



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

October 25, 2018

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 AMENDMENTS RE: REVISION TO TECHNICAL
SPECIFICATION 3.8.4, "DC SOURCES - OPERATING," CONDITION B
(EXIGENT CIRCUMSTANCES) (EPID: L-2018-LLA-0238)**

Dear Mr. Peters:

The U.S. Nuclear Regulatory Commission (the Commission) has issued the enclosed Amendment No. 170 to Facility Operating License No. NPF-87 and Amendment No. 170 to Facility Operating License No. NPF-89 for Comanche Peak Nuclear Power Plant (CPNPP), Unit Nos. 1 and 2, respectively. The amendments consist of changes to the Technical Specifications (TSs) in response to your application dated September 5, 2018, as supplemented by letters dated September 20 and October 3, 2018 (Agencywide Documents Access and Management System Accession Nos. ML18250A186, ML18267A059, and ML18277A207, respectively).

The amendments revise TS 3.8.4, "DC [Direct Current] Sources – Operating," by adding a new **REQUIRED ACTION** to **CONDITION B** and an extended **COMPLETION TIME (CT)**, on a one-time basis, to repair two affected battery cells on the CPNPP Unit No. 1 Train B safety-related batteries. Specifically, the amendments change the TS CT for each of the Unit No. 1 Train B safety-related batteries (BT1ED2 and BT1ED4) during Unit No. 1, Cycle 20, from 2 hours to 18 hours. The new **REQUIRED ACTION B.2** provides up to an 18-hour CT to replace cell 27 in battery BT1ED2 and up to an 18-hour CT to replace cell 41 in battery BT1ED4 (not at the same time).

The license amendments are issued under the exigent provisions of paragraph 50.91(a)(6) of Title 10 of the *Code of Federal Regulations* due to the time-critical nature of the amendments. In this instance, an exigent situation exists in that an unanticipated second battery cell failure on either of the CPNPP Unit No. 1, Train B batteries, would result in a potential shutdown.

A copy of our safety evaluation (SE) is also enclosed. The SE describes the exigent circumstances under which the amendments were issued and provides a final no significant hazards consideration determination. The Notice of Issuance, addressing the final no significant hazards determination and opportunity for a hearing, will be included in the Commission's biweekly *Federal Register* notice.

Sincerely,

A handwritten signature in black ink, appearing to read "M O'Banion". The signature is fluid and cursive.

Margaret W. O'Banion, 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. 170 to NPF-87
2. Amendment No. 170 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. 170
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 September 5, 2018, as supplemented by letters dated September 20 and October 3, 2018, 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. 170 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 and shall be implemented immediately as of its date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



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

Attachment:
Changes to the Facility
Operating License and
Technical Specifications

Date of Issuance: October 25, 2018



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. 170
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 September 5, 2018, as supplemented by letters dated September 20 and October 3, 2018, 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. 170 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 and shall be implemented immediately as of its date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



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

Attachment:
Changes to the Facility
Operating License and
Technical Specifications

Date of Issuance: October 25, 2018

ATTACHMENT TO LICENSE AMENDMENT NO. 170

TO FACILITY OPERATING LICENSE NO. NPF-87

AND AMENDMENT NO. 170

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 the Facility Operating License Nos. NPF-87 and NPF-89, and Appendix A Technical Specifications with the attached revised pages. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change.

Facility Operating License No. NPF-87

REMOVE

INSERT

3

3

Facility Operating License No. NPF-89

REMOVE

INSERT

3

3

Technical Specifications

REMOVE

INSERT

3.8-23

3.8-23

3.8-24

3.8-24

3.8.25

3.8-25

- (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. 170 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. 170 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

3.8 ELECTRICAL POWER SYSTEMS

3.8.4 DC Sources -- Operating

LCO 3.8.4 The Train A and Train B DC electrical power subsystems shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or two required battery chargers on one train inoperable.	A.1 Restore affected battery(ies) terminal voltage to greater than or equal to the minimum established float voltage.	2 hours
	<u>AND</u>	
	A.2 Verify affected battery(ies) float current \leq 2 amps.	Once per 12 hours
	<u>AND</u>	
	A.3 Restore required battery charger(s) to OPERABLE status.	7 days

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>B. One or two batteries on one train inoperable.</p>	<p>B.1 Restore affected battery(ies) to OPERABLE status.</p>	<p>2 hours</p>
	<p><u>OR</u></p> <p>B.2 -----NOTE----- Required Action B.2 is applicable for a one-time basis to replace cell 27 in battery BT1ED2 and cell 41 in battery BT1ED4 during Unit 1 Cycle 20 (not at the same time). If the second battery on the same train becomes inoperable, immediately initiate Required Actions D.1 and D.2. Regulatory Commitment 5644411 (Attachment 2 to TXX-18064) will be implemented during the 18 hour Completion Time.</p> <p>-----</p> <p>Restore affected battery to OPERABLE status.</p>	<p>18 hours</p>
<p>C. One DC electrical power subsystem inoperable for reasons other than Condition A or B.</p>	<p>C.1 Restore DC electrical power subsystem to OPERABLE status.</p>	<p>2 hours</p>
<p>D. Required Action and Associated Completion Time not met.</p>	<p>D.1 Be in MODE 3.</p>	<p>6 hours</p>
	<p><u>AND</u></p> <p>D.2 Be in MODE 5.</p>	<p>36 hours</p>

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.4.1	Verify battery terminal voltage is greater than or equal to the minimum established float voltage.	In accordance with the Surveillance Frequency Control Program.
SR 3.8.4.2	<p>Verify each battery charger supplies ≥ 300 amps at greater than or equal to the minimum established charger test voltage for ≥ 8 hours.</p> <p><u>OR</u></p> <p>Verify each battery charger can recharge the battery to the fully charged state within 24 hours while supplying the largest combined demands of the various continuous steady state loads, after a battery discharge to the bounding design basis event discharge state.</p>	In accordance with the Surveillance Frequency Control Program.
SR 3.8.4.3	<p>-----NOTES-----</p> <ol style="list-style-type: none"> 1. The modified performance discharge test in SR 3.8.6.6 may be performed in lieu of SR 3.8.4.3. 2. Verify requirement during MODES 3, 4, 5, 6 or with core off-loaded. <p>-----</p> <p>Verify battery capacity is adequate to supply, and maintain in OPERABLE status, the required emergency loads for the design duty cycle when subjected to a battery service test.</p>	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 NO. 170 TO

FACILITY OPERATING LICENSE NO. NPF-87

AND AMENDMENT NO. 170 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 application dated September 5, 2018 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML18250A186), as supplemented by letters dated September 20 and October 3, 2018 (ADAMS Accession Nos. ML18267A059 and ML18277A207), Vistra Operations Company LLC (Vistra OpCo, the licensee) requested changes to the Technical Specifications (TSs) for Comanche Peak Nuclear Power Plant (CPNPP), Unit Nos. 1 and 2.

The proposed changes revise TS 3.8.4, "DC [Direct Current] Sources – Operating," by adding a new REQUIRED ACTION to CONDITION B and an extended COMPLETION TIME (CT), on a one-time basis, to repair two affected battery cells on the CPNPP Unit No. 1, Train B safety-related batteries. Specifically, the amendments change the TS CT for each of the Unit No. 1, Train B safety-related batteries (BT1ED2 and BT1ED4) during CPNPP Unit No. 1, Cycle 20, from 2 hours to 18 hours. The new REQUIRED ACTION B.2 provides up to an 18-hour CT to replace cell 27 in battery BT1ED2 and up to an 18-hour CT to replace cell 41 in battery BT1ED4 (not at the same time). In addition, the amendments place operational limits on CPNPP Unit Nos. 1 and 2 during the extended CT as protective measures, as described in Attachment 2 of the letter dated September 20, 2018.

The license amendments are issued under the exigent provisions of paragraph 50.91(a)(6) of Title 10 of the *Code of Federal Regulations* (10 CFR) due to the time-critical nature of the amendments. In this instance, an exigent situation exists in that an unanticipated second battery cell failure on either of the CPNPP Unit No. 1, Train B batteries, would result in a potential shutdown.

On September 18, 2018, the U.S. Nuclear Regulatory Commission (NRC or the Commission) staff published a proposed no significant hazards consideration (NSHC) determination in the *Federal Register* (83 FR 47203) for the proposed amendment. Subsequently, by letters dated September 20, and October 3, 2018, the licensee provided additional information that expanded the scope of the amendment request as originally noticed in the *Federal Register*. Accordingly, the NRC published a second proposed NSHC determination in the *Federal Register* on October 10, 2018 (83 FR 50971), which superseded the original notice in its entirety.

2.0 REGULATORY EVALUATION

2.1 System Description

The CPNPP Unit No. 1 offsite power system is comprised of a 345 kilovolt (kV) system. Two physically independent and redundant sources of offsite power circuits are available on an immediate basis for the safe shutdown of either unit. The normal offsite power source for 6.9 kV Class 1E buses of Unit No. 1 is the 345 kV offsite supply from the 345 kV switchyard via startup transformer XST2 (or spare XST2A if XST2 is unavailable).

Two independent and redundant 6.9 kV Class 1E buses are provided for each unit, each capable of supplying the required safety-related loads to safely shut down the unit following a design-basis accident. Loss of both offsite power sources to any 6.9 kV Class 1E bus results in the diesel generator providing power to the associated Class 1E bus. The redundant safety-related loads are divided between two trains of Class 1E buses so that loss of either train does not impact the minimum required safe shutdown equipment. Physical separation and electrical isolation are maintained between the two trains of Class 1E buses.

The station DC systems supply power for plant instrumentation and control under all MODES of plant operation. The safety-related Class 1E 125 volt DC (VDC) electrical power system consists of two independent and redundant subsystems (Train A and Train B). The Class 1E 125 VDC batteries of each train are separately housed in ventilated rooms apart from their chargers and distribution centers. The CPNPP Unit No. 1 batteries BT1ED1 and BT1ED3 feed all Unit No. 1, Train A load requirements, while batteries BT1ED2 and BT1ED4 supply Unit No. 1, Train B load requirements. There are no bus ties or sharing of power supplies between redundant trains. Each Class 1E 125 VDC system has the capacity to continuously supply all the connected normal running load while maintaining its respective battery in a fully charged condition. Each battery is capable of carrying the essential load continuously for a period of 4 hours in the event of a total loss of onsite and offsite alternating current (AC) power.

Each battery has adequate capacity to meet its duty cycle requirements. The batteries are sized to meet the duty cycle requirements at end of battery life with a capacity of 80 percent of nameplate rating. The battery design also includes additional capacity above that required by the design duty cycle to allow for battery room temperature variations. During duty cycle, the batteries maintain a minimum voltage of 105 VDC or greater, which provides adequate voltage for operation of all required loads considering the circuit voltage drop from battery to load. The battery capacity for BT1ED1 and BT1ED2, at an 8-hour discharge rate with a final voltage of 1.75 volts per cell (VPC), is 1950 amperes per hour. The battery capacity for BT1ED3 and BT1ED4, at an 8-hour discharge rate with a final voltage of 1.75 VPC is 1200 amperes per hour.

There are two 100 percent 300 amperes capacity battery chargers per battery. Normally, one charger for each battery is in operation and the other charger is in standby. Each battery charger is sized to supply the combined steady-state loads while recharging the battery from the design minimum charge state to the fully charged state under all MODES of plant operation.

Each Class 1E DC bus can be energized either by a battery or by one of two battery chargers or a combination of battery and battery charger. During normal operation, the 125 VDC bus is powered from the battery charger and the battery is on float charge. In case of a loss of normal power to the battery charger, the DC bus is automatically powered from the battery. The Class 1E 125 battery VDC system supplies power to Class 1E loads without interruption during normal operations or design-basis accident conditions.

The battery cells are of lead-calcium type with a nominal specific gravity of 1.215. This specific gravity corresponds to an open circuit battery voltage of approximately 2.065 VPC. The open circuit voltage is the voltage maintained when there is no charging or discharging. Once fully charged with cell float voltage of 2.07 VPC, the battery cell will maintain its capacity for 30 days without further charging. The battery float charge voltage limit is established as 2.13 VDC per cell, which corresponds to a total minimum float voltage output of 128 volts for a 60 cell battery. However, optimal long term performance is obtained by maintaining a float voltage of 2.20 to 2.25 VPC. This provides adequate margin over rated potential, which limits the formation of lead sulfate and self-discharge. The nominal float voltage of 2.20 to 2.25 VPC corresponds to a total float voltage output of 132 to 135 volts for a 60 cell battery.

In addition, both CPNPP units are capable of coping with a station blackout (SBO) for 4 hours as AC Independent Plants. The 4-hour coping duration was determined by approved methods based on the redundancy and reliability of onsite emergency AC power sources, the expected frequency of loss of offsite power, and the probable time needed to restore offsite power. Selected safety-related systems at CPNPP are common systems (i.e., provide service to both Units 1 and 2). In the event of a station blackout, at least one EDG will be available on the opposing unit to power these systems.

2.2 Proposed TS Changes

The proposed changes would revise the REQUIRED ACTION and CT of CPNPP TS 3.8.4, CONDITION B. Currently, TS 3.8.4, REQUIRED ACTION B.1 requires the following action:

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. One or two batteries on one train inoperable.	B.1 Restore affected battery(ies) to OPERABLE status.	2 hours

The proposed changes to TS 3.8.4, CONDITION B, would add one new REQUIRED ACTION and associated CT, and a new NOTE. The proposed changes are illustrated below:

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. One or two batteries on one train inoperable.	B.1 Restore affected battery(ies) to OPERABLE status. <u>OR</u>	2 hours

	<p>B.2 -----NOTE-----</p> <p>Required Action B.2 is applicable for a one-time basis to replace cell 27 in battery BT1ED2 and cell 41 in battery BT1ED4 during Unit 1 Cycle 20 (not at the same time). If the second battery on the same train becomes inoperable, immediately initiate Required Actions D.1 and D.2.</p> <p>Regulatory Commitment 5644411 (Attachment 2 to TXX-18064) will be implemented during the 18 hour Completion Time.</p> <p>-----</p> <p>Restore affected battery to OPERABLE status.</p>	<p>18 hours</p>
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2.3 Applicable Regulatory Requirements

The NRC staff reviewed the license amendment request (LAR) based on the following regulatory requirements:

- Criterion 17 (GDC 17), "Electrical power systems," of Appendix A, "General Design Criteria [GDC] for Nuclear Power Plants," to 10 CFR Part 50, requires, in part, that

The onsite electric power supplies, including the batteries, and the onsite electric distribution system, shall have sufficient independence, redundancy, and testability to perform their safety functions assuming a single failure.

- The regulations at 10 CFR 50.36, "Technical specifications," require, in part, that the operating license of a production or utilization facility include TSs. The regulation at 10 CFR 50.36(c)(2) require that the TSs include limiting conditions for operation (LCOs), which are the lowest functional capability or performance levels of equipment required for safe operation of the facility. When an LCO of a nuclear reactor is not met, the licensee shall shut down the reactor or follow any remedial action permitted by the TSs until the condition can be met.
- The regulations at 10 CFR 50.63, "Loss of all alternating current power," paragraph (a), requires, in part, that each nuclear power plant must be able to withstand for a specified duration, and recover from a complete loss of offsite and onsite AC sources (i.e., an SBO event).

The NRC staff also reviewed the LAR based on the following regulatory guidance documents:

- Regulatory Guide (RG) 1.93, Revision 1, "Availability of Electric Power Sources," dated March 2012 (ADAMS Accession No. ML090550661), provides guidance with respect to operating restrictions (i.e., CTs/allowed outage times) if the number of available DC sources is less than that required by the TS LCO. In particular, this RG prescribes a maximum CT of 2 hours for an inoperable DC source.
- Regulatory Guide 1.155, "Station Blackout," dated August 1988 (ADAMS Accession No. ML003740034), provides guidance for complying with the requirement in 10 CFR 50.63 that nuclear power plants be capable of coping with an SBO event for a specified duration.
- Chapter 8, "Electric Power," of NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR [Light-Water Reactor] Edition," provides guidance to the NRC staff in reviewing LARs related to electric power.

3.0 TECHNICAL EVALUATION

3.1 Deterministic Evaluation

In Section 3.1.1, "Battery Sizing Analysis," of the LAR dated September 5, 2018, the licensee stated that all Class 1E batteries are designed to provide adequate voltage considering the voltage drop from battery to applicable loads. The CPNPP Unit No. 1 batteries BT1ED3 and BT1ED4 maintain a minimum voltage of 111.9 volts during their duty cycle, with steady-state loads only. The licensee further stated that momentary load demands during the first and last minute of duty cycle of batteries BT1ED1 and BT1ED2 result in a larger voltage drop for battery to connected loads, which requires a higher battery voltage to provide adequate voltage at the loads. The licensee stated that the safety-related Class 1E 125 VDC batteries maintain a voltage of greater than 105 volts during duty cycle, to provide adequate voltage for operation of all required loads. The licensee further stated that in accordance with plant procedure ECA-0.0A, "Loss of All AC Power," the 105 VDC ensures a sufficient DC voltage is available to flash the diesel generator field and to operate the associated output breaker for the diesel generator.

The NRC staff reviewed the voltage margin for the current Class 1E batteries during the battery duty cycle provided in Table 2 of Attachment 8 of the LAR and determined that the Unit No. 1 batteries have greater than the minimum required voltage of 105 VDC. As a result, the NRC staff determined that sufficient voltage margin exists with Unit No. 1 batteries. In addition, the staff reviewed the operational and maintenance history of the currently installed Class 1E batteries provided in Section 2.3, "Reason for Proposed Change," and Table 3 of Attachment 8 of the LAR. The staff noted that the safety-related Unit No. 1 Train B 125 VDC batteries BT1ED2 and BT1ED4 were last replaced in 1999 with a service life of 20 years. Thus, batteries BT1ED2 and BT1ED4 are nearing their 20-year nominal service life. In November 2017 and July 2018, the licensee discovered battery cell jar cracking on cell 41 in battery BT1ED4 and cell 27 in battery BT1ED2, respectively. The licensee stated that the cracking has been evaluated by the vendor and a jumper was placed across these cells in batteries BT1ED2 and BT1ED4 to restore operability of the batteries. While both batteries are currently OPERABLE, they are approaching end-of-life and are susceptible to additional cell jar cracking.

The CPNPP TS 3.8.4, CONDITION B, states that for one or two batteries on one train inoperable, the licensee must restore affected battery(ies) to OPERABLE status within 2 hours per REQUIRED ACTION B.1. The licensee stated that with the potential for additional failed battery cells in batteries BT1ED2 and BT1ED4, the 2 hours CT in TS 3.8.4, REQUIRED ACTION B.1 does not allow adequate time to replace a battery cell. In the event of an unanticipated second cell failure on either of these B train 125 VDC batteries, the licensee stated it would be forced to consider jumpering a second cell, if technically feasible, or shutting down the plant and imposing the associated transient, for approximately 18 hours for replacement of the failed cell. The licensee further stated that an unnecessary shutdown of CPNPP Unit No. 1 would have a potential impact on electrical grid stability during the remainder of Cycle 20. Therefore, the licensee requested a one-time extension to the CT for batteries BT1ED2 and BT1ED4 (not to be performed at the same time) to provide additional time to replace battery cell 27 in BT1ED2 and cell 41 in BT1ED4. The NRC staff noted that batteries BT1ED2 and BT1ED4 are the oldest batteries and thus have a greater potential for additional cell jar cracking. The licensee stated that these batteries (all cells) are scheduled for replacement in the next CPNPP Unit No. 1 refueling outage.

In Section 3.1.2, "Battery Cell Replacement Discussion," of the LAR dated September 5, 2018, the licensee stated that batteries BT1ED2 and BT1ED4 each consists of 60 series connected single cells and that each battery is mounted on two steel supported racks. Figure 2 of Attachment 7 of the LAR shows the plan view of the typical layout of the batteries. The licensee stated that the racks are of the single row, two-tier design with 15 cells on the bottom and 15 cells on the top, with the cells connected in series. The licensee further stated that bypassing or replacing a cell requires disconnecting the affected battery from the associated vital bus which, while in MODES 1 through 4, makes the battery inoperable, and requires entry into TS 3.8.4, CONDITION B. The licensee stated that the replacement cells are sized in accordance with the current licensing basis. The licensee explained that replacement of a battery cell will require partial disassembly of the seismically-qualified rack assembly, installation of rigging, removal of unaffected cell(s) to gain access, removal of cell connectors, removal of the affected cell, installation of the new cell, and reassembly of the previously removed cells (including connectors and seismic supports). The licensee stated that the replacement cells and supporting materials are staged, and the replacement cells are maintained on float charge per Institute of Electrical and Electronics Engineers (IEEE) 450-1995, "IEEE Recommended Practice for Maintenance, Testing, and Replacement of Vented Lead Acid Batteries for Stationary Applications." In addition, the NRC staff noted that the design basis for the maintenance, testing, and replacement of plant batteries is in compliance with the recommendations set forth in IEEE 450-1995, as discussed in Section 8.3.2, "DC Power Systems," of the CPNPP Final Safety Analysis Report (FSAR).

In Section 3.1.2 of the LAR dated September 5, 2018, the licensee stated that after reassembly of the battery, TS Surveillance Requirements (SRs) 3.8.4.1, 3.8.6.1, and Digital Low Resistance Ohmmeter (DLRO) inspection will be performed to confirm operability. In addition, the licensee stated that it performs a DLRO inspection of the installed intercell connections and documents the as-left conditions per CPNPP procedure MSE-P1-5003 to verify the connection resistances of the batteries are within the limits specified in the procedure. The licensee stated that the estimated time for replacing currently jumpered cell 27 in battery BT1ED2 is 18 hours (same estimated time for cell 41 in battery BT1ED4) and that battery cells 27 and 41 will NOT be replaced at the same time. Table 1 of Attachment 8 of the LAR provides a detailed timeline of activities for the 18-hour estimate to replace a jumpered battery cell. The licensee stated that even though the affected battery is inoperable due to the disassembly of seismic bracing, the battery will remain connected and available for approximately 16 hours of the requested

18-hour CT. For the planned activity, the licensee stated that the unavailability of the battery is limited to approximately 2 hours and is equivalent to the existing 2-hour CT for TS 3.8.4, REQUIRED ACTION B.1.

In Section 3.1.1 of the LAR, the licensee stated that the batteries are sized to provide adequate voltage for a loss of all AC voltage scenario (i.e., an SBO event). As described in Section 8B, "Station Blackout," of the CPNPP FSAR, both units are capable of coping with an SBO event for 4 hours by using Class 1E batteries, based on the loading requirements specified in Table 8.3-4, "125-vdc Class 1E Battery Load requirements." In its supplement dated September 20, 2018, the licensee stated, in part, the following:

Consistent with the guidance of the Regulatory Guide [1.155] and NUMARC [Nuclear Management and Resources Council] 87-00 ["Guidelines and Technical Bases for NUMARC Initiative Addressing Station Blackout at Light Water Reactors," Revision 1], the CPNPP coping assessment included a verification of the Class 1E batteries and determined each battery has sufficient capacity to supply SBO loads for the station blackout duration. Since the two trains of Class 1E DC power are independent of each other, this necessarily resulted in separate calculation of the loads and load carrying capability of each battery; for example, the calculation for BT1ED2 (Train B) is independent of the analysis of BT1ED1 (Train A). It is the results of such calculations which are reflected in FSAR Table 8.3-4 and which show that the Class 1E batteries would maintain an adequate 'end-of-duty-cycle' voltage... The logic behind analysis of using each train of DC power is simply to maximize the ability to recover AC power, either from an EDG [emergency diesel generator] or an offsite power source. The 'last minute load' shown on FSAR Table 8.3-4 for BT1ED1 (BT2ED1) and BT1ED2 (BT2ED2) includes consideration of breaker control loads and EDG field flashing...

During the time either affected Train B batteries will be under the extended CT, there will be no effect on the battery loading or assessment of the redundant Train A battery.

Consistent with RG 1.155, the licensee's analyses indicate that the Class 1E batteries would maintain an adequate 'end-of-duty-cycle' voltage to meet the SBO requirements in 10 CFR 50.63 during the battery repair evolution when the batteries are available but not OPERABLE, per the TS definition of OPERABLE. In addition, by letter dated October 1, 1992 (ADAMS Legacy Accession No. 9210080241), the licensee stated that it "meets the criteria of a four hour AC Independent Plant. With the availability of an emergency diesel generator in the non-black-out unit, credit is taken for the operation of selected systems which service both Units 1 and 2." By letter dated September 20, 2018, Regulatory Commitment 2 states that the CPNPP Unit Nos. 1 and 2 emergency diesel generators will have all testing and maintenance activities suspended for the duration of the extended CT. Additionally, the licensee stated its commitment to place signs on the doorways to the equipment noting the restriction of testing and maintenance. As discussed in Section 3.3 of this safety evaluation, these commitments have been incorporated into the license per the NOTE in TS 3.8.4, REQUIRED ACTION B.2. These risk reduction measures ensure continued availability of the Unit Nos. 1 and 2 emergency diesel generators for the entire duration of the extended CT. The NRC staff has reviewed the licensee's technical evaluation and finds that the proposed 18-hour CT extension is acceptable from an SBO coping perspective. The staff notes that the 4-hour SBO coping duration, discussed in RG 1.155 and part of licensing basis of the plant, is based on probability of

restoration of power from an offsite power source or an onsite power source to the Class 1E busses.

For defense-in-depth considerations, the NRC staff looked at whether the licensee had provisions for a supplemental power source capable of temporarily performing the functions of the inoperable battery system. In Section 3.1.2 of the LAR dated September 5, 2018, the licensee stated, in part, the following:

Even though the affected battery is inoperable due to the disassembly of seismic bracing, the battery will remain connected and available for approximately 16 hours of the requested 18 hour COMPLETION TIME. For the planned activity, unavailability is limited to approximately 2 hours and is equivalent to the existing 2 hour COMPLETION TIME for TS 3.8.4 REQUIRED ACTION B.1.

In addition, in Section 3.3, "Conclusions," of the LAR, the licensee stated, in part, that, "[i]n effect, the affected battery is acting as its own temporary supplemental backup power source." The NRC staff also reviewed Table 1 of Attachment 8 of the LAR that depicts estimated time to replace the jumpered cells 27 and 41. This table indicates that cell 27 or cell 41 will be disconnected and replaced with new cell within 2 hours and the batteries will be available for approximately 16 hours to perform their safety functions. The NRC staff noted that the proposed language in the NOTE in TS 3.8.4, REQUIRED ACTION B.2 did not discuss the need to enter TS 3.8.4, REQUIRED ACTION(S) D.1 (be in MODE 3 in 6 hours) and D.2 (be in MODE 5 in 36 hours) if batteries BT1ED2 and BT1ED4 are unavailable for greater than 2 hours each. In the supplement dated September 20, 2018, the licensee stated, in part, the following:

If the battery in LCO 3.8.4 REQUIRED ACTION B.2 is disconnected from its DC bus for greater than two hours, REQUIRED ACTION(s) D.1 (Be in MODE 3 in 6 hours) and D.2 (Be in MODE 5 in 36 hours) will be entered.

While in LCO 3.8.4 REQUIRED ACTION(s) D.1 and D.2, when the new battery cell is installed and the disconnect to its DC bus is closed, per LCO 3.0.2, LCO Applicability; LCO 3.8.4 REQUIRED ACTION(s) D.1 and D.2 will be exited and REQUIRED ACTION B.2 will be resumed not to exceed a total COMPLETION TIME of 18 hours from the original entry time.

The above conditions are captured in Attachments 1 and 2 and in the revised NOTE of REQUIRED ACTION B.2.

As noted in Section 3.3 of this safety evaluation, these conditions have been incorporated into the license per the NOTE in TS 3.8.4, REQUIRED ACTION B.2. Based on its review, the NRC staff finds that the physical replacement of the cells for each battery (BT1ED2 and BT1ED4) can be completed within the existing 2-hour CT for TS 3.8.4 REQUIRED ACTION B.1 and the DC system will be available to mitigate the consequences of postulated events. In addition, the staff finds the proposed 18-hour CT acceptable because the language in the revised Regulatory Commitment 5 and revised NOTE of REQUIRED ACTION B.2, require the licensee to enter REQUIRED ACTION(s) D.1 and D.2 if the battery is unavailable (disconnected from its DC bus) for greater than 2 hours, which is the length of time in the current TS 3.8.4, REQUIRED ACTION B CT.

Regulatory Commitment 5 as described in Attachment 2 of the LAR dated September 5, 2018 (denoted "original" Regulatory Commitment 5), addresses the proposed actions to be taken

should severe weather conditions be anticipated prior to the scheduled battery cell replacement or if a severe thunderstorm warning or tornado warning is issued after entering TS 3.8.4, proposed REQUIRED ACTION B.2. While the original Regulatory Commitment 5 addresses that the battery cell replacement will not be scheduled if severe weather conditions are anticipated, the NRC staff noted that the commitment did not address if the licensee will enter TS 3.8.4, proposed REQUIRED ACTION B.2, if severe weather conditions are anticipated. In the supplement dated September 20, 2018, the licensee stated that CPNPP is sensitive to severe weather anticipated or forecasted during the planned 18-hour CT. To address this concern, in Attachment 1 of the supplement, the licensee listed conditions where it would not consider entering the one-time extended CT, which included “[s]evere weather conditions are anticipated during the 18 hour CT (see commitment in Attachment 2).” In addition, the licensee changed the wording of the original Regulatory Commitment 5 (denoted “revised” Regulatory Commitment 5) to account for when the licensee will enter TS 3.8.4, proposed REQUIRED ACTION B.2. The revised Regulatory Commitment 5 states the following, in part:

Conditions related to REQUIRED ACTION B.2 (to address LCO 3.0.2 applicability, severe weather, grid stability, and battery unavailability)

- a. Prior to entry into REQUIRED ACTION B.2 CPNPP will:
 - i. Verify severe weather conditions are not anticipated during the 18 hour COMPLETION TIME (CT)

In the supplement dated September 20, 2018, the licensee explained its definition of severe weather conditions and that per plant procedure ABN-907, “Acts of Nature,” a “warning” is when a severe thunderstorm or tornado has been sighted or detected by radar and may be approaching, whereas a “watch” is when meteorological conditions are favorable for the formation of a severe thunderstorm or tornado. In Attachment 1 of the supplement, the licensee stated that if a “watch” was declared for Hood and/or Somervell counties, it would not enter into TS 3.8.4, proposed REQUIRED ACTION B.2. The licensee further stated that based on meteorological conditions, CPNPP ABN-907 is utilized to ensure proper plant risk is considered and mitigated as necessary. The notification of a “watch” initiates a continuous monitor and evaluate posture until the “watch” is cancelled or elevated to a “warning.” The licensee stated that the primary concern during severe weather is loss of offsite AC power and that its actions initiated in response to a “watch” provide a framework to more closely monitor changing conditions that may impact offsite AC power. Should conditions deteriorate to a “warning” being issued, the licensee stated it will enter REQUIRED ACTION(s) D.1 and D.2. The licensee clarified that work to restore the battery will continue if REQUIRED ACTION(s) D.1 and D.2 are entered and if the condition requiring entry into REQUIRED ACTION(s) D.1 and D.2 clears, proposed REQUIRED ACTION B.2 would be resumed, not to exceed a total CT of 18 hours from the original entry time. The licensee described these actions in the revised Regulatory Commitment 5 in Attachment 2 of the supplement. As noted in Section 3.3 of this safety evaluation, revised Regulatory Commitment 5 has been incorporated into the license per the NOTE in TS 3.8.4, REQUIRED ACTION B.2. The NRC staff finds that the licensee’s revised Regulatory Commitment 5 provides assurance on when the licensee would enter the proposed REQUIRED ACTION B.2 and REQUIRED ACTION(s) D.1 and D.2 if anticipated or forecasted severe weather conditions, warnings, and watches occur during the planned 18-hour CT. Thus, the NRC staff finds the proposed 18-hour CT acceptable.

As discussed earlier, the original Regulatory Commitment 5 of Attachment 2 of the LAR addresses the proposed actions to be taken should a severe thunderstorm or tornado warning be issued after entering TS 3.8.4, proposed REQUIRED ACTION B.2. In addition, the original Regulatory Commitment 6 addresses the proposed actions to be taken to ensure the local grid

is stable and no anticipated challenges have been identified. The NRC staff noted that the proposed language in the TS 3.8.4 NOTE indicated a one-time usage of proposed REQUIRED ACTION B.2 to replace each cell in batteries BT1ED2 and BT1ED4, whereas the original Regulatory Commitments 5 and 6 indicate that TS 3.8.4, proposed REQUIRED ACTION B.2, can be entered, exited, and reentered based on severe weather and grid instability. In its supplement, the licensee clarified the one-time usage of TS 3.8.4, proposed REQUIRED ACTION B.2 and modified the wording in the revised Regulatory Commitment 5. The licensee stated in part, the following:

REQUIRED ACTION(s) D.1 (Be in MODE 3 in 6 hours) and D.2 (Be in MODE 5 in 36 hours) will be entered if any the following conditions occur while in REQUIRED ACTION B.2;

1. Notification of a Severe Thunderstorm Warning or a Tornado Warning in Hood and/or Somervell counties per ABN-907, Acts of Nature, Section 5.0, Severe Weather
2. Notification from the Qualified Scheduling Entity (QSE) per ABN-601, Response to a 138/345 KV System Malfunction, Section 9.0, of Grid Frequency fluctuations/Loss of QSE Generation Controller Communications or Notification from TGM Transmission Grid Controller or QSE Generation Controller per ABN-601 Response to a 138/345 KV System Malfunction, Section 10.0, of Potentially Degraded Off-Site Power System Voltage
3. The battery in LCO 3.8.4 REQUIRED ACTION B.2 is disconnected from its DC bus for greater than two hours

While in LCO 3.8.4 REQUIRED ACTION(s) D.1 and D.2, if the condition requiring entry clears;

1. Severe Thunderstorm Warning or Tornado Warning for Hood and/or Somervell counties is cancelled
2. Notification from TGM Transmission Grid Controller or QSE Generation Controller that grid frequency and/or grid voltage is stable in the normal range
3. The battery in LCO 3.8.4 REQUIRED ACTION B.2 is connected to its DC bus

Per LCO 3.0.2, LCO Applicability; LCO 3.8.4 REQUIRED ACTION(s) D.1 and D.2 will be exited and REQUIRED ACTION B.2 will be resumed not to exceed a total COMPLETION TIME of 18 hours from the original entry time.

The above conditions are captured in Attachments 1 and 2 and in the revised NOTE of REQUIRED ACTION B.2 (See Attachments 3 and 4).

In the revised Regulatory Commitment 5 above, the licensee clarified that it will not exceed the extended CT of 18 hours from the original entry time, meaning if TS 3.8.4, REQUIRED ACTION B.2 must be exited and re-entered due to severe weather, the extended CT does not restart. Thus, the licensee will only have a maximum of 18 hours to repair each battery. As noted in Section 3.3 of this safety evaluation, these conditions have been incorporated into the license per the NOTE in TS 3.8.4, REQUIRED ACTION B.2. Based on its review, the NRC staff

finds the licensee's response acceptable because the licensee revised Regulatory Commitment 5 to be consistent with the proposed language in the NOTE for TS 3.8.4, proposed REQUIRED ACTION B.2, by clarifying the one-time usage of the proposed extended CT for each battery. Also, TS 3.8.4, REQUIRED ACTION(s) D.1 and D.2 will be exited and REQUIRED ACTION B.2 will be resumed, not to exceed a total CT of 18 hours from the original entry time to replace each cell in batteries BT1ED2 and BT1ED4.

In Section 3.1.4, "Defense in Depth Considerations," of the LAR dated September 5, 2018, the licensee states, in part, that "[t]he extension of the CT has no impact on the current safety analysis because the remaining OPERABLE batteries are still available to perform their safety functions while in this TS action." In the supplement dated September 20, 2018, the licensee further described the scenarios and failures it had evaluated and whether it had established plant procedures or will develop temporary plant procedures to address potential consequences to the plant in the event of a design-basis event or an anticipated operational occurrence. The licensee stated that all scenarios and failures described in the FSAR are responded to, per CPNPP normal, abnormal, and emergency procedures. In addition, the licensee stated that no new scenarios or failures have been created or changed as a result of this LAR. The licensee further stated that one of its existing procedures (ODA-308-3.8.4, Standard LCOAR for 3.8.4 DC Sources – Operating) will have a supplement added to capture the revised Regulatory Commitments and compensatory measures. In addition, the licensee stated that CPNPP procedure STI-600.01, "Protecting Plant Equipment and Sensitive Equipment Controls," establishes controls at the site (e.g., work planning, physical barriers, etc.). A more detailed description of the controls in place during each battery cell replacement is in the licensee's response to NRC's request for additional information 5 in the letter dated September 20, 2018. The NRC staff reviewed the licensee's application and supplement and determined that the proposed battery replacement can be performed safely. This determination is based on the fact that licensee's evaluation concluded that no new scenarios or failures have been created or changed and appropriate plant procedures are established to address potential consequences to the plant in the event of a design-basis event or an anticipated operational occurrence during the proposed battery cell replacements in Train B battery banks.

On March 12, 2012, the NRC issued Order EA-12-049, "Issuance of Order to Modify Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events" (BDBEE) (ADAMS Accession No. ML12054A735). This order directed licensees to develop, implement, and maintain guidance and strategies to maintain or restore core cooling, containment, and spent fuel pool cooling capabilities in the event of a BDBEE. By letter dated December 16, 2014 (ADAMS Accession No. ML15016A188), the licensee submitted a compliance letter in response to Order EA-12-051, "Order Modifying Licenses with Regard to Reliable Spent Fuel Pool Instrumentation," which stated that the licensee had achieved full compliance with Order EA-12-051. The NRC staff noted that the NRC's safety evaluation dated December 14, 2016 (ADAMS Accession No. ML16334A173), regarding implementation of mitigating strategies and reliable spent fuel pool instrumentation related to orders EA-12-049 and EA-12-051, stated that "Upon loss of all [AC] power, operators will complete an initial [DC] bus load stripping within 2 hours following the [extended loss of AC power (ELAP)] event. Once ELAP is declared operators perform a second [DC] bus load stripping within 5 hours following the event to ensure safety-related battery life is extended up to 12 hours. Following [DC] load stripping and prior to battery depletion, one 500-kilowatt (kW), 480 volt alternating current (Vac) generator will be deployed from the FLEX equipment storage building (FESB). The portable generators will be used to repower essential battery chargers within 12 hours of ELAP initiation." The staff determined that the licensee's actions during an ELAP (should it occur), including use of portable generators, provides additional defense-in-depth measures.

3.2 Risk Insights Evaluation

In the LAR dated September 5, 2018, the licensee stated that the basis for the proposed changes is a one-time, deterministic evaluation with supplemental risk insights to extend the CT from 2 hours to 18 hours to replace cell 27 in battery BT1ED2 and 18 hours CT to replace cell 41 in battery BT1ED4 (not at the same time) per TS 3.8.4, proposed REQUIRED ACTION B.2. Therefore, the subject LAR was not a risk-informed request and a risk evaluation was not required for the purpose of a regulatory decision.

The NRC staff determined that "special circumstances," as discussed in NUREG-0800, Section 19.2, "Review of Risk Information Used to Support Permanent Plant-Specific Changes to the Licensing Basis: General Guidance," which would have necessitated additional risk information be provided, did not exist. As such, the NRC staff did not request any additional risk information associated with the review of this LAR.

Since this is not a risk-informed application, the probabilistic risk assessment (PRA) models used to derive risk insights in the licensee's LAR were not reviewed by the NRC staff to determine their technical acceptability as a basis to support this application. However, the licensee did provide risk insights related to the proposed change in Section 3.2, "Supplemental Risk Information," of the LAR, risk mitigation efforts in Regulatory Commitment 4, and compensatory measures in the supplement dated September 20, 2018. The staff performed an independent assessment using the CPNPP Standardized Plant Analysis Risk Model (SPAR). The review of the CPNPP SPAR and the licensee-provided risk insights supported the traditional engineering conclusions associated with the licensee's proposed compensatory actions and regulatory commitments. The risk insights did not challenge the engineering conclusions that the proposed changes maintain defense-in-depth.

3.3 Compensatory Measures and Regulatory Commitments

In Attachment 1 of the LAR dated September 5, 2018, the licensee described the compensatory measures, inspections, and conditions that would be implemented to limit plant vulnerabilities during the battery replacement evolutions. The NRC staff reviewed Attachment 1 of the LAR and determined that many of these compensatory measures are incorporated in Attachment 2 of the LAR, as regulatory commitments. The NRC staff determined that implementation of the regulatory commitments is necessary to ensure that the battery cell replacement activities will not be planned or performed during times of potential electrical grid instability and to ensure that risk is appropriately managed. In letter dated September 14, 2018 (ADAMS Accession No. ML18256A257), the NRC staff informed the licensee of its intent to elevate all the commitments into conditions of the license by incorporation into the proposed NOTE in TS 3.8.4, REQUIRED ACTION B.2. By letter dated September 20, 2018, the licensee revised the list of commitments and incorporated the following language into the NOTE in TS 3.8.4, REQUIRED ACTION B.2: "Regulatory Commitment 5644411 (Attachment 2 to TXX-18064) will be implemented during the 18 hour Completion Time."

The licensee specified the following revised list of regulatory commitments to assure safe shutdown during inoperability of Unit No. 1, Train B batteries BT1ED2 and BT1ED4, which have been incorporated into the license per the NOTE in TS 3.8.4, REQUIRED ACTION B.2:

Regulatory Commitment (Number 5644411)
Will be implemented During the 18 hour COMPLETION TIME

1. Access to both switchyards and relay houses will be controlled and posted, and all planned maintenance will be suspended for the duration of the CT. This risk reduction measure was selected due to the reliance on offsite power during the CT extension. The measure is selected to deter any potential transmission grid perturbations or trip issues to the 6.9 kV power supplies from either the 345kV or 138kV switchyard. Work in the switchyard is administratively controlled by the Operations Shift Manager (SM) who by plant procedure, STA-629 "Switchyard Control and Transmission Grid Interface," has sole authority to grant access to the switchyards. By SM authority, any testing or maintenance activities or access to either switchyard will not be permitted, with the exception of normal operator visual inspection rounds.
2. The following applies to Unit 1 and Unit 2. The Emergency Diesel Generators, Alternate Power Generators, Turbine Driven Auxiliary Feedwater Pumps, Inservice Startup Transformers, Component Cooling Water Pumps, and Station Service Water Pumps will have ALL testing and maintenance activities suspended for the duration of the extended battery CT. Additionally, during the extended CT, signs will be placed on the doorways to the equipment, or in the case of the inservice Startup Transformers, boundary signs, and barrier tape, rope, or chains will be installed around the equipment and in-service batteries, chargers, and inverters, noting the restriction of testing and maintenance. These risk reduction measures ensure continued availability of these components for the entire duration of the CT.
3. For Fire Safety Shutdown Analysis (FSSA) – Fire Areas of Concern will have additional restrictions on combustible storage during the extended CT. All "Hot Work" in the Fire Areas of Concern will be suspended. An hourly roving fire watch will be in effect to protect the Fire Areas of Concern. The Fire Areas of Concern are the areas that credit the affected battery in the FSSA.
4. For Risk Mitigation –
 - a. Both Unit 1 and 2 Transient Combustible safe zones identified in the fire assessment, in the unaffected battery room, charger room, inverter rooms, the Main Control Room (MCR), the Cable Spreading Room (CSR) and the cable routing paths for the inservice Startup Transformers will have additional restrictions relating to combustible storage during the extended CT. Implementing this risk reduction measure will reduce the fire risks that were identified for the transient combustible scenarios in the fire analysis.
 - b. All hot work activities along the routing associated with power and control cabling for inservice Startup Transformers, in the unaffected battery room, charger room, and inverter room, MCR, and CSR will be suspended during the CT. This is to reduce the risks associated with fires that could damage and thus disable the Startup Transformer cabling.
 - c. An hourly roving fire watch will be in effect to protect areas

- i. credited by the fire assessment, specifically, the unaffected battery room, charger room, inverter room, MCR, and CSR (to minimize the exposure time for detection and suppression of potential fires) and
 - ii. Areas containing power and control cabling of the inservice Startup Transformers (to minimize loss of offsite power).
- 5. Conditions related to REQUIRED ACTION B.2 (to address LCO 3.0.2 applicability, severe weather, grid stability, and battery unavailability)
 - a. Prior to entry into REQUIRED ACTION B.2 CPNPP will:
 - i. Verify severe weather conditions are not anticipated during the 18 hour COMPLETION TIME (CT)
 - ii. Contact the Transmission Grid Controller (TGM) to ensure the local grid is stable and no anticipated challenges have been identified during the 18 hour CT
 - b. REQUIRED ACTION(s) D.1 and D.2 will be entered if any the following conditions occur while in REQUIRED ACTION B.2;
 - i. Notification of a Severe Thunderstorm Warning or a Tornado Warning in Hood and/or Somervell counties per ABN-907, Acts of Nature, Section 5.0, Severe Weather
 - ii. Notification from the Qualified Scheduling Entity (QSE) per ABN-601, Response to a 138/345 KV System Malfunction, Section 9.0, of Grid Frequency fluctuations/Loss of QSE Generation Controller Communications or Notification from TGM Transmission Grid Controller or QSE Generation Controller per ABN-601, Response to a 138/345 KV System Malfunction, Section 10.0, of Potentially Degraded Off-Site Power System Voltage
 - iii. The battery in REQUIRED ACTION B.2 is disconnected from its DC bus for greater than two hours
 - c. While in REQUIRED ACTION(s) D.1 and D.2 (due to item 5.b above), IF the condition requiring entry clears due to;
 - i. Severe Thunderstorm Warning or Tornado Warning is cancelled for Hood and/or Somervell counties is cancelled
 - ii. Notification from TGM Transmission Grid Controller or QSE Generation Controller that grid frequency and/or grid voltage is stable in the normal range
 - iii. The battery in REQUIRED ACTION B.2 is connected to its DC bus

THEN per LCO 3.0.2, LCO Applicability; REQUIRED ACTION(s) D.1 and D.2 will be exited and REQUIRED ACTION B.2 will be resumed not to exceed a total COMPLETION TIME of 18 hours from the original entry time.
 - d. Prior to entry into REQUIRED ACTION B.2, CPNPP will verify the following items and every 6 hours thereafter. If any item is not met after entry into REQUIRED ACTION B.2, then REQUIRED ACTION(s) D.1 and D.2 will be entered:

- i. Both offsite sources available as determined by performance of OPT-215-1, "Offsite Transmission Network Operability Data Sheet"
 - ii. Unit 1 6.9kV bus steady state frequency is 59.5 – 60.5 Hz (ABN-602)
 - iii. The Turbine Driven Auxiliary Feedwater Pumps (TDAFW) are OPERABLE per TS 3.7.5, "Auxiliary Feedwater (AFW) System"
 - iv. Unit 1 is not operating under an ACTION statement for an inoperable offsite AC power source or the opposite train Emergency Diesel Generator
- e. While in REQUIRED ACTION(s) D.1 and D.2 (due to item 5.d above), IF the condition requiring entry clears due to;
- i. Both offsite sources become available as determined by performance of OPT-215-1, "Offsite Transmission Network Operability Data Sheet"
 - ii. Unit 1 6.9kV bus steady state frequency returns to 59.5 – 60.5 Hz (ABN-602)
 - iii. The Turbine Driven Auxiliary Feedwater Pumps (TDAFW) return to OPERABLE per TS 3.7.5, "Auxiliary Feedwater (AFW) System"
 - iv. Unit 1 is not operating under an ACTION statement for an inoperable offsite AC power source or the opposite train Emergency Diesel Generator
- THEN per LCO 3.0.2, LCO Applicability; REQUIRED ACTION(s) D.1 and D.2 will be exited and REQUIRED ACTION B.2 will be resumed not to exceed a total COMPLETION TIME of 18 hours from the original entry time."

The licensee specified the following list of inspections, compensatory measures, and condition in Attachment 1 of the supplement dated September 20, 2018:

Summary of Current Routine Inspections (see Section 3.1.4)

- Maintenance Surveillances
 - Weekly Inspection
 - Monthly Inspection
 - Quarterly Inspection
 - IEEE 450-1995 Quarterly Inspections
- Operations Surveillance / Inspections (See Section 3.1.4)
 - Shiftly Surveillance (area temperature)
 - Shiftly Tours / Inspection of batteries
- Engineering enhanced monitoring / inspections due to cracking (See Section 3.1.4)
 - Weekly walkdowns of all Class 1E batteries that have a condition adverse to quality

Summary of New Compensatory Measures to be implemented in addition to the Current Routine Inspections described above

- Fire Protection Administrative Controls / Protective Measures for the fire areas / fire zones of the affected Unit 1 Train (See commitment in Attachment 2)

- Hourly roving fire watch in the Fire Areas of Concern
- Suspend ongoing "Hot Work" and prohibit start of any new "Hot Work" in the Fire Areas of Concern
- Do not introduce any new transient combustibles, or add to any transient combustibles already authorized in the Fire Areas of Concern
- Grid Stability (see Section 3.1.7 and commitment in Attachment 2)
 - Prior to entry into TS 3.8.4 REQUIRED ACTION B.2, contact Transmission Grid Controller (TGM) to assure local grid is stable and no anticipated challenges have been identified
- Prior to entry into TS 3.8.4 REQUIRED ACTION B.2 (see commitment in Attachment 2)
 - Access to both switchyards and relay houses will be controlled and posted, and all planned maintenance will be suspended for the duration of the CT.
 - The following applies to Unit 1 and Unit 2. The Emergency Diesel Generators, Alternate Power Generators, Turbine Driven Auxiliary Feedwater Pumps, inservice Startup Transformers, Component Cooling Water Pumps, and Station Service Water [Pumps] will have ALL testing and Maintenance activities suspended
 - Both Unit 1 and 2 Transient Combustible safe zones identified in the fire assessment, in the unaffected battery / inverter areas, the Main Control Room (MCR) and the Cable Spreading Room (CSR) and the cable routing paths for the inservice Startup Transformers will have additional restrictions relating to combustible storage during the extended CT durations.
 - All hot work activities along the routing associated with power and control cabling for inservice Startup Transformers, in the unaffected battery / inverter areas, the MCR, and the CSR will be suspended during the CT.
- Severe Weather (see commitment in Attachment 2)
 - If a Severe Thunderstorm Warning or Tornado Warning is issued per CPNPP procedure ABN 907 after entry into TS 3.8.4 REQUIRED ACTION B.2, then TS 3.8.4 REQUIRED ACTION D.1 (Be in MODE 3 within 6 hours) and TS 3.8.4 REQUIRED ACTION D.2 (Be in MODE 5 within 36 hours) will be entered.
 - Once the applicable severe weather warning is cancelled and plant system statuses are verified, TS 3.8.4 REQUIRED ACTIONs D.1 and D.2 will be exited and TS 3.8.4 REQUIRED ACTION B.2 will be resumed and battery cell replacement will continue until completed or 18 hours from initial entry into TS 3.8.4 REQUIRED ACTION B.2.

List of conditions where CPNPP would not enter the one-time extended COMPLETION TIME

- Severe weather conditions are anticipated during the 18 hour CT (see commitment in Attachment 2)
- Transmission Grid Controller (TGM) has been contacted and the local grid is not stable or anticipated challenges have been identified during the 18 hour CT (see commitment in Attachment 2)

List of conditions where CPNPP would exit the one-time extended COMPLETION TIME (see commitment in Attachment 2)

- Prior to entry into TS 3.8.4 REQUIRED ACTION B.2, CPNPP will verify the following items and every 6 hours thereafter. If any item is not met after entry into TS 3.8.4 REQUIRED ACTION B.2, then TS 3.8.4 REQUIRED ACTIONS D.1 and D.2 will be entered:
 - a. Both offsite sources available as determined by performance of CPNPP procedure OPT-215-1, "Offsite Transmission Network Operability Data Sheet"
 - b. Affected 6.9kV bus steady state frequency is 59.5 – 60.5 Hz (Reference 6.32)
 - c. The Turbine Driven Auxiliary Feedwater Pump (TDAFW) is OPERABLE per TS 3.7.5, "Auxiliary Feedwater (AFW) System"
 - d. The plant is not operating under an ACTION statement for an inoperable offsite AC power source or the opposite train Emergency Diesel Generator

The NRC staff has reviewed the revised regulatory commitments made by the licensee, which were incorporated into the TSs by reference from the NOTE in TS 3.8.4, REQUIRED ACTION B.2, and finds that the commitments provide defense-in-depth during the two 18-hour CTs for Unit 1 Train B batteries. In addition, the NRC staff find that the proposed TS changes to TS 3.8.4, CONDITION B, constitute satisfactory remedial actions per 10 CFR 50.36(c)(2) to be followed until LCO 3.8.4 can be met. Furthermore, the NRC staff finds that the revised regulatory commitments and compensatory measures are appropriate for limiting plant vulnerabilities during the battery replacement evolutions. In addition, protection of the equipment described in the regulatory commitments and compensatory measure will reasonably ensure that redundant, installed, equipment is available to respond to a transient, if one occurs during the battery cell replacement. Therefore, the NRC staff concludes that the proposed one-time extension of the CT for TS 3.8.4, REQUIRED ACTION B.2 is acceptable.

3.4 Summary of Technical Evaluation

The NRC staff concludes that the licensee has provided adequate revised regulatory commitments and compensatory measures and maintained defense-in-depth such that the proposed one-time extension of the CT for TS 3.8.4, CONDITION B is consistent with 10 CFR 50.36, 10 CFR 50.63, and GDC 17. In addition, the NRC staff concluded that the licensee's risk insights did not challenge the engineering conclusions that the proposed changes maintain defense-in-depth.

4.0 EXIGENT CIRCUMSTANCES

Background

The NRC's regulations contain provisions for issuance of amendments when the usual 30-day public comment period cannot be met. These provisions are applicable under exigent circumstances. Consistent with the requirements in 10 CFR 50.91(a)(6), exigent circumstances exist when: (1) a licensee and the NRC must act quickly; (2) time does not permit the NRC to publish a *Federal Register* notice allowing 30 days for prior public comment; and (3) the NRC determines that the amendments involve no significant hazards consideration. As discussed in

the licensee's application dated September 5, 2018, the licensee requested that the proposed amendments be processed by the NRC on an exigent basis.

Under the provisions in 10 CFR 50.91(a)(6), the NRC notifies the public in one of two ways: (1) by issuing a *Federal Register* notice providing an opportunity for hearing and allowing at least 2 weeks from the date of the notice for prior public comments; or (2) by using local media to provide reasonable notice to the public in the area surrounding the licensee's facility. In this case, the NRC issued a *Federal Register* notice providing an opportunity for hearing and allowing 14 days from the date of the notice (October 10, 2018) for prior public comments.

As discussed in the licensee's application dated September 5, 2018, the licensee requested that the proposed amendments be processed by the NRC on an exigent basis based on the following considerations:

Within several months, CPNPP Unit 1 experienced a single cell cracking failure / degradation on each of two redundant 125 VDC DC batteries feeding B train 125 VDC electrical power. In each case prompt short-term corrective actions were taken to jumper the affected cell within the time permitted in the action statements of TS 3.8.4. Longer term corrective action in the form of battery replacements are planned. This TS amendment would enable CPNPP to proactively replace both of the jumpered cells promptly (not at the same time) and thus avoid the need for either an unnecessary plant transient or requesting regulatory relief in the form of a Notice of Enforcement Discretion (NOED) or emergency technical specification amendment. In the event of an unanticipated second cell failure on either of these B train 125 VDC batteries, CPNPP would be forced to consider jumpering a second cell, if technically feasible, or shutting down the plant and imposing the associated transient, for approximately 18 hours for replacement of the failed cell. Avoidance of an unnecessary shutdown of CPNPP Unit 1 also will limit potential impact on electrical grid stability during the remainder of Cycle 20. In the event of extreme heat and or severe weather (e.g., tornado warning) coupled with an unplanned shutdown of CPNPP Unit 1 due to a failed battery (i.e., BT1ED2 or BT1ED4), the grid stability could be challenged with the loss of a large base load plant.

Vistra OpCo initiated dialog with the NRC on a technical specification change process following the November 2017 cell failure and is making a good faith effort to submit this license amendment request in a timely manner following the July 2018 failure. Vistra OpCo has communicated with the NRC Staff regarding this request. Accordingly, Vistra OpCo requests this amendment be processed under exigent circumstances pursuant to 10 CFR 50.91(a)(6) to avoid a potential shutdown in accordance with TS 3.8.4 REQUIRED ACTIONS D.1 and D.2 at the expiration of REQUIRED ACTION B.1 COMPLETION TIME of 2 hours.

NRC Staff Conclusion

Based on the above circumstances, the NRC staff finds that the licensee made a timely application for the proposed amendments following another failure of one of the affected battery cells in July 2018 and identification of the issue. The NRC staff determined that if a second battery cell were to fail on either of the CPNPP Unit No. 1, Train B batteries, the licensee would be unable to restore the affected battery(ies) to OPERABLE status within the current 2 hour CT and would be required to shut down. In addition, the NRC staff determined that if the licensee

requested license amendments under emergency circumstances per 10 CFR 50.91(a)(5) to extend the CT during the 2 hour CT, the staff would not have enough time to process the emergency amendments within the 2 hour CT and the licensee would be required to shut down. As a result, the NRC staff finds that exigent circumstances exist. Based on these findings, and the determination that the amendments involve no significant hazards consideration as discussed in Section 5.0 below, the NRC staff has determined that a valid need exists for issuance of the license amendments using the exigent provisions of 10 CFR 50.91(a)(6).

5.0 FINAL NO SIGNIFICANT HAZARDS CONSIDERATION DETERMINATION

The NRC's regulation in 10 CFR 50.92(c) states that the NRC may make a final determination, under the procedures in 10 CFR 50.91, that a license amendment involves no significant hazards consideration if operation of the facility, in accordance with the amendment, would not: (1) involve a significant increase in the probability or consequences of an accident previously evaluated; or (2) create the possibility of a new or different kind of accident from any accident previously evaluated; or (3) involve a significant reduction in a margin of safety.

An evaluation of the issue of no significant hazards consideration is presented below:

1. Do the proposed changes involve a significant increase in the probability or consequences of an accident previously evaluated?

Response: No.

The proposed changes add provisions to increase the COMPLETION TIME (CT) from two hours to eighteen hours, on a one-time basis for Comanche Peak Nuclear Power Plant Class 1E Batteries BT1ED2 and BT1ED4. This one-time increase will only be used once per battery during Unit 1 Cycle 20 (not at the same time). An additional REQUIRED ACTION, new Note, and associated COMPLETION TIME is specified when batteries BT1ED2 and BT1ED4, associated with the plant Class 1 E Direct Current (DC) electrical power subsystem, are declared inoperable to replace a jumpered cell. Regulatory Commitment 5644411 includes conditions (preventive measures) for Unit 1 and Unit 2 to reduce site risk for the planned replacement of cell 27 in battery BT1ED2 and cell 41 in battery BT1ED4. The proposed changes do not physically alter any plant structures, systems, or components, and are not accident initiators: therefore, there is no effect on the probability of accidents previously evaluated. As part of the single failure design feature, loss of any one DC electrical power subsystem does not prevent the minimum safety function from being performed. Also, the proposed changes do not affect the type or amounts of radionuclides release following an accident, or affect the initiation and duration of their release. Therefore, the consequences of accidents previously evaluated, which rely on the safety related Class 1E battery to mitigate, are not significantly increased.

Therefore, the proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Do the proposed changes create the possibility of a new or different kind of accident from any accident previously evaluated?

Response: No.

The proposed changes do not involve a change in design, configuration, or method of operation of the plant. The proposed changes will not alter the manner in which equipment is operated, nor will the functional demands on credited equipment be changed. The proposed changes do not impact the interaction of any systems whose failure or malfunction can initiate an accident. There are no identified redundant components affected by these changes and thus there are no new common cause failures or any existing common cause failures that are affected by extending the CT. The proposed changes do not create any new failure modes.

Therefore, the proposed change does not create the possibility of a new or different kind of accident from any previously evaluated.

3. Do the proposed changes involve a significant reduction in a margin of safety?

Response: No.

The proposed changes are based upon a deterministic evaluation. This evaluation is supplemented by risk information.

The deterministic evaluation concluded with one inoperable battery associated with the Class 1E DC electrical power subsystem, the redundant OPERABLE Class 1E DC electrical power subsystems will be able to perform the safety function as described in the accident analysis.

Supplemental risk information supporting this license amendment request concluded that the additional REQUIRED ACTION, new Note, associated COMPLETION TIME have a negligible impact on overall plant risk and is consistent with the NRC Safety Goal Policy statement and the thresholds in Regulatory Guide (RG) 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis," and RG 1.177, "An Approach for Plant-Specific, Risk-Informed Decisionmaking: Technical Specifications."

The deterministic evaluation, supplemental risk information, and Regulatory Commitment 5644411 (conditions for Unit 1 and Unit 2) provide assurance that the plant Class 1E DC electrical power subsystem will be able to perform its design function with a longer COMPLETION TIME for inoperable batteries BT1ED2 and BT1ED4 during Unit 1 Cycle 20, and risk is not significantly impacted by the change.

Therefore, the proposed change does not involve a significant reduction in a margin of safety.

Based on the above evaluation, the NRC staff concludes that the three standards of 10 CFR 50.92(c) are satisfied. Therefore, the NRC staff has made a final determination that no

significant hazards consideration is involved for the proposed amendments and that the amendments should be issued as allowed by the criteria contained in 10 CFR 50.91.

6.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Texas State official was notified of the proposed issuance of the amendments on September 26, 2018. The State official had no comments.

7.0 ENVIRONMENTAL CONSIDERATION

The amendments change a requirement with respect to installation or use of facility component 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, and there has been no public comment on such finding published in the *Federal Register* on October 10, 2018 (83 FR 50971). 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.

8.0 CONCLUSION

The NRC staff 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: October 25, 2018

**SUBJECT: COMANCHE PEAK NUCLEAR POWER PLANT, UNIT NOS. 1 AND 2 -
ISSUANCE OF AMENDMENTS RE: REVISION TO TECHNICAL
SPECIFICATION 3.8.4, "DC SOURCES - OPERATING," CONDITION B
(EXIGENT CIRCUMSTANCES) (EPID: L-2018-LLA-0238)
DATED OCTOBER 25, 2018**

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*by memo dated

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