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June 27, 2018
GO2-18-075

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
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION FOR
TSTF-542 LICENSE AMENDMENT REQUEST**

Reference:
1. Letter, GO2-17-038, R. E. Schuetz (Energy Northwest) to NRC, "License Amendment Request to Revise Technical Specifications to Adopt TSTF-542, "Reactor Pressure Vessel Water Inventory Control"," dated October 23, 2017 (ML17296B380)

2. Letter, GO2-17-194, W. G Hettel (Energy Northwest) to NRC, "Supplement to License Amendment Request to Revise Technical Specifications to Adopt TSTF-542, "Reactor Pressure Vessel Water Inventory Control"," dated November 15, 2017

3. Email, John Klos (NRC) to Lisa Williams (Energy Northwest), "RAIs for Columbia LAR TSTF-542," dated June 7, 2018

Dear Sir or Madam:

By Reference 1 and as supplemented by Reference 2, Energy Northwest submitted a License Amendment Request (LAR) to revise Columbia Generating Station (Columbia) Technical Specifications (TS) to adopt Technical Specification Task Force (TSTF)-542. By Reference 3, the Nuclear Regulatory Commission (NRC) requested additional information related to the Energy Northwest submittal. Enclosure 1 contains the requested information. Enclosure 2 contains supplemental replacement TS markups as a result of Columbia License Amendment 246 and a correction for TSTF-542 markup page 3.3.5.2-5. Enclosure 3 contains the clean TS pages. Enclosure 4 contains a TS Bases correction for information only.

The conclusions of the No Significant Hazards Consideration determination in the original submittal are not altered by this submittal.

Pursuant to 10 CFR 50.91, a copy of this response is being sent to the designated official of the State of Washington.

There are no new or revised commitments with this letter.

If you should have any questions regarding this submittal, please contact Ms. L. L. Williams, Licensing Supervisor, at 509-377-8148

I declare under penalty of perjury that the foregoing is true and correct. Executed this 27 day of June, 2018.

Respectfully,

Robert E. Schuetz
Vice President, Operations

Enclosure: As stated

cc: NRC Region IV Administrator
NRC NRR Project Manager
NRC Sr. Resident Inspector - 988C
CD Sonoda – BPA 1399 (email)
WA Horin – Winston & Strawn (email)
RR Cowley – WDOH (email)
EFSECutc.wa.gov – EFSEC (email)

NRC Request RAI-1:

In Attachment 2 of the LAR, on pages 3.3.5.2-4 and 3.3.5.2-5, proposed Columbia TS Table 3.3.5.2-1 contains Functions that are not consistent with the TSTF-542 Standard Technical Specifications (STS) values for Required Channels per Function column: Low Pressure Coolant Injection-A (LPCI), Low Pressure Core Spray, and High Pressure Core Spray (HPCS). The tables below compare Columbia's TS to the STS before implementation of TSTF-542 and after it has been implemented. A review of the variations section of the LAR did not provide sufficient description of this variation from the STS format.

NRC staff also reviewed Chapter 6 of Columbia's Final Safety Analysis Report and for table items 1.c and 3.b were able to determine why the selected Required Channels per Function were retained. However, for the proposed Columbia TS Table 3.3.5.2-1 Functions identified in the tables below, items 1.a, 1.d, 2.a, and 2.c please provide justification for varying from the Required Channels per Function nomenclature specified in TSTF-542, e.g., "1" becomes "1 per pump".

Required Channels Per Function Prior To Implementing TSTF-542

Existing Function	Columbia TS Table 3.3.5.1-1	TSTF-542 STS Table 3.3.5.1-1
1.f Reactor Vessel Pressure – Low (Injection Permissive)	1 per valve	[3]
1.h LPCI Pump A Discharge Flow – Low (Minimum Flow)	1	[1]
1.i Manual Initiation	2	[1]
2.f Reactor Vessel	1 per valve	[3]

Required Channels Per Function After Implementing TSTF-542

Relocated Function in proposed TS Table 3.3.5.2-1	Columbia Proposed TS Table 3.3.5.2-1	TSTF-542 STS Table 3.3.5.2-1
1.a Reactor Vessel Pressure – Low (Injection Permissive)	1 per valve	[3]
1.c LPCI Pump A Discharge Flow – Low (Minimum Flow)	1	[1 per pump]
1.d Manual Initiation	2	[1 per subsystem]
2.a Reactor Vessel	1 per valve	[3]

Existing Function	Columbia TS Table 3.3.5.1-1	TSTF-542 STS Table 3.3.5.1-1
Pressure – Low (Injection Permissive)		
2.h Manual Initiation	2	[1]
3.f HPCS System Flow Rate – Low (Minimum Flow)	1	[1]

Relocated Function in proposed TS Table 3.3.5.2-1	Columbia Proposed TS Table 3.3.5.2-1	TSTF-542 STS Table 3.3.5.2-1
Pressure – Low (Injection Permissive)		
2.c Manual Initiation	2	[1 per subsystem]
3.b HPCS System Flow Rate – Low (Minimum Flow)	1	[1 per pump]

Energy Northwest Response to RAI-1:

Required Channels Per Function
After Implementing TSTF-542

Relocated Function in proposed TS Table 3.3.5.2-1	**Columbia Proposed TS Table 3.3.5.2-1**	**TSTF-542 STS Table 3.3.5.2-1**	**Energy Northwest Response**
1. Low Pressure Coolant Injection – A (LPCI) and Low Pressure Core Spray (LPCS) Subsystems 1.a Reactor Vessel Pressure – Low (Injection Permissive)	1 per valve	[3]	Each Emergency Core Cooling system (ECCS) spray and injection subsystem has an associated injection valve. Redundant pressure switches, one per ECCS injection valve, monitor the variable and provide the permissive for the valve to open. As such, it is appropriate for the required channels per function to be 1 per valve and maintaining this function operable will ensure the valve will open if the subsystem is manually initiated.
1.c LPCI Pump A Discharge Flow – Low (Minimum Flow)	1	[1 per pump]	There is one minimum flow switch per ECCS pump. This function (1.h) involves only one pump. Therefore, there is no need to include “per pump.”
1.d Manual Initiation	2	[1 per subsystem]	The Manual Initiation Function is common to both the ECCS subsystems in Division 1. The Manual Initiation Function is comprised of one switch and one push button. Since the Division 1 Manual Initiation Function is common to LPCI A and LPCS, it is not correct to refer to a “per subsystem” basis.

Required Channels Per Function
After Implementing TSTF-542

Relocated Function in proposed TS Table 3.3.5.2-1	**Columbia Proposed TS Table 3.3.5.2-1**	**TSTF-542 STS Table 3.3.5.2-1**	**Energy Northwest Response**
2. LPCI B and LPCI C subsystems 2.a Reactor Vessel Pressure – Low (Injection Permissive)	 1 per valve	 [3]	See the discussion for Function 1.a above.
2.c Manual Initiation	2	[1 per subsystem]	Similar to the discussion for Function 1.d above, the Manual Initiation Function is common to both the ECCS subsystems in Division 2. The Manual Initiation Function is comprised of one switch and one push button. Since the Manual Initiation Function is common to both LPCI B and LPCI C, it is not correct to refer to a “per subsystem” basis.
3. High Pressure Core Spray (HPCS) System 3.b HPCS System Flow Rate – Low (Minimum Flow)	 1	 [1 per pump]	There is one minimum flow switch per ECCS pump. This function (3.b) only involves one pump. Therefore, there is no need to include “per pump.”

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Enclosure 2

Technical Specification Markup Pages

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.2.~~3~~4	Verify, for ~~each~~ the required ECCS injection/spray subsystem, locations susceptible to gas accumulation are sufficiently filled with water.	In accordance with the Surveillance Frequency Control Program
SR 3.5.2.~~4~~5	----------NOTE---------- ~~1. 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.~~ ~~2.~~ Not required to be met for system vent flow paths opened under administrative controls. ---------- Verify ~~each~~ for the required ECCS injection/spray subsystem, each 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.	In accordance with the Surveillance Frequency Control Program
SR 3.5.2.~~5~~6	~~Verify each required ECCS pump develops the specified flow rate with the specified differential pressure between reactor and suction source.~~ ~~DIFFERENTIAL PRESSURE BETWEEN REACTOR AND SYSTEM FLOW RATE SUCTION SOURCE~~ ~~LPCS ≥ 6200 gpm ≥ 128 psid~~ ~~LPCI ≥ 7200 gpm ≥ 26 psid~~ ~~HPCS ≥ 6350 gpm ≥ 200 psid~~---------- ----------NOTE---------- Injection into the vessel is not required. ---------- Operate the required ECCS injection/spray subsystem for ≥ 10 minutes.	~~In accordance with the INSERVICE TESTING PROGRAM~~In accordance with the Surveillance Frequency Control Program
SR 3.5.2.7	Verify each valve credited for automatically isolating a penetration flow path actuates to the isolation	In accordance with the

position on an actual or simulated isolation signal.	Surveillance Frequency Control Program

Table 3.3.5.2-1 (page 2 of 2)
RPV Water Inventory Control Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER FUNCTION	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
3. High Pressure Core Spray (HPCS) System					
a. Condensate Storage Tank Level - Low	4[(b)], 5[(b)]	1[(a)]	D	SR 3.3.5.2.2	≥ 448 ft 1 inch elevation
b. HPCS System Flow Rate - Low (Minimum Flow)	4, 5	1[(a)]	E	SR 3.3.5.2.2	≥ 1200 gpm and ≤ 1512 gpm
4. Residual Heat Removal (RHR) Shutdown Cooling (SDC) System Isolation					
a. Reactor Vessel Water Level - Low, Level 3	(c)	2 in one trip system	B	SR 3.3.5.2.1 SR 3.3.5.2.2	≥ 9.5 inches
5. Reactor Water Cleanup (RWCU) System Isolation					
a. Reactor Vessel Water Level - Low Low, Level 2	(c)	2 in one trip system	B	SR 3.3.5.2.2	≥ -58 inches

(a) Associated with an ECCS subsystem required to be OPERABLE by LCO 3.5.2, "Reactor Pressure Vessel Water Inventory Control."

(b) When HPCS is OPERABLE for compliance with LCO 3.5.2, "RPV Water Inventory Control," and aligned to the condensate storage tank.

(c) When automatic isolation of the associated penetration flow path(s) is credited in calculating DRAIN TIME.

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Enclosure 3

Technical Specification Clean Pages

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.5.2.4	Verify, for the required ECCS injection/spray subsystem, locations susceptible to gas accumulation are sufficiently filled with water.	In accordance with the Surveillance Frequency Control Program
SR 3.5.2.5	----------NOTE---------- Not required to be met for system vent flow paths opened under administrative controls. ----------	
	Verify for the required ECCS injection/spray subsystem, each 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.	In accordance with the Surveillance Frequency Control Program
SR 3.5.2.6	----------NOTE---------- Injection into the vessel is not required. ----------	
	Operate the required ECCS injection/spray subsystem for ≥ 10 minutes.	In accordance with the Surveillance Frequency Control Program
SR 3.5.2.7	Verify each valve credited for automatically isolating a penetration flow path actuates to the isolation position on an actual or simulated isolation signal.	In accordance with the Surveillance Frequency Control Program

Table 3.3.5.2-1 (page 2 of 2)
RPV Water Inventory Control Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER FUNCTION	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
3. High Pressure Core Spray (HPCS) System					
a. Condensate Storage Tank Level - Low	4[(b)], 5[(b)]	1[(a)]	D	SR 3.3.5.2.2	≥ 448 ft 1 inch elevation
b. HPCS System Flow Rate - Low (Minimum Flow)	4, 5	1[(a)]	E	SR 3.3.5.2.2	≥ 1200 gpm and ≤ 1512 gpm
4. Residual Heat Removal (RHR) Shutdown Cooling (SDC) System Isolation					
a. Reactor Vessel Water Level - Low, Level 3	(c)	2 in one trip system	B	SR 3.3.5.2.1 SR 3.3.5.2.2	≥ 9.5 inches
5. Reactor Water Cleanup (RWCU) System Isolation					
a. Reactor Vessel Water Level - Low Low, Level 2	(c)	2 in one trip system	B	SR 3.3.5.2.2	≥ -58 inches

(a) Associated with an ECCS subsystem required to be OPERABLE by LCO 3.5.2, "Reactor Pressure Vessel Water Inventory Control."

(b) When HPCS is OPERABLE for compliance with LCO 3.5.2, "RPV Water Inventory Control," and aligned to the condensate storage tank.

(c) When automatic isolation of the associated penetration flow path(s) is credited in calculating DRAIN TIME.

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Enclosure 4

Technical Specification Bases for Information Only

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

the minimum flow valve once the closure setpoint is exceeded. The LPCI minimum flow valves are time delayed such that the valves will not open for 8 seconds after the switches detect low flow. The time delay is provided to limit reactor vessel inventory loss during the startup of the Residual Heat Removal (RHR) shutdown cooling mode (for RHR A and RHR B).

The Pump Discharge Flow - Low Allowable Values are high enough to ensure that the pump flow rate is sufficient to protect the pump, yet low enough to ensure that the closure of the minimum flow valve is initiated to allow full flow into the core.

One channel of the Pump Discharge Flow - Low Function is required to be OPERABLE in MODES 4 and 5 when the associated LPCS or LPCI pump is required to be OPERABLE by LCO 3.5.2 to ensure the pumps are capable of injecting into the Reactor Pressure Vessel when manually initiated.

1.d, 2.c. Manual Initiation

The Manual Initiation switch and push button channels introduce signals into the appropriate ECCS logic to provide manual initiation capability and are redundant to the automatic protective instrumentation. There is one switch and push button (with two channels per switch and push button) for each of the two Divisions of low pressure ECCS (i.e., Division 1 ECCS, LPCS and LPCI A; Division 2 ECCS, LPCI B and LPCI C). Only the manual initiation function required to be OPERABLE is that associated with the ECCS subsystem required to be OPERABLE by LCO 3.5.2.

There is no Allowable Value for this Function since the channels are mechanically actuated based solely on the position of the push buttons.

High Pressure Core Spray System

3.a. Condensate Storage Tank Level – Low

Low level in the CST indicates the unavailability of an adequate supply of makeup water from this normal source. Normally the suction valves between HPCS and the CST are open and water for HPCS injection would be taken from the CST. However, if the water level in the CST falls below a preselected level, first the suppression pool suction valve automatically opens, and then the CST suction valve automatically closes. This ensures that an adequate supply of makeup water is available to the HPCS pump. To prevent losing suction to the pump, the