



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

February 1, 2021

Mr. Ken J. Peters
Senior Vice President and
Chief Nuclear Officer
Attention: Regulatory Affairs
Vistra Operations Company LLC
Comanche Peak Nuclear Power Plant
6322 N FM 56
P.O. Box 1002
Glen Rose, TX 76043

SUBJECT: COMANCHE PEAK NUCLEAR POWER PLANT, UNIT NOS. 1 AND 2 -
ISSUANCE OF AMENDMENT NOS. 177 AND 177 REGARDING REVISION TO
TECHNICAL SPECIFICATION 3.8.1, "AC SOURCES – OPERATING"
(EPID L-2020-LLA-0059)

Dear Mr. Peters:

The U.S. Nuclear Regulatory Commission (NRC, the Commission) has issued the enclosed Amendment No. 177 to Facility Operating License No. NPF-87 and Amendment No. 177 to Facility Operating License No. NPF-89 for Comanche Peak Nuclear Power Plant, Unit Nos. 1 and 2, respectively. The amendments consist of changes to the technical specifications (TSs) in response to your application dated March 31, 2020, as supplemented by letter dated December 9, 2020.

The amendments revise TS 3.8.1, "AC [Alternating Current] Sources – Operating," to change the emergency diesel generator surveillance requirement (SR) steady-state frequency band in multiple SRs from a band from 58.8 hertz (Hz) to 61.2 Hz to a band from 59.9 Hz to 60.1 Hz. The amendments would also remove historical information from TS 3.8.1 and a Note from SR 3.8.1.13.

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. 50-445 and 50-446

Enclosures:

1. Amendment No. 177 to NPF-87
2. Amendment No. 177 to NPF-89
3. Safety Evaluation

cc: Listserv



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

COMANCHE PEAK POWER COMPANY LLC
AND VISTRA OPERATIONS COMPANY LLC
COMANCHE PEAK NUCLEAR POWER PLANT, UNIT NO. 1
DOCKET NO. 50-445
AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 177
License No. NPF-87

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Vistra Operations Company LLC (Vistra OpCo) dated March 31, 2020, as supplemented by letter dated December 9, 2020, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and 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 license 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 Facility Operating License No. NPF-87 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. 177 and the Environmental Protection Plan contained in Appendix B, are hereby incorporated into this license. Vistra OpCo shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. The license amendment is effective as of its date of issuance and shall be implemented within 90 days from 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 the Facility
Operating License and
Technical Specifications

Date of Issuance: February 1, 2021



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

COMANCHE PEAK POWER COMPANY LLC
AND VISTRA OPERATIONS COMPANY LLC
COMANCHE PEAK NUCLEAR POWER PLANT, UNIT NO. 2
DOCKET NO. 50-446
AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 177
License No. NPF-89

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Vistra Operations Company LLC (Vistra OpCo) dated March 31, 2020, as supplemented by letter dated December 9, 2020, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and 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 license 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 Facility Operating License No. NPF-89 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. 177 and the Environmental Protection Plan contained in Appendix B, are hereby incorporated into this license. Vistra OpCo shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. This license amendment is effective as of its date of issuance and shall be implemented within 90 days from 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 the Facility
Operating License and
Technical Specifications

Date of Issuance: February 1, 2021

ATTACHMENT TO LICENSE AMENDMENT NO. 177
TO FACILITY OPERATING LICENSE NO. NPF-87
AND AMENDMENT NO. 177
TO FACILITY OPERATING LICENSE NO. NPF-89
COMANCHE PEAK NUCLEAR POWER PLANT, UNIT NOS. 1 AND 2
DOCKET NOS. 50-445 AND 50-446

Replace the following pages of Facility Operating License Nos. NPF-87 and NPF-89, 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.

Facility Operating License No. NPF-87

REMOVE
3

INSERT
3

Facility Operating License No. NPF-89

REMOVE
3

INSERT
3

Technical Specifications

REMOVE
3.8-2
3.8-6
3.8-8
3.8-10
3.8-11
3.8-12
3.8-15
3.8-16

INSERT
3.8-2
3.8-6
3.8-8
3.8-10
3.8-11
3.8-12
3.8-15
3.8-16

- (3) Vistra OpCo, pursuant to the Act and 10 CFR Part 70, to receive, possess, and use at any time, special nuclear material as reactor fuel, in accordance with the limitations for storage and amounts required for reactor operation, and described in the Final Safety Analysis Report, as supplemented and amended;
- (4) Vistra OpCo, pursuant to the Act and 10 CFR Parts 30, 40 and 70, to receive, possess, and use, at any time, any byproduct, source, and special nuclear material as sealed neutron sources for reactor startup, sealed sources for reactor instrumentation and radiation monitoring equipment calibration, and as fission detectors in amounts as required;
- (5) Vistra OpCo, pursuant to the Act and 10 CFR Parts 30, 40 and 70, to receive, possess, and use in amounts as required, any byproduct, source, and special nuclear material without restriction to chemical or physical form, for sample analysis or instrument calibration or associated with radioactive apparatus or components; and
- (6) Vistra OpCo, pursuant to the Act and 10 CFR Parts 30, 40 and 70, to possess, but not separate, such byproduct and special nuclear materials as may be produced by the operation of the facility.

C. This 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

Vistra OpCo is authorized to operate the facility at reactor core power levels not in excess of 3458 megawatts thermal through Cycle 13 and 3612 megawatts thermal starting with Cycle 14 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. 177 and the Environmental Protection Plan contained in Appendix B, are hereby incorporated into this license. Vistra OpCo shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

- (3) Vistra OpCo, pursuant to the Act and 10 CFR Part 70, to receive, possess, and use at any time, special nuclear material as reactor fuel, in accordance with the limitations for storage and amounts required for reactor operation, and described in the Final Safety Analysis Report, as supplemented and amended;
- (4) Vistra OpCo, pursuant to the Act and 10 CFR Parts 30, 40 and 70, to receive, possess, and use, at any time, any byproduct, source, and special nuclear material as sealed neutron sources for reactor startup, sealed sources for reactor instrumentation and radiation monitoring equipment calibration, and as fission detectors in amounts as required;
- (5) Vistra OpCo, pursuant to the Act and 10 CFR Parts 30, 40 and 70, to receive, possess, and use in amounts as required, any byproduct, source, and special nuclear material without restriction to chemical or physical form, for sample analysis or instrument calibration or associated with radioactive apparatus or components; and
- (6) Vistra OpCo, pursuant to the Act and 10 CFR Parts 30, 40 and 70, to possess, but not separate, such byproduct and special nuclear materials as may be produced by the operation of the facility.

C. This 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

Vistra OpCo is authorized to operate the facility at reactor core power levels not in excess of 3458 megawatts thermal through Cycle 11 and 3612 megawatts thermal starting with Cycle 12 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. 177 and the Environmental Protection Plan contained in Appendix B, are hereby incorporated into this license. Vistra OpCo shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

(3) Antitrust Conditions

DELETED

ACTIONS

-----NOTE-----

LCO 3.0.4.b is not applicable to DGs.

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>A. One required offsite circuit inoperable.</p>	<p>A.1 Perform SR 3.8.1.1 for required OPERABLE offsite circuit.</p> <p><u>AND</u></p> <p>A.2 -----NOTE----- In MODES 1, 2 and 3, the TDAFW pump is considered a required redundant feature.</p> <p>-----</p> <p>Declare required feature(s) with no offsite power available inoperable when its redundant required feature(s) is inoperable.</p> <p><u>AND</u></p> <p>A.3 Restore required offsite circuit to OPERABLE status.</p>	<p>1 hour</p> <p><u>AND</u></p> <p>Once per 8 hours thereafter</p> <p>24 hours from discovery of no offsite power to one train concurrent with inoperability of redundant required feature(s)</p> <p>72 hours</p>

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
H. Three or more required AC sources inoperable.	H.1 Enter LCO 3.0.3.	Immediately
I. One Blackout Sequencer inoperable	I.1 Declare associated DG inoperable	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.1.1	Verify correct breaker alignment and indicated power availability for each required offsite circuit.	In accordance with the Surveillance Frequency Control Program.
SR 3.8.1.2	<p>-----NOTES-----</p> <ol style="list-style-type: none"> Performance of SR 3.8.1.7 satisfies this SR. All DG starts may be preceded by an engine prelube period and followed by a warmup period prior to loading. A modified DG start involving idling and gradual acceleration to synchronous speed may be used for this SR as recommended by the manufacturer. When modified start procedures are not used, the time, voltage, and frequency tolerances of SR 3.8.1.7 must be met. <p>-----</p> <p>Verify each DG starts from standby conditions and achieves steady state voltage ≥ 6480 V and ≤ 7150 V, and frequency ≥ 59.9 Hz and ≤ 60.1 Hz.</p>	In accordance with the Surveillance Frequency Control Program.

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.7 -----NOTE----- All DG starts may be preceded by an engine prelube period. -----</p> <p>Verify each DG starts from standby condition and achieves:</p> <p>a. in ≤ 10 seconds, voltage ≥ 6480 V and frequency ≥ 58.8 Hz; and</p> <p>b. steady state, voltage ≥ 6480 V and ≤ 7150 V, and frequency ≥ 59.9 Hz and ≤ 60.1 Hz.</p>	<p>In accordance with the Surveillance Frequency Control Program.</p>
<p>SR 3.8.1.8 -----NOTE----- This Surveillance shall not normally be performed in MODE 1 or 2. However, this Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. -----</p> <p>Verify automatic and manual transfer of AC power sources from the normal offsite circuit to each alternate required offsite circuit.</p>	<p>In accordance with the Surveillance Frequency Control Program.</p>

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.11 -----NOTES-----</p> <ol style="list-style-type: none"> 1. All DG starts may be preceded by an engine prelube period. 2. This Surveillance shall not normally be performed in MODE 1 or 2. However, portions of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. <p>-----</p> <p>Verify on an actual or simulated loss of offsite power signal:</p> <ol style="list-style-type: none"> a. De-energization of emergency buses; b. Load shedding from emergency buses; c. DG auto-starts from standby condition and: <ol style="list-style-type: none"> 1. energizes permanently connected loads in ≤ 10 seconds, 2. energizes auto-connected shutdown loads through automatic load sequencer, 3. maintains steady state voltage ≥ 6480 V and ≤ 7150 V, 4. maintains steady state frequency ≥ 59.9 Hz and ≤ 60.1 Hz, and 5. supplies permanently connected and auto-connected shutdown loads for ≥ 5 minutes. 	<p>In accordance with the Surveillance Frequency Control Program.</p>

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.12</p> <p>-----NOTE----- All DG starts may be preceded by prelube period. -----</p> <p>Verify on an actual or simulated Safety Injection (SI) actuation signal each DG auto-starts from standby condition and;</p> <ul style="list-style-type: none"> a. in ≤ 10 seconds after auto-start and during tests, achieves voltage ≥ 6480 V and frequency ≥ 58.8 Hz; b. Achieves steady state voltage ≥ 6480 V and ≤ 7150 V and frequency ≥ 59.9 Hz and ≤ 60.1 Hz; c. Operates for ≥ 5 minutes. 	<p>In accordance with the Surveillance Frequency Control Program.</p>
<p>SR 3.8.1.13</p> <p>Verify each DG's automatic trips are bypassed on actual or simulated (i) loss of voltage signal on the emergency bus, and (ii) SI actuation signal, except:</p> <ul style="list-style-type: none"> a. Engine overspeed; and b. Generator differential current. 	<p>In accordance with the Surveillance Frequency Control Program.</p>

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.14 -----NOTE----- Momentary transients outside the load and power factor ranges do not invalidate this test.</p> <p>-----</p> <p>Verify each DG operates for ≥ 24 hours:</p> <p>a. For ≥ 2 hours loaded ≥ 6900 kW and ≤ 7700 kW; and</p> <p>b. For the remaining hours of the test loaded ≥ 6300 kW and ≤ 7000 kW.</p>	<p>In accordance with the Surveillance Frequency Control Program.</p>
<p>SR 3.8.1.15 -----NOTES-----</p> <p>1. This Surveillance shall be performed within 5 minutes of shutting down the DG after the DG has operated ≥ 2 hours loaded ≥ 6300 kW and ≤ 7000 kW. Momentary transients outside of load range do not invalidate this test.</p> <p>2. All DG starts may be preceded by an engine prelube period.</p> <p>-----</p> <p>Verify each DG starts and achieves:</p> <p>a. in ≤ 10 seconds, voltage ≥ 6480 V and frequency ≥ 58.8 Hz; and</p> <p>b. steady state, voltage ≥ 6480 V and ≤ 7150 V and frequency ≥ 59.9 Hz and ≤ 60.1 Hz.</p>	<p>In accordance with the Surveillance Frequency Control Program.</p>

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.19 -----NOTES-----</p> <ol style="list-style-type: none"> 1. All DG starts may be preceded by an engine prelube period. 2. This Surveillance shall not normally be performed in MODE 1 or 2. However, portions of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. <p>-----</p> <p>Verify on an actual or simulated loss of offsite power signal in conjunction with an actual or simulated SI actuation signal:</p> <ol style="list-style-type: none"> a. De-energization of emergency buses; b. Load shedding from emergency buses; and c. DG auto-starts from standby condition and: <ol style="list-style-type: none"> 1. energizes permanently connected loads in ≤ 10 seconds, 2. energizes auto-connected emergency loads through load sequencer, 3. achieves steady state voltage ≥ 6480 V and ≤ 7150 V, 4. achieves steady state frequency ≥ 59.9 Hz and ≤ 60.1 Hz, and 5. supplies permanently connected and auto-connected emergency loads for ≥ 5 minutes. 	<p>In accordance with the Surveillance Frequency Control Program.</p>

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.20 -----NOTE----- All DG starts may be preceded by an engine prelube period. -----</p> <p>Verify when started simultaneously from standby condition, each DG achieves:</p> <p>a. in ≤ 10 seconds, voltage ≥ 6480 V and frequency ≥ 58.8 Hz, and</p> <p>b. steady state, voltage ≥ 6480 V, and ≤ 7150 V and frequency ≥ 59.9 Hz and ≤ 60.1 Hz.</p>	<p>In accordance with the Surveillance Frequency Control Program.</p>
<p>SR 3.8.1.21 Calibrate BO sequencers.</p>	<p>In accordance with the Surveillance Frequency Control Program.</p>
<p>SR 3.8.1.22 -----NOTES----- 1. Verification of setpoint is not required. 2. Actuation of final devices is not included. -----</p> <p>Perform TADOT for SI and BO sequencers.</p>	<p>In accordance with the Surveillance Frequency Control Program.</p>



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 177 TO

FACILITY OPERATING LICENSE NO. NPF-87

AND AMENDMENT NO. 177 TO

FACILITY OPERATING LICENSE NO. NPF-89

COMANCHE PEAK POWER COMPANY LLC

AND VISTRA OPERATIONS COMPANY LLC

COMANCHE PEAK NUCLEAR POWER PLANT, UNIT NOS. 1 AND 2

DOCKET NOS. 50-445 AND 50-446

1.0 INTRODUCTION

By letter dated March 31, 2020 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML20091H586), as supplemented by letter dated December 9, 2020 (ADAMS Accession No. ML20344A441), Vistra Operations Company LLC (the licensee) submitted a license amendment request (LAR) to revise the technical specifications (TSs) for Comanche Peak Nuclear Power Plant (Comanche Peak, CPNPP), Unit Nos. 1 and 2.

The amendments would revise multiple surveillance requirements (SRs) in Comanche Peak TS 3.8.1, "AC [Alternating Current] Sources – Operating," related to the steady-state frequency band of the emergency diesel generators (EDGs). The current steady-state frequency band of 58.8 hertz (Hz) to 61.2 Hz will be changed to 59.9 Hz to 60.1 Hz. The LAR also removes historical information from TS 3.8.1, Required Action A.3 Completion Time and a Note from SR 3.8.1.13.

The supplemental letter dated December 9, 2020, provided additional information that clarified the application, did not expand the scope of the application as originally noticed, and did not change the U.S. Nuclear Regulatory Commission (NRC, the Commission) staff's original proposed no significant hazards consideration determination as published in the *Federal Register* on June 2, 2020 (85 FR 33753).

Background

The standard technical specifications were issued as a generic document and provided guidance parameters for all variables applicable to critical plant equipment. Licensees were

expected to replace the generic values with the plant-specific parameters based on assumptions and criteria used in safety analysis and analytical limits. The standard technical specifications have SRs that provide details on operating limits for EDGs in order to ensure that they function satisfactorily when required to perform their intended safety functions for mitigating consequences of accidents. The EDG operating limits include steady-state allowable voltage and frequency requirements to ensure that accident mitigation equipment can perform as designed. In 2013, NRC inspectors identified that the Comanche Peak licensee had not updated the safety-related design basis calculations to include the TS allowable frequency range of ± 2 percent for the EDGs. This LAR was submitted to address this issue.

2.0 REGULATORY EVALUATION

2.1 Description of the Preferred Power System

The Class 1E buses for Comanche Peak, Units 1 and 2 can each be supplied by two independent and reliable immediate-access offsite power sources. Two circuits, one at 138 kilovolt (kV) and one at 345 kV are the preferred power sources for the safety-related buses during plant startup, normal operation, emergency shutdown, and upon a unit trip. These sources originate from two separate 138 kV and 345 kV switchyards and supply power to the 6900 volt (V) Class 1E auxiliary bus systems through two startup transformers designated as XST1 and XST2. The primary side of three winding transformer XST1 is connected to the 138 kV switchyard, and the secondary connections at 6900 V are made as follows: the x-winding is connected to the Class 1E buses of Unit 1, and the y-winding is connected to the Class 1E buses of Unit 2. The second offsite power source is provided through 345 kV transformer XST2. The transformer's primary side is connected to the 345 kV switchyard and the secondary connections at 6900 V are made as follows: the x-winding is connected to the Unit 2 Class 1E buses and the y-winding is connected to the Class 1E buses of Unit 1.

An alternate offsite power source for Unit 1 is from the 138 kV switchyard through transformer XST1A, which can replace XST1. For Unit 2, an alternate power source is the 345 kV switchyard through transformer XST2A, which can replace XST2.

During normal power operation, Unit 1 buses 1EA1 and 1EA2 and Unit 2 buses 2EA1 and 2EA2 are powered from their preferred sources. In the LAR dated March 31, 2020, the licensee stated, in part, that "CPNPP has established voltage and frequency requirements for offsite sources to ensure adequate voltage and frequency for performance of SSCs [structures, systems, and components]." The licensee further stated in the LAR that, "The grid normally maintains its frequency at 60 ± 0.03 Hz and switchyards normally maintain their voltages \geq [greater than or equal to] 138 kV for 138 kV switchyard and ≥ 342 kV for 345 kV switchyard. These voltages correspond to 6900 V bus voltages of 6900/6840 V at no load."

2.2 Description of the Standby Power System

Section 8.3.1, "AC Power Systems," of the Comanche Peak Updated Final Safety Analysis Report (UFSAR) (ADAMS Accession Package No. ML20315A055) describes the onsite power systems, including the standby power supply, which consists of two EDGs per unit. The UFSAR states that the EDGs are sized so that each set is capable of carrying the required load for one unit in the unlikely case of a design-basis accident or loss of offsite power (LOOP). The continuous output rating of each diesel generator is 7000 kilowatt (kW) at 0.8 power factor 6900 V, three phase, 60 Hz, and has a normal operating speed of 450 revolutions per minute (rpm). Each EDG also has a 2-hour rating of 7700 kW. The safety-related function of

each division's EDG is to provide sufficient power to (1) control and shutdown systems in the event of an accident condition and loss of preferred power from the offsite power source and (2) enable a controlled shutdown of the plant whenever there is no accident but preferred power is lost for the unit.

2.3 Proposed Changes to the TSs

TS 3.8.1 has several SRs that demonstrate operability of the EDGs. These SRs have, in part, frequency and voltage requirements, alignment requirements, and load shedding requirements for the EDGs. The primary effect of frequency variations on the safety functions of SSCs required to safely shutdown the plant is to change the speed of safety-related motors that are powered by the EDGs, which affects pump performance, motor-operated valve (MOV) stroke times, and cooling fan performance.

In the LAR, the licensee discussed the reason for the proposed changes to TS 3.8.1 SRs. The licensee stated:

During a Component Design Bases Inspection performed in 2013, the inspectors identified a Green, non-cited violation of 10 CFR Part 50, Appendix B, Criterion XVI, Corrective Action, [which] states, in part, "measures shall be established to assure that conditions adverse to quality are promptly identified and corrected." Specifically, since May 2010, the licensee failed to correct a condition adverse to quality in a timely manner that involved updating design basis calculations for safety-related equipment to include the allowed technical specification frequency range of ± 2 percent for the emergency diesel generators.

In response to the NRC inspection findings in 2013, the licensee proposed changes to TS 3.8.1 SRs to address EDG frequency acceptance criteria. The current frequency acceptance criteria in TS 3.8.1 SRs have a surveillance testing frequency tolerance of (60 ± 1.2) Hz (e.g., ± 2 percent) for steady-state operation. The proposed frequency acceptance criteria provide assurance that the EDG controls are performing as designed to ensure adequate frequency at safety-related loads for performance of their safety-related function.

In the LAR dated March 31, 2020, the licensee stated, in part, that,

EDGs operate in the isochronous mode to perform their design function. Following restoration of offsite power, the EDGs are required to synchronize with the grid to restore offsite power to safety buses without interruption of power. EDG capability to provide adequate voltage and frequency for performance of safety-related functions during isochronous mode is required to be validated by the surveillance testing program.

In the LAR, the licensee identified TS 3.8.1-related SRs that have an acceptance criteria of ≥ 58.8 Hz and less than or equal to (\leq) 61.2 Hz for allowable EDG frequency. The licensee proposed to revise the acceptance criteria of the frequency band to ≥ 59.9 Hz and ≤ 60.1 Hz for the following SRs:

- SR 3.8.1.2 (Diesel Generator (DG) Monthly Slow Start)
- SR 3.8.1.7 (DG Semi-annual Fast Start)
- SR 3.8.1.11 (Emergency Bus Load Shed, DG Start, Sequence and Run on LOOP)

- SR 3.8.1.12 (DG Safety Injection (SI) Auto Start)
- SR 3.8.1.15 (DG Hot Restart)
- SR 3.8.1.19 (Emergency Bus Load Shed, DG Start, Sequence and Run on SI in Conjunction with LOOP)
- SR 3.8.1.20 (Simultaneous Start of Both DGs)

In the LAR, the licensee proposed the following editorial changes to TS 3.8.1 to remove historical information and a Note that are no longer needed.

- TS 3.8.1, Condition A, Required Action A.3, Completion Time states “72 hours OR 14 days for a one time outage on XST1 to complete a plant modification to be completed by March 31, 2017.” The licensee proposed to delete the phrase “OR 14 days for a one time outage on XST1 to complete a plant modification to be completed by March 31, 2017.”
- The licensee proposed to remove the NOTE for SR 3.8.1.13, which states: “For Unit 2, testing need only be performed for LOOP concurrent with SI until startup following refueling outage 05 (2RF05).”

2.4 Applicable Regulatory Requirements and Guidance

The regulations in 10 CFR 50.36, “Technical specifications,” establish the requirements related to the content of the TSs. Pursuant to 10 CFR 50.36(c), TSs are required to include items in five specific categories related to station operation: (1) safety limits, limiting safety system settings, and limiting control settings; (2) limiting conditions for operation; (3) SRs; (4) design features; and (5) administrative controls. The proposed changes in this LAR relate to the SRs.

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 following general design criteria (GDC) in 10 CFR Part 50, “Domestic Licensing of Production and Utilization Facilities,” Appendix A, “General Design Criteria for Nuclear Power Plants,” are applicable to this review.

- GDC 17, “Electric power systems,” requires, in part, that nuclear power plants have an onsite and an offsite electric power system to permit the functioning of SSCs that are important to safety. The onsite electrical distribution system shall have sufficient independence, redundancy, and testability to perform its safety function, assuming a single failure.
- GDC 18, “Inspection and testing of electric power systems,” requires that electric power systems that are important to safety must be designed to permit appropriate periodic inspection and testing.
- GDC 34, “Residual heat removal,” states that a “system to remove residual heat shall be provided. The system safety function shall be to transfer fission product decay heat and

other residual heat from the reactor core at a rate such that specified acceptable fuel design limits and the design conditions of the reactor coolant pressure boundary are not exceeded.” The GDC requires in part that capabilities shall be provided to assure that for onsite electric power system operation (assuming offsite power is not available) the system safety function can be accomplished, assuming a single failure.

The regulations in 10 CFR 50.46 “Acceptance criteria for emergency core cooling systems for light-water nuclear power reactors” require, in part, that nuclear power plants must be provided with an emergency core cooling system (ECCS) that must be designed so that its calculated cooling performance following postulated loss-of-coolant accidents conforms to the criteria set forth in the section. ECCS cooling performance must be calculated in accordance with an acceptable evaluation model and must be calculated for a number of postulated loss-of-coolant accidents of different sizes, locations, and other properties sufficient to provide assurance that the most severe postulated loss-of-coolant accidents are calculated. Comparisons to applicable experimental data must be made and uncertainties in the analysis method and inputs must be identified and assessed so that the uncertainty in the calculated results can be estimated.

3.0 TECHNICAL EVALUATION

In the LAR, the licensee requested to revise several Comanche Peak TS 3.8.1 SRs to incorporate steady-state frequency limits, ≥ 59.9 Hz and ≤ 60.1 Hz.. The frequency band tests the ability of the EDG controls to maintain steady-state frequency. The licensee stated that a review of operating experience over a significant number of years has demonstrated that the sole time when the EDG controls could not control frequency at $60 \text{ Hz} \pm 0.1 \text{ Hz}$, the EDG controls were inoperable; thus, the EDG was inoperable.

Plant safety analyses make specific assumptions regarding the ECCS flow to provide the core cooling function following any event that requires SI to mitigate the event. For the events that assume offsite power is lost, the EDGs provide power to the ECCS pumps. The primary effect of reduced frequency and voltage on the ECCS safety functions is to decrease the speed of safety-related motors that are powered by the EDGs, which affects pump performance, MOV stroke times, and cooling fan performance. A higher than normal frequency will result in a higher speed of rotating equipment and a potential increase of pressure in the ECCS.

The NRC staff evaluated the licensee’s application to determine if the proposed changes are consistent with the guidance, regulations, and plant-specific design and licensing basis information. Specifically, the NRC staff reviewed the proposed changes to TS 3.8.1 to restrict the steady-state frequency limits for the EDGs to ensure that accident mitigation equipment can adequately perform its functions to satisfy the requirements of 10 CFR 50.46.

The licensee stated in the LAR that safety-related pump degradation issues were evaluated and documented in Comanche Peak Engineering Report ER-ME-109, Revision 1, “Evaluation of Safety-Related Pump Degradation.” The licensee concluded that a ± 0.1 Hz frequency variation has a negligible impact on the performance of motors and pumps that are designed for operation at 60 Hz. EDG steady-state voltage is defined as ≥ 6480 V and ≤ 7150 V which ensures ± 10 percent at the motor voltage terminals.

Attachment 4 to the LAR, “CPNPP Safety Related Pump and Motor Operated Valve Response,” provides a summary of the evaluation performed to assess the performance of safety-related pumps and valves when the associated motors are operating at a frequency in the allowable range of 60 ± 1.2 Hz and 60 ± 0.1 Hz. In Attachment 4, the licensee provided volumetric

flowrates for the auxiliary feedwater, containment spray, residual heat removal, SI, centrifugal charging, station service water, component cooling water, and safety chilled water recirculation safety-related pumps and concluded that flows at the frequencies considered provide adequate flow for mitigating the consequences of a loss-of-coolant accident (LOCA). The licensee stated that, "the current Technical Specification 6900-volt acceptance criteria minimum of 6480 volts and maximum of 7150 volts do not adversely impact pump performance."

In Attachment 4 to the LAR, the licensee calculated the flow rates for pumps and torque values for MOVs at the nominal frequency, the existing frequency band, and the proposed frequency band. The NRC staff reviewed the results of the sample calculations, which show the effect of the proposed frequency band of 60 ± 0.1 Hz (59.9 to 60.1 Hz) on flowrates. The licensee stated, in part, that, "as long as Technical Specification Maximum and Minimum voltages and frequencies are maintained there is little change to motor torque," and the results of the sample calculations for flow rates show that the effect of the proposed frequency band on flow rate maintains the assumptions for flow rates considered in accident analyses.

The NRC staff reviewed a sample of design parameters for pumps described in the Comanche Peak UFSAR. Section 6.2.2, "Containment Heat Removal Systems," of the Comanche Peak UFSAR describes the containment spray system (CSS). The CSS is designed to remove heat from the containment environment following a LOCA, a main steam line break accident, or a feedwater line break accident. Section 6.2.2.2.1, "Component Description," of the Comanche Peak UFSAR states that each Comanche Peak Unit has four CSS pumps (two per train) with nominal capability to deliver 3000 gallons per minute (gpm). Each train of the CSS is designed to deliver a minimum of 5800 gpm of cold water to the spray nozzles during the injection phase of system operation. Attachment 4 to the LAR shows that each CSS pump can provide 3320 gpm when the EDG is operating at 59.9 Hz. This is sufficient to maintain the containment pressure and temperature below containment design values.

Section 9.5.4.2.2, "Equipment Design Bases," of the Comanche Peak UFSAR states that, "Each fuel-oil transfer pump has a capacity equal to 125 percent of the engine's full load fuel requirement." Using the pump affinity relationship that the change in flow rate is proportional to the change in frequency, the fuel oil transfer pump flow rate will decrease 0.2 percent at a frequency of 59.9 Hz. Therefore, each fuel oil transfer pump will have a capacity equal to 124.8 percent of the engine's full load fuel requirement.

Table 9.5-17, "Lube Oil Cooler Design Parameters," in the Comanche Peak UFSAR states that the lube oil design flow rate is 500 gpm. Using the pump affinity relationship above, the engine driven lube oil pump will have a flow rate of 499 gpm at a frequency of 59.9 Hz.

Table 9.5-18, "Jacket Water Cooler Design Parameters," in the Comanche Peak UFSAR states that the jacket water design flow rate is 1,250 gpm. Using the pump affinity relationship above, the engine driven jacket water pump will have a flow rate of 1,248 gpm at a frequency of 59.9 Hz.

Based on the above examples, the NRC staff finds that with a reduction in flow rates at reduced speed or lower frequency of 59.9 Hz, the EDG engine driven pumps and motor-driven pumps have adequate flow rates, and these pumps will perform their safety functions at the lower frequency of 59.9 Hz.

Attachment 4 to the LAR shows that the current TS 480-volt acceptance criteria minimum of 455 V and maximum of 508 V do not adversely impact MOV performance.

The licensee used a standard equation:

Torque = ((HP x 5252)/3400 rpm) (V/Hz1)/(V/Hz2) where
Torque = motor torque in foot-pounds force (ft-lbf)
HP = motor power in horsepower (hp)
The constant 5252 is the rounded value of (33,000 ft-lbf/minute)/(2π radians per revolution).
V/Hz1 = Volts per Hertz at 60.0 Hz
V/Hz2 = Volts per Hertz at proposed Technical Specification value.

The licensee illustrated that, at the proposed frequency band ≥ 59.9 Hz and ≤ 60.1 Hz, the deviation of required torque values from the nominal values is negligible and will not affect the operation of the MOVs.

The NRC staff notes that MOV stroke time is proportional to frequency, and an increase in the EDG under-frequency limit of 58.8 Hz to 59.9 Hz will improve MOV performance. Compared to the nominal frequency of 60 Hz, an EDG under-frequency of 59.9 Hz will lower the MOV stroke time by 0.2 percent. The NRC staff finds that lowering the MOV stroke time by 0.2 percent due to an EDG under-frequency limit of 59.9 Hz is not significant and will not affect the performance of the MOVs associated with the EDG or its support systems or the ECCS. The proposed allowable frequency range does not result in an increase or decrease in MOV motor torque outside the bounds of the existing frequency range. The tighter frequency band will mean a tighter stroke band, which is conservative, and therefore acceptable.

Attachment 5 to the LAR, "CPNPP DBD-EE-041, 480V and 120V AC Electrical Power System, Table 5.3, MOV Minimum Starting Voltage Required," is a table that lists minimum starting voltage requirements for active MOVs. The highest minimum required starting voltage shown in the table is 410 V. Attachment 4 states that the current TS 480 V AC Electrical Power System minimum voltage acceptance criteria is 455 V. Since the highest MOV minimum starting voltage of 410 V is well below the TS 480 V AC Electrical Power System minimum voltage acceptance criteria of 455 V, the 410 V highest MOV minimum starting voltage is acceptable.

The NRC staff noted that the effect of the proposed frequency band on pump flowrates and MOV torque values is minimal and the licensee evaluation is acceptable. The proposed changes provide reasonable assurance that ECCS pumps and MOV performance requirements assumed in accident analyses will be maintained when the Comanche Peak EDGs are operating within the proposed frequency range.

The NRC staff reviewed the proposed deletions of the Note from SR 3.8.1.13 and the phrase "OR 14 days for a one time outage on XST1 to complete a plant modification to be completed by March 31, 2017." from the Completion Time of Required Action A.3 of TS 3.8.1. The NRC staff determined the phrases are no longer applicable and their deletion will have no impact on the TS requirements. Therefore, the NRC staff determined the proposed deletions are acceptable.

Technical Conclusion

The NRC staff reviewed the licensee's proposed changes to revise frequency acceptance criteria from ≥ 58.8 Hz and ≤ 61.2 Hz to ≥ 59.9 Hz and ≤ 60.1 Hz for surveillance testing and the proposed editorial changes. The NRC staff finds that the proposed TS changes will not adversely impact the capacity and capability of the safety-related electrical equipment required

for accident mitigation and plant shutdown. Therefore, the NRC staff finds that the revised SRs provide requirements to ensure the necessary quality of the electrical equipment is maintained and the associated limiting conditions of operation will be met.

The NRC staff concludes that there is reasonable assurance that the requirements of 10 CFR 50.36(c)(3) will continue to be met. Therefore, the NRC staff finds that the proposed TS changes provide reasonable assurance that the licensee will continue to comply with GDC 17, GDC 18, GDC 34, and 10 CFR 50.46. In conclusion, the NRC staff finds the licensee's proposed changes in the LAR are acceptable.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Texas State official was notified of the proposed issuance of the amendments on December 3, 2020. The State official had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

The amendments change requirements with respect to the 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, as published in the *Federal Register* on June 2, 2020 (85 FR 33753), 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.

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Date: February 1, 2021

SUBJECT: COMANCHE PEAK NUCLEAR POWER PLANT, UNIT NOS. 1 AND 2 -
ISSUANCE OF AMENDMENT NOS. 177 AND 177 REGARDING REVISION TO
TECHNICAL SPECIFICATION 3.8.1, "AC SOURCES – OPERATING"
(EPID L-2020-LLA-0059) DATED FEBRUARY 1, 2021

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