Additionally, other limitations, remedial actions, or compensatory actions may be identified as a result of the support system inoperability and corresponding exception to entering supported system Conditions and Required Actions. The SFDP implements the requirements of TS LCO 3.0.6.

3.3 System Description

The SW System is designed to remove heat from plant systems that are required for a safe reactor shutdown following a design basis accident (DBA) or transient. The SW

System provides cooling water for the removal of heat from unit auxiliaries, such as Residual Heat Removal (RHR) System heat exchangers, standby DGs, and heat exchangers/room coolers for Emergency Core Cooling System (ECCS) equipment and critical electrical equipment. The SW System also provides cooling to unit components (e.g., Reactor Core Isolation Cooling (RCIC) System), as required, during normal shutdown and reactor isolation modes. Heat exchangers and room coolers perform a support function to the SW System by transferring the heat generated by plant equipment and systems to the SW System. The SW System consists of two independent cooling water headers (subsystems A and B), and their associated pumps, piping, valves, and instrumentation. The two SW pumps, or one SW pump and the high pressure core spray service water pump (LCO 3.7.2, "High Pressure Core Spray (HPCS) Service Water (SW) System"), are sized to provide sufficient cooling capacity to support the required safety related systems during safe shutdown of the unit following a loss of coolant accident (LOCA). Subsystems A and B are redundant and service equipment in Divisions 1 and 2, respectively. Cooling water is pumped from two spray ponds by the two SW pumps to the essential components through the two main redundant supply headers (subsystems A and B). After removing heat from the components, the water is discharged to the spray ponds via the spray rings, where the heat is rejected through evaporation. Subsystems A and B supply cooling water to redundant equipment required for a safe reactor shutdown. The SW System is designed to withstand a single active failure, coincident with a loss of offsite power, without losing the capability to supply adequate cooling water to equipment required for safe reactor shutdown. Following a DBA or transient, the SW System will operate automatically upon receipt of an ECCS, DG, or RCIC start signal.

4.0 TECHNICAL ANALYSIS

Energy Northwest has evaluated the proposed SW CT extension both deterministically and through a risk-informed assessment. As discussed below, the proposed CT extension complies with the applicable regulatory requirements and Energy Northwest commitments.

Since a single failure is not considered while a plant is in a TS Action Statement, the operable redundant SW subsystem is capable of performing its required function and to maintain the plant design basis. Thus, the requested action will not alter the assumptions relative to the mitigation of a design basis accident or transient. Therefore, the proposed AOT extension is acceptable from a deterministic standpoint.

Energy Northwest has evaluated the risk impacts of having one SW subsystem inoperable for an additional 72 hours. The resulting increase in core damage frequency (CDF) and large early release frequency (LERF) are small and consistent with the intent of the Commission's Safety Goal Policy Statement (51FR30038) and the regulatory positions contained in Regulatory Guides 1.174 and 1.177. In addition, Energy Northwest uses a proceduralized risk-based approach for scheduling and managing maintenance activities.

When taken together, the results of the deterministic evaluation and risk-informed assessment provide a high degree of assurance that the SW system will remain capable of performing its safety function with the proposed CT.

4.1 Deterministic Engineering Evaluation

4.1.1 Defense-in-Depth

The impact of the proposed extension of the SW CT was evaluated and it maintains the defense-in-depth philosophy of the plant's licensing basis. The limited unavailability of a SW subsystem does not significantly change the balance among the defense-in-depth principles of prevention of core damage, prevention of containment failure, and consequence mitigation. The operable SW subsystem is robust. The proposed change does not introduce the possibility of new accidents or transients nor increase the likelihood of an accident or transient.

Administrative controls serve to minimize any system challenges. The potential for a common cause failure is not increased and the independence of physical barriers is not degraded. Defenses against human errors are maintained.

4.1.2 Compensatory Measures

The compensatory measures described below serve to reduce the risk of continued power operation during the refurbishment/replacement of 1B SW pump and serve to minimize challenges to the operable SW subsystem. These compensatory measures were not modeled or credited in the risk values calculated in the RG 1.174 and 1.177 analyses with the exception of the compensatory measure (the last item in the below list) developed to reduce fire risk.

Loss of an AC source, such as the Division II EDG in this case, is an important risk consideration at Columbia as is electrical grid reliability. In consideration of this, Energy Northwest will coordinate with the Bonneville Power Administration (BPA) to forecast a period of time of high grid stability in which to perform the SW subsystem B maintenance. This forecast will consider electrical power supply and demand, weather conditions, and grid maintenance activities. Maintenance on the SW subsystem B will only be performed in the forecasted period of high electrical grid stability. Energy Northwest will continue to work with BPA to evaluate factors affecting grid stability throughout the 144-hour maintenance period.

The proposed compensatory actions conform to the Maintenance Rule requirements as specified in 10 CFR 50.65(a)(4). Energy Northwest will continue to use Columbia's Maintenance Rule Program to evaluate and manage the risk associated with extending SW subsystem B out-of-service time.

The following compensatory actions will be implemented during the period of time the SW subsystem B is out of service for refurbishment/replacement while Columbia operates in mode 1.

- On an 8 hour frequency, Energy Northwest will verify correct breaker alignment and indicated power availability for each offsite power circuit. As part of this verification, Energy Northwest will contact the BPA Munro and Dittmer Dispatching Centers to verify no unusual conditions exist that could affect the reliability of the plant offsite power circuits.

- Declare the required feature(s) supported by EDG 2 inoperable within 4 hours of discovery of the inoperability of the redundant required feature(s).

- Determine within 24 hours of entering TS 3.7.1, that EDG 1 and EDG 3 are not inoperable due to a common cause failure or perform the monthly testing pursuant to TS SR 3.8.1.2 on EDG-1 and EDG-3 within 24 hours.

- The normal entrances to the Columbia Generating Station transformer yard will be locked and posted. Planned maintenance in the transformer yard will be suspended. Access to the transformer yard is controlled in accordance with plant procedure PPM 1.9.13, "Transformer Yard Access and Controls."

- Periodic daily briefings will be conducted on the status of SW B subsystem restoration to station management.

- Energy Northwest will reduce the duration of maintenance on the SW B subsystem as much as practical by using a 24-hour work schedule, dedicated project management, and dedicated support for the activity.

- Energy Northwest will install protected train signs for the protected systems.

- Energy Northwest will ensure that no maintenance activities are performed in the transformer yard that could directly cause a loss of offsite power event unless required to ensure the continued reliability and availability of the offsite power sources.

- BPA will be informed of the unavailability of SW B subsystem and will be requested to defer discretionary maintenance on the local network around Columbia Generating Station. The local network is defined as all 500 kV, 230 kV and 115 kV transmission system equipment located in an area bounded by the Midway Substation, White Bluffs Substation, Benton Substation, and Ashe Substation.

- Energy Northwest will request BPA notification of any emergent conditions that could affect local grid stability or reliability.

- A check of the weather forecast will be performed to anticipate severe weather. Severe weather is currently defined in plant procedures as wind gusts greater than or equal to 58 mph, hail greater than or equal to ¾" in diameter, visual

sighting of a funnel cloud or tornado, or lighting strikes in the local area. The work will be performed when the weather forecast is favorable.

- Energy Northwest will not perform elective maintenance and testing on risk significant equipment without approval from the Plant General Manager. Required surveillance testing on risk significant equipment will be performed only if it cannot be rescheduled around the 144-hour period.

- Energy Northwest will provide simulator training for the applicable control room operating crews to practice procedures for performing plant shutdown without the SW B subsystem and for coping with Station Blackout.

- Energy Northwest will augment fire watches and limit and control welding, grinding, brazing, and transient combustibles in the vicinity of protected equipment. Probabilistic Risk Assessment (PRA) insights will be used to identify areas for augmented fire watches and operator actions to reduce the impacts of postulated hot shorts on risk significant motor-operated valves.

4.1.3 Potential for Common Cause Failures

The proposed extension of the SW CT does not add or delete any safety-related systems, equipment, or loads, or alter the design or function of the SW system. Therefore, the potential for a common cause failure is not increased.

4.1.4 Independence of Physical Barriers

The proposed extension of the SW CT does not affect fuel cladding, primary coolant systems, or containment. Therefore, the independence of physical barriers is not degraded.

4.1.5 Defense against Human Error

The supplemental training, the protected train philosophy, and aggressive management of other work activities as described in section 4.1.2 will serve to minimize potential human errors.

4.1.6 Compliance with Current Regulations and Commitments

The proposed extension of the SW CT does not add or delete any safety-related systems, equipment, or loads, or alter the design or function of the SW system. Energy Northwest has reviewed Columbia's Licensing Basis and determined that no commitments are affected by this proposed change.

4.1.7 Safety Analysis and Final Safety Analysis Report Acceptance Criteria

The proposed extension of the SW CT is consistent with the safety analysis and UFSAR acceptance criteria. The SW system is composed of two redundant subsystems and can perform its design basis safety functions with one subsystem out of service.

4.2 Evaluation of Risk Impact

4.2.1 Three Tiered Approach

In Regulatory Guide 1.177, the NRC staff identified a three-tiered approach for licensees to evaluate the risk associated with proposed TS CT changes.

Tier 1 is an evaluation of the impact on plant risk of the proposed TS change as expressed by the change in CDF, the incremental conditional core damage probability (ICCDP), and, when appropriate, the change in LERF, the incremental conditional large early release probability (ICLERP).

Tier 2 is an identification of potentially high-risk configurations that could exist if equipment in addition to that associated with the change were to be taken out of service simultaneously, or other risk-significant operational factors such as concurrent system or equipment testing were also involved. The objective of this part of the evaluation is to ensure that appropriate restrictions on dominant risk-significant configurations associated with the change are in place.

Tier 3 is the establishment of an overall configuration risk management program to ensure that other potentially lower probability, but nonetheless risk-significant configurations resulting from maintenance and other operational activities are identified and appropriate compensation taken. If the Tier 2 assessment demonstrates, with reasonable assurance, that there are no risk-significant configurations involving the subject equipment, the application of Tier 3 to the proposed TS CT may not be necessary. Although defense in depth is protected to some degree by most current TS, application of the three-tiered approach to risk-informed TS CT changes discussed below provides additional assurance that defense in depth will not be significantly impacted by such changes to the licensing basis.

Energy Northwest has evaluated the proposed extension of the TS CT using the guidance of Regulatory Guide 1.177 and the results are provided below.

The PRA model used by Columbia for this evaluation was first developed for the Individual Plant Examination (IPE) that was submitted to the NRC by Letter GO2-94-175, dated July 27, 1994, JV Parrish to NRC, "Revision 1 to Response to Generic Letter 88-20, Individual Plant Examination for Severe Accident Vulnerabilities - 10 CFR 50.54(f)." The NRC staff issued its Safety Evaluation (SE) for the Columbia IPE by letter dated April 8, 1997, wherein the NRC staff concluded that the Columbia IPE submittal met the intent of Generic Letter 88-20. In the SE accompanying this letter, the NRC cited certain issues, which were classified as limitations or weaknesses in the

PRA. These issues were then evaluated by Energy Northwest staff to determine the impact on the PRA and then prioritized for inclusion in future updates. The major PRA limitations identified in the NRC SE were incorporated into the PRA via three subsequent updates.

The Peer Review Process developed as part of the Boiling Water Reactor Owners' Group (BWROG) PRA Peer Review Certification Program was first used in 1997 to assure the Columbia PRA was comparable to other PRA programs in use throughout the industry. Additionally, in February 2004, an independent assessment of the Columbia PRA was performed by an external peer review team (Erin Engineering) based on ASME RA-S-2002, Addendum 2003 "Standard For Probabilistic Risk Assessment For Nuclear Power Plant Applications" and Appendix A of RG 1.200 For Trial Use "An Approach For Determining The Technical Adequacy of Probabilistic Risk Assessment Results For Risk-Informed Activities." Columbia was a pilot plant for RG 1.200. The review team found the technical adequacy of the PRA and completeness of the PRA documentation to be consistent with the requirement of RG 1.200 Section 4.2.

The PRA model, Revision 5.1, is used in this evaluation to determine changes in risk from equipment removed from service for maintenance. The risk metrics calculated by the PRA model include core damage frequency and large early release frequency. Work Control, and operating personnel throughout the process of planning and implementing work use the PRA model. This is implemented through the use of a risk monitor, ORAM-SENTINEL, described in Columbia Procedure 1.5.14, "Risk Assessment Management for Maintenance/Surveillance Activities." The results obtained from the risk monitor are used as guidance along with other inputs such as TS requirements for determining the final work schedule.

The PRA addresses internal and external events at full power. Updating and maintenance of the PRA is controlled under Quality Control Instructions within the PRA program manual. Energy Northwest is confident that the results of the risk evaluation are technically sound and consistent with the expectations for PRA quality. The scope, level of detail, and quality of the PRA is sufficient to support a technically defensible and realistic evaluation of the risk change from this proposed CT extension.

The risk metrics for the proposed changes to the SW CT is based on PRA calculations performed to quantify the change from baseline CDF and LERF. To determine the effect of the proposed changes with respect to plant risk, the guidance provided in RG 1.174 and RG 1.177 was used. An evaluation was performed based on the assumption that the full extended CT (i.e., 144 hours applied once during power operations). The incremental conditional core damage probability (ICCDP) and incremental conditional large early release probability (ICLERP) were computed in accordance with RG 1.177. The results of the risk evaluation, including the computed ICCDP and ICLERP, are presented below. The quantified risk metrics meet their acceptance guidelines and demonstrate that the proposed SW CT change has a very small quantitative impact on plant risk.

Tier 1 – Evaluation of Risk Impact

Regulatory Guide 1.174 provides the guidance framework for using PRA in risk-informed decisions for plant-specific changes to the licensing basis. The acceptance guidelines consider the baseline CDF and LERF values as well as the changes to them. The guidance included in Regulatory Guide 1.174 provides a framework in assisting in the interpretation of the numerical results of the PRA.

As stated in Regulatory Guide 1.174:

- When the calculated increase in CDF is in the range of 10E-6 per reactor yr to 10E-5 per reactor yr, applications will be considered only if it can be reasonably shown that the total CDF is less than 10E-4 per reactor year (Region II).

- When the calculated increase in LERF is in the range of 10E-7 per reactor yr to 10E-6 per reactor yr, applications will be considered only if it can be reasonably shown that the total CDF is less than 10E-5 per reactor year (Region II).

In order to model the impact of the proposed CT extension, two models were run:

- Current TS Case - The base case model (zero maintenance model) was revised to reflect 72 hours of unavailability.

- Extended CT Case - The base case model (zero maintenance model) was revised to reflect 144 hours of unavailability.

The delta in CDF is calculated by evaluating the difference between the baseline (72-hr unavailability of SW-B), and the Extended CT (144-hr unavailability of SW-B) Case. The PRA model used is Zero-Maintenance with both internal and external event model.

ICCDP and ICLERP are defined by Regulatory Guide 1.177, and are evaluated as:

ICCDP = [(Conditional CDF w/ equipment out of service) – (Baseline CDF)] x (duration under consideration)

and

ICLERP = [(Conditional LERF w/ equipment out of service) – (Baseline LERF)] x (duration under consideration)

The results of the CDF/ICCDP and LERF/ICLERP risk measures calculations are presented below:

Description	Base Case (per year)		Extended CT Case (per year)		Change CDF[1]	Change LERF[1]	ICCDP[2]	ICLERP[3]
	CDF	LERF	CDF	LERF				
SW B Out of Service	1.86E-5	3.06E-6	1.91E-5	3.06E-6	4.65E-7	5.47E-9	4.65E-7	5.47E-9

(1) The changes in CDF and LERF are below the Regulatory Guide 1.174 guidelines of IE-6 for CDF and IE-7 for LERF.
(2) The value for ICCDP is below the Regulatory Guide 1.177 guideline for acceptability of 5.0E-7.
(3) The value for ICLERP is below the Regulatory Guide 1.177 guideline for acceptability of 5.OE-8.

As can be seen from the above table, the change due to extension of the current 72 hour SW CT is not risk significant and is below the NRC acceptance criteria specified in Regulatory Guides 1.174 and 1.177.

Tier 2: Avoidance of Risk-Significant Plant Configurations

As noted previously, a configuration risk management process is in place at Columbia in accordance with Energy Northwest commitments for compliance with I0 CFR 50.65, particularly with respect to paragraph (a)(4) of that regulatory requirement. The program provides assurance that risk-significant plant equipment configurations are precluded or minimized when plant equipment is removed from service. For a SW subsystem removed from service, increases in risk posed by potential combinations of out-of-service equipment will be managed in accordance with the program and the compensatory measures discussed in section 4.1.2 of this submittal.

Tier 3: Risk-Informed Configuration Risk Management Program

Consistent with 10 CFR 50.65(a)(4), as indicated above, Energy Northwest has developed a program to ensure that risk impacts of out-of-service equipment are appropriately evaluated prior to performing a maintenance activity. The procedure that governs this process is described in Columbia Procedure PPM 1.5.14, "Risk Assessment and Management for Maintenance/Surveillance Activities." This program uses blended (quantitative and qualitative) methods, consistent with the NUMARC 93-01 guidelines, for assessing and managing the increase in risk that may result from maintenance activities.

4.3 Summary and Conclusion

Energy Northwest has evaluated the proposed extension of the SW CT to 144 hours both deterministically and through a risk-informed assessment. The deterministic evaluation concluded the proposed change is consistent with the defense-in-depth

philosophy. Energy Northwest uses a proceduralized risk-based approach for scheduling maintenance, which limits and manages the removal of risk sensitive equipment from service. The deterministic evaluation concluded that the proposed change will not adversely affect any of the safety analyses assumptions or conclusions described in the UFSAR. This ensures the protection of the public health and safety.

The risk-informed assessment concluded the increase in plant risk is small. The proposed change results in small increases, within acceptable guidelines, in the Conditional Core Damage Probability and the Conditional Large Early Release Probability. The proposed change is consistent with:

- The NRC's "Safety Goals for the Operations of Nuclear Power Plants; Policy Statement," Federal Register, Volume 51, Page 30028 (51 FR 30028), dated August 4, 1996

- Regulatory Guide 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis," Revision 1; and

- Regulatory Guide 1.177, "An Approach for Plant-Specific, Risk-Informed Decisionmaking: Technical Specifications," Revision 1.

When taken together, the results of the deterministic evaluation and risk-informed assessment provide a high degree of assurance the equipment required to safely shutdown the plant and mitigate the effects of a design basis accident or transient will remain capable of performing their safety function when the affected train of the SW subsystem is out of service for the refurbishment/replacement of the 1B SW pump during the period allowed by the proposed CT.

5.0 REGULATORY ANALYSIS

5.1 Determination of No Significant Hazards

In accordance with 10 CFR 50.92(c), a proposed change to the operating license involves a no significant hazards consideration if operation of the facility in accordance with the proposed change would not: 1) involve a significant increase in the probability or consequences of any accident previously evaluated; 2) create the possibility of a new or different kind of accident from any accident previously evaluated; or 3) involve a significant reduction in a margin of safety. Energy Northwest has evaluated the proposed changes to the Columbia Generating Station Technical Specifications using the three criteria set forth in 10 CFR 50.92(c) and has determined that they warrant a no significant hazards consideration as described below:

1. **Does the operation of Columbia Generating Station in accordance with the proposed amendment involve a significant increase in the probability or consequences of an accident previously evaluated?**

   Response: No

   Since only one subsystem of SW components is affected by the condition and an additional failure is not considered while a plant is in a Limiting Condition for Operation (LCO) Action, the operable SW subsystem is adequate to maintain compliance with the plant's design basis. Thus, this condition will not alter assumptions relative to the mitigation of an accident or transient event.

   Energy Northwest has determined that there is no significant risk associated with the operation of the plant for an additional 3 days with one SW subsystem out of service. The incremental change in risk has been quantitatively evaluated using the guidance of Regulatory Guide 1.174 and 1.177. The incremental risk values are within the criteria of Region III (where the increase in risk is considered "very small") as established in RG 1.174.

   Based on this evaluation, there is no significant increase in the probability or consequence of an accident previously evaluated.

2. **Does the operation of Columbia Generating Station in accordance with the proposed amendment create the possibility of a new or different kind of accident from any accident previously evaluated?**

   Response: No

   This proposed action only extends the CT and will not physically alter the plant. No new or different type of equipment will be installed by this action. The changes in methods governing normal plant operation are consistent with current safety analysis assumptions. No change to the system as evaluated in the Columbia Generating Station safety analysis is proposed. Therefore, this proposed change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. **Does the operation of Columbia Generating Station in accordance with the proposed amendment involve a significant reduction in the margin of safety?**

   Response: No

   Columbia is designed with sufficient redundancy such that a SW subsystem may be removed from service for maintenance or testing. The remaining subsystem is capable of providing water and removing heat loads to satisfy the UFSAR requirements for accident mitigation or unit safe shutdown.

A risk-informed evaluation concluded that the risk contribution of the CT extension is non-risk significant.

There will be no change to the manner in which safety limits or limiting safety system settings are determined nor will there be any change to those plant systems necessary to assure the accomplishment of protection functions. For these reasons, the proposed amendment does not involve a significant reduction in a margin of safety.

Based upon the analysis provided herein, the proposed amendments do not involve a significant hazards consideration.

5.2 Applicable Regulatory Requirements/Criteria

With the implementation of the proposed change, Columbia continues to meet applicable design criteria. The proposed change is a one-time extension to the TS 3.7.1.B CT and one-time exemption to note 1 of Required Action 3.7.1.B.1 and does not affect the design basis of the plant. In addition, Columbia will remain within the scope of the proposed TS Limiting Conditions for Operation and is still subject to the requirements of the TS action statements.

Since the mid-1980s, the NRC has been reviewing and granting improvements to TS that are based, at least in part, on PRA insights. In its final policy statement on TS improvements of July 22, 1993, the NRC stated that it expects that licensees, in preparing their Technical Specification related submittals, will utilize any plant-specific PSA (probabilistic safety assessment) or risk survey and any available literature on risk insights and PSAs. Similarly, the NRC staff will also employ risk insights and PSAs in evaluating Technical Specification related submittals. Further, as a part of the Commission's ongoing program of improving Technical Specifications, it will continue to consider methods to make better use of risk and reliability information for defining future generic Technical Specification requirements. The NRC reiterated this point when it issued the revision to 10 CFR 50.36, "Technical Specifications," in July 1995.

In August 1995, the NRC adopted a final policy statement on the use of PRA methods in nuclear regulatory activities that improve safety decision making and regulatory efficiency. The PRA policy statement included the following points:

1 The use of PRA technology should be increased in all regulatory matters to the extent supported by state-of-the-art in PRA methods and data and in a manner that compliments the NRC's deterministic approach and supports the NRC's traditional defense-in-depth philosophy.

2 PRA and associated analyses (e.g., sensitivity studies, uncertainty analyses, and importance measures) should be used in regulatory matters, where practical within the bounds of the state-of-the-art, to reduce unnecessary conservatism associated with current regulatory requirements.

3 PRA evaluations in support of regulatory decisions should be as realistic as practicable and appropriate supporting data should be publicly available for review.

In conclusion, based on the deterministic and PRA considerations discussed in this submittal, (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

6.0 ENVIRONMENTAL CONSIDERATION

A review has determined that the proposed amendment would change a requirement with respect to installation or use of a facility component located within the restricted area, as defined in 10 CFR 20, or would change an inspection or surveillance requirement. However, the proposed amendment does not involve; (i) a significant hazards consideration; (ii) a significant change in the types or significant increase in the amounts of any effluent that may be released offsite; or, (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment needs be prepared in connection with the proposed amendment.

LICENSE AMENDMENT REQUEST: EXTENSION OF TS 3.7.1 SERVICE WATER COMPLETION TIME
Attachment 1

Proposed Technical Specifications Changes (mark-up)

Page 3.7.1-2

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. One SW subsystem inoperable.	B.1 --------NOTES-------- 1. Enter applicable Conditions and Required Actions of LCO 3.8.1, "AC Sources—Operating," for diesel generator made inoperable by SW System. 2. Enter applicable Conditions and Required Actions of LCO 3.4.9, "Residual Heat Removal (RHR) Shutdown Cooling System—Hot Shutdown," for RHR shutdown cooling subsystem made inoperable by SW System. ---------- Restore SW subsystem to OPERABLE status.	72 hours*

(continued)

*On a one-time basis, during the refurbishment/replacement of the 1B Service Water Pump during Cycle 18, the COMPLETION TIME for an inoperable service water subsystem is extended to 144 hours. During this extended COMPLETION TIME, the action specified in Note 1 of Required Action B.1 is waived based on the implementation of selected risk management compensatory measures. This one-time extension expires at the end of Cycle 18.

LICENSE AMENDMENT REQUEST: EXTENSION OF TS 3.7.1 SERVICE WATER COMPLETION TIME
Attachment 2

Proposed Technical Specifications Bases Changes (mark-up)

Page B 3.7.1.5

BASES (continued)

ACTIONS

A.1

With average sediment depth in either or both spray ponds $\geq$ 0.5 and < 1.0 ft, water inventory is reduced such that the combined cooling capability of both spray ponds may be less than required for 30 days of operation after a LOCA. Therefore, action must be taken to restore average sediment depth to < 0.5 ft. The Completion Time of 30 days is based on engineering judgement and plant operating experience and takes into consideration the low probability of a design basis accident occurring in this time period.

On a one-time basis, during the refurbishment/replacement of the 1B Service Water Pump during Cycle 18, the COMPLETION TIME for an inoperable service water subsystem is extended to 144 hours. The one-time extension is based upon a risk assessment performed in accordance with Regulatory Guides 1.174 and 1.177. During this extended COMPLETION TIME, administrative controls must be implemented to enhance the reliability of required electrical sources and to minimize plant activities that might challenge other safety-related equipment. This one-time extension expires at the end of Cycle 18.

B.1

If one SW subsystem is inoperable, it must be restored to OPERABLE status within 72 hours. With the unit in this condition, the remaining OPERABLE SW subsystem is adequate to perform the heat removal function. However, the overall reliability is reduced because a single failure in the OPERABLE SW subsystem could result in loss of SW function. The 72 hour Completion Time was developed taking into account the redundant capabilities afforded by the OPERABLE subsystem and the low probability of a DBA occurring during this period.

The Required Action is modified by two Notes indicating that the applicable Conditions of LCO 3.8.1, "AC Sources—Operating," and LCO 3.4.9, "Residual Heat Removal (RHR) Shutdown Cooling System—Hot Shutdown," be entered and the Required Actions taken if the inoperable SW subsystem results in an inoperable DG or RHR shutdown cooling subsystem, respectively. This is in accordance with LCO 3.0.6 and ensures the proper actions are taken for these components.

C.1 and C.2

If the SW subsystem cannot be restored to OPERABLE status within the associated Completion Time, or both SW subsystems are inoperable, or the UHS is determined inoperable for reasons other than Condition A, the unit must be placed in a MODE in which the LCO does not apply. To achieve this

(continued)

During the one-time extended COMPLETION TIME, the action to enter LCO 3.8.1, as directed by Note 1, is waived based on the implementation of selected risk management compensatory measures and the verification that a loss of safety function does not exist.

List of Regulatory Commitments

Upon approval of the proposed license amendment, Energy Northwest will implement a change to the applicable TS Bases to add the following information:

"On a one-time basis, during the refurbishment/replacement of the 1B Service Water Pump during Cycle 18, the COMPLETION TIME for an inoperable service water subsystem is extended to 144 hours. The one-time extension is based upon a risk assessment performed in accordance with Regulatory Guides 1.174 and 1.177. During this extended COMPLETION TIME, administrative controls must be implemented to enhance the reliability of required electrical sources and to minimize plant activities that might challenge other safety-related equipment. This one-time extension expires at the end of Cycle 18."

"During the one-time extended COMPLETION TIME, the action to enter LCO 3.8.1, as directed by Note 1, is waived based on the implementation of selected risk management compensatory measures and the verification that a loss of safety function does not exist."

The following compensatory actions will be implemented during the period of time the SW subsystem B is out of service for refurbishment/replacement while Columbia operates in mode 1.

- On an 8 hour frequency, Energy Northwest will verify correct breaker alignment and indicated power availability for each offsite power circuit. As part of this verification, Energy Northwest will contact the BPA Munro and Dittmer Dispatching Centers to verify no unusual conditions exist that could affect the reliability of the plant offsite power circuits.

- Declare the required feature(s) supported by EDG 2 inoperable within 4 hours of discovery of the inoperability of the redundant required feature(s).

- Determine within 24 hours of entering TS 3.7.1, that EDG 1 and EDG 3 are not inoperable due to a common cause failure or perform the monthly testing pursuant to TS SR 3.8.1.2 on EDG-1 and EDG-3 within 24 hours.

- The normal entrances to the Columbia Generating Station transformer yard will be locked and posted. Planned maintenance in the transformer yard will be suspended. Access to the transformer yard is controlled in accordance with plant procedure PPM 1.9.13, "Transformer Yard Access and Controls."

- Periodic daily briefings will be conducted on the status of SW B subsystem restoration to station management.

- Energy Northwest will reduce the duration of maintenance on the SW B subsystem as much as practical by using a 24-hour work schedule, dedicated project management, and dedicated support for the activity.

- Energy Northwest will install protected train signs for the protected systems.

- Energy Northwest will ensure that no maintenance activities are performed in the transformer yard that could directly cause a loss of offsite power event unless required to ensure the continued reliability and availability of the offsite power sources.

- BPA will be informed of the unavailability of SW B subsystem and will be requested to defer discretionary maintenance on the local network around Columbia Generating Station. The local network is defined as all 500 kV, 230 kV and 115 kV transmission system equipment located in an area bounded by the Midway Substation, White Bluffs Substation, Benton Substation, and Ashe Substation.

- Energy Northwest will request BPA notification of any emergent conditions that could affect local grid stability or reliability.

- A check of the weather forecast will be performed to anticipate severe weather. Severe weather is currently defined in plant procedures as wind gusts greater than or equal to 58 mph, hail greater than or equal to ¾" in diameter, visual sighting of a funnel cloud or tornado, or lighting strikes in the local area. The work will be performed when the weather forecast is favorable.

- Energy Northwest will not perform elective maintenance and testing on risk significant equipment without approval from the Plant General Manager. Required surveillance testing on risk significant equipment will be performed only if it cannot be rescheduled around the 144-hour period.

- Energy Northwest will provide simulator training for the applicable control room operating crews to practice procedures for performing plant shutdown without the SW B subsystem and for coping with Station Blackout.

- Energy Northwest will augment fire watches and limit and control welding, grinding, brazing, and transient combustibles in the vicinity of protected equipment. PRA insights will be used to identify areas for augmented fire watches and operator actions to reduce the impacts of postulated hot shorts on risk significant motor-operated valves.