



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
1600 EAST LAMAR BOULEVARD
ARLINGTON, TEXAS 76011-4511

January 23, 2023

Ken Peters
Senior Vice President
and Chief Nuclear Officer
Vistra Operations Company, LLC
P.O. Box 1002
Glen Rose, TX 76043

SUBJECT: COMANCHE PEAK NUCLEAR POWER PLANT, UNITS 1 AND 2 –
TI-194 REPORT 05000445/2022010 AND 05000446/2022010

Dear Ken Peters:

On January 19, 2023, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Comanche Peak Nuclear Power Plant, Units 1 and 2 and discussed the results of this inspection with Mr. S. Sewell, Acting Site Vice President, and other members of your staff. The results of this inspection are documented in the enclosed report.

No findings or violations of more than minor significance were identified during this inspection.

This letter, its enclosure, and your response (if any) will be made available for public inspection and copying at <http://www.nrc.gov/reading-rm/adams.html> and at the NRC Public Document Room in accordance with Title 10 of the *Code of Federal Regulations* 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,

A handwritten signature in black ink, appearing to read "Nicholas H. Taylor".

Signed by Taylor, Nicholas
on 01/23/23

Nicholas H. Taylor, Chief
Engineering Branch 2
Division of Operating Reactor Safety

Docket Nos. 05000445, 05000446
License Nos. NPF-87, NPF-89

Enclosure:
As stated

cc w/ encl: Distribution via LISTSERV

COMANCHE PEAK NUCLEAR POWER PLANT, UNITS 1 AND 2 – TI-194 REPORT
 05000445/2022010 AND 05000446/2022010- DATED JANUARY 23, 2023

DISTRIBUTION:

- SMorris, ORA
- JMonninger, ORA
- RLantz, DORS
- MHay, DORS
- DCylkowski, RC
- VDricks, ORA
- LWilkins, OCA
- MFerdas, RIV/OEDO
- DGalvin, NRR
- AMoreno, RIV/OCA
- RAlexander, RSLO
- FRamirez, IPAT
- GWerner, DORS
- DProulx, DORS
- ASaunders, DORS
- JEllegood, DORS
- NDay, DORS
- LReyna, DORS
- R4-DORS-IPAT
- R4Enforcement

DOCUMENT NAME: COMANCHE PEAK NUCLEAR POWER PLANT, UNITS 1 AND 2 – TI-194 REPORT
 05000445/2022010 AND 05000446/2022010

ADAMS ACCESSION NUMBER: **ML23023A058**

<input checked="" type="checkbox"/> SUNSI Review		<input checked="" type="checkbox"/> Non-Sensitive <input type="checkbox"/> Sensitive		<input checked="" type="checkbox"/> Publicly Available <input type="checkbox"/> Non-Publicly Available	
OFFICE	DORS/EB2	DORS/EB2	DORS	DORS/EB2	
NAME	JDrake	SGraves	RDeese	NTaylor	
SIGNATURE	/RA/	/RA/	/RA/	/RA/	
DATE	01/23/23	01/23/23	01/23/23	01/23/23	

OFFICIAL RECORD COPY

**U.S. NUCLEAR REGULATORY COMMISSION
Inspection Report**

Docket Numbers: 05000445 and 05000446

License Numbers: NPF-87 and NPF-89

Report Numbers: 05000445/2022010 and 05000446/2022010

Enterprise Identifier: I-2022-010-0058

Licensee: Vistra Operations Company, LLC

Facility: Comanche Peak Nuclear Power Plant, Units 1 and 2

Location: Glen Rose, TX 76043

Inspection Dates: November 14, 2022 to November 18, 2022

Inspectors: J. Drake, Senior Reactor Inspector
S. Graves, Senior Reactor Inspector
R. Deese, Senior Reactor Analyst

Approved By: Nicholas H. Taylor, Chief
Engineering Branch 2
Division of Operating Reactor Safety

SUMMARY

The U.S. Nuclear Regulatory Commission (NRC) continued monitoring the licensee's performance by conducting a Temporary Instruction 2515/194, "Inspection of the Licensees' Implementation of Industry Initiative Associated with the Open Phase Condition Design Vulnerabilities in Electric Power Systems (NRC Bulletin 2012-01)," at Comanche Peak Nuclear Power Plant, Units 1 and 2, in accordance with the Reactor Oversight Process. The Reactor Oversight Process is the NRC's program for overseeing the safe operation of commercial nuclear power reactors. Refer to <https://www.nrc.gov/reactors/operating/oversight.html> for more information.

List of Findings and Violations

No findings or violations of more than minor significance were identified.

Additional Tracking Items

None.

INSPECTION SCOPES

Inspections were conducted using the appropriate portions of the inspection procedures (IPs) in effect at the beginning of the inspection unless otherwise noted. Currently approved IPs with their attached revision histories are located on the public website at <http://www.nrc.gov/reading-rm/doc-collections/insp-manual/inspection-procedure/index.html>. Samples were declared complete when the IP requirements most appropriate to the inspection activity were met consistent with Inspection Manual Chapter (IMC) 2515, "Light-Water Reactor Inspection Program - Operations Phase." The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel to assess licensee performance and compliance with Commission rules and regulations, license conditions, site procedures, and standards.

OTHER ACTIVITIES – TEMPORARY INSTRUCTIONS, INFREQUENT AND ABNORMAL

2515/194 - Inspection of the Licensee's Implementation of Industry Initiative Associated With the Open Phase Condition Design Vulnerabilities In Electric Power Systems (NRC Bulletin 2012-01)

The inspectors reviewed the licensee's implementation of revision three to "Nuclear Energy Institute Voluntary Industry Initiative," (ADAMS Accession No. ML19163A176) dated June 6, 2019. This review focused on modifications to the open phase detection system designed and manufactured by Power System Sentinel Technologies, LLC. The inspectors also reviewed the licensee's application of risk screening techniques to determine that the risk associated with an open phase condition (OPC) event is significantly reduced through the implementation of detection circuits and the use of operator manual actions in lieu of automatic trip functions.

Sections 03.01.a, "Detection, Alarms and General Criteria," and 03.01.b, "Protective Actions," were previously inspected and documented in Inspection Report 05000445/2018012 and 05000446/2018012 with noted exceptions. Because the licensee chose to demonstrate compliance with Revision 3 of the Open Phase Condition Initiative using the Risk Informed Evaluation Method in lieu of the design's automatic protective functions, section 03.01.c, "Use of Risk-Informed Evaluation Method" was inspected and documented in Inspection Report 05000445/2021012 and 05000446/2021012 with one noted exception. The licensee implemented modifications to the OPC equipment installed on the XST2 transformer due to a high impedance condition which prevented the OPC equipment from being able to detect an open phase condition with the transformer lightly loaded. This modification has been inspected by the NRC staff and the results documented in this report. This included reviewing how the licensee updated their licensing basis to reflect the need to protect against open phase conditions.

Inspection of the Licensee's Implementation of Industry Initiative Associated With the Open Phase Condition Design Vulnerabilities In Electric Power Systems (NRC Bulletin 2012-01) (1 Sample)

- (1) Vistra Operations Company, LLC selected the open phase detection system designed and manufactured by Power System Sentinel Technologies, LLC, as the design vendor for Comanche Peak Nuclear Power Plant. Due to a high impedance condition on the XST2 transformer neutral preventing the use of active injection to identify unbalanced phase conditions, the licensee elected to modify the Open Phase Condition (OPC) equipment installed on the XST2 transformer. At the end of this inspection the licensee had installed complete systems in monitoring mode on all four startup transformers but removed the Active Injection signal capability for identifying

unbalanced conditions under low loading from the OPC equipment installed on the XST2 transformer. The inspectors reviewed the engineering change documents for the modifications to the open phase detection equipment for the XST2 transformer, including loading calculations and scenarios and electrical load diagrams to verify that the XST2 transformer would be loaded in excess of the vendor-identified minimum loading (600 kVA) necessary to ensure open phase conditions would be detected.

Exceptions:

None

Observations:

1. The XST2 transformer OPC equipment has been modified by removal of relay CR112 from the open phase monitoring equipment and revision of SEL2411 code (Schweitzer Engineering Laboratories). This modification eliminated the injection abnormal and injection source failure alarms from the channel general alarm and disabled the test initiate and injection signal reference pushbuttons.
2. The modification requires that the XST2 transformer always have a minimum loading of 600 kVA to ensure ~~on~~-open phase conditions will be detected by the passive mode of the OPC equipment. Inspectors reviewed electrical drawings and diagrams which showed that normal and likely conditions the loading on the XST2 transformer would be above this threshold when in service.

INSPECTION RESULTS

No findings were identified.

EXIT MEETINGS AND DEBRIEFS

The inspectors verified no proprietary information was retained or documented in this report.

- On January 19, 2023, the inspectors presented the TI-194 post modification exit meeting inspection results to Mr. S. Sewell, Acting Site Vice President, and other members of the licensee staff.

DOCUMENTS REVIEWED

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
2515/194	Calculations	EE-VP-U1-1E_05	Unit 1 Class 1E System Voltage Profile	5
	Engineering Changes	FDA-2016-000005-04	Revise FDA to removed relay CR112 from the Byron open phase modification	2
		FDA-2016-000005-04-02	Final Design Authorization	10/31/2022
	Miscellaneous		6.9 kV / 480 VAC Big Book	12/07/2013
		EE-VP-U1-1E_05	Specification - OPEN PHASE PROTECTION SYSTEM	2
		IEGR-DD-1741	OPPSys_protection_settings_CPNPP_U2_XST2-A	
		IEGR-DD-2564 (003)	OPPSys_protection_settings_CPNPP_U2_XST2	
		SL-011517	Report - Open Phase Evaluation - Transformers XST1, XST2 and XST2A	0
		VDRT-6034826	Open Phase Protection (OPP) System Failure Modes and Effects Analysis (FMEA) Comanche Peak NPP XST2	0
		VDRT-6034827	Open Phase Protection (OPP) System Operating and Maintenance Manual-Comanche Peak for Transformer XST-2	0
	Procedures	SOP-602	138 KV AND 345 KV TRANSFORMERS AND SWITCHYARD AIR SWITCHES	14
		SOP-602	138 KV AND 345 KV TRANSFORMERS AND SWITCHYARD AIR SWITCHES	15