



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

December 15, 2022

Mr. Adam C. 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. 220, 220, AND 220, TO REVISE
TECHNICAL SPECIFICATIONS TO ADOPT TSTF-487, "RELOCATE DNB
PARAMETERS TO THE COLR" (EPID L-2022-LLA-0061)

Dear Mr. Heflin:

The U.S. Nuclear Regulatory Commission (the Commission) has issued the enclosed Amendment No. 220 to Renewed Facility Operating License No. NPF-41, Amendment No. 220 to Renewed Facility Operating License No. NPF-51, and Amendment No. 220 to Renewed Facility Operating License No. NPF-74 for the Palo Verde Nuclear Generating Station (Palo Verde), Units 1, 2, and 3, respectively. The amendments consist of changes to the Technical Specifications (TSs) in the above-referenced licenses and are issued in response to your application dated April 26, 2022.

The amendments revise the TSs to adopt Technical Specifications Task Force Traveler TSTF-487, Revision 1, "Relocate DNB [Departure from Nucleate Boiling] Parameters to the COLR [Core Operating Limits Report]," which is an approved change to the Improved Standard Technical Specifications, into the Palo Verde TSs.

The proposed amendments replace the DNB numeric limits in the TSs with references to the COLR.

A. Heflin

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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/

Dennis J. Galvin, 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. 220 to NPF-41
2. Amendment No. 220 to NPF-51
3. Amendment No. 220 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. 220
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 April 26, 2022, 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. 220, 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 6 months of the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Jennifer L. Dixon-Herrity, 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: December 15, 2022



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. 220
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 April 26, 2022, 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. 220, 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 6 months of the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Jennifer L. Dixon-Herrity, 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: December 15, 2022



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. 220
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 April 26, 2022, 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. 220, 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 6 months of the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Jennifer L. Dixon-Herrity, 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: December 15, 2022

ATTACHMENT TO LICENSE AMENDMENT NOS. 220, 220, AND 220 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 License 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
5

INSERT
5

Renewed Facility Operating License No. NPF-51

REMOVE
6

INSERT
6

Renewed Facility Operating License No. NPF-74

REMOVE
4

INSERT
4

Technical Specifications

REMOVE
3.1.11-1
3.4.1-1
3.4.1-2
3.4.1-3
5.6-3
5.6-8

INSERT
3.1.11-1
3.4.1-1
3.4.1-2
3.4.1-3
5.6-3
5.6-8

(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. 220, 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. 220, 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. 220, 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.

3.1 REACTIVITY CONTROL SYSTEMS

3.1.11 Special Test Exceptions (STE) - Reactivity Coefficient Testing

LCO 3.1.11 During performance of PHYSICS TESTS, the requirements of:
 LCO 3.1.7, "Regulating Control Element Assembly (CEA) Insertion Limits";
 LCO 3.1.8, "Part Strength Control Element Assembly (CEA) Insertion Limits;" and
 LCO 3.4.1, "RCS Pressure, Temperature and Flow limits" (RCS Cold Leg Temperature only)

may be suspended, provided LHR and DNBR do not exceed the limits in the COLR.

APPLICABILITY: MODE 1 with Thermal Power > 20% RTP during PHYSICS TESTS.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. LHR or DNBR outside the limits specified in the COLR.	A.1 Reduce THERMAL POWER to restore LHR and DNBR to within limits.	15 minutes
B. Required Action and associated Completion Time not met.	B.1 Suspend PHYSICS TESTS.	1 hour

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.1.11.1 Verify LHR and DNBR do not exceed limits by performing SR 3.2.1.1 and SR 3.2.4.1.	Continuously

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.1 RCS Pressure, Temperature, and Flow Departure from Nucleate Boiling (DNB) Limits

LCO 3.4.1 RCS DNB parameters for pressurizer pressure, cold leg temperature, and RCS total flow rate shall be within the limits specified in the COLR.

APPLICABILITY: MODE 1 for RCS total flow rate,
 MODES 1 and 2 for pressurizer pressure,
 MODE 1 for RCS cold leg temperature (Tc).
 MODE 2 with $K_{eff} \geq 1$ for RCS cold leg temperature (Tc).

-----NOTE-----
 Pressurizer pressure limit does not apply during:
 a. THERMAL POWER ramp > 5% RTP per minute; or
 b. THERMAL POWER step > 10% RTP.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. RCS flow rate not within limit.	A.1 Restore RCS flow rate to within limit.	2 hours
B. Required Action and associated Completion Time of Condition A not met.	B.1 Be in MODE 2.	6 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Pressurizer pressure or RCS cold leg temperature not within limits.	C.1 Restore parameter(s) to within limits.	2 hours
D. Required Action and associated Completion Time of Condition C not met.	D.1 Be in MODE 3.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.4.1.1 Verify pressurizer pressure is within the limits specified in the COLR.	In accordance with the Surveillance Frequency Control Program
SR 3.4.1.2 Verify RCS cold leg temperature is within the limits specified in the COLR.	In accordance with the Surveillance Frequency Control Program
SR 3.4.1.3 -----NOTE----- Required to be met in MODE 1 with all RCPs running. ----- Verify RCS total flow rate is greater than or equal to the limits specified in the COLR.	In accordance with the Surveillance Frequency Control Program

Figure Deleted

5.6 Reporting Requirements (continued)

5.6.5 CORE OPERATING LIMITS REPORT (COLR)

- a. Core operating limits shall be established prior to each reload cycle, or prior to any remaining portion of a reload cycle, and shall be documented in the COLR for the following:
1. Shutdown Margin - Reactor Trip Breakers Open for Specification 3.1.1.
 2. Shutdown Margin - Reactor Trip Breakers Closed for Specification 3.1.2.
 3. Moderator Temperature Coefficient BOL and EOL limits for Specification 3.1.4.
 4. Boron Dilution Alarm System for Specification 3.3.12.
 5. CEA Alignment for Specification 3.1.5.
 6. Regulating CEA Insertion Limits for Specification 3.1.7.
 7. Part Strength CEA Insertion Limits for Specification 3.1.8.
 8. Linear Heat Rate for Specification 3.2.1.
 9. Azimuthal Power Tilt - T_q for Specification 3.2.3.
 10. DNBR for Specification 3.2.4.
 11. Axial Shape Index for Specification 3.2.5.
 12. RCS Pressure, Temperature, and Flow Departure from Nucleate Boiling (DNB) Limits for Specification 3.4.1.
 13. Boron Concentration (Mode 6) for Specification 3.9.1.
 14. Fuel types and cladding material in the reactor for Specification 4.2.1.a and 4.2.1.b, and the associated COLR methodologies for Specification 4.2.1.a.
- b. The analytical methods used to determine the core operating limits shall be those previously reviewed and approved by the NRC, specifically those described in the following documents:

-----NOTE-----
The COLR will contain the complete identification for each of the Technical Specification referenced topical reports used to prepare the COLR (i.e., report number, title, revision, date, and any supplements).

(continued)

5.6 Reporting Requirements

5.6.5 Core Operating Limits Report (COLR) (continued)

- c. The core operating limits shall be determined assuming operation up to RATED THERMAL POWER such that all applicable limits (e.g., fuel thermal mechanical limits, core thermal hydraulic limits, Emergency Core Cooling Systems (ECCS) limits, nuclear limits such as SDM, transient analysis limits, and accident analysis limits) of the safety analysis are met.
- d. The COLR, including any mid cycle revisions or supplements, shall be provided upon issuance for each reload cycle to the NRC.

5.6.6 PAM Report

When a report is required by Condition B or F of LCO 3.3.10, "Post Accident Monitoring (PAM) Instrumentation," a report shall be submitted within the following 14 days. The report shall outline the preplanned alternate method of monitoring, the cause of the inoperability, and the plans and schedule for restoring the instrumentation channels of the Function to OPERABLE status.

5.6.7 Tendon Surveillance Report

Any abnormal degradation of the containment structure detected during the tests required by the Pre-Stressed Concrete Containment Tendon Surveillance Program shall be reported to the NRC within 30 days. The report shall include a description of the tendon condition, the condition of the concrete (especially at tendon anchorages), the inspection procedures, the tolerances on cracking, and the corrective action taken.

5.6.8 Steam Generator Tube Inspection Report

A report shall be submitted within 180 days after the initial entry into MODE 4 following completion of an inspection performed in accordance with the Specification 5.5.9, Steam Generator (SG) Program. The report shall include:

- a. The scope of inspections performed on each SG.
- b. Active degradation mechanisms found.
- c. Nondestructive examination techniques utilized for each degradation mechanism.
- d. Location, orientation (if linear), and measured sizes (if available) of service induced indications.
- e. Number of tubes plugged during the inspection outage for each active degradation mechanism.
- f. Total number and percentage of tubes plugged to date.
- g. The results of condition monitoring, including the results of tube pulls and in-situ testing.

(continued)



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NOS. 220, 220, AND 220 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 April 26, 2022 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML22116A220), Arizona Public Service Company (the licensee) requested changes to the Technical Specifications (TSs) for Palo Verde Nuclear Generating Station, Units 1, 2, and 3 (Palo Verde).

The proposed changes would revise TS 3.4.1, "RCS [Reactor Coolant System] Pressure, Temperature, and Flow Departure from Nucleate Boiling (DNB) Limits," the associated bases for TS 3.4.1, and TS 5.6.5, "Core Operating Limits Report (COLR)," and TS 5.6.5, "Core Operating Limits Report (COLR)," by replacing the DNB numeric limits with references to the COLR. The changes are consistent with Technical Specifications Task Force (TSTF) Change Traveler, TSTF-487, Revision 1, "Relocate DNB Parameters to the COLR." These changes would allow the licensee to recalculate the DNB parameter limits using U.S. Nuclear Regulatory Commission (NRC or the Commission)-approved methodologies without the need for a license amendment request (LAR). The availability of this TSTF-487, Revision 1 was announced in the *Federal Register* on June 5, 2007 (72 FR 31108) as part of the Consolidated Line Item Improvement Process.

The proposed changes include the following:

- Change TS 3.4.1, Limiting Conditions for Operation (LCO) 3.4.1 and the associated surveillance requirements (SRs) to replace the specific limit values of RCS pressurizer pressure, cold leg temperature, and RCS total flow rate with "the limits specified in the COLR."
- Change the bases for LCO 3.4.1 to reflect that the DNB limits are specified in the COLR.
- Change TS 5.6.5 to include the NRC approved methodologies and requirements used to calculate the DNB limits.

The licensee has also proposed variations from the TS changes described in TSTF-487, Revision 1. The variations are described and evaluated in section 3.2 of this SE.

Generic Letter (GL) 88-16, "Removal of Cycle-Specific Parameter Limits from Technical Specifications" (ML031130447), is the regulatory guidance for this change.

2.0 REGULATORY EVALUATION

The Commission's regulatory requirements related to the content of TSs are specified in Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.36, "Technical specifications." As stated in 10 CFR 50.36(c)(2)(i), "Limiting conditions for operation are the lowest functional capability or performance levels of equipment required for safe operation of the facility." For the DNB parameters, 10 CFR 50.36(c)(2)(ii)(B) Criterion 2 applies, which requires that TS LCOs be established for each "process variable, design feature, or operating restriction that is an initial condition of a design basis accident or transient analysis that either assumes the failure of or presents a challenge to the integrity of a fission product barrier."

LARs are required for each fuel cycle design that results in changes to parameter limits specified in TSs. To meet 10 CFR 50.36(c)(2)(ii) requirements and alleviate the need for LARs to update parameter limits every fuel cycle, the NRC issued GL 88-16 with specific guidance for replacing the limit values for cycle-specific parameters in the TSs with references to an owner-controlled document, namely, the COLR. The guidance in GL 88-16 includes the following three actions:

1. The addition of the definition of a named formal report (i.e., COLR) in TSs that includes the values of cycle-specific parameter limits that have been established using an NRC-approved methodology and consistent with all applicable limits of the safety analyses.
2. The addition of an administrative reporting requirement (in TS 5.6.5) to submit the formal report on cycle-specific parameter limits to the Commission for information.
3. The modification of individual TSs to note that the specific parameters shall be maintained within the limits provided in the defined formal report (COLR).

The proposed change has been evaluated against GL 88-16 and found to be consistent with that regulatory guidance.

3.0 TECHNICAL EVALUATION

3.1 Proposed TS Changes to Adopt TSTF-487, Revision 1

TS LCO 3.4.1 specifies the limit values of the DNB parameters to assure that the pressurizer pressure, the RCS cold leg temperature, and RCS flow rate during operation at the rated thermal power (RTP) will be maintained within the limits assumed in the safety analyses in the final safety analysis report. The safety analyses of anticipated operational occurrences and accidents assume initial conditions within the envelope of normal steady state operation at the RTP to demonstrate that the applicable acceptance criteria, including the specified acceptable fuel design limits (such as DNB ratio) and RCS pressure boundary design conditions, are met for each event analyzed. The TS limits placed on the DNB-related parameters ensure that these

parameters, when appropriate measurement uncertainties are applied, will be bounded by those assumed in the safety analyses, and thereby provide assurance that the applicable acceptance criteria will not be violated should a transient or accident occur while operating at the RTP.

It is essential to safety that the plant is operated within the DNB parameter limits. This change retains the requirement to maintain the plant within the DNB parameter limits in LCO 3.4.1 along with the SR verification for each of the DNB parameters. As these parameter limits are calculated using NRC-approved methodologies and are consistent with all applicable limits of the plant safety analyses, this change does not affect nuclear safety.

TS 5.6.5 specifies that the core operating limits shall be determined such that all applicable limits of the safety analyses are met, and that the analytical methods used to determine the core operating limits shall be those previously reviewed and approved by the NRC. This change modifies the list of NRC-approved methodologies in TS 5.6.5 to include those used to calculate the DNB limits on pressurizer pressure, RCS cold leg temperature, and RCS total flow rate. The limit values of these parameters in the COLR will comply with existing operating fuel cycle analysis requirements, and are initial conditions assumed in safety analyses. Replacing the DNB parameter values with references to the COLR does not lessen the requirement for compliance with all applicable limits.

Any revisions to the safety analyses that require prior NRC approval will be identified by the 10 CFR 50.59, "Changes, tests, and experiments," review process. TS 5.6.5 also specifies that the COLR, including any midcycle revisions or supplements, shall be provided upon issuance for each reload cycle to the NRC. This will allow NRC staff to continue trending the information even though prior NRC approval of the changes to these limits will not be required.

Section 50.36 of 10 CFR requires LCOs to contain the lowest functional capability or performance levels of equipment for safe operation of the facility. The NRC staff finds that the proposed change to LCO 3.4.1 referencing the specific values of the DNB parameter limits in TS in the COLR continues to meet the regulatory requirement of 10 CFR 50.36(c)(2)(ii)(B) (Criterion 2), and follows the guidance described in GL 88-16. The NRC staff, therefore, concludes that this change is acceptable.

For safety analyses of transients or accidents, various sections of Chapter 15, "Technical Specifications," of NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR [Light-Water Reactor] Edition," specify that the reactor is initially at the RTP plus uncertainty, and the RCS flow is at nominal design flow including the measurement uncertainty. If one or more DNB parameter limits change, and these changes do not support the RTP, a license amendment would be required to either reduce the RTP or limit the plant operation at a level below the RTP.

The regulations at 10 CFR Part 50 Appendix K, "ECCS [Emergency Core Cooling System] Evaluation Models," require that the loss-of-coolant accident analysis be performed at 102 percent of the RTP. Other plant-specific analyses can contain an initial condition to be performed at RTP. To ensure a clear understanding of this requirement, TS 5.6.5.c has been reworded to add the underlined text: "The core operating limits shall be determined assuming operation up to RATED THERMAL POWER such that all applicable limits..."

3.2 Additional Proposed TS Changes

3.2.1 Editorial Variations

The licensee noted that the Palo Verde TSs have different numbering and nomenclature than the current applicable Improved Standard Technical Specifications (ISTS) in NUREG-1432, "Standard Technical Specifications Combustion Engineering Plants," Volume 1, "Specifications," and Volume 2, "Bases," Revision 5 (ML21258A421 and ML21258A424, respectively). The NRC staff notes that the licensee's adoption of the ISTSs with variations is referred to as Improved Technical Specifications (ITS). The Palo Verde ITS were issued with Palo Verde License Amendment 117 dated May 20, 1998 (ML021720060 and ML17313A399). The licensee also proposed the following editorial variations:

- For Palo Verde, the COLR is addressed by TS 5.6.5, whereas in TSTF-487, Revision 1 for the COLR is addressed by TS 5.6.3.
- An editorial change to LCO 3.1.11 and TS Bases B 3.1.11 is included to remove "LCO 3.4.1.b" wording to state "RCS Cold Leg Temperature only."
- The proposed amendment includes editorial changes to TS 3.1.11, "Special Test Exceptions (STE) – Reactivity Coefficient Testing," and the corresponding TS Bases B 3.1.11. These sections refer to LCO 3.4.1.b, which is being removed from TS 3.4.1 per TSTF-487, Revision 1.
- The editorial change made to SR 3.4.1.4 in TSTF-487, Revision 1 is not included in this proposed amendment since the Palo Verde TS do not utilize this SR. The Palo Verde TSs utilizes SRs 3.3.1.2 and 3.3.1.5 to satisfy the requirements for NUREG-1432, Revision 5. The surveillance frequency for SRs 3.3.1.2 and 3.3.1.5 are controlled by the Surveillance Frequency Control Program (currently on a 12 hour and 31 day frequency, respectively), rather than the 18 month frequency for SR 3.4.1.4 listed in NUREG-1432, Revision 5. This is consistent with the Palo Verde licensing basis as documented in Palo Verde License Amendment 117

The NRC staff finds the above variations acceptable since the differences are editorial and do not affect the applicability of TSTF-487, Revision 1 to the proposed LAR.

3.2.2 Other Variations

The licensee also proposed the following variations:

- Palo Verde TSs utilize figure 3.4.1-1, "Reactor Coolant Cold Leg Temperature vs. Core Power Level," to stipulate the area of acceptable operation for RCS cold leg temperature. Figure 3.4.1-1 is included with the conversion to the ITS as documented in Palo Verde License Amendment 117. Figure 3.4.1-1 is being removed from TS 3.4.1 and incorporated into the COLR. TS Bases B 3.4.1 is also revised to describe that the LCO limit is specified in the COLR.
- The Modes of Applicability for Palo Verde TS 3.4.1 differ from the ISTS on which TSTF-487, Revision 1, was based. The ISTS specifies MODE 1 only. The Modes of Applicability for Palo Verde TS 3.4.1 is specific for "MODE 1 for RCS total flow rate, MODES 1 and 2 for

pressurizer pressure, MODE 1 for RCS cold leg temperature (T_c), and MODE 2 with k -effective (i.e., the effective neutron multiplication factor (k_{eff})) ≥ 1 for RCS cold leg temperature (T_c)." The Modes of Applicability remained unchanged from the conversion to the ITS as documented in Palo Verde License Amendment 117 and is consistent with the Palo Verde licensing basis.

The NRC staff finds that these variations do not affect the applicability of TSTF-487, Revision 1 to the Palo Verde TSs. The NRC staff, therefore, finds these variations acceptable.

3.3 Technical Evaluation Summary

The NRC staff has reviewed this proposed change to replace the values of the DNB parameters in TS with references to the COLR. This change will allow the licensee the flexibility to manage operating and core design margins associated with the DNB parameters without the need for cycle-specific LARs. Any future revisions to safety analyses that require prior NRC approval will be identified by the 10 CFR 50.59 review process. Based on this evaluation, the NRC staff concludes that this change meets the regulatory requirements of 10 CFR 50.36, follows the guidance described in GL 88-16, and is 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 November 30, 2022. 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 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, published in the *Federal Register* on June 14, 2022 (87 FR 36006), and there has been no public comment on such finding. 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.

Principal Contributor: R. Grover, NRR

Date: December 15, 2022

SUBJECT: PALO VERDE NUCLEAR GENERATING STATION, UNITS 1, 2, AND 3 -
 ISSUANCE OF AMENDMENT NOS. 220, 220, AND 220, TO REVISE
 TECHNICAL SPECIFICATIONS TO ADOPT TSTF-487, "RELOCATE DNB
 PARAMETERS TO THE COLR" (EPID L-2022-LLA-0061)
 DATED DECEMBER 15, 2022

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