



**ENERGY  
NORTHWEST**

Sudesh K. Gambhir  
Technical Services  
P.O. Box 968, Mail Drop PE04  
Richland, WA 99352-0968  
Ph. 509-377-8313 F. 509-377-2354  
sgambhir@energy-northwest.com

July 26, 2007  
GO2-07-109

**10 CFR 50.90**

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 TO TECHNICAL SPECIFICATIONS  
ASSOCIATED WITH CONDENSATE STORAGE TANK LEVEL**

Dear Sir or Madam:

Pursuant to 10 CFR 50.90, Energy Northwest hereby requests an amendment to the Technical Specifications (TS) for Columbia Generating Station (Columbia) Operating License (NPF-21). The proposed change would revise the requirements of TS LCO 3.3.5.2, Reactor Core Isolation Cooling (RCIC) System Instrumentation and TS LCO 3.5.2, ECCS - Shutdown. It is requested that these sections be modified to reflect an increase in the allowable value for Condensate Storage Tank level-low function in Table 3.3.5.2-1 and an increase in the required Condensate Storage Tank level of SR 3.5.2.2. These changes reflect corrections that were made to supporting calculations for these two values.

The proposed changes have been evaluated in accordance with 10 CFR 50.91 using criteria in 10 CFR 50.92(c) and this change presents a no significant hazards consideration. The basis for this determination is provided in Attachment 1 to this letter. The proposed change does not involve any new commitments.

Energy Northwest requests approval of these changes prior to August 1, 2008. Once approved, the amendment will be implemented within 60 days. This implementation period will provide adequate time for station documents to be revised using the appropriate change control mechanisms.

In accordance with 10 CFR 50.91, "Notice for public comment; State consultation," paragraph (b), Energy Northwest is notifying the State of Washington of this application for change to the TS by transmitting a copy of this letter and its attachments to the designated State Official.

ACCI  
NRR

9

**LICENSE AMENDMENT REQUEST TO TECHNICAL SPECIFICATIONS ASSOCIATED  
WITH CONDENSATE STORAGE TANK LEVEL**

Page 2

If you have any questions or require additional information, please contact GV Cullen,  
Licensing Supervisor at (509) 377-6105.

I declare under penalty of perjury that the foregoing is true and correct. Executed on  
the date of this letter.

Respectfully,



SK Gambhir

Vice President, Technical Services

Attachments:

1. Evaluation of the Proposed Change
2. Proposed Technical Specification Changes (mark-up)
3. Proposed Technical Specification Pages (re-typed)
4. Changes to Technical Specification Bases (reference only)

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

# **LICENSE AMENDMENT REQUEST TO TECHNICAL SPECIFICATIONS ASSOCIATED WITH CONDENSATE STORAGE TANK LEVEL**

## **Attachment 1**

Page 1 of 5

### **Licensee Evaluation**

#### **1.0 DESCRIPTION**

This letter is a request to amend the Operating License (NPF-21) for Columbia Generating Station (Columbia).

The proposed change would revise the requirements of TS LCO 3.3.5.2, Reactor Core Isolation Cooling (RCIC) System Instrumentation and TS LCO 3.5.2, ECCS - Shutdown. It is requested that these sections be modified to reflect an increase in the allowable value for Condensate Storage Tank level-low function in Table 3.3.5.2-1 and an increase in the required Condensate Storage Tank level of SR 3.5.2.2. These changes reflect corrections that were made to supporting calculations for these two values.

#### **2.0 PROPOSED CHANGE**

Energy Northwest (EN) proposes the following two changes to the Columbia Technical Specifications (TSs):

1. Revise the allowable value for Condensate Storage Tank Level – Low in Table 3.3.5.2-1, Reactor Core Isolation Cooling System Instrumentation, from " $\geq 446$  ft 0 inches elevation" to " $\geq 447$  ft 7 inches elevation"
2. Revise the required Condensate Storage Tank (CST) water level in SR 3.5.2.2 from " $\geq 14.8$  ft in a single CST or  $\geq 9.1$  ft in each CST" to " $\geq 16.5$  ft in a single CST or  $\geq 10.5$  ft in each CST"

#### **3.0 BACKGROUND**

Both of the proposed changes were identified during the process of developing a formal design basis record for the Reactor Core Isolation Cooling (RCIC) system. These proposed changes represent corrections related to calculational errors that were identified in the process of documenting the design basis.

##### **Change to TS Table 3.3.5.2-1**

TS Table 3.3.5.2-1 provides a list RCIC system functions for which instrumentation is required to be provided. The instruments required to meet function three, "Condensate Storage Tank Level-Low" are RCIC-LS-15A and 15B. These instruments initiate an automatic transfer of RCIC pump suction from the CST to the suppression pool on low CST level. They are required to be set high enough to ensure adequate pump suction head while water is being taken from the CST. The value for automatic transfer is set high enough to ensure that during swap-over of suction from the CST to the suppression pool, the volume in the CST will remain above the required submergence level to prevent vortexing. The current TS allowable value is  $\geq 446' 0"$ .

# **LICENSE AMENDMENT REQUEST TO TECHNICAL SPECIFICATIONS ASSOCIATED WITH CONDENSATE STORAGE TANK LEVEL**

## **Attachment 1**

Page 2 of 5

It was discovered that the plant specific calculation (E/I-02-93-1272) used to support the existing values for the CST level setpoint incorrectly based the vortex limit on the centerline of the suction pipe (445' 4") feeding the RCIC pump when it should have been based on the upper edge of the pipe (446' 3.625"). The new lower analytical limit was subsequently determined to be 447' 1". Accounting for drift and loop uncertainties at approximately 1", the new calculated minimum setting would need to be 447' 2". To provide additional conservatism, EN proposes to add another 5" for a TS allowable of  $\geq 447' 7"$ . Currently, the level switch setting for both level switches are set conservatively at 448' 3" in compliance with Licensee Controlled Specifications (LCS) Table 1.3.5.3-1.

### **Change to SR 3.5.2.2**

This surveillance requires that for operability of the High Pressure Core Spray (HPCS) System, either the suppression pool or the CSTs provide adequate volume (135,000 gallons) to minimize the consequences of a drain down event while in Mode 4 or Mode 5 (if required). There are two Condensate Storage Tanks, each with a nominal capacity of 400,000 gallons. For the CSTs to satisfy this surveillance requirement there must either be two tanks each with 67,500 gallons available or else one tank with 135,000 gallons available.

While in standby, the HPCS pump is normally aligned to the CSTs to minimize the injection of suppression pool water into the Reactor Pressure Vessel (RPV). However, on low CST level or high suppression pool level an automatic transfer of the HPCS pump suction to the suppression pool occurs upon activation of the level switches. Of particular concern are the measurement effects on the CST low level switches (HPCS-LS-1A and 1B). When the level in the CSTs fall below a preset level, contact closure from HPCS-LS-1A and 1B, with one out of two logic, signals the HPCS suction valve from the suppression pool to open. Opening of the suppression pool suction valve signals the CST suction valve to close.

It was discovered that the calculated minimum level to assure 135,000 gallons in the CSTs in plant specific calculation (E/I-02-91-1011) did not take into consideration the plant conditions at which automatic transfer from the CST to the suppression pool could take place. These level switches are not connected directly to the CSTs but rather on a standpipe located downstream on the suction line in the reactor building. Thus, they are influenced by such factors as differential head between the tank and the standpipe (due primarily to flow losses), reactor building temperature, and reactor building pressure. Previously, the calculation did not address the head loss that occurs in the switches when the HPCS pump is drawing water from the CST. When taking into consideration the effects of full HPCS flow on the sensing instrument, it was discovered that premature switching could occur due to a sensed lower level by HPCS-LS-1A and 1B than that which actually exists in the tanks. After taking into consideration the effect that flow had on the level sensors, it was determined that an additional margin of 1.4 ft in two tanks and 1.7 ft in one tank was necessary to assure 135,000 gallons was available to inject into the Reactor Pressure Vessel (RPV).

# **LICENSE AMENDMENT REQUEST TO TECHNICAL SPECIFICATIONS ASSOCIATED WITH CONDENSATE STORAGE TANK LEVEL**

## **Attachment 1**

Page 3 of 5

As a compensatory measure, the surveillance procedures that are used to satisfy SR 3.5.2.2 for CST level have been revised to reflect this concern.

### **4.0 TECHNICAL ANALYSIS**

In each case, the proposed change reflects a correction to previously calculated values used to support existing TS limits. Therefore, in order to restore the TS values to ensure that the underlying premise of LCOs 3.3.5.1 and 3.5.2.2 are met, this amendment request is necessary.

### **5.0 REGULATORY ANALYSIS**

#### **5.1 No Significant Hazard Consideration**

EN has evaluated whether or not a significant hazards consideration is involved with the proposed amendment by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of Amendment" as discussed below:

1. Does the proposed change involve a significant increase in the probability or consequences of an accident previously evaluated?

Response: No.

The operation of Columbia in accordance with the proposed amendment will not involve a significant increase in the probability or consequences of an accident previously evaluated. Neither of these changes affects the probability of any accident previously evaluated as they do not involve or impact accident initiators.

The proposed change to TS 3.3.5.1 would ensure that the consequences would remain the same as that previously evaluated for during any event in which the RCIC pump was utilized. Adequate volume would be maintained in the CST whenever the RCIC pump was aligned to it to ensure that it did not experience loss of suction due to vortexing.

The proposed changes to TS 3.5.2.2 would ensure that the previously assumed volume of water in the CST would still be available to inject into the reactor vessel during Modes 4 and 5 should the suppression pool not meet minimum volume requirements. Therefore, operation of Columbia in accordance with the proposed amendment will not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the proposed change create the possibility of a new or different kind of accident from any accident previously evaluated?

Response: No.

# **LICENSE AMENDMENT REQUEST TO TECHNICAL SPECIFICATIONS ASSOCIATED WITH CONDENSATE STORAGE TANK LEVEL**

## **Attachment 1**

Page 4 of 5

The operation of Columbia 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 will not create a new or different kind of accident since it only affects the amount of water held in reserve to support reactor vessel inventory loss. The proposed change does not introduce any credible mechanisms for unacceptable radiation release nor does it require physical modification to the plant. The plant has operated well within the existing allowable values. The increased margin provided by the increased level will assure no new or different kinds of accidents result from the proposed change. Therefore, the operation of Columbia in accordance with the proposed amendment will not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does the proposed change involve a significant reduction in a margin of safety?

Response: No.

The operation of Columbia in accordance with the proposed amendment will not involve a significant reduction in the margin of safety. The proposed amendment provides assurance that the RCIC pump suction will be transferred without loss of suction and that 135,000 gallons of CST inventory will continue to be available for injection into the RPV under worst case conditions. Therefore, operation of Columbia in accordance with the proposed amendment will not involve a significant reduction in the margin of safety.

## **5.2 Applicable Regulatory Requirements/Criteria**

The applicable regulatory criteria are found in 10 CFR 50, Appendix A, Criterion 13, and in 10 CFR 50 Appendix B, Criterion XII.

### **10 CFR 50, Appendix A, Criterion 13-Instrumentation and control**

*Instrumentation shall be provided to monitor variables and systems over their anticipated ranges for normal operation, for anticipated operational occurrences, and for accident conditions as appropriate to assure adequate safety, including those variables and systems that can affect the fission process, the integrity of the reactor core, the reactor coolant pressure boundary, and the containment and its associated systems. Appropriate controls shall be provided to maintain these variables and systems within prescribed operating ranges.*

### **10 CFR 50, Appendix B, Criterion XII-Control of Measuring and Test Equipment**

*Measures shall be established to assure that tools, gages, instruments, and other measuring and testing devices used in activities affecting quality*

# **LICENSE AMENDMENT REQUEST TO TECHNICAL SPECIFICATIONS ASSOCIATED WITH CONDENSATE STORAGE TANK LEVEL**

## **Attachment 1**

Page 5 of 5

*are properly controlled, calibrated, and adjusted at specified periods to maintain accuracy within necessary limits.*

Revising the TSs to the ranges specified in this submittal will result in the prescribed CST operating ranges being maintained for normal operation, anticipated operational occurrences, and for accident conditions. In addition, the establishment of the new ranges will provide the necessary limits for the instruments currently being used to satisfy the affected surveillance requirements.

### **6.0 ENVIRONMENTAL CONSIDERATION**

EN has evaluated the proposed amendment against the criteria for identification of licensing and regulatory actions requiring environmental assessment in accordance with 10 CFR 51.21. The proposed change meets the criteria for categorical exclusion as provided for in 10 CFR 51.22(c)(9). The change request does not pose a significant hazards consideration nor does it involve an increase in the amounts, or a change in the types, of any effluent that may be released off-site. Furthermore, this proposed request does not involve an increase in individual or cumulative occupational exposure.

### **7.0 REFERENCES**

1. Calculation E/I-02-91-1011, "Calculation for Setting Range Determination for Instrument Loop" (HPCS-LS-1A and 1B)
2. Calculation E/I-02-93-1272, "Calculation for Setting Range Determination for Instrument Loop RCIC Level Switch 15A & 15B"

**LICENSE AMENDMENT REQUEST TO TECHNICAL SPECIFICATIONS ASSOCIATED  
WITH CONDENSATE STORAGE TANK LEVEL  
Attachment 2**

**Proposed Technical Specifications Changes (mark-up)**



RCIC System Instrumentation  
3.3.5.2

Table 3.3.5.2-1 (page 1 of 1)  
Reactor Core Isolation Cooling System Instrumentation

FUNCTION	REQUIRED CHANNELS PER FUNCTION	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Reactor Vessel Water Level - Low Low, Level 2	4	B	SR 3.3.5.2.1 SR 3.3.5.2.2 SR 3.3.5.2.3 SR 3.3.5.2.4	≥ -58 inches
2. Reactor Vessel Water Level - High, Level 8	2	C	SR 3.3.5.2.1 SR 3.3.5.2.2 SR 3.3.5.2.3 SR 3.3.5.2.4	≤ 56 inches
3. Condensate Storage Tank Level - Low	2	D	SR 3.3.5.2.1 SR 3.3.5.2.2 SR 3.3.5.2.3 SR 3.3.5.2.4	≥ 446 ft 0 inches elevation
4. Manual Initiation	2	C	SR 3.3.5.2.4	NA

447 ft 7 inches

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.5.2.1    Verify, for each required low pressure ECCS injection/spray subsystem, the suppression pool water level is $\geq 18$ ft 6 inches.	12 hours
SR 3.5.2.2    Verify, for the required High Pressure Core Spray (HPCS) System, the: <ul style="list-style-type: none"> <li>a.    Suppression pool water level is <math>\geq 18</math> ft 6 inches; or</li> <li> <div style="display: flex; align-items: center;"> <div style="border: 1px solid black; border-radius: 50%; padding: 2px 5px; margin-right: 10px;">16.5</div> <div style="display: flex; flex-direction: column; align-items: center;"> <div style="width: 100px; height: 10px; background-color: black; margin-bottom: 5px;"></div> <div style="width: 100px; height: 10px; background-color: black; margin-bottom: 5px;"></div> <div style="width: 100px; height: 10px; background-color: black;"></div> </div> </div></li> <li>b.    Condensate storage tank (CST) water level is <math>\geq 14.8</math> ft in a single CST or <math>\geq 9.1</math> ft in each CST.</li> </ul>	12 hours
SR 3.5.2.3    Verify, for each required ECCS injection/spray subsystem, the piping is filled with water from the pump discharge valve to the injection valve.	31 days
SR 3.5.2.4    -----NOTE----- One low pressure coolant injection (LPCI) subsystem may be considered OPERABLE during alignment and operation for decay heat removal, if capable of being manually realigned and not otherwise inoperable. ----- Verify each required ECCS injection/spray subsystem manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position.	31 days

(continued)

**LICENSE AMENDMENT REQUEST TO TECHNICAL SPECIFICATIONS ASSOCIATED  
WITH CONDENSATE STORAGE TANK LEVEL  
Attachment 3**

**Proposed Technical Specification Pages (re-typed)**

# SURVEILLANCE REQUIREMENTS

- NOTES-----
1. Refer to Table 3.3.5.2-1 to determine which SRs apply for each RCIC Function.
  2. When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed as follows: (a) for up to 6 hours for Functions 2 and 4; and (b) for up to 6 hours for Functions 1 and 3 provided the associated Function maintains RCIC initiation capability.
- 

SURVEILLANCE	FREQUENCY
SR 3.3.5.2.1 Perform CHANNEL CHECK.	12 hours
SR 3.3.5.2.2 Perform CHANNEL FUNCTIONAL TEST.	92 days
SR 3.3.5.2.3 Perform CHANNEL CALIBRATION.	18 months
SR 3.3.5.2.4 Perform LOGIC SYSTEM FUNCTIONAL TEST.	24 months

Table 3.3.5.2-1 (page 1 of 1)  
Reactor Core Isolation Cooling System Instrumentation

FUNCTION	REQUIRED CHANNELS PER FUNCTION	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Reactor Vessel Water Level - Low Low, Level 2	4	B	SR 3.3.5.2.1 SR 3.3.5.2.2 SR 3.3.5.2.3 SR 3.3.5.2.4	$\geq$ -58 inches
2. Reactor Vessel Water Level - High, Level 8	2	C	SR 3.3.5.2.1 SR 3.3.5.2.2 SR 3.3.5.2.3 SR 3.3.5.2.4	$\leq$ 56 inches
3. Condensate Storage Tank Level - Low	2	D	SR 3.3.5.2.1 SR 3.3.5.2.2 SR 3.3.5.2.3 SR 3.3.5.2.4	$\geq$ 447 ft 7 inches elevation
4. Manual Initiation	2	C	SR 3.3.5.2.4	NA

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.5.2.1      Verify, for each required low pressure ECCS injection/spray subsystem, the suppression pool water level is $\geq$ 18 ft 6 inches.	12 hours
SR 3.5.2.2      Verify, for the required High Pressure Core Spray (HPCS) System, the: <ul style="list-style-type: none"> <li>a.    Suppression pool water level is <math>\geq</math> 18 ft 6 inches; or</li> <li>b.    Condensate storage tank (CST) water level is <math>\geq</math> 16.5 ft in a single CST or <math>\geq</math> 10.5 ft in each CST.</li> </ul>	12 hours
SR 3.5.2.3      Verify, for each required ECCS injection/spray subsystem, the piping is filled with water from the pump discharge valve to the injection valve.	31 days
SR 3.5.2.4      -----NOTE----- One low pressure coolant injection (LPCI) subsystem may be considered OPERABLE during alignment and operation for decay heat removal, if capable of being manually realigned and not otherwise inoperable. ----- Verify each required ECCS injection/spray subsystem manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position.	31 days

(continued)

SURVEILLANCE REQUIREMENTS

SURVEILLANCE			FREQUENCY												
SR 3.5.2.5	Verify each required ECCS pump develops the specified flow rate with the specified developed head.  <table><thead><tr><th><u>SYSTEM</u></th><th><u>FLOW RATE</u></th><th><u>TOTAL DEVELOPED HEAD</u></th></tr></thead><tbody><tr><td>LPCS</td><td>≥ 6350 gpm</td><td>≥ 128 psid</td></tr><tr><td>LPCI</td><td>≥ 7450 gpm</td><td>≥ 26 psid</td></tr><tr><td>HPCS</td><td>≥ 6350 gpm</td><td>≥ 200 psid</td></tr></tbody></table>		<u>SYSTEM</u>	<u>FLOW RATE</u>	<u>TOTAL DEVELOPED HEAD</u>	LPCS	≥ 6350 gpm	≥ 128 psid	LPCI	≥ 7450 gpm	≥ 26 psid	HPCS	≥ 6350 gpm	≥ 200 psid	In accordance with the Inservice Testing Program
<u>SYSTEM</u>	<u>FLOW RATE</u>	<u>TOTAL DEVELOPED HEAD</u>													
LPCS	≥ 6350 gpm	≥ 128 psid													
LPCI	≥ 7450 gpm	≥ 26 psid													
HPCS	≥ 6350 gpm	≥ 200 psid													
SR 3.5.2.6	-----NOTE----- Vessel injection/spray may be excluded. -----  Verify each required ECCS injection/spray subsystem actuates on an actual or simulated automatic initiation signal.		24 months												

**LICENSE AMENDMENT REQUEST TO TECHNICAL SPECIFICATIONS ASSOCIATED  
WITH CONDENSATE STORAGE TANK LEVEL  
Attachment 4**

**Changes to Technical Specifications Bases (reference only)**



BASES

---

ACTIONS C.1, C.2, D.1, D.2, and D.3 (continued)

stationing a dedicated operator, who is in continuous communication with the control room, at the controls of the isolation device. In this way, the penetration can be rapidly isolated when a need for secondary containment isolation is indicated). This may be performed by an administrative check, by examining logs or other information, to determine if the components are out of service for maintenance or other reasons. It is not necessary to perform the Surveillances needed to demonstrate OPERABILITY of the components. If, however, any required component is inoperable, then it must be restored to OPERABLE status. In this case, the Surveillances may need to be performed to restore the component to OPERABLE status. Actions must continue until all required components are OPERABLE.

---

SURVEILLANCE REQUIREMENTS SR 3.5.2.1 and SR 3.5.2.2

The minimum water level of 18 ft 6 inches required for the suppression pool is periodically verified to ensure that the suppression pool will provide adequate net positive suction head (NPSH) for the ECCS pumps, recirculation volume (135,000 gallons consistent with the CST volume requirements described below), and vortex prevention. With the suppression pool water level less than the required limit, all ECCS injection/spray subsystems are inoperable unless they are aligned to an OPERABLE CST (Ref. 5).

When the suppression pool level is < 18 ft 6 inches, the HPCS System is considered OPERABLE only if it can take suction from the CST and the CST water level is sufficient to provide the required NPSH for the HPCS pump. Therefore, a verification that either the suppression pool water level is  $\geq$  18 ft 6 inches or the HPCS System is aligned to take suction from the CST and the CST contains  $\geq$  135,000 gallons of water. This volume of water is equivalent to a level of 14.8 ft in a single CST or 9.1 ft in each CST above the top of the suction line. This ensures that the HPCS System can supply makeup water to the RPV. Calculations that determine this water level are listed as References 3 and 4.

(continued)

16.5

10.5