Luminant

Steven K. Sewell
Site Vice President

Comanche Peak
Nuclear Power Plant
(Vistra Operations
Company LLC)
P.O. Box 1002
6322 North FM 56
Glen Rose, TX 76043

T 254.897.6113

CP-202300566
TXX-23093
December 12, 2023

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Ref 10 CFR 50.36

Subject: Comanche Peak Nuclear Power Plant (CPNPP)
Docket No. 50-445
SPECIAL REPORT 1-SR-23-001-00
INOPERABLE POST ACCIDENT MONITORING INSTRUMENTATION

Dear Sir or Madam:

Vistra Operations Company LLC ("Vistra OpCo") provides the enclosed 14-day Special Report titled "COMANCHE PEAK NUCLEAR POWER PLANT - UNIT 1, SPECIAL REPORT 1-SR-23-001-00, INOPERABLE POST ACCIDENT MONITORING INSTRUMENTATION" submitted in accordance with CPNPP Technical Specification 5.6.8, PAM Report.

This communication contains no new regulatory commitments.

Should you have any questions, please contact Kristopher Brigman at (430) 203-3013 or Kristopher.brigman@luminant.com.

Sincerely,

Steven K Sewell

Steven K. Sewell

Enclosure: CPNPP - UNIT 1, SPECIAL REPORT 1-SR-23-001-00, INOPERABLE POST ACCIDENT MONITORING INSTRUMENTATION

c (email) - John Monninger, Region IV [John.Monninger@nrc.gov]
Dennis Galvin, NRR [Dennis.Galvin@nrc.gov]
John Ellegood, Senior Resident Inspector, CPNPP [John.Ellegood@nrc.gov]
Dominic Antonangeli, Resident Inspector, CPNPP [Dominic.Antonangeli@nrc.gov]

VISTRA OPERATIONS COMPANY LLC
COMANCHE PEAK NUCLEAR POWER PLANT - UNIT 1
SPECIAL REPORT 1-SR-23-001-00
INOPERABLE POST ACCIDENT MONITORING INSTRUMENTATION

1.0 Report Requirements

This special report is submitted in accordance with Section 5.6.8, PAM Report of the CPNPP Technical Specifications (TS). Specifically, TS Section 3.3.3, Post Accident Monitoring (PAM) Instrumentation requires the PAM Instrumentation to be OPERABLE in MODES 1, 2, and 3 for each function in Table 3.3.3-1. With one or more functions with one required channel inoperable, Condition A.1 requires the inoperable channel be restored to OPERABLE status within 30 days. If the Required Action and associated Completion Time of Condition A is not met then, Required Action B.1 requires initiating actions immediately in accordance with Specification 5.6.8.

When a report is required by the required actions of LCO 3.3.3, "Post Accident Monitoring (PAM) Instrumentation," a report shall be submitted within the following 14 days. The report shall outline the preplanned alternate method of monitoring, the cause of the inoperability, and the plans and schedule for restoring the instrumentation channels of the Function to OPERABLE status.

2.0 Event Background

The Reactor Vessel Level Indicating System (RVLIS) directly measures reactor vessel coolant inventory and temperature above the fuel alignment plate. RVLIS is required to provide detection capability of the approach to Inadequate Core Cooling (ICC), in addition to giving the operator immediate feedback on his initiating actions, or the functioning of automatic equipment in the subsequent restoration of optimal core cooling.

The configuration of the sensor probes of RVLIS is as follows:

Sensor #1 - 49 inches above FLANGE
Sensor #2 - 0.25 inches above FLANGE
Sensor #3 - 79 inches above CORE PLATE
Sensor #4 - 61 inches above CORE PLATE
Sensor #5 - 47 inches above CORE PLATE
Sensor #6 - 33 inches above CORE PLATE
Sensor #7 - 22 inches above CORE PLATE
Sensor #8 - 11 inches above CORE PLATE

Technical Specification 3.3.3 requires both trains of RVLIS to be in operation for Modes 1, 2, 3. For a train to be Operable, a minimum of four sensors total are required to be operable consisting of a minimum of one of the two sensors above the flange and three of the six sensors located in the lower section (above core plate) being operable.

During 1RF23 on November 9, 2023, at 16:03, while performing of OPT-112A-1, Accident Monitoring Instrument Check, Train B of RVLIS on Unit 1 was found in the following condition:

Sensor #1 Thermocouples failed high: indicating 2300 °F.
Sensors #3 Removed from service due to failure of sensor during 1RF16 (FDA-2013-87-01)
Sensors #4 Removed from service due to failure of sensor during 1RF16 (FDA-2013-87-01)
Sensor #5 Thermocouples failed high: indicating 2300 °F.
Sensor #7 Heater failed: no difference in indication between heated and unheated T/C.
Sensor #8 Heater failed: no difference in indication between heated and unheated T/C.

Only Sensor #2 and Sensor #6 displayed proper indication.

At the Train B cabinet of RVLIS, CP1-EIPRCV-16, with field leads lifted, measured resistance from field wire to ground. Results were as follows:

For Sensor #1 – found a short to ground on the negative lead of the thermocouple.
For Sensor #5 – found a short to ground on the negative lead of the thermocouple.
For Sensor #7 – found a short to ground on the heater lead. Heater not functional.
For Sensor #8 – found a short to ground on the heater lead. Heater not functional.

So that RVLIS can measure a temperature difference between the heated and unheated thermocouples in a RVLIS sensor, the negative Alumel leads of both thermocouples are tied together. The Open Thermocouple circuit on the Signal Conditioning board at the Train B RVLIS cabinet senses the short and determines that both thermocouples are open and drive the indication high to 2300 °F.

For RVLIS to indicate the presence of water at each sensor, a temperature difference between the heated and unheated thermocouples must be created by the heater circuit. Without a functional heater circuit, both thermocouples read the same water temperature which will prevent RVLIS from indicating proper and accurate water level.

Only Sensor #2 in the head region and Sensor #6 in the plenum region of the Reactor are currently functioning by properly and accurately indicating water level.

Due to Train B RVLIS being Inoperable, Technical Specification LCO 3.3.3, PAM Instrumentation, Condition A for one or more Functions with one required channel inoperable was entered under active LCOAR 7407 on November 10, 2023, at 1734 when Unit 1 entered Mode 3 and TS LCO 3.3.3 became applicable. Condition B was entered on December 10, 2023, at 1734 requiring this report within 14 days.

3.0 Required Information

3.1 Preplanned Alternate Methods of Monitoring

Train A of RVLIS on Unit 1 currently has seven sensors available (Sensor #3 was taken out of service during 1RF21 – FDA-2020-000104-1) and is not impacted by this issue and accurately indicated water level of the Reactor.

The Train A RVLIS remains Operable and is the most readily available means of alternate monitoring of reactor vessel level. In event that Train A RVLIS becomes unavailable during a Post Accident Monitoring scenario, Train B RVLIS Sensors #2 (0.25" above the vessel flange) would be conservatively used in lieu of Sensor #4 (61" above the core plate) for filled RCS hot legs and Sensor #6 (33" above the core plate) would be conservatively used in lieu of Sensor #8 (11" above the core plate) to validate for core coverage. In addition to the remaining functioning RVLIS lights on Train B, the core cooling monitor can be used to assess saturation conditions in the vessel and pressurizer level can be used to determine the presence of large voids in the vessel when an RCP is not in operation. The Emergency Response Guidelines (ERGs) remain navigable for conditions in which RVLIS is not available.

3.2 Cause of the Inoperability

During the reassembly and termination of the Reactor Vessel Head, the RVLIS cable conductors acquired shorts to ground due to water intrusion in the connectors or improper connections during termination activities. The failure of the Train B RVLIS was caused during the maintenance activity of the termination of the Reactor Head cables for Train B RVLIS.

3.3 Plans and Schedule for Restoring the Instrumentation Channels of the Function to Operable Status

Due to the environment at the locations of the shorts near or on the Reactor, probably at the connectors of the cables, the shorted cable leads cannot be repaired until the next outage of Unit 1, 1RF24, scheduled April 2025.

Sensors #2 and #6 on Train B will be restored to service for the time this channel is inoperable as an alternate indication to train A via FDA-2013-000078-02, Work Order # 23-499745. The failed sensors #1, #5, #7 and #8 on train B will be planned for repair during 1RF24 via Work Order # 23-462449.