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

August 20, 2024

Adam Heflin
Executive Vice President/
Chief Nuclear Officer
Mail Station 7605
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 AMENDMENT NOS. 224, 224, AND 224 REGARDING REVISION TO TECHNICAL SPECIFICATIONS 3.5.1, 3.5.2, AND 3.6.5 (EPID L-2023-LLA-0098)

Dear Adam Heflin:

The U.S. Nuclear Regulatory Commission (the Commission) has issued the enclosed Amendment No. 224 to Renewed Facility Operating License No. NPF-41, Amendment No. 224 to Renewed Facility Operating License No. NPF-51, and Amendment No. 224 to Renewed Facility Operating License No.NPF-74 for 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, 2023, as supplemented by letters dated March 6, 2024, and June 18, 2024.

The amendments revise TS 3.5.1, “Safety Injection Tanks (SITs) – Operating”; TS 3.5.2, “Safety Injection Tanks (SITs) – Shutdown”; and TS 3.6.5, “Containment Air Temperature.” Specifically, the changes revise the SITs volumes as design values expressed in cubic feet from the loss-of-coolant accident analyses with no instrument uncertainties included. Additionally, the changes revise the containment average air temperature limiting condition for operation limit to reflect the design-basis accident analytical limit without instrument uncertainty.

A copy of the related safety evaluation is also enclosed. Notice of Issuance will be included in the Commission's monthly *Federal Register* notice.

Sincerely,

/RA/

William Orders, 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

Enclosure:
1. Amendment No. 224 to NPF-41
2. Amendment No. 224 to NPF-51
3. Amendment No. 224 to NPF-74
4. Safety Evaluation

cc: Listserv

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. 224
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) 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, 2023, as supplemented by letters dated March 6, 2024, and June 18, 2024, 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. 224, 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 90 days of the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Jennivine K. Rankin

Digitally signed by Jennivine K. Rankin
Date: 2024.08.20 11:34:33 -04'00'

Jennivine K. Rankin, Chief
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

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

Date of Issuance: August 20, 2024

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. 224
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) 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, 2023, as supplemented by letters dated March 6, 2024, and June 18, 2024, 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. 224, 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 90 days of the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Jennivine K. Rankin

Digitally signed by Jennivine K. Rankin
Date: 2024.08.20 11:36:05 -04'00'

Jennivine K. Rankin, Chief
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

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

Date of Issuance: August 20, 2024

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. 224
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) 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, 2023, , as supplemented by letters dated March 6, 2024, and June 18, 2024, 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. 224, 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 90 days of the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Jennivine K. Rankin

Digitally signed by Jennivine K. Rankin
Date: 2024.08.20 11:36:44 -04'00'

Jennivine K. Rankin, Chief
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

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

Date of Issuance: August 20, 2024

ATTACHMENT TO LICENSE AMENDMENT NOS. 224, 224, AND 224 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 Renewed Facility Operating Licenses Nos. NPF-41, NPF-51, and NPF-74, and the 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

REMOVE	INSERT
5	5

Renewed Facility Operating License No. NPF-51

REMOVE	INSERT
6	6

Renewed Facility Operating License No. NPF-74

REMOVE	INSERT
4	4

Technical Specifications

REMOVE	INSERT
3.5.1-2	3.5.1-2
3.5.2-1	3.5.2-1
3.5.2-2	3.5.2-2
3.6.5-1	3.6.5-1

(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. 224, 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. 224, 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. 224, 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. 212, are hereby incorporated into this renewed operating license. The licensee shall operate the facility in accordance with the Additional Conditions.

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
D. Required Action and associated Completion Time of Condition A, B, or C not met.	D.1	Be in MODE 3.	6 hours
	AND		
	D.2	Reduce pressurizer pressure to < 1837 psia.	12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.1.1	Verify each SIT isolation valve is fully open.	In accordance with the Surveillance Frequency Control Program
SR 3.5.1.2	Verify borated water volume in each SIT is ≥ 1750 cubic feet and ≤ 1950 cubic feet.	In accordance with the Surveillance Frequency Control Program
SR 3.5.1.3	Verify nitrogen cover pressure in each SIT is ≥ 600 psig and ≤ 625 psig.	In accordance with the Surveillance Frequency Control Program

(continued)

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

3.5.2 Safety Injection Tanks (SITs) - Shutdown

LCO 3.5.2 Four SITs shall be OPERABLE with a borated water volume > 908 cubic feet and < 2000 cubic feet;

OR

Three SITS shall be OPERABLE with a borated water volume > 1361 cubic feet and < 2000 cubic feet.

APPLICABILITY: MODES 3 and 4 with pressurizer pressure < 1837 psia.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required SIT inoperable due to boron concentration not within limits. OR One required SIT inoperable due to inability to verify level or pressure.	A.1 Restore required SIT to OPERABLE status.	72 hours
B. One required SIT inoperable for reasons other than Condition A.	B.1 Restore required SIT to OPERABLE status.	24 hours
C. Inoperability of the required SIT was discovered but not restored while in ITS 3.5.1, "SITs Operating" OR Required Action and associated Completion Time of Condition A or B not met.	C.1 Be in MODE 5.	24 hours
D. Two or more required SITs inoperable.	D.1 Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.2.1	Verify each required SIT isolation valve is fully open when pressurizer pressure is ≥ 430 psia.	In accordance with the Surveillance Frequency Control Program
SR 3.5.2.2	Verify borated water volume in each required SIT is: a. For four OPERABLE SITs, > 908 cubic feet and < 2000 cubic feet. OR b. For three OPERABLE SITs, > 1361 cubic feet and < 2000 cubic feet.	In accordance with the Surveillance Frequency Control Program
SR 3.5.2.3	Verify nitrogen cover pressure in each required SIT is ≥ 260 psig and ≤ 625 psig.	In accordance with the Surveillance Frequency Control Program

(continued)

3.6 CONTAINMENT SYSTEMS

3.6.5 Containment Air Temperature

LCO 3.6.5 Containment average air temperature shall be ≤ 120°F.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Containment average air temperature not within limit.	A.1 Restore containment average air temperature to within limit.	8 hours
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.5.1	Verify containment average air temperature is within limit.	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. 224, 224, AND 224 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 application dated June 29, 2023 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML23180A222), as supplemented by letters dated March 6, 2024, and June 18, 2024 (ML24066A047 and ML24170A996, respectively), Arizona Public Service Company (the licensee) submitted a license amendment request (LAR) for Palo Verde Nuclear Generating Station, Units 1, 2, and 3 (Palo Verde or PVNGS).

The proposed amendments would modify the limiting condition for operation (LCO) for Technical Specification (TS) 3.5.2, "Safety Injection Tanks (SITs) – Shutdown"; the LCO for TS 3.6.5, "Containment Air Temperature"; and Surveillance Requirements (SRs) 3.5.1.2 and 3.5.2.2 in TS 3.5.1, "Safety Injection Tanks (SITs) – Operating," and TS 3.5.2, respectively. Specifically, the proposed changes would revise the SITs volumes as design values expressed in cubic feet (ft^3) from the loss-of-coolant accident (LOCA) analyses with no instrument uncertainties included. Additionally, the proposed changes would revise the containment average air temperature LCO limit to reflect the design-basis accident (DBA) analytical limit without instrument uncertainty.

The supplemental letters dated March 6, 2024, and June 18, 2024, provided additional information that clarified the application. Said supplemental letters did not expand the scope of the application as originally noticed and did not change the U.S. Nuclear Regulatory Commission (NRC or the Commission) staff's original proposed no significant hazards consideration determination as published in the *Federal Register* (FR) on September 5, 2023 (88 FR 60716).

2.0 REGULATORY EVALUATION

2.1 System Description

2.1.1 Safety Injection Tanks

In section 3.1 of the enclosure to the LAR, the licensee provided the following system description:

> The functions of the four SITs are to supply water to the reactor vessel during the blowdown phase of a LOCA, to provide inventory to help accomplish the refill phase that follows thereafter, and to provide Reactor Coolant System (RCS) makeup for a small break LOCA. The SITs are pressure vessels partially filled with borated water and pressurized with nitrogen gas. The SITs are passive components, since no operator or control action is required for them to perform their function. Internal tank pressure is sufficient to discharge the contents to the RCS, if RCS pressure decreases below the SIT pressure.
>
> The minimum volume requirement for the SITs ensures that three SITs can provide adequate inventory to reflood the core and downcomer following a LOCA. The downcomer then remains flooded until the HPSI [high pressure safety injection] and LPSI [low pressure safety injection] systems start to deliver flow. The maximum volume limit is based on maintaining an adequate gas volume to ensure proper injection and the ability of the SITs to fully discharge, as well as limiting the maximum amount of boron inventory in the SITs.
>
> In Modes 1 and 2, and Modes 3 and 4 with pressurizer pressure ≥ 1837 psia [per square inch absolute], a minimum of 1750 cubic feet of borated water, and a maximum of 1950 cubic feet of borated water are used in the safety analyses as the volume in the SITs. To allow for instrument inaccuracy, a 28% narrow range (corresponding to 1802 cubic feet) and a 72% narrow range (corresponding to 1914 cubic feet) are specified. The analyses are based upon the cubic feet requirements; the percentage figures are provided in the LCO for operator use because the level indicators provided in the control room are marked in percentages, not in cubic feet.
>
> In Modes 3 and 4 with pressurizer pressure less than 1837 psia, for three OPERABLE SITs, the safety analysis uses a minimum of 1361 cubic feet of borated water and a maximum of 2000 cubic feet of borated water. To allow for instrument inaccuracy, a 60% wide range level (corresponding to 1451.5 cubic feet) and an 83% wide range level (corresponding to 1914 cubic feet) are specified. For four OPERABLE SITs, the safety analysis uses a minimum of 908 cubic feet of borated water and a maximum of 2000 cubic feet of borated water. To allow for instrument inaccuracy, a 39% wide range level (corresponding to 1029.2 cubic feet) and an 83% wide range level (corresponding to 1914 cubic feet) are specified. The percentage figures are provided in the LCO for operator use because the level indicators provided in the control room are marked in percentage, not in cubic feet.

2.1.2 Containment Heating, Ventilation, and Air Conditioning

In section 3.2 of the enclosure to the LAR, the licensee provided the following system description:

> The primary function of the containment heating, ventilation, and air conditioning (HVAC) system is to maintain containment temperature within acceptable limits for equipment and structures during all modes of operation. The containment normal cooling system consists of four 50% air cooling units (ACUs) and two electric heaters. Each ACU (HCN-A01A, B, C, and D) contains cooling coils and a fan. During operation, air is drawn pass the cooling coils by the associated fan and discharged to a common distribution duct. Containment cooling is maintained via two cooling units running and two remaining in standby. The normal chilled water (WC) system provides cooling flow through the cooling coils. All four ACUs are controlled from the control room to keep containment average air temperature less than the TS indicated limit of 117°F [degrees Fahrenheit] during operation. The temperature indicators for each level in the containment building are also provided in the control room.

2.2 Description of Changes

2.2.1 LCO and SRs Related to Safety Injection Tanks

The current TS SRs 3.5.1.2 and 3.5.2.2 as well as the LCO for TS 3.5.2 list the borated water volume for each SIT as tank percent level values with instrument uncertainties included. The proposed change will list the SIT volumes as design values expressed in cubic feet from the LOCA analyses with no instrument uncertainties included.

Current LCO 3.5.2 states:

> Four SITs shall be OPERABLE with a borated water volume > 39% wide range indication and < 83% wide range indication;
>
> OR
>
> Three SITs shall be OPERABLE with a borated water volume > 60% wide range indication and < 83% wide range indication.

The licensee's proposed change for LCO 3.5.2 would state:

> Four SITs shall be OPERABLE with a borated water volume > 908 cubic feet and < 2000 cubic feet;
>
> OR
>
> Three SITs shall be OPERABLE with a borated water volume > 1361 cubic feet and < 2000 cubic feet.

Current SRs 3.5.1.2 and 3.5.2.2 for TS 3.5.1 and TS 3.5.2, respectively, states:

SR 3.5.1.2 Verify borated water volume in each SIT is ≥ 28% narrow range and ≤ 72% narrow range.

SR 3.5.2.2 Verify borated water volume in each required SIT is:

a. For four OPERABLE SITs, > 39% wide range indication and < 83% wide range indication.

OR

b. For three OPERABLE SITs, > 60% wide range indication and < 83% wide range indication.

The licensee's proposed change for SRs 3.5.1.2 and 3.5.2.2 would state:

SR 3.5.1.2 Verify borated water volume in each SIT is ≥ 1750 cubic feet and ≤ 1950 cubic feet.

SR 3.5.2.2 Verify borated water volume in each required SIT is:

a. For four OPERABLE SITs, > 908 cubic feet and < 2000 cubic feet.

OR

b. For three OPERABLE SITs, > 1361 cubic feet and < 2000 cubic feet.

2.2.2 LCO for Containment Average Air Temperature

The current LCO for TS 3.6.5 requires the containment average air temperature shall be ≤ 117°F, which reflects temperature indication uncertainty, while in Modes 1, 2, 3, and 4.

Current LCO 3.6.5 states:

Containment average air temperature shall be ≤ 117°F.

The licensee's proposed change for LCO 3.6.5 would state:

Containment average air temperature shall be ≤ 120°F.

2.3 Applicable Regulatory Requirements

Section 182a of the Atomic Energy Act requires applicants for nuclear power plant operating licenses to include TSs as part of the application. The NRC's regulatory requirements related to the content of the TSs are contained in Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.36, "Technical specifications." Pursuant to 10 CFR 50.36, each operating license issued by the Commission includes TSs and includes items in the following categories: (1) safety limits, limiting safety system settings, and limiting control settings, (2) LCOs, (3) SRs,

(4) design features, (5) administrative controls, (6) decommissioning, (7) initial notification, and (8) written reports.

As provided in 10 CFR 50.36(c)(2)(ii), four criteria are utilized to define the scope of equipment and parameters to be included in the TS LCOs. These criteria were developed for licenses authorizing operation (i.e., operating reactors) and focused on instrumentation to detect degradation of the RCS pressure boundary; process variables and equipment, design features, or operating restrictions related to the integrity of a fission product barrier; and structures, systems, and components that mitigate design basis accidents or transients. A fourth criterion refers to the use of operating experience and probabilistic risk assessment to identify and include in the TS those structures, systems, and components shown to be significant to public health and safety.

The regulation in 10 CFR 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."

The regulation in 10 CFR 50.46(a)(1)(i) with respect to an acceptable emergency core cooling system (ECCS) evaluation model describes the behavior of the reactor during LOCAs.

The regulations in 10 CFR 50.46(b) require that, during a LOCA event, the following criteria are satisfied:

(1) *Peak cladding temperature*. The calculated maximum fuel element cladding temperature shall not exceed 2200° F.

(2) *Maximum cladding oxidation*. The calculated total oxidation of the cladding shall nowhere exceed 0.17 times the total cladding thickness before oxidation. …

(3) *Maximum hydrogen generation*. The calculated total amount of hydrogen generated from the chemical reaction of the cladding with water or steam shall not exceed 0.01 times the hypothetical amount that would be generated if all of the metal in the cladding cylinders surrounding the fuel, excluding the cladding surrounding the plenum volume, were to react.

(4) *Coolable geometry*. Calculated changes in core geometry shall be such that the core remains amenable to cooling.

Criterion (5) is long term cooling, which is not applicable to this proposed change.

Appendix A, "General Design Criteria for Nuclear Power Plants," to 10 CFR Part 50 establishes minimum requirements for the principal design criteria for water-cooled nuclear power plants similar in design and location to plants for which construction permits have been issued by the NRC. The general design criteria (GDC) are typically applicable to other types of nuclear power units and are intended to provide guidance in establishing the principal design criteria for similar units. The following GDC are applicable to this LAR review.

- GDC 16, "Containment design," as it relates to providing a reactor containment and associated systems "to establish an essentially leak-tight barrier against the uncontrolled

release of radioactivity to the environment and to assure that the containment design conditions important to safety are not exceeded for as long as postulated accident conditions require."

- GDC 35, "Emergency core cooling," as it relates to demonstrating that the ECCS would provide abundant emergency core cooling to satisfy the ECCS safety function of transferring heat from the reactor core following any loss of reactor coolant at a rate such that:

  (1) fuel and clad damage that could interfere with continued effective core cooling [would be] prevented, and

  (2) clad metal-water reaction [would be] limited to negligible amounts.

- GDC 38, "Containment heat removal," as it relates to providing a system to remove heat from the reactor containment whose safety function is to reduce rapidly, consistent with the functioning of other associated systems, the containment pressure and temperature following any LOCA and maintain them at acceptably low levels.

- GDC 50, "Containment design basis," as it relates to designing the "reactor containment structure, including access openings, penetrations, and the containment heat removal system so that the containment structure and its internal compartments can accommodate, without exceeding the design leakage rate and with sufficient margin, the calculated pressure and temperature conditions resulting from any loss-of-coolant accident."

3.0 TECHNICAL EVALUATION

3.1 Technical Discussion

3.1.1 TS Associated with SITs Water Volume

The below tables summarize the current TS values, expressed both in cubic feet and percent level with the current installed instrumentation, the proposed changes to the TSs, and the safety analyses as described in the Palo Verde Updated Final Safety Analysis Report (UFSAR) (ML23181A166):

SR 3.5.1.2 During Normal Operation

		Current SR Values		Proposed SR Values
	Safety analyses SIT volume (ft^3)	SIT Volume (ft^3)	Level (% narrow range)	SIT Volume (ft^3)
Minimum	1750	1802	≥ 28	≥ 1750
Maximum	1950	1914	≤ 72	≤ 1950

SR 3.5.2.2 During Shutdown

	Safety analyses SIT volume (ft^3) – (4 SITs)	Safety analyses SIT volume (ft^3) – (3 SITs)	Current SR Values (4 Operable SITs)		Current SR Values (3 Operable SITs)		Proposed SR Values (4 SITs)	Proposed SR Values (3 SITs)
			SIT Volume (ft^3)	Level (% wide range)	SIT Volume (ft^3)	Level (% wide range)	SIT Volume (ft^3)	SIT Volume (ft^3)
Minimum	908	1361	1029.2	> 39	1451.5	> 60	> 908	> 1361
Maximum	2000	2000	1914	< 83	1914	< 83	< 2000	< 2000

The NRC staff requested clarification from the licensee on any potential impact on LOCA containment peak pressure analysis due to an apparent conflict in the SIT volume of 1914 ft^3/tank as analysis input stated in Palo Verde UFSAR, Table 6.2.1-7, "Engineered Safety Systems Operating Assumptions for Containment Peak Pressure Analysis – At 102% of 3990," which is different than the proposed TS values restated in the above tables. In the supplement to the LAR dated March 6, 2024, the licensee stated the limiting factor in the LOCA containment peak pressure analysis, as it relates to the SIT, comes from the nitrogen used to pressurize the tanks and not the water inventory itself. The licensee stated that nitrogen does have the capability of influencing the containment response but that the current LOCA containment response analysis uses a conservative assumption about initial nitrogen volume in the SIT. The analysis models the nitrogen injection in the containment as discharging into a pure air environment, which has already experienced a large LOCA released mass and steam energy in the containment, and considers blowdown from one SIT plus lump sum nitrogen addition from the remaining three SITs.

The NRC staff finds it acceptable that the current LOCA containment pressure response analysis conservatively includes nitrogen addition from SITs and is not affected by the volume of water in SIT. The licensee captured the need to remove the SIT volume as an input to the containment peak pressure analysis from the Palo Verde UFSAR Table 6.2.1-7 in their corrective action program. The NRC finds that the difference in water level in the SIT will not have a significant impact on the containment peak pressure analysis as compared to the nitrogen levels, which are unchanged due to this proposed amendment request.

Additionally, the NRC staff requested additional information about the technical basis for the values used in the safety analyses for TS 3.5.2. Specifically, the origin of the SIT volumes 908 ft^3 minimum (with four SITs operable) and 2000 ft^3 maximum (with three or four SITs operable) was unclear. In the supplement to the LAR dated March 6, 2024, the licensee stated that:

- The minimum SIT volume > 908 ft^3 (four SITs operable) corresponds to the amount of water that would be necessary to fill the reactor vessel above the top of active core assuming: (1) a lower mode LOCA involving a postulated RCS cold leg break; (2) the loss of inventory from one OPERABLE SIT through the postulated cold leg break to containment; (3) an empty reactor vessel (that is, no RCS coolant inventory is retained in the reactor vessel after the break occurs and before the SITs inject into their respective cold legs); and (4) no analytical credit taken for HPSI pump flow into the reactor vessel before the SITs have emptied.

- The maximum SIT volume < 2000 ft^3 is based on the total physical SIT volume of 2406 ft^3 which must include the volume of the nitrogen, which without nitrogen will be effectively water solid. The volume of 2000 ft^3 is less than the total physical SIT volume, and the equivalent wide range (WR) level is such that the WR level instrument span indicated in the control room is readable such that the reactor operator will be able to notice any changes in the water volume.

- For the minimum or maximum or any SIT water volume between these limits, the licensee justified the TS SR 3.5.2.3 lowest SIT gas pressure of 260 pounds per square inch gauge (psig) that must be able to discharge enough water to satisfy the SIT design function of filling the reactor vessel above the active core during a design basis LOCA.

The NRC staff reviewed the licensee's deterministic analysis method, inputs, and assumptions and finds them acceptable because they conservatively determine the minimum and maximum analytical limits of SIT volumes and the lowest SR 3.5.2.3 SIT pressure which would satisfy the SIT design function of filling the reactor above the core during a DBA or a LOCA in a lower operating mode.

The NRC staff has reviewed the licensee's analysis provided in sections 3.1 and 4.1 of the LAR and the information in the supplemental letter dated March 6, 2024, and finds that the proposed TS changes restate the values used in the safety analyses without changing those inputs which maintains the conclusions of that analysis. Based on these findings, the NRC staff finds that there is reasonable assurance that the requirements of 10 CFR 50.46(a)(1)(i), 10CFR 50.46(b), and 10 CFR Part 50, Appendix A, GDC 35 will continue to be met and therefore finds the proposed change acceptable.

3.1.2 TS LCO 3.6.5 Change Associated with Containment Air Temperature

For containment air temperature, the licensee proposes to use the analytical value as the TS LCO limiting value without incorporating instrument uncertainty into the TS value itself. To justify, in the supplement to the LAR dated March 6, 2024, the licensee stated the following:

> PVNGS Technical Specifications contain both the LCO limit and Surveillance Requirement (SR) which is implemented by the Control Room Operators in accordance with surveillance testing (ST). The ST procedures reflect the total loop uncertainty calculations which specifies the indicated value to provide reasonable assurance that the analytical limit is not exceeded. Therefore, the TS value of ≤ 120°F does not account for instrument uncertainty and instead it is controlled within the licensee-controlled TS Bases and surveillance procedures, pursuant to 10 CFR 50.59.

As stated above, the licensee proposes to control the instrument inaccuracies using station operating procedures and surveillance acceptance criteria that reflects the instrument inaccuracies of the containment temperature measuring and testing equipment. The licensee provided additional clarification in the supplement to the LAR dated June 18, 2024, which describes the method the licensee uses to ensure containment temperature remains within design assumptions. The current surveillance procedure directs operators to record the containment temperature readings from the nine individual containment temperature monitors every 24 hours in accordance with the surveillance frequency control program. If any individual monitor reading is greater than the 117°F procedure acceptance criteria, operators take an

arithmetic average to provide a representative sample of containment temperature. If this average temperature is greater than 117°F, operators comply with the required actions of TS LCO 3.6.5 to restore containment temperature within limits in 8 hours or, failing that, shutdown the reactor. Taking this action at 117°F ensures compliance with the analytical limit of 120°F maximum initial containment temperature assumed in the safety analyses when accounting for instrument loop uncertainties. In the future, should the licensee obtain measuring and test equipment with a tighter band, the procedure surveillance acceptance criteria can be changed to reflect that action.

The NRC staff reviewed the licensee's analysis provided in sections 3.2 and 4.2 of its submittal and finds that the proposed TS changes restate the values used in the DBA calculations without changing those inputs which maintains the conclusions of that analysis. Based on these findings, the NRC staff finds that there is reasonable assurance that the requirements of GDCs 16, 38, and 50 will continue to be met and therefore, the staff finds the proposed change acceptable.

3.2 NRC Staff Technical Conclusions

Based on the above technical evaluation, the NRC staff findings are as follows:

- The proposed changes in SR 3.5.1.2 and SR 3.5.2.2 are acceptable because they restate the values used in DBA calculations without changing the inputs, which maintains the analysis conclusions. Therefore, there is reasonable assurance that the requirements of 10 CFR 50.36(c)(2), 10 CFR 50.36(c)(3), 10 CFR 50.46(a)(1)(i), 10 CFR 50.46(b), and 10 CFR Part 50, Appendix A, GDC 35 will continue to be met.

- The proposed change in TS 3.6.5 for the containment air temperature during normal operation from its current value of 117°F to its analytical limit of 120°F is acceptable because the licensee will control the containment temperature measuring instrument uncertainties in accordance with the licensee-controlled surveillance procedures pursuant to 10 CFR 50.59, "Changes, tests and experiments," and because the requirements of 10 CFR 50.36(c)(2) and GDCs 16, 38, and 50 will continue to be met.

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 July 24, 2024. The State official had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

The amendments change requirements with respect to installation or use of facility components located within the restricted area as defined in 10 CFR Part 20. 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, published in the *Federal Register* on September 5, 2023 (88 FR 60716), and there has been no public comment on such finding. Accordingly, the amendments meet the eligibility criteria for categorical exclusion as 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.

Principal Contributors: D. Scully, NRR
J. Ambrosini, NRR

Date: August 20, 2024

SUBJECT: PALO VERDE NUCLEAR GENERATING STATION, UNITS 1, 2, AND 3 – ISSUANCE OF AMENDMENT NOS. 224, 224, AND 224 REGARDING REVISION TO TECHNICAL SPECIFICATIONS 3.5.1, 3.5.2, AND 3.6.5 (EPID L-2023-LLA-0098) DATED AUGUST 20, 2024

DISTRIBUTION:
PUBLIC
RidsACRS_MailCTR Resource
RidsNrrDorlLpl4 Resource
RidsNrrDssScpb Resource
RidsNrrDssSnsb Resource
RidsNrrDssStsb Resource
RidsNrrDraApob Resource
RidsNrrPMPaloVerde Resource
RidsNrrLAPBlechman Resource
RidsRgn4MailCenter Resource
DScully , NRR
JAmbrosini , NRR
ASallman, NRR
MHamm, NRR

ADAMS Accession No. ML24208A061 ***concurrence via email**

OFFICE	NRR/DORL/LPL4/PM	NRR/DORL/LPL4/LA*	NRR/DSS/SCPB/BC*	NRR/DSS/STSB/BC*
NAME	WOrders	PBlechman	MValentin	SMehta/KWest for
DATE	8/1/2024	8/1/2024 w/comments	8 /15/2024	8/15/2024
OFFICE	NRR/SNSB/BC*	OGC – NLO*	NRR/DORL/LPL4/BC*	NRR/DORL/LPL4/PM*
NAME	PSahd	ALeatherman	JRankin	WOrders
DATE	8/19/2024	8/15/2024	8/20/2024	8/20/2024

OFFICIAL RECORD COPY