



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

May 16, 2017

Mr. Robert S. Bement
Executive Vice President Nuclear/
Chief Nuclear Officer
Mail Station 7602
Arizona Public Service Company
P.O. Box 52034
Phoenix, AZ 85072-2034

SUBJECT: PALO VERDE NUCLEAR GENERATING STATION, UNITS 1, 2, AND 3 -
ISSUANCE OF AMENDMENTS TO REVISE TECHNICAL SPECIFICATIONS
TO ADOPT TECHNICAL SPECIFICATION TASK FORCE TRAVELER
TSTF-523, "GENERIC LETTER 2008-01, MANAGING GAS ACCUMULATION"
(CAC NOS. MF8082, MF8083, AND MF8084)

Dear Mr. Bement:

The U.S. Nuclear Regulatory Commission has issued the enclosed Amendment No. 202 to Renewed Facility Operating License No. NPF-41, Amendment No. 202 to Renewed Facility Operating License No. NPF-51, and Amendment No. 202 to Renewed Facility Operating License No. NPF-74 for the Palo Verde Nuclear Generating Station, Units 1, 2, and 3, respectively. The amendments consist of changes to the Technical Specifications (TSs) in response to your application dated June 29, 2016.

The amendments revise the TSs by modifying the TS requirements to address Generic Letter (GL) 2008-01, "Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems," dated January 11, 2008, as described in Technical Specification Task Force (TSTF) Traveler TSTF-523, Revision 2, "Generic Letter 2008-01, Managing Gas Accumulation," dated February 21, 2013. The availability of this TS improvement was announced in the *Federal Register* (FR) on January 15, 2014 (79 FR 2700), as part of the consolidated line item improvement process.

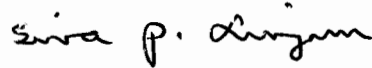
To address the concerns addressed in GL 2008-01, the amendments revise or add surveillance requirements to verify that the safety injection, shutdown cooling, and containment spray system locations susceptible to gas accumulation are sufficiently filled with water and to provide allowances, which permit performance of the verification.

R. Bement

- 2 -

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,



Siva P. Lingam, Project Manager
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. STN 50-528, STN 50-529,
and STN 50-530

Enclosures:

1. Amendment No. 202 to NPF-41
2. Amendment No. 202 to NPF-51
3. Amendment No. 202 to NPF-74
4. Safety Evaluation

cc w/encls: Distribution via Listserv

SUBJECT: PALO VERDE NUCLEAR GENERATING STATION, UNITS 1, 2, AND 3 -
 ISSUANCE OF AMENDMENTS TO REVISE TECHNICAL SPECIFICATIONS
 TO ADOPT TECHNICAL SPECIFICATION TASK FORCE TRAVELER
 TSTF-523, "GENERIC LETTER 2008-01, MANAGING GAS ACCUMULATION"
 (CAC NOS. MF8082, MF8083, AND MF8084) DATED MAY 16, 2017

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ADAMS Accession No.: ML17123A435

*SE memorandum dated

**by e-mail

OFFICE	NRR/DORL/LPL4/PM	NRR/DORL/LPL4/LA	NRR/DSS/STSB/BC (A)*	NRR/DSS/SRXB/BC**
NAME	SLingam	PBlechman	JWhitman	EOesterle
DATE	05/04/17	05/04/17	04/26/17	05/09/17
OFFICE	OGC (NLO)	NRR/DORL/LPL4/BC	NRR/DORL/LPL4/PM	
NAME	BHarris	RPascarelli	SLingam (MWatford for)	
DATE	05/10/17	05/15/17	05/16/17	

OFFICIAL AGENCY RECORD



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

ARIZONA PUBLIC SERVICE COMPANY, ET AL.

DOCKET NO. STN 50-528

PALO VERDE NUCLEAR GENERATING STATION, UNIT 1

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 202
License No. NPF-41

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by the Arizona Public Service Company (APS or the licensee) on behalf of itself and the Salt River Project Agricultural Improvement and Power District, El Paso Electric Company, Southern California Edison Company, Public Service Company of New Mexico, Los Angeles Department of Water and Power, and Southern California Public Power Authority dated June 29, 2016, 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-41 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. 202, and the Environmental Protection Plan contained in Appendix B, are hereby incorporated into this renewed operating license. APS shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan, except where otherwise stated in specific license conditions.

3. This license amendment is effective as of the date of issuance and shall be implemented within 1 year from the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



Robert J. Pascarelli, Chief
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Renewed Facility
Operating License No. NPF-41
and Technical Specifications

Date of Issuance: May 16, 2017



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

ARIZONA PUBLIC SERVICE COMPANY, ET AL.

DOCKET NO. STN 50-529

PALO VERDE NUCLEAR GENERATING STATION, UNIT 2

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 202
License No. NPF-51

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by the Arizona Public Service Company (APS or the licensee) on behalf of itself and the Salt River Project Agricultural Improvement and Power District, El Paso Electric Company, Southern California Edison Company, Public Service Company of New Mexico, Los Angeles Department of Water and Power, and Southern California Public Power Authority dated June 29, 2016, 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-51 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. 202, and the Environmental Protection Plan contained in Appendix B, are hereby incorporated into this renewed operating license. APS shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan, except where otherwise stated in specific license conditions.

3. This license amendment is effective as of the date of issuance and shall be implemented within 1 year from the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



Robert J. Pascarelli, Chief
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Renewed Facility
Operating License No. NPF-51
and Technical Specifications

Date of Issuance: May 16, 2017



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

ARIZONA PUBLIC SERVICE COMPANY, ET AL.

DOCKET NO. STN 50-530

PALO VERDE NUCLEAR GENERATING STATION, UNIT 3

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 202
License No. NPF-74

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by the Arizona Public Service Company (APS or the licensee) on behalf of itself and the Salt River Project Agricultural Improvement and Power District, El Paso Electric Company, Southern California Edison Company, Public Service Company of New Mexico, Los Angeles Department of Water and Power, and Southern California Public Power Authority dated June 29, 2016, 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-74 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. 202, and the Environmental Protection Plan contained in Appendix B, are hereby incorporated into this renewed operating license. APS shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan, except where otherwise stated in specific license conditions.

3. This license amendment is effective as of the date of issuance and shall be implemented within 1 year from the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



Robert J. Pascarelli, Chief
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Renewed Facility
Operating License No. NPF-74
and Technical Specifications

Date of Issuance: May 16, 2017

ATTACHMENT TO LICENSE AMENDMENT NOS. 202, 202, AND 202 TO
RENEWED FACILITY OPERATING LICENSE NOS. NPF-41, NPF-51, AND NPF-74
PALO VERDE NUCLEAR GENERATING STATION, UNITS 1, 2, AND 3
DOCKET NOS. STN 50-528, STN 50-529, AND STN 50-530

Replace the following pages of the Renewed Facility Operating License Nos. NPF-41, NPF-51, and NPF-74, and Appendix A Technical Specifications with the attached revised pages. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change.

Renewed Facility Operating License No. NPF-41

<u>REMOVE</u>	<u>INSERT</u>
5	5

Renewed Facility Operating License No. NPF-51

<u>REMOVE</u>	<u>INSERT</u>
6	6

Renewed Facility Operating License No. NPF-74

<u>REMOVE</u>	<u>INSERT</u>
4	4

Technical Specifications

<u>REMOVE</u>	<u>INSERT</u>
3.4.6-3	3.4.6-3
3.4.7-3	3.4.7-3
3.4.8-2	3.4.8-2
3.5.3-2	3.5.3-2
3.6.6-2	3.6.6-2
3.9.4-2	3.9.4-2
----	3.9.5-3

(1) Maximum Power Level

Arizona Public Service Company (APS) is authorized to operate the facility at reactor core power levels not in excess of 3990 megawatts thermal (100% power), in accordance with the conditions specified herein.

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, as revised through Amendment No. 202, and the Environmental Protection Plan contained in Appendix B, are hereby incorporated into this renewed operating license. APS shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan, except where otherwise stated in specific license conditions.

(3) Antitrust Conditions

This renewed operating license is subject to the antitrust conditions delineated in Appendix C to this renewed license.

(4) Operating Staff Experience Requirements

Deleted

(5) Post-Fuel-Loading Initial Test Program (Section 14, SER and SSER 2)*

Deleted

(6) Environmental Qualification

Deleted

(7) Fire Protection Program

APS shall implement and maintain in effect all provisions of the approved fire protection program as described in the Final Safety Analysis Report for the facility, as supplemented and amended, and as approved in the SER through Supplement 11, subject to the following provision:

APS may make changes to the approved fire protection program without prior approval of the Commission only if those changes would not adversely affect the ability to achieve and maintain safe shutdown in the event of a fire.

* 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.

(1) Maximum Power Level

Arizona Public Service Company (APS) is authorized to operate the facility at reactor core power levels not in excess of 3990 megawatts thermal (100% power) in accordance with the conditions specified herein.

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, as revised through Amendment No. 202, and the Environmental Protection Plan contained in Appendix B, are hereby incorporated into this renewed operating license. APS shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan, except where otherwise stated in specific license conditions.

(3) Antitrust Conditions

This renewed operating license is subject to the antitrust conditions delineated in Appendix C to this renewed operating license.

(4) Operating Staff Experience Requirements (Section 13.1.2, SSER 9)*

Deleted

(5) Initial Test Program (Section 14, SER and SSER 2)

Deleted

(6) Fire Protection Program

APS shall implement and maintain in effect all provisions of the approved fire protection program as described in the Final Safety Analysis Report for the facility, as supplemented and amended, and as approved in the SER through Supplement 11, subject to the following provision:

APS may make changes to the approved fire protection program without prior approval of the Commission only if those changes would not adversely affect the ability to achieve and maintain safe shutdown in the event of a fire.

(7) Inservice Inspection Program (Sections 5.2.4 and 6.6, SER and SSER 9)

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.

- (4) Pursuant to the Act and 10 CFR Part 30, 40, and 70, APS to receive, possess, and use in amounts required any byproduct, source or special nuclear material without restriction to chemical or physical form, for sample analysis or instrument calibration or associated with radioactive apparatus or components; and
 - (5) Pursuant to the Act and 10 CFR Parts 30, 40, and 70, APS to possess, but not separate, such byproduct and special nuclear materials as may be produced by the operation of the facility.
- C. This renewed operating license shall be deemed to contain and is subject to the conditions specified in the Commission's regulations set forth in 10 CFR Chapter I and is subject to all applicable provisions of the Act and to the rules, regulations, and orders of the Commission now or hereafter in effect; and is subject to the additional conditions specified or incorporated below:
- (1) Maximum Power Level
Arizona Public Service Company (APS) is authorized to operate the facility at reactor core power levels not in excess of 3990 megawatts thermal (100% power), in accordance with the conditions specified herein.
 - (2) Technical Specifications and Environmental Protection Plan
The Technical Specifications contained in Appendix A, as revised through Amendment No. 202, and the Environmental Protection Plan contained in Appendix B, are hereby incorporated into this renewed operating license. APS shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan, except where otherwise stated in specific license conditions.
 - (3) Antitrust Conditions
This renewed operating license is subject to the antitrust conditions delineated in Appendix C to this renewed operating license.
 - (4) Initial Test Program (Section 14, SER and SSER 2)
Deleted
 - (5) Additional Conditions
The Additional Conditions contained in Appendix D, as revised through Amendment No. 200, are hereby incorporated into this renewed operating license. The licensee shall operate the facility in accordance with the Additional Conditions.

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
SR 3.4.6.3 Verify correct breaker alignment and indicated power available to the required pump that is not in operation.	In accordance with the Surveillance Frequency Control Program
SR 3.4.6.4 -----NOTE----- Not required to be performed until 12 hours after entering MODE 4. ----- Verify required SDC train locations susceptible to gas accumulation are sufficiently filled with water.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.7.1	Verify one SDC train is in operation.	In accordance with the Surveillance Frequency Control Program
SR 3.4.7.2	Verify required SG secondary side water level is $\geq 25\%$.	In accordance with the Surveillance Frequency Control Program
SR 3.4.7.3	Verify correct breaker alignment and indicated power available to the required SDC pump that is not in operation.	In accordance with the Surveillance Frequency Control Program
SR 3.4.7.4	<p>-----NOTE----- Not required to be performed until 12 hours after entering MODE 4. -----</p> <p>Verify required SDC train locations susceptible to gas accumulation are sufficiently filled with water.</p>	In accordance with the Surveillance Frequency Control Program

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Required SDC trains inoperable. <u>OR</u> No SDC train in operation.	B.1 Suspend all operations involving reduction of RCS boron concentration.	Immediately
	<u>AND</u> B.2 Initiate action to restore one SDC train to OPERABLE status and operation.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.4.8.1 Verify one SDC train is in operation.	In accordance with the Surveillance Frequency Control Program
SR 3.4.8.2 Verify correct breaker alignment and indicated power available to the required SDC pump that is not in operation.	In accordance with the Surveillance Frequency Control Program
SR 3.4.8.3 Verify SDC train locations susceptible to gas accumulation are sufficiently filled with water.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
<p style="text-align: center;">-----NOTE----- Not required to be met for system vent flow paths opened under administrative control. -----</p>		
SR 3.5.3.1	Verify each ECCS 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 3.5.3.2	Verify ECCS locations susceptible to gas accumulation are sufficiently filled with water.	In accordance with the Surveillance Frequency Control Program
SR 3.5.3.3	Verify each ECCS pump develops the required differential pressure at the flow test point.	In accordance with the Inservice Testing Program
SR 3.5.3.4	Verify each ECCS automatic valve that is not locked, sealed, or otherwise secured in position, in the flow path actuates to the correct position on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program
SR 3.5.3.5	Verify each ECCS pump starts automatically on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program
SR 3.5.3.6	Verify each LPSI pump stops on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
	<p>-----NOTE----- Not required to be met for system vent flow paths opened under administrative control. -----</p>	
SR 3.6.6.1	Verify each containment spray 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 3.6.6.2	Verify the containment spray piping is full of water to the 113 ft level in the containment spray header.	In accordance with the Surveillance Frequency Control Program
SR 3.6.6.3	Verify containment spray locations susceptible to gas accumulation are sufficiently filled with water.	In accordance with the Surveillance Frequency Control Program
SR 3.6.6.4	Verify each containment spray pump's developed head at the flow test point is greater than or equal to the required developed head.	In accordance with the Inservice Testing Program
SR 3.6.6.5	Verify each automatic containment spray valve in the flow path that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program
SR 3.6.6.6	Verify each containment spray pump starts automatically on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program
SR 3.6.6.7	Verify each spray nozzle is unobstructed.	In accordance with the Surveillance Frequency Control Program

SDC and Coolant Circulation – High Water Level
3.9.4

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.4 Close all containment penetrations providing direct access from containment atmosphere to outside atmosphere.	4 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.9.4.1 Verify one SDC loop is operable and in operation.	In accordance with the Surveillance Frequency Control Program
SR 3.9.4.2 Verify required SDC loop locations susceptible to gas accumulation are sufficiently filled with water.	In accordance with the Surveillance Frequency Control Program

SDC and Coolant Circulation – Low Water Level
3.9.5

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
SR 3.9.5.3 Verify required SDC loop locations susceptible to gas accumulation are sufficiently filled with water.	In accordance with the Surveillance Frequency Control Program



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NOS. 202, 202, AND 202 TO RENEWED FACILITY
OPERATING LICENSE NOS. NPF-41, NPF-51, AND NPF-74
ARIZONA PUBLIC SERVICE COMPANY, ET AL.
PALO VERDE NUCLEAR GENERATING STATION, UNITS 1, 2, AND 3
DOCKET NOS. STN 50-528, STN 50-529, AND STN 50-530

1.0 INTRODUCTION

By letter dated June 29, 2016 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML16182A171), Arizona Public Service Company (the licensee) requested changes to the Technical Specifications (TSs) for Palo Verde Nuclear Generating Station (PVNGS), Units 1, 2, and 3. Specifically, the licensee requested to adopt U.S. Nuclear Regulatory Commission (NRC)-approved Technical Specifications Task Force (TSTF) Standard Technical Specifications (STS) Change Traveler TSTF-523, Revision 2, "Generic Letter 2008-01, Managing Gas Accumulation," dated February 21, 2013 (ADAMS Accession No. ML13053A075). The availability of this TS improvement was announced in the *Federal Register* (FR) on January 15, 2014 (79 FR 2700) as part of the consolidated line item improvement process.

The proposed change would revise surveillance requirements (SRs) related to gas accumulation for the emergency core cooling system (ECCS). The proposed change would also add new SRs related to gas accumulation for the shutdown cooling (SDC) and containment spray (CS) systems. TS Bases changes associated with these SRs would also be made.

The licensee stated that it has reviewed the information contained in the model safety evaluation (SE) dated December 23, 2013 (ADAMS Accession No. ML13255A169), and that the license amendment request is consistent with NRC-approved TSTF-523, Revision 2.

2.0 REGULATORY EVALUATION

2.1 Background

Gas accumulation in reactor systems can result in water hammer, pump cavitation, and pumping of non-condensable gas into the reactor vessel. These effects may result in the subject system being unable to perform its specified safety function. The NRC issued Generic Letter (GL) 2008-01, "Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems," in January 2008 to address the issue of gas accumulation in

ECCS, decay heat removal (DHR), and CS systems (ADAMS Accession No. ML072910759). The industry and NRC staff agreed that a change to the STS and plant-specific TSs would be necessary to address some issues discussed in GL 2008-01. TSTF-523 contains changes to the TSs SRs and TS Bases to address some of the concerns in GL 2008-01. The licensee proposed amending the PVNGS TSs using a plant-specific adoption of the TSTF-523 changes.

2.2 Technical Specification Changes

Changes were proposed for SRs 3.5.3.1, 3.5.3.2, and 3.6.6.1, as well as the addition of new SRs 3.4.6.4, 3.4.7.4, 3.4.8.3, 3.6.6.3, 3.9.4.2, and 3.9.5.3 to TS 3.4.6, "RCS [Reactor Coolant System] Loops – MODE 4," TS 3.4.7, "RCS Loops - MODE 5, Loops Filled," TS 3.4.8, "RCS Loops - MODE 5, Loops Not Filled," TS 3.5.3, "ECCS - Operating," TS 3.6.6, "Containment Spray System," TS 3.9.4, "Shutdown Cooling (SDC) and Coolant Circulation – High Water Level," and TS 3.9.5, "Shutdown Cooling (SDC) and Coolant Circulation – Low Water Level," respectively.

2.3 Regulatory Review

The regulations in Appendix A to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50 or similar plant-specific principal design criteria provide design requirements. Appendix B to 10 CFR Part 50, the TSs, and the licensee quality assurance programs provide operating requirements. The regulatory requirements of 10 CFR Part 50, Appendix A, that are applicable to gas management in the subject systems include: General Design Criteria (GDC) for Nuclear Power Plant, Criterion 1, "Quality standards and records"; Criterion 34, "Residual heat removal"; Criterion 35, "Emergency core cooling"; Criterion 36, "Inspection of emergency core cooling system"; Criterion 37, "Testing of emergency core cooling system"; Criterion 38, "Containment heat removal"; Criterion 39, "Inspection of containment heat removal system"; and Criterion 40, "Testing of containment heat removal system." GDC 1 requires that the subject systems be designed, fabricated, erected, and tested to quality standards. GDC 34 requires a residual heat removal (RHR) system designed to maintain specified acceptable fuel design limits and to meet design conditions that are not exceeded if a single failure occurs and specified electrical power systems fail. GDC 35, 36, and 37 require an ECCS design that meets performance, inspection, and testing requirements. Additionally, the regulations in 10 CFR 50.46, "Acceptance criteria for emergency core cooling systems for light-water nuclear power reactors," provide specified ECCS performance criteria. GDC 38, 39, and 40 require a containment heat removal system design that meets performance, inspection, and testing requirements.

Quality assurance criteria provided in 10 CFR Part 50, Appendix B, that apply to gas management in the subject systems include: Criteria III, V, XI, XVI, and XVII. Criteria III and V require measures to ensure that applicable regulatory requirements and the design basis, as defined in 10 CFR 50.2, "Definitions," and as specified in the license application, are correctly translated into controlled specifications, drawings, procedures, and instructions. Criterion XI requires a test program to ensure that the subject systems will perform satisfactorily in service and requires that test results shall be documented and evaluated to ensure that test requirements have been satisfied. Criterion XVI requires measures to ensure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and non-conformances, are promptly identified and corrected, and that significant conditions adverse to quality are documented and reported to management. Criterion XVII requires maintenance of records of activities affecting quality.

The NRC's regulatory requirements related to the content of the TSs are contained in 10 CFR 50.36(c). The regulations at 10 CFR 50.36, "Technical specifications," require that the TSs 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. SRs 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 LCOs will be met. Typically, TS Section 5 requires that licensees establish, implement, and maintain written procedures covering the applicable procedures recommended in Appendix A to Regulatory Guide (RG) 1.33, Revision 2, "Quality Assurance Program Requirements (Operation)," February 1978 (ADAMS Accession No. ML003739995). Appendix A to RG 1.33, Revision 2, identifies instructions for filling and venting the ECCS and DHR system, as well as for draining and refilling heat exchangers.

The STS and most licensee's TSs include SRs to verify that at least some of the subject systems piping is filled with water.

The NRC's guidance for the format and content of licensee TSs can be found in NUREG-1432, Revision 4, "Standard Technical Specifications - Combustion Engineering Plants" (ADAMS Accession No. ML12102A165).

Regulatory guidance for the NRC staff's review of containment heat removal systems, ECCS, and RHR systems is provided in the following revisions and sections of NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR [Light-Water Reactor] Edition" (SRP) during the review.

- Revision 5 of SRP, Section 6.2.2, "Containment Heat Removal Systems," dated March 2007 (ADAMS Accession No. ML070160661), provides the procedures concerning the review of containment heat removal under post-accident conditions to help ensure compliance with GDC 38, 39, and 40.
- Revision 3 of SRP, Section 6.3, "Emergency Core Cooling System," dated March 2007 (ADAMS Accession No. ML070550068), provides the procedures concerning the review of ECCS to help ensure compliance with GDC 35, 36, and 37.
- Revision 5 of SRP, Section 5.4.7, "Residual Heat Removal (RHR) System," dated May 2010 (ADAMS Accession Number ML100680577), provides the procedures concerning the review of RHR system as it is used to cool the RCS during and following shutdown to help ensure compliance with GDC 34.

3.0 TECHNICAL EVALUATION

The proposed changes adopted the TS format and content, to the extent practicable, contained in the changes made to NUREG-1432, by TSTF-523.

The NRC staff compared the proposed changes to the existing SRs, as well as the regulatory requirements of 10 CFR 50.36(c).

The licensee proposed the following TS changes:

1. Add SR 3.4.6.4, which states "Verify required SDC train locations susceptible to gas accumulation are sufficiently filled with water," with a note that states "Not required to be performed until 12 hours after entering MODE 4," and a frequency of "In accordance with the Surveillance Frequency Control Program."
2. Add SR 3.4.7.4, which states "Verify required SDC train locations susceptible to gas accumulation are sufficiently filled with water," with a note that states "Not required to be performed until 12 hours after entering MODE 4," and a frequency of "In accordance with the Surveillance Frequency Control Program."
3. Add SR 3.4.8.3, which states "Verify SDC train locations susceptible to gas accumulation are sufficiently filled with water," with a frequency of "In accordance with the Surveillance Frequency Control Program."
4. Add a note to SR 3.5.3.1, which states "Not required to be met for system vent flow paths opened under administrative control."
5. Revise the language for SR 3.5.3.2 from "Verify ECCS piping is full of water" to "Verify ECCS locations susceptible to gas accumulation are sufficiently filled with water."
6. Add a note to SR 3.6.6.1, which states "Not required to be met for system vent flow paths opened under administrative control."
7. Add SR 3.6.6.3, which states "Verify containment spray locations susceptible to gas accumulation are sufficiently filled with water," with a frequency of "In accordance with the Surveillance Frequency Control Program."
8. Revise numbering scheme for SRs 3.6.6.3 through 3.6.6.6 to SRs 3.6.6.4 through 3.6.6.7 due to addition of SR 3.6.6.3.
9. Add SR 3.9.4.2, which states "Verify required SDC loop locations susceptible to gas accumulation are sufficiently filled with water," with a frequency of "In accordance with the Surveillance Frequency Control Program."
10. Add SR 3.9.5.3, which states "Verify required SDC loop locations susceptible to gas accumulation are sufficiently filled with water," with a frequency of "In accordance with the Surveillance Frequency Control Program."

The new language for the SRs was developed using the licensee responses to GL 2008-01 and the NRC discussion contained in Task Interface Agreement (TIA) 2008-03, "Emergency Core Cooling System (ECCS) Voiding Relative To Compliance With Surveillance Requirements (SR) 3.5.1.1, 3.5.2.3, and 3.5.3.1" (ADAMS Accession No. ML082560209). Many of the GL 2008-01 responses stated that the licensees identified system locations susceptible to gas accumulation. In the TIA, the NRC stated that the intent of the TS SRs, which state "full of water," may be met if the licensee can establish, through an Operability Determination, that there is a reasonable expectation that the system in question will perform its specified safety function. Therefore the phrase, "sufficiently filled with water" was recommended for the proposed TS changes. In the TS, "sufficiently filled with water" is understood to mean

“sufficiently filled with water to support Operability.” The regulation at 10 CFR 50.36(c)(3) states that one of the purposes of the SR is to verify that the LCO is met. Therefore, the new SR language, “Verify the [system name] locations susceptible to gas accumulation are sufficiently filled with water,” is acceptable since this language will allow the licensee to make a conclusion as to whether or not a system is operable.

The notes in SR 3.4.6.4 and SR 3.4.7.4 that state that the SR does not have to be performed until 12 hours after entering Mode 4 provide a limited time to perform the surveillance after entering the Applicability of the LCOs. The note allows sufficient time to verify all SDC train locations susceptible to gas accumulation are sufficiently filled with water upon entering the mode of Applicability during a rapid shutdown. In addition PVNGS TS Section 1.4 contains usage rules that define the proper use and application of frequency requirements and ensures the requirement to manage gas accumulation is not affected. Because the note (as controlled by TS 1.4) allows sufficient time to take actions necessary to maintain safety and is consistent with STS Section 1.4, the note is acceptable.

The addition of the notes that allow the SRs to not be met for system vent flow paths opened under administrative control is necessary to allow the licensee to use administratively controlled manual action to close the system vent flow path in order to maintain system Operability during system venting and performance of the proposed gas accumulation SR. Therefore, these notes are acceptable.

The NRC staff found that the proposed SRs meet the regulatory requirements of 10 CFR 50.36 because they provide assurance that the necessary quality of systems and components will be maintained and that the LCOs will be met. Therefore, the NRC staff finds the proposed amendment acceptable.

4.0 STATE CONSULTATION

In accordance with the Commission’s regulations, the Arizona State official was notified of the proposed issuance of the amendments on May 2, 2017. The State official had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

The amendments change a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and change SRs. The NRC staff has determined that the amendments involve 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 amendments involve no significant hazards consideration and there has been no public comment on such finding published in the *Federal Register* on August 16, 2016 (81 FR 54613). Accordingly, the amendments meet 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 amendments.

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 amendments will not be inimical to the common defense and security or to the health and safety of the public.

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Date: May 16, 2017