From:	Chawla, Mahesh
Sent:	Wednesday, May 18, 2022 5:35 PM
To:	'Garcia, Richard M.'
Cc:	Tsao, John; Hamm, Matthew; Scully, Derek; Smith, Ashley; Wagage, Hanry; Moyer, Carol; Forsaty, Fred; Dixon-Herrity, Jennifer
Subject:	Draft - Request for Additional Information - Columbia Generating Station - LAR to change TS 3.4.11 - Reactor Coolant System Pressure and Temperature Limits - EPID L-2021-LLA-0191
Attachments:	Columbia Draft RAIs.docx

Dear Mr. Garcia,

By letter dated October 13, 2021 (Agencywide Documents and Access Management System (ADAMS) Accession No. ML21299A182), Energy Northwest (the licensee) requested to revise Technical Specification (TS) 3.4.11, “Reactor Coolant System Pressure and Temperature (P/T) Limits,” at the Columbia Generating Station (CGS). The license amendment request will replace the P/T (P-T) limit curves for inservice leak and hydrostatic testing, non-nuclear heating and cooldown, and nuclear heating and cooldown in TS Figures 3.4.11-1, 3.4.11-2, and 3.4.11-3, respectively. In addition, the licensee provided the revised P/T curves to satisfy the license renewal commitment Number 54 in Appendix A, Table A-1 of NUREG-2123 "Safety Evaluation Report Related to the License Renewal of Columbia Generating Station," which the Nuclear Regulatory Commission (NRC) published in May 2012 (ML12139A300 and ML12139A302).

Please arrange a teleconference with the NRC staff to discuss the attached request for additional information. Thanks

Sincerely,

Mahesh Chawla, Project Manager
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
ph: 301-415-8371
Docket No. 50-483

	DORL/LPL4/PM	DORL/LPL4/BC
	MChawla	JDixon-Herrity
	5/18/22	5/18/22

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REQUEST FOR ADDITIONAL INFORMATION
LICENSE AMENDMENT REQUEST
REVISED PRESSURE TEMPERATURE LIMIT CURVES
IN TECHNICAL SPECIFICATIONS
COLUMBIA GENERATING STATION
ENERGY NORTHWEST
DOCKET NO. 50-397
EPID L-2021-LLA-0191

By letter dated October 13, 2021 (Agencywide Documents and Access Management System (ADAMS) Accession No. ML21299A182), Energy Northwest (the licensee) requested to revise Technical Specification (TS) 3.4.11, "Reactor Coolant System Pressure and Temperature (P/T) Limits," at the Columbia Generating Station (CGS). The license amendment request will replace the P/T limit curves for inservice leak and hydrostatic testing, non-nuclear heating and cooldown, and nuclear heating and cooldown in TS figures 3.4.11-1, 3.4.11-2, and 3.4.11-3, respectively. In addition, the licensee provided the revised P/T curves to satisfy the license renewal commitment No. 54 in appendix A, table A-1 of NUREG-2123 "Safety Evaluation Report Related to the License Renewal of Columbia Generating Station," which the Nuclear Regulatory Commission (NRC) dated May 2012 (ML12139A300 and ML12139A302).

To complete its review, the NRC staff requests additional information:

Regulatory Basis

The regulations in Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, Appendix G, require: (1) sufficient fracture toughness for reactor pressure vessel (RPV) ferritic materials to provide adequate safety margins during any condition of normal operation, including anticipated operational occurrences and system hydrostatic tests; (2) P/T limits that satisfy the American Society of Mechanical Engineers (ASME) Code, section XI, appendix G, and the minimum temperature requirements during normal heat-up, cool-down, and pressure test operations; and (3) applicable surveillance data from RPV material surveillance programs developed in accordance with 10 CFR Part 50, appendix H, "Reactor Vessel Material Surveillance Program Requirements," be incorporated into the calculations of P/T limits.

Regulatory Guide (RG) 1.99, Revision 2, "Radiation Embrittlement of Reactor Vessel Materials," dated May 1988 (ML003740284), describes procedures for calculating the adjusted nil-ductility transition reference temperature RT_{NDT} (ART) due to neutron irradiation on RPVs.

Requests for Additional Information (RAIs)

RAI-1

Issue

(1) Section 3.3 of NEDO-33929, "Energy Northwest/Columbia Generating Station Pressure and Temperature Limits Report (PTLR) up to 54 effective full-power years," in the license amendment request discusses initial reference nil ductility transition temperature (RT_{NDT}). Appendix B of NEDO-33929 presents the initial RT_{NDT} of various RPV materials. TS figures 3.4.11-1 and 3.4.11-3 show the initial RT_{NDT} for the upper vessel and bottom head. The NRC staff is not clear how the initial RT_{NDT} was derived because section 3.3 and appendix B (Tables B-1 to B-4) of NEDO-33929 do not show the initial RT_{NDT} of the upper vessel and bottom head.

(2) The initial RT_{NDT} for the bottom head in TS figures 3.4.11-1 and 3.4.11-3 is different from that of TS figure 3.4.11-2. The NRC staff is not clear why the initial RT_{NDT} for the same bottom head is different in these figures.

(3) Section 3.3 of NEDO-33929 indicates that the initial RT_{NDT} values for various RPV materials, such as the bottom head, used in the P/T curves are proprietary information. However, TS figures 3.4.11-1, 3.4.11-2, and 3.4.11-3 present the initial RT_{NDT} values for the same RPV materials as non-proprietary. The NRC staff is not clear why two different proprietary information classifications exist for the same RT_{NDT} values of the same RPV materials.

Request

(1) Discuss how the initial RT_{NDT} of the upper vessel and bottom head is derived.
(2) Clarify the discrepancy in the initial RT_{NDT} value for the bottom head between figures 3.4.11-1/3.4.11-3 and figure 3.4.11-2.
(3) Clarify the discrepancy in the proprietary information classifications.

RAI-2

Issue

(1) Note 2 to 10 CFR Part 50, appendix G, table 1 specifies that the RPV minimum temperature requirement under several operating conditions is "The highest reference temperature of the material in the closure flange region that is highly stressed by the bolt preload…." Table B-1 of NEDO-33929 shows a RT_{NDT} for the RPV head flange, and TS figures 3.4.11-1, 3.4.11-2, and 3.4.11-3 show a different initial RT_{NDT} for the upper vessel. The NRC staff is not clear on what is the highest reference temperature in the closure flange region that is used in TS figures 3.4.11-1, 3.4.11-2, and 3.4.11-3. In addition, the NRC staff is not clear whether the initial RT_{NDT} for the upper vessel in the three TS figures is applicable to the RPV head flange (i.e., is the initial RT_{NDT} for the upper vessel to be used for the RPV head flange?)

(2) The nuclear heating and cooldown curve in proposed TS figure 3.4.11-3 shows the minimum vessel temperature as 80 ^{o}F at 60 pounds per square inch gauge (psig). The NRC staff is not clear whether the 80 degrees Fahrenheit (^{o}F) temperature satisfies the minimum temperature requirements of 10 CFR Part 50, appendix G.

(3) Appendix G to 10 CFR Part 50, table 1, item 2.d requires that when the reactor internal pressure is > 20 percent of the preservice system hydrostatic test pressure, the minimum temperature must be larger than the minimum permissible temperature for the inservice system hydrostatic pressure test or closure flange RT_{NDT} plus 160 °F. The NRC staff is not clear the proposed TS figure 3.4.11-3 satisfies this requirement.

(4) The NRC staff is not clear whether TS figures 3.4.11-1, 3.4.11-2, and 3.4.11-3 satisfy the minimum temperature requirements of 10 CFR Part 50, appendix G, table 1.

Request

(1) Discuss the highest reference temperature of the material in the closure flange region that is highly stressed by the bolt preload used in the proposed P/T curves. Clarify whether the initial RT_{NDT} for the upper vessel in the three TS figures is applicable to the RT_{NDT} of the RPV closure flange as specified in table 1 of 10 CFR Part 50, appendix G.

(2) Discuss the minimum permissible temperature for the inservice system hydrostatic pressure test.

(3) Discuss how TS figures 3.4.11-1, 3.4.11-2, and 3.4.11-3 satisfy the minimum temperature requirements in item numbers 1a, 1b, 2a, 2b, 2c, 2d, and 2e of 10 CFR Part 50, appendix G, table 1.

RAI-3

Issue

TS figures 3.4.11-1 and 3.4.11-2 contain a P/T curve for the bottom head and a minimum temperature for the bottom head. The NRC staff is not clear how the bottom head P/T curve is monitored and whether the minimum temperature value shown in TS figures 3.4.11-1 and 3.4.11-2 satisfies the minimum temperature requirements of 10 CFR Part 50, appendix G.

Request

(1) Discuss whether the control room has instrumentation to show that the pressure and temperature at the bottom head region are not exceeded during the inservice leak and hydrostatic testing and non-nuclear heat-up and cool-down operation.

(2) Discuss how the minimum temperature for the bottom head in TS figures 3.4.11-1 and 3.4.11-2 satisfies requirements in item numbers 1a, 1b, 2a, and 2b of 10 CFR Part 50, appendix G, table 1.

RAI-4

Issue

Section 3.6 of the licensee's report NEDC-33929P in the license amendment request states that CGS has two indications in a reactor vessel beltline weld and that these indications were not reviewed in the NEDO-33929P report. The NRC staff notes that the purpose of the P/T limit curve is to protect the structural integrity of the reactor vessel. Therefore, the existence of these two indications cannot be ignored when generating new P/T limit curves. The NRC staff is not clear whether the two indications affect the P/T limit curves and reactor vessel structural integrity.

Request

Discuss why the two indications do not affect the construction of the P/T limit curves. In the discussion, include the following information: (a) the length, depth, and orientation of the two indications, (b) discuss whether the indications are located in a longitudinal or circumferential weld, (c) discuss the location of the indications with respect to the wall thickness of the beltline weld, and (d) discuss whether the two indications are embedded in the weld or are connected to the inside diameter surface of the RPV.