UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

March 27, 2015

Mr. Mark E. Reddemann
Chief Executive Officer
Energy Northwest
P.O. Box 968 (Mail Drop 1023)
Richland, WA 99352-0968

SUBJECT: COLUMBIA GENERATING STATION - ISSUANCE OF AMENDMENT RE: LICENSE AMENDMENT REQUEST FOR CHANGING TECHNICAL SPECIFICATION TABLE 3.3.1.1-1 FUNCTION 7, "SCRAM DISCHARGE VOLUME WATER LEVEL – HIGH" (TAC NO. MF3673)

Dear Mr. Reddemann:

The U.S. Nuclear Regulatory Commission (Commission) has issued the enclosed Amendment No. 232 to Renewed Facility Operating License No. NPF-21 for the Columbia Generating Station. The amendment consists of changes to the Technical Specifications (TS) in response to your application dated March 24, 2014, as supplemented by letters dated May 8, August 28, November 6, and December 15, 2014.

The amendment revises TS Table 3.3.1.1-1, "Reactor Protection System Instrumentation," Functions 7.a and 7.b, as follows:

- Function 7.a: change the term "Transmitter/Trip Unit" to "Transmitter/Level Indicating Switch" and add Surveillance Requirement (SR) 3.3.1.1.1 to require performance of a Channel Check every 12 hours; and

- Function 7.b: change the term "Float Switch" to "Transmitter/Level Switch" and add footnotes (d) and (e) to SR 3.3.1.1.10 for the new scram discharge instrumentation.

Addition of footnotes (d) and (e) to SR 3.3.1.1.10 of Function 7.b is in accordance with Option A of TS Task Force (TSTF) change traveler TSTF-493, Revision 4, "Clarify Application of Setpoint Methodology for LSSS [Limiting Safety System Settings] Functions."

A copy of the related Safety Evaluation is also enclosed. The Notice of Issuance will be included in the Commission's next biweekly *Federal Register* notice.

Sincerely,

Andrea E. George, Project Manager
Plant Licensing Branch IV-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-397

Enclosures:
1. Amendment No. 232 to NPF-21
2. Safety Evaluation

cc w/encls: Distribution via Listserv

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

ENERGY NORTHWEST

DOCKET NO. 50-397

COLUMBIA GENERATING STATION

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 232
License No. NPF-21

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by Energy Northwest (licensee), dated March 24, 2014, as supplemented by letters dated May 8, August 28, November 6, and December 15, 2014, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act) and the Commission's regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and Paragraph 2.C.(2) of Renewed Facility Operating License No. NPF-21 is hereby amended to read as follows:

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, as revised through Amendment No. 232 and the Environmental Protection Plan contained in Appendix B, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. The license amendment is effective as of its date of issuance and shall be implemented prior to restarting from refueling outage R-22, scheduled for spring 2015.

FOR THE NUCLEAR REGULATORY COMMISSION

Michael T. Markley, Chief
Plant Licensing Branch IV-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Renewed Facility
Operating License No. NPF-21
and Technical Specifications

Date of Issuance: March 27, 2015

ATTACHMENT TO LICENSE AMENDMENT NO. 232

RENEWED FACILITY OPERATING LICENSE NO. NPF-21

DOCKET NO. 50-397

Replace the following pages of the Renewed Facility Operating License No. NPF-21 and Appendix A, Technical Specifications with the attached revised pages. The revised pages are identified by amendment number and contain vertical lines indicating the areas of change.

Facility Operating License

REMOVE	INSERT
-4-	-4-

Technical Specification

REMOVE	INSERT
3.3.1.1-7	3.3.1.1-7
3.3.1.1-8	3.3.1.1-8
3.3.1.1-17	3.3.1.1-17
3.3.1.1-18	3.3.1.1-18

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, as revised through Amendment No. 232 and the Environmental Protection Plan contained in Appendix B, are hereby incorporated in the renewed license. The licensee shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

a. For Surveillance Requirements (SRs) not previously performed by existing SRs or other plant tests, the requirement will be considered met on the implementation date and the next required test will be at the interval specified in the Technical Specifications as revised in Amendment No. 149.

(3) Deleted.

(4) Deleted.

(5) Deleted.

(6) Deleted.

(7) Deleted.

(8) Deleted.

(9) Deleted.

(10) Deleted.

(11) Shield Wall Deferral (Section 12.3.2, SSER #4, License Amendment #7)

The licensee shall complete construction of the deferred shield walls and window as identified in Attachment 3, as amended by this license amendment.

(12) Deleted.

(13) Deleted.

*The parenthetical notation following the title of many license conditions denotes the section of the Safety Evaluation Report and/or its supplements wherein the license condition is discussed.

Table 3.3.1.1-1 (page 2 of 3)
Reactor Protection System Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	CONDITIONS REFERENCED FROM REQUIRED ACTION D.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
3.	Reactor Vessel Steam Dome Pressure - High	1,2	2	G	SR 3.3.1.1.8 SR 3.3.1.1.10 SR 3.3.1.1.14 SR 3.3.1.1.15	≤ 1079 psig
4.	Reactor Vessel Water Level - Low, Level 3	1,2	2	G	SR 3.3.1.1.1 SR 3.3.1.1.8 SR 3.3.1.1.10 SR 3.3.1.1.14 SR 3.3.1.1.15	≥ 9.5 inches
5.	Main Steam Isolation Valve - Closure	1	8	F	SR 3.3.1.1.8 SR 3.3.1.1.10 SR 3.3.1.1.14 SR 3.3.1.1.15	≤ 12.5% closed
6.	Primary Containment Pressure - High	1,2	2	G	SR 3.3.1.1.8 SR 3.3.1.1.10 SR 3.3.1.1.14	≤ 1.88 psig
7.	Scram Discharge Volume Water Level - High					
	a. Transmitter/ Level Indicating Switch	1,2	2	G	SR 3.3.1.1.1 SR 3.3.1.1.8 SR 3.3.1.1.10 SR 3.3.1.1.14	≤ 529 ft 9 inches elevation
		5[a]	2	H	SR 3.3.1.1.1 SR 3.3.1.1.8 SR 3.3.1.1.10 SR 3.3.1.1.14	≤ 529 ft 9 inches elevation
	b. Transmitter/Level Switch	1,2	2	G	SR 3.3.1.1.8 SR 3.3.1.1.10[d][e] SR 3.3.1.1.14	≤ 529 ft 9 inches elevation
		5[a]	2	H	SR 3.3.1.1.8 SR 3.3.1.1.10[d][e] SR 3.3.1.1.14	≤ 529 ft 9 inches elevation

(a) With any control rod withdrawn from a core cell containing one or more fuel assemblies.

(d) If the as-found channel setpoint is outside its predefined as-found tolerance, then the channel shall be evaluated to verify that it is functioning as required before returning the channel to service.

(e) The instrument channel setpoint shall be reset to a value that is within the as-left tolerance around the Limiting Trip Setpoint (LTSP) at the completion of the surveillance; otherwise, the channel shall be declared inoperable. Setpoints more conservative than the LTSP are acceptable provided that the as-found and as-left tolerances apply to the actual setpoint implemented in the surveillance procedures (Nominal Trip Setpoint) to confirm channel performance. The LTSP and the methodologies used to determine the as-found and the as-left tolerances are specified in the Licensee Controlled Specifications.

Table 3.3.1.1-1 (page 3 of 3)
Reactor Protection System Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	CONDITIONS REFERENCED FROM REQUIRED ACTION D.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
8.	Turbine Throttle Valve - Closure	≥ 30% RTP	4	E	SR 3.3.1.1.8 SR 3.3.1.1.10 SR 3.3.1.1.12 SR 3.3.1.1.14 SR 3.3.1.1.15	≤ 7% closed
9.	Turbine Governor Valve Fast Closure, Trip Oil Pressure - Low	≥ 30% RTP	2	E	SR 3.3.1.1.8 SR 3.3.1.1.10 SR 3.3.1.1.12 SR 3.3.1.1.14 SR 3.3.1.1.15	≥ 1000 psig
10.	Reactor Mode Switch - Shutdown Position	1,2	2	G	SR 3.3.1.1.13 SR 3.3.1.1.14	NA
		5[(a)]	2	H	SR 3.3.1.1.13 SR 3.3.1.1.14	NA
11.	Manual Scram	1,2	2	G	SR 3.3.1.1.4 SR 3.3.1.1.14	NA
		5[(a)]	2	H	SR 3.3.1.1.4 SR 3.3.1.1.14	NA

(a) With any control rod withdrawn from a core cell containing one or more fuel assemblies.

Table 3.3.1.1-1 (page 3 of 4)
Reactor Protection System Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	CONDITIONS REFERENCED FROM REQUIRED ACTION D.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
3.	Reactor Vessel Steam Dome Pressure - High	1,2	2	G	SR 3.3.1.1.8 SR 3.3.1.1.10 SR 3.3.1.1.14 SR 3.3.1.1.15	≤ 1079 psig
4.	Reactor Vessel Water Level - Low, Level 3	1,2	2	G	SR 3.3.1.1.1 SR 3.3.1.1.8 SR 3.3.1.1.10 SR 3.3.1.1.14 SR 3.3.1.1.15	≥ 9.5 inches
5.	Main Steam Isolation Valve - Closure	1	8	F	SR 3.3.1.1.8 SR 3.3.1.1.10 SR 3.3.1.1.14 SR 3.3.1.1.15	≤ 12.5% closed
6.	Primary Containment Pressure - High	1,2	2	G	SR 3.3.1.1.8 SR 3.3.1.1.10 SR 3.3.1.1.14	≤ 1.88 psig
7.	Scram Discharge Volume Water Level - High					
	a. Transmitter/Level Indicating Switch	1,2	2	G	SR 3.3.1.1.1 SR 3.3.1.1.8 SR 3.3.1.1.10 SR 3.3.1.1.14	≤ 529 ft 9 inches elevation
		5[a]	2	H	SR 3.3.1.1.1 SR 3.3.1.1.8 SR 3.3.1.1.10 SR 3.3.1.1.14	≤ 529 ft 9 inches elevation
	b. Transmitter/Level Switch	1,2	2	G	SR 3.3.1.1.8 SR 3.3.1.1.10[d][e] SR 3.3.1.1.14	≤ 529 ft 9 inches elevation
		5[a]	2	H	SR 3.3.1.1.8 SR 3.3.1.1.10[d][e] SR 3.3.1.1.14	≤ 529 ft 9 inches elevation

(a) With any control rod withdrawn from a core cell containing one or more fuel assemblies.

(d) If the as-found channel setpoint is outside its predefined as-found tolerance, then the channel shall be evaluated to verify that it is functioning as required before returning the channel to service.

(e) The instrument channel setpoint shall be reset to a value that is within the as-left tolerance around the Limiting Trip Setpoint (LTSP) at the completion of the surveillance; otherwise, the channel shall be declared inoperable. Setpoints more conservative than the LTSP are acceptable provided that the as-found and as-left tolerances apply to the actual setpoint implemented in the surveillance procedures (Nominal Trip Setpoint) to confirm channel performance. The LTSP and the methodologies used to determine the as-found and the as-left tolerances are specified in the Licensee Controlled Specifications.

Table 3.3.1.1-1 (page 4 of 4)
Reactor Protection System Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	CONDITIONS REFERENCED FROM REQUIRED ACTION D.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
8.	Turbine Throttle Valve - Closure	≥ 30% RTP	4	E	SR 3.3.1.1.8 SR 3.3.1.1.10 SR 3.3.1.1.12 SR 3.3.1.1.14 SR 3.3.1.1.15	≤ 7% closed
9.	Turbine Governor Valve Fast Closure, Trip Oil Pressure - Low	≥ 30% RTP	2	E	SR 3.3.1.1.8 SR 3.3.1.1.10 SR 3.3.1.1.12 SR 3.3.1.1.14 SR 3.3.1.1.15	≥ 1000 psig
10.	Reactor Mode Switch - Shutdown Position	1,2	2	G	SR 3.3.1.1.13 SR 3.3.1.1.14	NA
		5[(a)]	2	H	SR 3.3.1.1.13 SR 3.3.1.1.14	NA
11.	Manual Scram	1,2	2	G	SR 3.3.1.1.4 SR 3.3.1.1.14	NA
		5[(a)]	2	H	SR 3.3.1.1.4 SR 3.3.1.1.14	NA

(a) With any control rod withdrawn from a core cell containing one or more fuel assemblies.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 232 TO

RENEWED FACILITY OPERATING LICENSE NO. NPF-21

ENERGY NORTHWEST

COLUMBIA GENERATING STATION

DOCKET NO. 50-397

1.0 INTRODUCTION

By application dated March 24, 2014 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML14098A400), as supplemented by letters dated May 8, August 28, November 6, and December 15, 2014 (ADAMS Accession Nos. ML14141A538, ML14254A177, ML14321A407, and ML14351A304, respectively), Energy Northwest (the licensee) requested changes to the Technical Specifications (TSs), Appendix A to Renewed Facility Operating License No. NPF-21, for the Columbia Generating Station (CGS). The requested change would revise TS Table 3.3.1.1-1, "Reactor Protection System Instrumentation," Functions 7.a and 7.b, as follows:

- Function 7.a: change the term "Transmitter/Trip Unit" to "Transmitter/Level Indicating Switch" and add Surveillance Requirement (SR) 3.3.1.1.1 to require performance of a Channel Check every 12 hours; and

- Function 7.b: change the term "Float Switch" to "Transmitter/Level Switch" and add footnotes (d) and (e) to SR 3.3.1.1.10 for the new scram discharge instrumentation.

The purpose of the changes is to more accurately describe the existing instrument's indication capability, to correct the inadvertent omission of the SR for Function 7.a, and to reflect the planned replacement of existing Magnetrol Level Float Switches with the comparably reliable and more accurate level transmitters and associated trip units for Function 7.b. Addition of footnotes (d) and (e) to SR 3.3.1.1.10 of Function 7.b is in accordance with Option A of TS Task Force (TSTF) change traveler TSTF-493, Revision 4, "Clarify Application of Setpoint Methodology for LSSS [limiting safety system settings] Functions" (ADAMS Accession No. ML100060064).

The supplemental letters dated August 28, November 6, and December 15, 2014, provided additional information that clarified the application, did not expand the scope of the application as originally noticed, and did not change the U.S. Nuclear Regulatory Commission (NRC) staff's

original proposed no significant hazards consideration determination as published in the *Federal Register* on July 22, 2014 (79 FR 42544).

2.0 REGULATORY EVALUATION

Plant protective systems are designed to initiate reactor trips (scrams) or other protective actions before selected unit parameters exceed analytical limits (ALs) assumed in the safety analysis in order to prevent violation of the reactor core safety limits (SLs) and reactor coolant system (RCS) pressure SL from postulated anticipated operational occurrences (AOOs) and to assist the engineered safety features (ESF) systems in mitigating accidents. The reactor core and RCS pressure SLs ensure that the integrity of the reactor core and RCS is maintained. The design criteria for instrumentation used by this evaluation are discussed below.

The regulation at Title 10 of the *Code of Federal Regulations* (10 CFR), Part 50, Appendix A, General Design Criteria [GDC] for Nuclear Power Plants," Criterion 13, "Instrumentation and control," states:

> 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.

The regulation at 10 CFR Part 50, Appendix A, Criterion 20, "Protection system functions," states:

> The protection system shall be designed (1) to initiate automatically the operation of appropriate systems including the reactivity control systems, to assure that specified acceptable fuel design limits are not exceeded as a result of anticipated operational occurrences and (2) to sense accident conditions and to initiate the operation of systems and components important to safety.

CGS Final Safety Analysis Report (FSAR) Section 3.1, "Conformance with NRC General Design Criteria" states, in part, "Based on the content herein, Energy Northwest concludes that CGS is in compliance with the GDC." CGS FSAR Section 3.1.2.2.4, "Criterion 13 – Instrumentation and Control" states, in part, "As noted above, adequate instrumentation is provided to monitor system variables in the reactor core, RCPB [reactor coolant pressure boundary], and reactor containment. Appropriate controls are provided to maintain the variables in the operating range and to initiate the necessary corrective action in the event of abnormal operational occurrence or accident. These instrumentation and controls meet the requirements of Criterion 13." In addition, CGS FSAR Section 3.1.2.3.1, "Criterion 20 – Protection System Functions" states, in part, "The design of the protection system satisfies the functional requirements as specified in Criterion 20."

The Commission's regulatory requirements related to the content of the TS are contained in 10 CFR 50.36, "Technical specifications." The regulation at 10 CFR 50.36 requires applicants for nuclear power plant operating licenses to include TS as part of the license. The regulation requires, in part, that the TS include items in the following categories: (1) safety limits, limiting safety systems settings, and limiting control settings; (2) limiting conditions for operation (LCOs); (3) SRs; (4) design features; and (5) administrative controls. However, the regulation does not specify the particular requirements to be included in TSs.

Instrumentation required by the TSs has been designed to assure that the applicable safety analysis limits will not be exceeded during accidents and AOOs. This is achieved by specifying limiting trip setpoints (LTSPs), including testing requirements to assure the necessary quality of systems, in terms of parameters directly monitored by the applicable instrumentation systems for limiting safety system settings (LSSSs), as well as specifying LCOs on other plant parameters and equipment in accordance with 10 CFR 50.36(c)(2), "Limiting conditions for operation."

- Section 50.36(c)(1)(i)(A) states, in part:

  Safety limits for nuclear reactors are limits upon important process variables that are found to be necessary to reasonably protect the integrity of certain of the physical barriers that guard against the uncontrolled release of radioactivity.

- Section 50.36(c)(1)(ii)(A) states, in part:

  Limiting safety system settings for nuclear reactors are settings for automatic protective devices related to those variables having significant safety functions. Where a limiting safety system setting is specified for a variable on which a safety limit has been placed, the setting must be so chosen that automatic protective action will correct the abnormal situation before a safety limit is exceeded. If, during operation, it is determined that the automatic safety system does not function as required, the licensee shall take appropriate action, which may include shutting down the reactor.

- Section 50.36(c)(2) states, in part:

  Limiting conditions for operation are the lowest functional capability or performance levels of equipment required for safe operation of the facility. When a limiting condition for operation of a nuclear reactor is not met, the licensee shall shut down the reactor or follow any remedial action permitted by the technical specifications until the condition can be met.

- Section 50.36(c)(3), "Surveillance requirements," states:

  Surveillance requirements are requirements relating to test, calibration, or inspection to assure that the necessary quality of systems and

components is maintained, that facility operation will be within safety limits, and that the limiting conditions for operation will be met.

- Section 50.36(c)(5), "Administrative controls," states, in part:

  Administrative controls are the provisions relating to organization and management, procedures, recordkeeping, review and audit, and reporting necessary to assure the operation of the facility in a safe manner.

In addition to the regulatory requirements stated above, the NRC staff also considered the following previously approved NRC guidance:

- NUREG-1433, Revision 4, "Standard Technical Specifications, General Electric, BWR/4 Plants" (STS), dated April 2012 (ADAMS Accession No. ML12104A192)[1].

- Regulatory Guide (RG) 1.105, Revision 3, "Setpoints for Safety-Related Instrumentation," dated December 1999 (ADAMS Accession No. ML993560062), for determining the acceptability of revising instrumentation TS requirements. RG 1.105 describes a method acceptable to the NRC staff for complying with the NRC's regulations for ensuring that setpoints for safety-related instrumentation are initially within and remain within the TS limits. The RG endorses Part 1 of ISA-S67.04-1994,[2] "Setpoints for Nuclear Safety-Related Instrumentation," subject to NRC staff clarifications. The ISA standard provides a basis for establishing setpoints for nuclear instrumentation for safety systems and addresses known contributing errors in the channel. Part 1 establishes a framework for ensuring that setpoints for nuclear safety-related instrumentation are established and maintained within specified limits.

- Regulatory Issue Summary (RIS) 2006-17, "NRC Staff Position on the Requirements of 10 CFR 50.36, Technical Specifications, Regarding Limiting Safety System Settings during Periodic Testing and Calibration of Instrument Channels," dated August 24, 2006 (ADAMS Accession No. ML051810077). RIS 2006-17 describes a method acceptable to the NRC staff for determining which instrument functions, as a subset of LSSSs, are required to be placed in TS. RIS 2006-17 also provides a method acceptable to the NRC staff for establishing the test acceptance criteria band for as-found instrument values based on nominal trip setpoints (NTSPs), with three conditions.

The technical requirements from TSTF Traveler TSTF-493, "Clarify Application of Setpoint Methodology for LSSS Functions," also pertain to the proposed change. The Notice of

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[1] CGS is a BWR5 type plant and certain portions of the CGS TSs are based on NUREG-1434, Revision 4, "Standard Technical Specifications, General Electric BWR/6 Plants," dated April 2012 (ADAMS Accession No. ML12104A195). The safety evaluation may contain references to NUREG-1434 for specific applications.

[2] Copies of this document may be obtained upon request from Instrument Society of America, 67 Alexander Drive, Research Triangle Park, NC 20779.

Availability for this Traveler was published in the *Federal Register* on May 11, 2010 (75 FR 26294).

3.0 TECHNICAL EVALUATION

3.1 Background

The Scram Discharge Volume (SDV) receives water displaced by the motion of the control rod drive pistons during a reactor scram. The SDV Water Level - High scram setpoint provides for scram action before water level in the discharge volume becomes high enough to where it could adversely affect scram capability. A scram is automatically initiated while sufficient capacity remains in the discharge volume to accommodate a scram.

Water level in the SDV water level is measured by two diverse methods, and the system is designed consistent with Generic Letter (GL) 80-107, "BWR Scram Discharge System," dated December 9, 1980 (http://www.nrc.gov/reading-rm/doc-collections/gen-comm/gen-letters/1980/gl80107.html), and GL 81-18, "BWR Scram Discharge System; Clarification of Diverse Instrumentation Requirement," dated March 30, 1981 (ADAMS Accession No. ML031080572). Diversity and redundancy between the instruments supporting the 7.a and 7.b functions is required and ensures no single event can prevent a scram caused by SDV high water level.

There are two interconnected scram discharge instrument volume tanks, and each tank has four instrument loops for sensing level. The outputs of the level instruments are arranged so there is a signal from both diverse methods (i.e., Function 7.a and 7.b instruments) to each reactor protection system (RPS) trip channel (A1, A2, B1, and B2) of the RPS trip system. Even though these signals are inputs to the RPS, no reactor protection credit is taken for a scram initiated from these functions or any of the design-basis accidents or transients analyzed in the FSAR.

The Function 7.a instrument set employs a strain gage sensor that converts a mechanical force (pressure) to an electrical signal. This instrument loop includes level transmitters (Gould PD-series) and Rosemount 510 level indicating switch trip units (indicating trip units). The instrument and logic configuration are not being modified.

The current Function 7.b instrument uses Magnetrol level float switches with associated relays. These switches have problems with crud accumulation, and thus the licensee is proposing to replace this instrument with new level transmitters and non-indicating level switch (trip units).

3.2 Proposed TS Changes

Current TS Table 3.3.1.1-1 Function 7.a contains the term "Transmitter/Trip Unit."

Revised TS Table 3.3.1.1-1 Function 7.a would state "Transmitter/Level Indicating Switch."

Current TS Table 3.3.1.1-1 Function 7.b contains the term "Float Switch."

Revised TS Table 3.3.1.1-1 Function 7.b would state "Transmitter/Level Switch."

Current TS Table 3.3.1.1-1 Function 7.a lists SRs 3.3.1.1.8, 3.3.1.1.10, and 3.3.1.1.14.

Revised TS Table 3.3.1.1-1 Function 7.a would list SRs 3.3.1.1.1, 3.3.1.1.8, 3.3.1.1.10, and 3.3.1.1.14.

In addition, TS Table 3.3.1.1-1 Function 7.b would be revised to add TSTF-493, Option A footnotes to SR 3.3.1.1.10, which would state the following:

(d) If the as-found channel setpoint is outside its predefined as-found tolerance, then the channel shall be evaluated to verify that it is functioning as required before returning the channel to service.

(e) The instrument channel setpoint shall be reset to a value that is within the as-left tolerance around the Limiting Trip Setpoint (LTSP) at the completion of the surveillance; otherwise, the channel shall be declared inoperable. Setpoints more conservative than the LTSP are acceptable provided that the as-found and as-left tolerances apply to the actual setpoint implemented in the surveillance procedures (Nominal Trip Setpoint) to confirm channel performance. The LTSP and the methodologies used to determine the as-found and the as-left tolerances are specified in the Licensee Controlled Specifications.

3.3 NRC Staff Evaluation

3.3.1 Changes to Function 7.a

The licensee is not modifying TS Table 3.3.1.1-1 Function 7.a design and logic configuration. As stated in its supplement dated May 8, 2014, the licensee intended to change (like-for-like) the level transmitter for Function 7.a with a level transmitter supplied by Ametek. However, in its supplement dated November 6, 2014, the licensee explained that this like-for-like change was not necessary and they would continue to use the Gould PD 3218 level transmitter.

3.3.1.1 Change of Term from "Transmitter/Trip Unit" to Transmitter/Level Indicating Switch"

In its letter dated March 24, 2014, the licensee requested NRC staff approval for two TS Table 3.3.1.1-1 modifications for this function. The first modification consists of changing the term "Transmitter/Trip Unit" to "Transmitter/Level Indicating Switch." The proposed term describes more accurately the existing instrumentation, and the instrumentation as it is described in the CGS FSAR. The NRC staff concludes that this change is administrative in nature and, therefore, is acceptable.

3.3.1.2 Addition of SR 3.3.1.1.1 to TS Function 7.a

The other modification to Function 7.a consists of the inclusion of a new SR added to the TS for Function 7.a. Specifically, the existing instrumentation associated with Function 7.a provides

level indication, and allows performance of a channel check. This capability is not currently included in the TS, and thus the licensee is requesting a modification to the TS to add SR 3.3.1.1.1 to perform a channel check every 12 hours in accordance with station procedures. In its letter dated May 8, 2014, the licensee stated that this frequency is consistent with the frequency used for other reactor protection functions, and it is also consistent with the STS (NUREG-1434, "Standard Technical Specifications General Electric, BWR/6" Plants, ADAMS Accession Nos. ML12104A195 and ML12104A196).

In its letter dated March 24, 2014, the licensee explained that an SR to perform channel checks had not been included in the current TS because at the time of the Improved TS (ITS) conversion at CGS, it was believed that the Function 7.a instrumentation could not provide an indicated value of the level being measured. Once the licensee realized the Function 7.a instrumentation did provide indicated values for SDV level, the plant procedures were modified to perform channel check in accordance with Administrative Letter (AL) 98-10, "Disposition of Technical Specifications That Are Insufficient to Assure Plant Safety," dated December 29, 1998 (ADAMS Accession No. ML031110108). This modification (and license amendment request (LAR)) would complete the actions required by AL 98-10. Furthermore, addition of the new SR would increase the probability that any problems with the instrument would be detected earlier, given the increased monitoring frequency (every 12 hours).

Since the SR should have already been in place for Function 7.a when CGS converted to ITS, and because the addition of the SR results in enhanced monitoring of the Function 7.a instrumentation, the NRC staff concludes that the change is acceptable.

3.3.2 Changes to Function 7.b

3.3.2.1 Change of Term from "Float Switch" to "Transmitter/Level Switch"

In its LAR, as supplemented, the licensee proposed a modification to replace the current Magnetrol level float switches associated with Function 7.b with Rosemount 3152N level transmitters and Ametek ET-1214 level switch, non-indicating, trip units.

In its supplement dated May 8, 2014, the licensee included a diagram illustrating the existing and new design for Function 7.b. This information shows the licensee will use different level transmitter trip units to maintain diversity. It also described the power source to be used for loops A1 and A2, which will be different from the power source for loops B1 and B2. Based on the proposed redundancy of instrument channels and the proposed diversity in level instruments and power supplies, the NRC staff concludes that the required design criteria described in the GLs cited in Section 3.1 of this safety evaluation continue to be met.

Because the level instrument for Function 7.b will be replaced, the current terminology in the TS Table 3.3.1.1-1 associated with this function does not properly describe the proposed configuration. The licensee has proposed to change the term "Float Switch" to "Transmitter/Level Switch." This change in terminology is necessary to reflect the new instrumentation hardware. This change is administrative in nature, and is, therefore, acceptable.

In addition, the proposed new instrument channel hardware for Function 7.b does not provide a capability for level indication. Therefore, the licensee has not proposed a requirement for channel check surveillance for this function. The NRC staff notes the original Magnetrol float switches proposed to be replaced also did not have remote level indication capability, nor did the GLs require such capability.

3.3.2.2 Addition of Footnotes (d) and (e) to Function 7.b SR 3.3.1.1.10

Adoption of Traveler TSTF-493, Option A, consists of adding requirements to assess channel performance during surveillance testing that verifies instrument channel setting values established by the plant-specific setpoint methodology. Specifically, these TS changes are made by the addition of two surveillance notes to the applicable SR in the SR column of TS instrumentation function tables. TSTF-493 establishes exclusion criteria to determine which functions do not need to receive the additional surveillance test requirements. Instruments are excluded from the additional requirements when their functional purpose can be described as (1) a manual actuation circuit, (2) an automatic actuation logic circuit, or (3) an instrument function that derives input from contacts, which have no associated sensor or adjustable device. Many permissives or interlocks, are excluded, if they derive input from a sensor or adjustable device that is tested as part of another TS function. The existing float switch instrumentation in Function 7.b met the exclusion. However, the new instrumentation for Function 7.b no longer meets the exclusion criteria. Since the licensee requested adding the TS surveillance notes to the channel calibration for Function 7.b, the licensee proposed to add footnotes (d) and (e) to SR 3.3.1.1.10. These notes are consistent with the notes described in TSTF-493, Revision 4 and the NRC staff's model safety evaluation for Option A plants (ADAMS Accession No. ML100710442).

The purpose of the change is to resolve operability determination issues associated with potentially non-conservative TSs allowable values (AVs)[3] calculated using some methods in the industry standard ISA-S67.04-1994, Part 2, "Methodologies for the Determination of Setpoints for Nuclear Safety-Related Instrumentation." The concern is that when these values are used to assess instrument channel performance during testing, non-conservative decisions about the equipment operability may result. In addition, the proposed change will resolve operability determination issues related to relying on AVs associated with TSs LSSSs[4] to ensure that TSs requirements, not plant procedures, will be used for assessing instrument channel operability.

The licensee added the term "Limiting Trip Setpoint" as terminology for the setpoint value calculated by means of the plant-specific setpoint methodology documented in the Licensee Controlled Specifications. As stated by the licensee in its letter dated March 24, 2014, the LTSP is more conservative than the AV and is the least conservative value to which the instrument channel is adjusted following surveillance testing. The LTSP is the limiting setting for the

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[3] The instrument setting "Allowable Value" is a limiting value of an instrument's as-found trip setting used during surveillances. The AV is more conservative than the Analytical Limit (AL) to account for applicable instrument measurement errors consistent with the plant-specific setpoint methodology. If during testing, the actual instrumentation setting is less conservative than the AV, the channel is declared inoperable and actions must be taken consistent with the TS requirements.

[4] The regulations at 10 CFR 50.36(c)(1)(ii)(A) state: "Limiting safety system settings for nuclear reactors are settings for automatic protective devices related to those variables having significant safety functions."

channel trip setpoint considering all credible instrument errors associated with the instrument channel. The LTSP is the least conservative value (with an as-left tolerance (ALT)) to which the channel must be reset at the conclusion of periodic testing to ensure that the AL will not be exceeded during an AOO or accident before the next periodic surveillance or calibration. It is impossible to set a physical instrument channel to an exact value, so a calibration tolerance is established around the LTSP. Therefore, the LTSP adjustment is considered successful if the as-left instrument setting is within the setting tolerance (i.e., a range of values around the LTSP). The nominal trip setpoint (NTSP) is LTSP with margin added. The NTSP is equal to or more conservative than the LTSP.

The AVs are the only values included in the TSs to indicate the least conservative value that the as-found trip point may have during testing for the channel to be operable. In this case, the LTSP values in the Licensee Controlled Specifications, and the title of this document, are identified in surveillance footnote (e) in order to satisfy the 10 CFR 50.36 requirements that the LSSS be in the TSs. Additionally, to ensure proper use of the AV, LTSP, and NTSP, the methodology for calculating the as-left and as-found tolerances must also be included in a document incorporated by reference in the FSAR and listed in footnote (e) as discussed below.

Setpoint calculations calculate an LTSP based on the AL of the CGS Safety Analysis to ensure that trips or protective actions will occur prior to exceeding the process parameter value assumed by the Safety Analysis calculations. These setpoint calculations may also calculate an allowable limit of change to be expected (i.e., the as-found tolerance (AFT)) between performance of the surveillance tests for assessing the value of the setpoint setting. The least conservative as-found instrument setting value that a channel can have during calibration without requiring performance of a TS remedial action is the setpoint AV. Discovering an instrument setting to be less conservative than the setting AV indicates that there may not be sufficient margin between the LTSP setting and the AL. Technical Specifications channel calibrations are performed to verify channels are operating within the assumptions of the setpoint methodology used to calculate the LTSP and that channel settings have not exceeded the TS AVs. When the measured as-found setpoint is non-conservative with respect to the AV, the channel is inoperable and the actions identified in the TSs must be taken.

Footnote (d) requires evaluation of channel performance for the condition where the as-found setting for the channel setpoint is outside its AFT but conservative with respect to the AV. Evaluation of channel performance will verify that the channel will continue to function in accordance with safety analysis assumptions and the channel performance assumptions in the CGS setpoint methodology and establishes a high confidence of acceptable channel performance in the future. Because the AFT allows for both conservative and non-conservative deviation from the LTSP, changes in channel performance that are conservative with respect to the LTSP will also be detected and evaluated for possible effects on expected performance. The purpose of the assessment is to ensure confidence in the channel performance prior to returning the channel to service. For channels determined to be OPERABLE but degraded, after returning the channel to service the channels will be evaluated under the CGS Corrective Action Program (CAP). Entry into the CAP will ensure required review and documentation of the condition to establish a reasonable expectation for continued operability.

Verifying that a trip setting is conservative with respect to the AV when a surveillance is performed does not by itself verify the instrument channel will operate properly in the future, since setpoint drift is a concern. Although the channel was operable during the previous surveillance interval, if it is discovered that channel performance is outside the performance predicted by the plant setpoint calculations for the test interval, then the design basis for the channel may not be met, and proper operation of the channel for a future demand cannot be assured. Surveillance footnote (d) formalizes the establishment of the appropriate AFT for each channel. This AFT is applied about the LTSP or about any other more conservative trip setpoint. The as-found setting tolerance ensures that channel operation is consistent with the assumptions or design inputs used in the setpoint calculations and establishes a high confidence of acceptable channel performance in the future. Because the setting tolerance allows for both conservative and non-conservative deviation from the LTSP, changes in channel performance that are conservative with respect to the LTSP will also be detected and evaluated for possible effects on expected performance.

Footnote (e) requires that the as-left setting for the channel be returned to within the ALT of the LTSP. Where a setpoint more conservative than the LTSP is used in the plant surveillance procedures, the ALT and AFT, as applicable, will be applied to the surveillance procedure setpoint. This will ensure that sufficient margin to the SL and AL is maintained. If the as-left channel setting cannot be returned to a setting within the ALT of the LTSP, then the channel would be declared inoperable. Footnote (e) also requires that the LTSP and the methodologies for calculating the ALT and the AFT be included in the Licensee Controlled Specifications.

To implement footnote (e), the ALT for some instrumentation function channels is established to ensure that realistic values are used that do not mask instrument performance. In its LAR, the licensee stated that setpoint calculations assume that the instrument setpoint is left at the LTSP within a specific ALT (e.g., 25 pounds per square inch gauge (psig) + 2 psig). A tolerance is necessary because it is not possible to read and adjust a setting to an absolute value due to the readability and/or accuracy of the test instruments or the ability to adjust potentiometers. The licensee also stated that the ALT is normally as small as possible considering the tools and the objective to meet an as low as reasonably achievable calibration setting of the instruments. The ALT is considered in the setpoint calculation. Failure to set the actual plant trip setpoint to the LTSP and within the ALT would invalidate the assumptions in the setpoint calculation because any subsequent instrument drift would not start from the expected as-left setpoint.

The footnotes require the licensee to calculate the magnitudes of the AFT and ALT, respectively. A tolerance band is necessary because it is not possible to read and adjust a setting to an absolute value due to the readability and/or accuracy of the test instruments or the ability to adjust springs or potentiometers. The licensee provided a summary of the setpoint calculation for the new Function 7.b in its letters dated May 8, August 27, November 6, and December 15, 2014. In its letters dated May 8 and November 6, 2014, the licensee stated its setpoint calculation was performed in accordance with the CGS Setpoint Methodology Standards, EES-4.

The summary calculation provided in the letter dated May 8, 2014, identified a calibration frequency of 24 months, which is different from the 18-month calibration frequency identified in the CGS TS. This use of a 24-month surveillance frequency resulted in the drift term becoming

non-conservative for the calculation of AFT. To resolve this non-conservatism, the licensee revised its calculation to use the calibration frequency for the scram discharge instrumentation identified in the TS (18 months). In its supplements dated August 27 and November 6, 2014, the licensee provided revised values for the instrument uncertainties, using the appropriate TS calibration frequency. In addition, the licensee recalculated the AFT using the drift value associated with an 18-month calibration frequency.

In its supplement dated May 8, 2014, the licensee explained the reason for maintaining the current TS AV (529 ft. 9 in.), even though the new level instrument for Function 7.b could result in a different AV. In particular, the licensee stated that maintaining the existing TS AV provides additional margin for the discharge scram volume instrument function.

The NRC staff reviewed the licensee's calculational basis for the NTSP, AFT, and ALT for Function 7.b. In its summary calculation, the licensee identified uncertainty, calibration, drift, and other design inputs necessary to calculate the AFT and ALT. The summary calculation shows the setpoint methodology was based on square-root-sum-of-the squares (SRSS) of applicable uncertainties terms and algebraic addition of the bias terms. In its supplement dated November 6, 2014, the licensee noted the calculation for AFT was revised to account for modifications to the system design. In its supplement dated December 15, 2014, the licensee explained the basis for this revision and also described the revised formulas for the AFT and ALT. These revised formulas also used the SRSS of applicable uncertainties terms, but in the revised calculation, the licensee only considered the reference accuracy, calibration, and drift uncertainty terms associated with the level switch, and not for the total loop (i.e., level transmitter and level switch). This modification resulted in narrower AFT and ALT than for the total loop, making them more restrictive.

Based on the above evaluations and the information provided by the licensee, the NRC staff concludes that the summary calculation demonstrates that the proposed setting limits are reasonable. In addition, the NRC staff concludes that the licensee defined the as-left calibration tolerance based on the setting limit by taking the SRSS of instrument uncertainties measured during testing, which is consistent with the criteria described in RIS 2006-17. The NRC staff also concludes that the licensee's setpoint calculation methodology aligns with the guidance of RG 1.105, Revision 3. In its LAR, the licensee stated that its surveillance procedure requires the setpoint to be returned to within the specified as-left calibration tolerance if found outside the ALT band. If the setpoint is found outside the AFT band, plant surveillance procedures require an evaluation to be performed per the requirements of the plant corrective action program. The channel will be declared inoperable until it is repaired, replaced, or recalibrated, as needed.

3.4 Results of NRC Staff Evaluation

Based on the review of the licensee's application, as supplemented, the NRC staff concludes that the Scram Discharge Volume Water Level –High instrumentation channels will continue to meet the requirements of GDCs 13 and 20 of Appendix A to 10 CFR Part 50, meet the guidance in RIS 2006-17, and satisfy the applicability of TSTF-493, Revision 4. Additionally, the instrumentation continues to meet the clarified diverse instrumentation requirements described in GL 80-107 and GL 81-18. The NRC staff also concludes that the licensee's setpoint calculation methodology is consistent with RG 1.105, Revision 3, and is, therefore, acceptable.

The NRC staff further concludes that the proposed TSs changes meet the requirements of 10 CFR 50.36(c)(1)(ii)(A) and 10 CFR 50.36(c)(3) and are, therefore, acceptable. The addition of surveillance notes to Function 7.b SR 3.3.1.1.10 ensures that instrument function operability will be controlled in the TS rather than plant procedures and that additional uncertainties have been included in the AFT calculation in a manner acceptable to the NRC staff. Therefore, there is reasonable assurance of the adequate protection capabilities of these instrument channels.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Washington State official was notified of the proposed issuance of the amendment. The State official had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

The amendment changes a requirement with respect to the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The NRC staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendment involves no significant hazards consideration and there has been no public comment on such finding published in the *Federal Register* on July 22, 2014 (79 FR 42544). Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

6.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) there is reasonable assurance that 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.

Principal Contributors: R. Avarado, NRR/DE/EICB
K. Bucholtz, NRR/DSS/STSB

Date: March 27, 2015.

A copy of the related Safety Evaluation is also enclosed. The Notice of Issuance will be included in the Commission's next biweekly *Federal Register* notice.

Sincerely,

/RA/

Andrea E. George, Project Manager
Plant Licensing Branch IV-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-397

Enclosures:
1. Amendment No. 232 to NPF-21
2. Safety Evaluation

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