



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

May 8, 2018

Mr. Ken J. 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 – NRC INTEGRATED  
INSPECTION REPORT 05000445/2018001 AND 05000446/2018001

Dear Mr. Peters:

On March 31, 2018, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Comanche Peak Nuclear Power Plant, Units 1 and 2. On April 5, 2018, the NRC inspectors discussed the results of this inspection with Mr. Tom McCool, Site Vice President, and other members of your staff. The results of this inspection are documented in the enclosed report.

NRC inspectors documented five findings of very low safety significance (Green) in this report. All of these findings involved violations of NRC requirements. The NRC is treating these violations as non-cited violations (NCVs) consistent with Section 2.3.2.a of the Enforcement Policy.

If you contest the violations or significance of these NCVs, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region IV; the Director, Office of Enforcement; and the NRC resident inspector at the Comanche Peak Nuclear Power Plant.

If you disagree with a cross-cutting aspect assignment in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region IV; and the NRC resident inspector at the Comanche Peak Nuclear Power Plant.

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 10 CFR 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,

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Mark S. Haire, Chief  
Project Branch A  
Division of Reactor Projects

Docket Nos. 5000445 and 5000446  
License Nos. NPF-87 and NPF-89

Enclosure:  
Inspection Report 05000445/2017004  
and 05000446/2017004  
w/ Attachment:  
Documents Reviewed

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

Docket Numbers: 05000445, 05000446

License Numbers: NPF-87, NPF-89

Report Numbers: 05000445/2018001 and 05000446/2018001

Enterprise Identifier: I-2018-001-0011

Licensee: Vistra Operations Company, LLC

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

Location: Glen Rose, Texas

Inspection Dates: January 1, 2018 to March 31, 2018.

Inspectors: J. Josey, Senior Resident Inspector  
R. Kumana, Resident Inspector  
I. Anchondo, Reactor Inspector  
E. Uribe, Reactor Inspector

Approved By: M. Haire, Chief  
Project Branch A  
Division of Reactor Projects

## SUMMARY

The U.S. Nuclear Regulatory Commission (NRC) continued monitoring the licensee’s performance by conducting an Integrated Inspection at Comanche Peak Nuclear Power Plant 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. Findings and violations being considered in the NRC’s assessment are summarized in the table below.

### List of Findings and Violations

Failure to Follow Commercial Grade Dedication Process			
Cornerstone	Significance	Cross-cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000445/2018001-01; 05000446/2018001-01 Closed	None	711112 - Maintenance Effectiveness
<p>The inspectors identified a Green, non-cited violation of 10 CFR Part 50, Appendix B, Criterion V, Instructions, Procedures, and Drawings, associated with the licensee’s failure to accomplish activities affecting quality in accordance with documented procedures. Specifically, the licensee upgraded the safety classification of Ashcroft series 200 diaphragms to safety related without following the requirements of station procedure ECE-6.02-03, “Critical Characteristics Development.” The licensee entered this issue into the corrective action program as Condition Reports CR- CR-2016-009733 and CR-2017-007811.</p>			

Failure to Incorporate Design Information Into System Test Procedures			
Cornerstone	Significance	Cross-cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000445/2018001-02; 05000446/2018001-02 Closed	None	71152 - Problem Identification and Resolution
<p>The inspectors identified a Green, non-cited violation of 10 CFR 50, Appendix B, Criterion XI, “Test Control,” for the licensee’s failure to ensure that station test procedures incorporated all requirements contained in applicable design documents. Specifically, the station’s test procedures for the component cooling water system failed to test the safeguards loops supply and return train isolation valves for leakage. Excess leakage from these valves could prevent the performance of a safety function. This finding was entered into the licensee’s corrective action program as Condition Report CR-2017-012024.</p>			

Failure to Provide an Adequate Procedure			
Cornerstone	Significance	Cross-cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000445/2018001-03; 05000446/2018001-03 Closed	None	71152 - Problem Identification and Resolution
<p>The inspectors identified a Green, non-cited violation of Technical Specification 5.4.1, "Procedures," associated with the licensee's failure to provide procedures appropriate to the circumstances. Specifically, station procedure INC-2085, "Rework and Replacement of I&amp;C Equipment," did not contain adequate instructions for wiring current to pressure (I/P) converters for safety related components which resulted in the steam generator atmospheric relief valve I/P converters being placed in a seismically unqualified configuration. This finding was entered into the licensee's corrective action program as Condition Report CR-2017-011922.</p>			

Inadequate Maintenance Procedure for Feedwater Valves			
Cornerstone	Significance	Cross-cutting Aspect	Report Section
Initiating Events	Green NCV 05000445/2018001-04; 05000446/2018001-04 Closed	None	71153 - Follow-up of Events and Notices of Enforcement Discretion
<p>The inspectors reviewed a self-revealed Green, non-cited violation of Technical Specification 5.4.1, "Procedures," associated with the licensee's failure to prescribe adequate procedures for performing maintenance on the feedwater bypass control valves. Specifically, the licensee's procedure failed to specify the correct torque on the handwheel screw locknut, resulting in a loose locknut which led to a control valve failure and a turbine trip. This finding was entered into the licensee's corrective action program as Condition Report CR-2017-009139.</p>			

Failure to Correct a Significant Condition Adverse to Quality			
Cornerstone	Significance	Cross-cutting Aspect	Report Section
Initiating Events	Green NCV 05000445/2018001-05; 05000446/2018001-05 Closed	P.2 – Problem Identification and Resolution, Evaluation	71153- Follow-up of Events and Notices of Enforcement Discretion
<p>The inspectors identified a Green, non-cited violation of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," associated with the licensee's failure to take corrective action for the identified cause of a significant condition adverse to quality. Specifically, a feedwater bypass control valve vibrated open resulting in a turbine trip and initiation of auxiliary feedwater. The licensee determined that the cause was an inadequate procedure for performing maintenance on the feedwater bypass control valves, but failed to correct the inadequate procedure after</p>			

identifying it as the cause of a control valve failure and a turbine trip. This finding was entered into the licensee's corrective action program as Condition Report CR-2018-000959.

**Additional Tracking Items**

Type	Issue number	Title	Report Section	Status
LER	05000445;05000446/ 2017-001-00; 05000445;05000446/ 2017-001-01	Unanalyzed Condition Involving Teflon Installed in Containment Spray Pump Diaphragm Seal Assemblies	71153	Closed
LER	05000446/2017-001-00; 05000446/2017-001-01; 05000446/2017-001-02	Auxiliary Feedwater System Actuation During Unit 2 Turbine Trip	71153	Closed
LER	05000446/2017-002-00	Manual Reactor Trip Due to Dropped Rods	71153	Closed
LER	05000446/2017-003-00	Manual Reactor Trip due to trip of both Main Feedwater Pumps	71153	Closed
VIO	05000445/2015008-01; 05000446/2015008-01	Failure to Evaluate the Lack of Missile Protection on the Turbine Driven Auxiliary Feedwater Pumps' Steam Exhaust Piping	92702	Closed

## PLANT STATUS

Unit 1 began the inspection period at approximately 100 percent power, and operated at full power for the rest of the inspection period.

Unit 2 began the inspection period at approximately 100 percent power, and operated at full power for the rest of the inspection period.

## 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 performed plant status activities described in IMC 2515 Appendix D, "Plant Status" and conducted routine reviews using IP 71152, "Problem Identification and Resolution." 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.

## REACTOR SAFETY

### 71111.01 - Adverse Weather Protection

#### Impending Severe Weather (1 Sample)

The inspectors evaluated readiness for impending adverse weather conditions for severe thunderstorms on March 19, 2018.

### 71111.04 - Equipment Alignment

#### Partial Walkdown (3 Samples)

The inspectors evaluated system configurations during partial walkdowns of the following systems/trains:

- (1) Unit 2 emergency diesel generator 2-01 while diesel generator 2-02 was out of service in an unplanned maintenance outage, on February 9, 2018
- (2) Unit 2 Train B sequencer equipment during Train A actuation testing, on February 21, 2018
- (3) Unit 1 coolant charging pump 1-02 while coolant charging pump 1-01 was out of service for maintenance, on March 21, 2018

#### Complete Walkdown (1 Sample)

The inspectors evaluated system configurations during a complete walkdown of the

Unit 1 emergency diesel generators system on March 14, 2018.

71111.05AQ—Fire Protection Annual/Quarterly

Quarterly Inspection (5 Samples)

The inspectors evaluated fire protection program implementation in the following selected areas:

- (1) Fire zone SG10a, Unit 1 emergency diesel generator A, on March 23, 2018
- (2) Fire zone SI12a, Unit 1 emergency diesel generator B, on March 23, 2018
- (3) Fire zone SH11, Unit 1 emergency diesel generator A day tank room, on March 23, 2018
- (4) Fire zone SJ13, Unit 1 emergency diesel generator B day tank room, on March 23, 2018
- (5) Fire zone EM63, Unit 2 cable spreading room, on March 26, 2018

71111.06—Flood Protection Measures

Internal Flooding (1 Sample)

The inspectors evaluated internal flooding mitigation protections in the Unit 2 emergency diesel generator rooms on March 14, 2018.

71111.11—Licensed Operator Requalification Program and Licensed Operator Performance

Operator Requalification (1 Sample)

The inspectors observed and evaluated a crew during a simulator evaluated scenario for licensed operator requalification training on February 27, 2018.

Operator Performance (1 Sample)

The inspectors observed and evaluated:

- (1) Unit 1 control room actions during testing of steam generator atmospheric relief valves, on March 6, 2018
- (2) Unit 1 control room operator's response to the unexpected lifting of power operated relief valve 455A, on March 20, 2018

71111.12—Maintenance Effectiveness

Routine Maintenance Effectiveness (2 Samples)

The inspectors evaluated the effectiveness of routine maintenance activities associated with the following equipment and/or safety significant functions:

- (1) Unit 1 emergency diesel generators, on March 6, 2018
- (2) Unit 1 and Unit 2 steam generator atmospheric relief valves, on March 20, 2018

Quality Control (1 Sample)

The inspectors evaluated maintenance and quality control activities associated with the following equipment performance issues:

- (1) Unit 1 and Unit 2 upgrade of series 200 diaphragm seals

71111.13—Maintenance Risk Assessments and Emergent Work Control (5 Samples)

The inspectors evaluated the risk assessments for the following planned and emergent work activities:

- (1) Unit 2 diesel generator 2-01 during unplanned maintenance on diesel 2-02, on January 11, 2018
- (2) Unit 1 train A service water/component cooling water outage, on January 23, 2018
- (3) Unit 2 component cooling water pump 2-02 recirculation flow control valve 2-HS-4537, on January 29, 2018
- (4) Unit 2 emergent maintenance on diesel generator 2-02 due to broken amphenol, on February 7, 2018
- (5) Unit 2 emergent maintenance on component cooling water pump 2-02 due to excessive shaft and bearing wear, on February 12, 2018

71111.15—Operability Determinations and Functionality Assessments (6 Samples)

The inspectors evaluated the following operability determinations and functionality assessments:

- (1) Unit 2, CR-2017-013643, 2-02 component cooling water heat exchange fouling, on January 8, 2018
- (2) Unit 1 and 2, CR-2017-010346, condensate storage tank level transmitter uncertainty, on January 10, 2018
- (3) Unit 1 and 2, IR-2018-000815, vent chiller X-04 liquid level too high, on January 30, 2018
- (4) Unit 2, CR-2018-000941, component cooling water pump 2-02 excessive shaft wear, on February 9, 2018
- (5) Unit 1, opening seismically qualified cabinet doors for maintenance, on February 15, 2018
- (6) Unit 1, CR-2018-001264, water in-leakage degrading concrete, on March 1, 2018

#### 71111.18—Plant Modifications (1 Sample)

The inspectors evaluated the following temporary or permanent modifications:

- (1) Unit 2, component cooling water pump 2-02 increase in thrust bearing locknut torque due to identified degraded condition, on February 13, 2018

#### 71111.19—Post Maintenance Testing (6 Samples)

The inspectors evaluated the following post maintenance tests:

- (1) Unit 2, diesel generator 2-02 following corrective maintenance, on January 16, 2018
- (2) Unit 2, diesel generator 2-02 following amphenol replacement, on February 9, 2018
- (3) Unit 2, component cooling water pump 2-02 following corrective maintenance, on February 12, 2018
- (4) Unit 2, centrifugal charging pump 2-01 following maintenance, on February 15, 2018
- (5) Unit 2, steam generator 2-03 atmospheric relief valve following wiring removal, on March 18, 2018
- (6) Unit 1, centrifugal charging pump 1-01 following maintenance, on March 28, 2018

#### 71111.22—Surveillance Testing

The inspectors evaluated the following surveillance tests:

##### Routine (4 Samples)

- (1) Unit 1, OPT-214A diesel generator 1-02, on January 12, 2018
- (2) Unit 2, OPT-214B diesel generator 2-02, on March 12, 2018
- (3) Unit 2, OPT-214B diesel generator 2-01, on March 22, 2018
- (4) Unit 1, OPT-414A, blackout sequencer logic test, on March 29, 2018

##### In-service (2 Samples)

- (1) Unit 2, OPT-208B, component cooling water pump 2-02 recirculation flow control valve 2-HS-4537, on January 30, 2018
- (2) Unit 2, OPT-509, in-service testing of main steam isolation valves, on March 15, 2018

#### 71114.06—Drill Evaluation

##### Emergency Planning Drill (1 Sample)

The inspectors evaluated an extended loss of AC power to Unit 1 drill on

February 14, 2018.

## **OTHER ACTIVITIES – BASELINE**

### 71151—Performance Indicator Verification (6 Samples)

The inspectors verified licensee performance indicators submittals listed below for the period from January 1 through December 31, 2017, for both Units 1 and 2:

- (1) IE01: Unplanned Scrams per 7000 Critical Hours Sample
- (2) IE03: Unplanned Power Changes per 7000 Critical Hours Sample
- (3) IE04: Unplanned Scrams with Complications (USwC) Sample

### 71152—Problem Identification and Resolution

#### Annual Follow-up of Selected Issues (2 Samples)

The inspectors reviewed the licensee's implementation of its corrective action program related to the following issues:

- (1) Unexpected lifting of steam generator atmospheric relief valves 1-PV-2327 and 2-PV-2327
- (2) Component cooling water supply cross connect valve leakage

### 71153—Follow-up of Events and Notices of Enforcement Discretion

#### Licensee Event Reports (4 Samples)

The inspectors evaluated the following licensee event reports which can be accessed at <https://lersearch.inl.gov/LERSearchCriteria.aspx>:

- (1) Licensee Event Report (LER) 05000445;05000446/2017-001-01, Unanalyzed Condition Involving Teflon Installed in Containment Spray Pump Diaphragm Seal Assemblies, on January 11, 2017 [revisions 00 and 01 reviewed]
- (2) LER 05000446/2017-001-02, Auxiliary Feedwater System Actuation During Unit 2 Turbine Trip, on August 11, 2017 [revisions 00, 01, and 02 reviewed]
- (3) LER 05000446/2017-002-00, Manual Reactor Trip Due to Dropped Rods, on September 1, 2017
- (4) LER 05000446/2017-003-00, Manual Reactor Trip due to trip of both Main Feedwater Pumps, on November 25, 2017

## OTHER ACTIVITIES – TEMPORARY INSTRUCTIONS, INFREQUENT AND ABNORMAL

### 92702—Followup on Traditional Enforcement Actions Including Violations, Deviations, Confirmatory Action Letters, Confirmatory Orders, and Alternative Dispute Resolution Confirmatory Orders

The inspectors reviewed the licensee’s response to NOV 05000445/2015008-01; 05000446/2015008-01 and determined that the reason, corrective actions taken and planned to address recurrence, and the date when full compliance will be achieved for this violation is adequately addressed and captured on the docket.

## INSPECTION RESULTS

Failure to Follow Commercial Grade Dedication Process			
Cornerstone	Significance	Cross-cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000445/2018001-01; 05000446/2018001-01 Closed	None	71111.12 - Maintenance Effectiveness
<p>The inspectors identified a Green, non-cited violation of 10 CFR Part 50, Appendix B, Criterion V, Instructions, Procedures, and Drawings, associated with the licensee’s failure to accomplish activities affecting quality in accordance with documented procedures. Specifically, the licensee upgraded the safety classification of Ashcroft series 200 diaphragms to safety related without following the requirements of station procedure ECE-6.02-03, “Critical Characteristics Development.”</p>			
<p><u>Description:</u> While reviewing information related to Licensee Event Report 05000445;05000446/2017-001-01, “Unanalyzed Condition Involving Teflon Installed in Containment Spray Pump Diaphragm Seal Assemblies,” inspectors reviewed the licensee’s root cause analyses documented in Condition Report CR-2016-010346. During this review inspectors noted that the licensee had upgraded previously installed commercial grade material to safety related. Specifically, Ashcroft series 200 diaphragms were supplied to the licensee during initial construction as non-safety related parts and installed in the centrifugal coolant charging pumps and positive displacement pumps suction and discharge pressure indicators as such. Subsequently, in 2003 the licensee determined that the diaphragm seals were in fact part of the safety related pressure boundary and were required to be safety related, and the licensee upgraded the Ashcroft series 200 diaphragms to safety related components due to seismic boundary concerns.</p> <p>However, the inspectors also noted that the licensee’s root cause analyses stated that the upgrade of the diaphragm seal assemblies did not appear to have resulted in any additional evaluation. Inspectors questioned this and asked for the licensee’s commercial grade dedication packages for the Ashcroft series 200 diaphragms. The licensee responded that they had not done a commercial grade dedication package because the diaphragms had been supplied as quality group C (safety related) by the vendor. Inspectors asked to see the vendor paperwork designating the components as quality group C but the licensee responded that they did not have copies of this paperwork and they would have to get it from the vendor.</p> <p>During subsequent discussions with the vendor, the licensee determine that the Ashcroft series 200 diaphragms were in fact provided as quality group C but this designation did not</p>			

mean they were safety related. In fact, the vendor specification sheet provided to the licensee designated quality group C as non-safety related commercial grade components. Based on this, the licensee determined that they had made errors in their assumptions when upgrading the diaphragms in 2003. Specifically, the licensee had made errors in their interpretation of what the vendor quality group designator meant, and they did not have copies of the appropriate specifications/paperwork when upgrading the diaphragm seal assemblies. The licensee initiated Condition Report CR-2016-009733 to capture this issue in the station's corrective action program. Subsequently, the licensee determined that there were approximately 29 additional Ashcroft series 200 diaphragms that had been inappropriately upgraded to safety related without commercial grade dedication packages.

Inspectors determined that had the licensee followed the requirements of station procedure ECE-6.02-03, "Critical Characteristics Development," when upgrading the Ashcroft series 200 diaphragms to safety related components this would have required them to review all applicable paperwork. As such, inspectors determined that the licensee's failure to follow procedural requirement resulted in non-safety related components being installed in a safety related application.

Corrective Action(s): The licensee performed an operability determination that established a reasonable expectation of operability pending additional corrective actions which include commercial grade dedication of the affected diaphragm seals.

Corrective Action Reference(s): CR-2016-009733 and CR-2017-007811

Performance Assessment:

Performance Deficiency: The licensee's failure to follow the requirements of procedure ECE-6.02-03 when upgrading the safety classification of material was a performance deficiency.

Screening: The inspectors determined the performance deficiency was more than minor because it adversely affected the equipment performance attribute of the Mitigating Systems Cornerstone and affected the cornerstone objective to ensure availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the use of unqualified materials could result in equipment not being available to function during design events such as response to a seismic event.

Significance: The inspectors assessed the significance of the finding using Inspection Manual Chapter 0609, Attachment 04, "Initial Characterization of Findings," dated October 7, 2016, and Inspection Manual Chapter 0609, Appendix A, "Significance Determination Process for Findings At-Power," Exhibit 4, "External Events Screening Questions," the inspectors determined the finding was of very low safety significance (Green) because the finding is a deficiency affecting the design or qualification of a mitigating system, structure, or component (SSC), but the SSC maintained its operability.

Cross-cutting Aspect: The inspectors determined that the performance deficiency occurred more than three years ago and was not indicative of current performance.

Enforcement:

Violation: Title 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," requires, in part, that activities affecting quality shall be accomplished in accordance with documented instructions, procedures, or drawings, of a type appropriate to

the circumstances. Procedure ECE-6.02-03, "Critical Characteristics Development," an Appendix B quality related procedure, provides instructions for the commercial grade dedication of materials and parts.

Contrary to the above, in 2003 when upgrading the safety classification of Ashcroft series 200 diaphragms to safety related, the licensee failed to accomplish activities affecting quality in accordance with documented instructions, procedures, or drawings, of a type appropriate to the circumstances. Specifically, the licensee failed to follow the requirements of procedure ECE-6.02-03 when upgrading the safety classification of material.

Disposition: This violation is being treated as a non-cited violation, consistent with Section 2.3.2 of the Enforcement Policy.

Failure to Incorporate Design Information Into System Test Procedures

Cornerstone	Significance	Cross-cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000445/2018001-02; 05000446/2018001-02 Closed	None	71152 - Problem Identification and Resolution

The inspectors identified a Green, non-cited violation of 10 CFR 50, Appendix B, Criterion XI, "Test Control," for the licensee's failure to ensure that station test procedures incorporated all requirements contained in applicable design documents. Specifically, the station's test procedures for the component cooling water system failed to test the safeguards loops supply and return train isolation valves for leakage. Excess leakage from these valves could prevent the performance of a safety function.

Description: During fill and vent activities on the B train safeguards loop of the Unit 1 component cooling water system on October 24, 2017, the licensee noted a system pressure rise and determined the cause to be leakage past safeguards loops train A and B isolation valves 1-HV-4513 and 1-HV-4515 (respectively). The component cooling water system has four valves that close on an empty level in the surge tank to separate the safeguards loops from each other and from the non-safeguards loop. The licensee initiated Condition Report CR-2017-011897 to capture this issue in the station's corrective action program.

The inspectors reviewed this condition report and noted that the licensee had determined that the leakage past the valves was approximately 40.3 gallons per minute (gpm). Inspectors noted that this exceeded the allowable leakage limit of 37 gpm and the licensee had performed an operability determination and determined that the valves were operable but degraded based on an engineering evaluation. During their review of the operability evaluation, the inspectors noted the following:

- Makeup to the surge tank is normally an automatic function; however, during events that result in a loss of instrument air, automatic makeup to the surge tank is lost and manual makeup is required but not assumed to start for 30 minutes following receipt of the empty alarm.
- When the surge tank reaches the empty level setpoint, this causes safeguards loops supply and return train isolation valves 1-HV-4512, 1-HV-4514, 1-HV-4513, and 1-HV-4515 to close which separates the safeguards loops from each other

and isolates them from the non-safeguards loop fast enough to prevent loss of inventory from at least one of the safeguards loops.

- The surge tank design analysis assumes a system leak rate of 1 gpm (0.4 gpm for Unit 2).
- Safeguards loop supply and return isolation valve design stroke time is 45 seconds.
- Worst case break is in the non-seismic piping in the non-safeguards loop (seismic event will result in a loss of offsite power which stops automatic makeup to the surge tank).
- Therefore, based on the operator response time and system leak rate the allowable train leakage limit is 37 gpm [10 gpm for Unit 2]. This ensures that there is adequate volume in the surge tank below the empty level to accommodate the water depletion due to postulated line break in the non-safeguard loop or the opposite train during the closing time of the isolation valves, without depleting the tank volume.
- The licensee used measured stroke time of the valves, 27 seconds for both valves, as the assumed closing time and determined that the allowed train leakage was 46 gpm.

Inspectors also noted that previously the licensee had experienced a similar issue. Specifically, on May 15, 2016, during train A restoration activities, the licensee identified that train A and B isolation valves 1-HV-4512 and 1-HV-4514 (respectively) were leaking by at approximately 43.55 gpm.

Inspectors questioned how the licensee was monitoring the system for leakage and queried the licensee about what testing is done on the system. The licensee responded that walk downs were done looking for leakage. Inspectors asked if the licensee performed train leakage test since the supply and return isolation valves were potential leak paths that could not be identified by walk down. The licensee responded that no testing looking for leaks was conducted, nor did the licensee believe they were required to do so.

However, following a review of the station's Updated Final Safety Analysis Report, Chapters 3 and 9, the inspectors determined that:

- The component cooling water system and its safeguards loop components are required to withstand the effects of natural phenomena, such as seismic events, without loss of capability to perform its safety function [remove heat from safeguards loop components]. Therefore, one of the safeguards loops of the component cooling water system is required to remain operational during and following a failure of a non-seismic component in the non-safeguards loop following a seismic event assuming a single failure in the other loop [makes that loop unavailable].
- The closure time of the safeguards loop isolation valves and the train leakage limit are design requirements since they affect the ability of the system to perform its safety function.

Further, Title 10 CFR 50, Appendix B, Criterion XI requires, in part, that a test program shall be established to assure that all testing required to demonstrate that structures, systems, and components will perform satisfactorily in service is identified and performed in accordance with written test procedures which incorporate the requirements and acceptance limits contained in applicable design documents.

Based on this, inspectors determined that the licensee's practice of walking down the component cooling water system looking for leakage was not adequate and that the licensee should be testing the safeguards loops for leakage since leakage past the loop isolation valves could prevent the system from performing its safety function. Inspectors determined that this was applicable to both units.

Inspectors determined that this issue did not represent current performance because the licensee had not reviewed nor revised the testing methodology for the system in the last three years.

Corrective Action(s): The licensee performed an operability determination that established a reasonable expectation of operability pending development of additional corrective actions.

Corrective Action Reference(s): Condition Report CR-2017-012024

Performance Assessment:

Performance Deficiency: The licensee's failure to incorporate design information into system test procedures was a performance deficiency.

Screening: The inspectors determined the performance deficiency was more than minor because it adversely affected the equipment performance attribute of the Mitigating Systems cornerstone and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, not monitoring for system leakage could result in a leak rate that would prevent the performance of system safety function.

Significance: The inspectors assessed the significance of the finding using Inspection Manual Chapter 0609, Attachment 04, "Initial Characterization of Findings," dated October 7, 2016, and Inspection Manual Chapter 0609, Appendix A, "Significance Determination Process for Findings At Power," Exhibit 2, "Mitigating Systems Screening Questions," the inspectors determined the finding was of very low safety significance (Green) because: (1) it was not a design deficiency; (2) it did not represent a loss of system and/or function; (3) it did not represent an actual loss of function of at least a single train for longer than its technical specification allowed outage time; and (4) it did not result in the loss of a high safety significant nontechnical specification train.

Cross-cutting Aspect: The finding was not assigned a cross-cutting aspect because the performance deficiency was not reflective of current performance.

Enforcement:

Violation: Title 10 CFR Part 50, Appendix B, Criterion XI, "Test Control," requires, in part, that a test program shall be established to assure that all testing required to demonstrate components will perform satisfactorily in service is identified and performed in accordance with written procedures which incorporate the requirements and acceptance limits contained in applicable design documents.

Contrary to the above, from initial construction until present, the licensee failed to established a test program to assure that all testing required to demonstrate components will perform satisfactorily in service is identified and performed in accordance with written procedures which incorporate the requirements and acceptance limits contained in applicable design documents. Specifically, the licensee failed to incorporate design information into system test procedures for the component cooling water system relative to leak testing for the safeguards loops supply and return train isolation valves.

Disposition: This violation is being treated as a non-cited violation, consistent with Section 2.3.2 of the Enforcement Policy.

Failure to Provide Adequate Procedure

Cornerstone	Significance	Cross-cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000445/2018001-03; 05000446/2018001-03 Closed	None	71152 - Problem Identification and Resolution

The inspectors identified a Green, non-cited violation of Technical Specification (TS) 5.4.1, "Procedures," associated with the licensee's failure to provide procedures appropriate to the circumstances. Specifically, station procedure INC-2085, "Rework and Replacement of I&C Equipment," did not contain adequate instructions for wiring current-to-pressure (I/P) converters for safety related components which resulted in the steam generator atmospheric relief valve I/P converters being placed in a seismically unqualified configuration.

Description: On October 24, 2017, it was reported to the control room that steam generator 2-03 atmospheric dump valve 2-PV-2327 was leaking. The valve was found to be open approximately 20 percent. This issue was entered into the corrective action program as Condition Report CR-2017-011922. During the licensee's investigation they noted that work had been going on in the vicinity of the I/P converter for valve 2-PV-2327 and that maintenance workers had inadvertently struck the housing for the I/P converter with a scaffold pole. The licensee also found that the I/P converter output settings were high. When the licensee removed the cover of the converter they discovered that excess lead wires stored in the housing were in contact with moveable parts of the converter which caused valve 2-PV-2327 to open. The licensee moved the lead wires so they were no longer in contact with the moveable parts of the I/P converter.

Subsequently, on October 30, 2017, operators noted that steam generator 1-03 atmospheric dump valve 1-PV-2327 was not indicating fully shut as demanded. The valve was found to be open approximately 20 percent. This issue was entered into the corrective action program as Condition Report CR-2017-012141. During the licensee's investigation they noted that work had been going on in the vicinity of the I/P converter for valve 1-PV-2327 and that maintenance workers had inadvertently struck the housing for the I/P converter with a scaffold pole. The licensee also found that the I/P converter output settings were high. When the licensee removed the cover of the converter they discovered that excess lead wires stored in the housing were in contact with moveable parts of the converter which caused valve 1-PV-2327 to open. The licensee moved the lead wires so they were no longer in contact with the moveable parts of the I/P converter.

The licensee performed an equipment cause analysis checklist and determined that inadequate work practices was the cause of the issues. Inspectors questioned the licensee's identified cause in that that both issues appeared to happen after the housing for the converters was struck with a scaffold pole, and raised concerns regarding seismic qualification of the converters.

These concerns were expressed to the licensee who subsequently determined that the excess wiring in the converter housing was not in a qualified seismic configuration. The licensee determined that this configuration had existed most likely since initial installation of the I/P converters and this was due to inadequate guidance provided in station procedure INC-2085, "Rework and Replacement of I&C Equipment," for maintenance personnel regarding proper storage of excess field leads. Specifically, the procedure did not provide sufficient guidance to ensure that electrical lead wire or other components within the I/P converter were sufficiently secured to preclude contact with the moveable parts of the I/P converter, in order to ensure the function and seismic qualification of the components were maintained.

Corrective Action(s): The licensee performed an operability determination that established a reasonable expectation of operability, developed work orders to remove the excess wiring from the converters, and changed procedure INC-2085 to not allow excess wiring in the converter housing.

Corrective Action Reference(s): Condition Report CR-2017-011922

Performance Assessment:

Performance Deficiency: The licensee's failure to prescribe adequate procedures to perform quality related activities associated with the steam generator atmospheric relief valve I/P converters was a performance deficiency.

Screening: The inspectors determined the performance deficiency was more than minor because it adversely affected the equipment performance attribute of the Mitigating Systems cornerstone and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the improper training of the lead wires resulted in the I/P converters being in a non-seismically qualified configuration.

Significance: The inspectors assessed the significance of the finding using Inspection Manual Chapter 0609, Attachment 04, "Initial Characterization of Findings," dated October 7, 2016, and Inspection Manual Chapter 0609, Appendix A, "Significance Determination Process for Findings At-Power," Exhibit 2, "Mitigating Systems Screening Questions," the inspectors determined the finding was of very low safety significance (Green) because: (1) it was not a design deficiency; (2) it did not represent a loss of system and/or function; (3) it did not represent an actual loss of function of at least a single train for longer than its technical specification allowed outage time; and (4) it did not result in the loss of a high safety significant non-technical specification train.

Cross-cutting Aspect: The finding was not assigned a cross-cutting aspect because the performance deficiency was not reflective of current performance.

Enforcement:

Violation: Technical Specification 5.4.1.a states, in part, that written procedures shall be established, implemented, and maintained covering the applicable procedures recommended in Regulatory Guide 1.33, Revision 2, Appendix A, February 1978. Regulatory Guide 1.33, Appendix A, Section 9.a, requires that maintenance that can affect the performance of safety-related equipment be performed in accordance with written procedures appropriate to the circumstances.

Contrary to the above, from initial installation through March 13, 2018, for maintenance activities on steam generator atmospheric relief valve I/P converters, an activity that can affect the performance of safety-related equipment to which Technical Specification 5.4.1.a applies, the licensee failed to assure that the maintenance procedures were appropriate to the circumstances.

Disposition: This violation is being treated as a Non-Cited Violation, consistent with Section 2.3.2 of the Enforcement Policy.

Inadequate Maintenance Procedure for Feedwater Valves			
Cornerstone	Significance	Cross-cutting Aspect	Report Section
Initiating Events	Green NCV 05000445/2018001-04; 05000446/2018001-04 Closed	None	71153 - Follow-up of Events and Notices of Enforcement Discretion
The inspectors reviewed a self-revealed, Green non-cited violation of TS 5.4.1, "Procedures," associated with the licensee's failure to prescribe adequate procedures for performing maintenance on the feedwater bypass control valves. Specifically, the licensee's procedure failed to specify the correct torque on the hand wheel screw locknut, resulting in a loose locknut which led to a control valve failure and a turbine trip.			
<p><u>Description:</u> During the Unit 2 startup on August 11, 2017, following a forced outage, a turbine trip and initiation of auxiliary feedwater occurred when attempting to place the main generator on the grid. The turbine trip and initiation of auxiliary feedwater was caused by steam generator 2-02 water level rising above the high level setpoint due to a failure of the steam generator 2-02 feedwater bypass control valve 2-LV-2163 to close on demand. These valves are equipped with a valve hand wheel locknut designed to prevent the manual hand wheel from rotating due to vibration. The valve failed to close because the valve hand wheel locknut had backed off its normal fully closed position allowing the manual hand wheel to rotate open and preventing the valve from closing. The licensee performed a review of work history on the valve and identified work activities during which the locknut was manipulated.</p> <p>The licensee determined that the locknut was last manipulated during replacement of the 2-LV-2163 elastomers on October 15, 2015. The work was done in accordance with MSM-C0-6602, "Fisher Diaphragm Actuator Maintenance," Section 8.5. The guidance in MSM-C0-6602 section 8.5, step 8.5.43 states to "TIGHTEN hand wheel screw locknut," but does not include specific acceptance criteria or guidance on the required torque to apply when tightening. For comparison, MSM-C0-6602 section 8.4 also includes a step to tighten the locknut, but states "TIGHTEN hand wheel screw locknut snug tight." The phrase "snug</p>			

tight” is used by licensee maintenance personnel to denote a qualitative torque value to apply to a component to ensure it will not come loose during normal operation. The licensee determined that the locknut needed to be left “snug tight,” and that the guidance in section 8.5 was not adequate. The inspectors determined that the inadequate procedural guidance had existed in the procedure since October 2007.

Inspectors determined that the failure of steam generator 2-02 feedwater bypass control valve 2-LV-2163 to close on demand was a significant condition adverse to quality because this issue resulted in a turbine trip and initiation of auxiliary feedwater, and could have resulted in a reactor scram

Corrective Action(s): The licensee verified all feedwater bypass control valve locknuts have been properly tightened in accordance with the appropriate qualitative torque value of “snug tight.”

Corrective Action Reference(s): CR-2017-009139

Performance Assessment:

Performance Deficiency: The licensee’s failure to prescribe adequate procedures to perform quality related activities associated with the feedwater bypass control valves was a performance deficiency.

Screening: The inspectors determined the performance deficiency was more than minor because it adversely affected the procedure quality attribute of the Initiating Events Cornerstone and affected the cornerstone objective to limit the likelihood of events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, the inadequate procedure resulted in a failure of a feedwater bypass control valve leading to an unplanned turbine trip and initiation of auxiliary feedwater.

Significance: The inspectors assessed the significance of the finding using Inspection Manual Chapter 0609, Attachment 04, “Initial Characterization of Findings,” dated October 7, 2016, and Inspection Manual Chapter 0609, Appendix A, Exhibit 1, “Initiating Events Screening Questions,” the inspectors determined the finding was of very low safety significance (Green) because it did not cause a reactor trip and the loss of mitigation equipment relied upon to transition the plant to a stable shutdown condition.

Cross-cutting Aspect: The finding was not assigned a cross-cutting aspect because the performance deficiency was not reflective of current performance.

Enforcement:

Violation: Technical Specification 5.4.1.a states, in part, that written procedures shall be established, implemented, and maintained covering the applicable procedures recommended in Regulatory Guide 1.33, Revision 2, Appendix A, February 1978. Regulatory Guide 1.33, Appendix A, Section 9.a, requires that maintenance that can affect the performance of safety-related equipment be performed in accordance with written procedures appropriate to the circumstances.

Contrary to the above, from October 2007 through August 2017, for maintenance activities on the feedwater bypass control valves, an activity that can affect the performance of safety-related equipment to which Technical Specification 5.4.1.a applies, the licensee failed to assure that the maintenance procedures were appropriate to the circumstances.

Disposition: This violation is being treated as a non-cited violation, consistent with Section 2.3.2 of the Enforcement Policy.

Failure to Correct a Significant Condition Adverse to Quality

Cornerstone	Significance	Cross-cutting Aspect	Report Section
Initiating Events	Green NCV 05000445/2018001-05; 05000446/2018001-05 Closed	P.2 – Problem Identification and Resolution, Evaluation	71153 - Follow-up of Events and Notices of Enforcement Discretion

The inspectors identified a Green, non-cited violation of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," associated with the licensee's failure to take corrective action to preclude repetition of a significant condition adverse to quality. Specifically, a feedwater bypass control valve vibrated open resulting in a turbine trip and initiation of auxiliary feedwater. The licensee determined that the cause was an inadequate procedure for performing maintenance on the feedwater bypass control valves, but failed to correct the inadequate procedure after identifying it as the cause of a control valve failure and a turbine trip.

Description: During the Unit 2 startup on August 11, 2017, following a forced outage, a turbine trip and initiation of auxiliary feedwater occurred when attempting to place the main generator on the grid (refer to NCV 05000445/2018001-04; 05000446/2018001-04 above).

The turbine trip and initiation of auxiliary feedwater was caused by steam generator 2-02 water level rising above the high level setpoint due to a failure of the steam generator 2-02 feedwater bypass control valve 2-LV-2163 to close on demand. Inspectors determined that this was a significant condition adverse to quality because this issue resulted in a turbine trip and initiation of auxiliary feedwater, and could have resulted in a reactor scram.

The licensee determined that the valve failed to close because the valve hand wheel locknut had backed off its normal fully closed position, preventing the valve from closing. The licensee performed a cause evaluation and identified that MSM-C0-6602, "Fisher Diaphragm Actuator Maintenance," contained inadequate guidance for restoration of the valve following maintenance. The guidance in MSM-C0-6602 section 8.5, step 8.5.43 states to "TIGHTEN hand wheel screw locknut," but does not include specific acceptance criteria or guidance on the required torque to apply when tightening. Section 8.5 is used to perform elastomer replacement on these valves and was last used on 2-LV-2163 during replacement of the elastomers on October 15, 2015. Although the procedure contained inadequate guidance in section 8.5, the procedure also contains a section for general reassembly of the valve. MSM-C0-6602 section 8.4 includes a step to tighten the locknut, but states "TIGHTEN hand wheel screw locknut snug tight." The phrase "snug tight" is used by licensee maintenance personnel to denote a qualitative torque value to apply to a component to ensure it will not come loose during normal operation. The licensee, in developing their corrective action plan, conflated section 8.4 and 8.5 and erroneously credited the correct step in section 8.4 as a corrective action for the inadequate step in section 8.5. The licensee assumed the corrective action had been completed during a procedural revision in 2012, and closed the corrective action plan without correcting section 8.5.

The inspectors reviewed the cause evaluation and corrective actions and identified that the licensee had failed to correct the inadequate procedure. The inspectors determined that MSM-C0-6602 section 8.5, step 8.5.43 was not revised, and no action was planned to revise it. The inspectors determined this to be a result of the licensee's cause evaluation failing to identify the specific inadequate procedural step that caused the failure and as a result did not correct the deficiency.

The inspectors determined that the licensee had failed to implement corrective actions to preclude repetition of a significant condition adverse to quality.

Corrective Action(s): The licensee has verified all feedwater bypass control valve locknuts have been properly tightened, and changed procedure MSM-C0-6602, "Fisher Diaphragm Actuator Maintenance," step 8.5.43 to require the locknut to be tightened snug tight.

Corrective Action Reference(s): CR-2018-000959

Performance Assessment:

Performance Deficiency: The licensee's failure to implement corrective actions to preclude repetition of a significant condition adverse to quality was a performance deficiency.

Screening: The inspectors determined the performance deficiency was more than minor because it adversely affected the procedure quality attribute of the Initiating Events Cornerstone and affected the cornerstone objective to limit the likelihood of events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, the inadequate procedure could reasonably be expected to result in another failure of the control valve and subsequent turbine trip.

Significance: The inspectors assessed the significance of the finding using Inspection Manual Chapter 0609, Attachment 04, "Initial Characterization of Findings," dated October 7, 2016, and Inspection Manual Chapter 0609, Appendix A, Exhibit 1, "Initiating Events Screening Questions," the inspectors determined the finding was of very low safety significance (Green) because it did not cause a reactor trip and the loss of mitigation equipment relied upon to transition the plant to a stable shutdown condition.

Cross-cutting Aspect: The finding was assigned a cross-cutting aspect of evaluation because the licensee did not thoroughly evaluate issues to ensure that resolutions address causes and extent of conditions commensurate with their safety significance. (P.2)

Enforcement:

Violation: 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," requires, in part, that, for significant conditions adverse to quality, measures shall assure that the cause of the condition is determined and corrective action taken to preclude repetition.

Contrary to the above, from August 2017 through February 2018, the licensee failed to establish measures to assure corrective action was taken to preclude repetition of a significant condition adverse to quality. Specifically, the licensee failed to correct the cause of the event by correcting the inadequate maintenance procedure for the feedwater bypass control valves.

Disposition: This violation is being treated as a non-cited violation, consistent with Section 2.3.2 of the Enforcement Policy.

## **EXIT MEETINGS AND DEBRIEFS**

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

The inspectors confirmed that proprietary information was controlled to protect from public disclosure.

On March 31, 2018, the inspectors presented the quarterly resident inspector inspection results to Mr. T. McCool, Site Vice President, and other members of the licensee staff.

## **THIRD PARTY REVIEWS**

Inspectors reviewed Institute of Nuclear Power Operations reports that were issued during the inspection period.

## DOCUMENTS REVIEWED

### 711112 – Maintenance Effectiveness

#### Condition Reports

CR-2016-009733	CR-2017-007811	CR-2016-010346	CR-2016-008375
CR-2003-000664			

#### Procedures

(Number)	Title	Revision Or Date
ECE-6.02-03	Critical Characteristics Development	5b

### 71152 – Problem Identification and Resolution

#### Condition Reports

CR-2017-012024	CR-2017-011897	CR-2016-004715	CR-2017-011922
CR-2017-012141	CR-2017-012144	CR-2018-000909	CR-2017-011944
CR-2018-002058	CR-2018-001629		

#### Work Orders

3793710	3505655	3793738	3-01-330488-02
3-01-330490-02	3-01-332709-01	3-01-330492-02	4793333
5516071	5435660	5520265	5520201
4925302	5520253		

#### Procedures

(Number)	Title	Revision Or Date
MSM-C0-8837	Fisher Butterfly Valve Rework	0
ICA-101	I&C Work Control	7
INC-2085	Rework and Replacement of I&C Equipment	5
INC-4270A	Channel Calibration Power Relief Valve Control Steam Generator 3 Channel 2327	5

#### Miscellaneous Documents

Number	Title	Revision or Date
ME(B)-073	CCW Surge Tank Volume	3
SEQSP-MS-78-01	Fisher Air Operated Globe Valve Model 8X6 EWP	0

### 71153 – Follow-up of Events and Notices of Enforcement Discretion

#### Condition Reports

CR-2017-009139	CR-2018-000959	CR-2013-006702	CR-2017-005448
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#### Procedures

(Number)	Title	Revision Or Date
MSM-C0-6602	Fisher Diaphragm Actuator Maintenance	4

COMANCHE PEAK NUCLEAR POWER PLANT – NRC INTEGRATED INSPECTION REPORT  
05000445/2018001 AND 05000446/2018001 – DATED MAY 8, 2018

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Electronic Distribution for Comanche Peak Nuclear Power Plant

**ADAMS ACCESSION NUMBER: ML18127A572**

<input checked="" type="checkbox"/> SUNSI Review By: MSH/rdp		ADAMS <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		<input checked="" type="checkbox"/> Non-Sensitive <input type="checkbox"/> Sensitive		<input checked="" type="checkbox"/> Publicly Available <input type="checkbox"/> Non-Publicly Available		Keyword: NRC-002	
OFFICE	SRI:DRP/A	RI:DRP/A	SPE:DRP/A	BC:EB1	BC:EB2	BC:OB			
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DATE	04/30/18	04/30/18	04/27/18	04/26/18	04/26/18	04/26/18			
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