



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**
REGION IV
1600 E. LAMAR BLVD.
ARLINGTON, TX 76011-4511

February 3, 2017

Mr. Ken Peters, Senior Vice President
and Chief Nuclear Officer
TEX Operations Company LLC
Attention: Regulatory Affairs
P.O. Box 1002
Glen Rose, TX 76043

**SUBJECT: COMANCHE PEAK NUCLEAR POWER PLANT – NRC INTEGRATED
INSPECTION REPORT AND INDEPENDENT SPENT FUEL STORAGE
INSTALLATION (ISFSI) INSPECTION REPORT 05000445/2016004 and
05000446/2016004 AND 07200074/2016001**

Dear Mr. Peters:

On December 31, 2016, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Comanche Peak Nuclear Power Plant, Units 1 and 2. On January 5, 2017, the NRC inspectors discussed the results of this inspection with Mr. Steven Sewell, Senior Director for Engineering and Regulatory Affairs, and other members of your staff. Inspectors documented the results of this inspection in the enclosed inspection report.

NRC inspectors documented two findings of very low safety significance (Green) in this report. Both of these findings involved violations of NRC requirements.

Further, inspectors documented two licensee-identified violations which were determined to be of very low safety significance in this report. The NRC is treating these violations as non-cited violations (NCVs) consistent with Section 2.3.2.a of the NRC 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, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; 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 Regional Administrator, Region IV; and the NRC resident inspector at the Comanche Peak Nuclear Power Plant.

In accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) 2.390, "Public Inspections, Exemptions, Requests for Withholding," a copy of this letter, its enclosure, and your response (if any) will be made available electronically for public inspection in the NRC's Public Document Room or the NRC's Agencywide Documents Access and Management System (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>. To the extent possible, your response, if any, should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the public without redaction.

Sincerely,

/RA/

Jeremy R. Groom, Chief
Project Branch A
Division of Reactor Projects

Docket Nos. 05000445,
05000446, and 07200074

License Nos. NPF-87 and NPF-89

Enclosure:
Inspection Report 05000445/2016004 and
05000446/2016004 and 07200074/2016001
w/ Attachment: Supplemental Information

COMANCHE PEAK NUCLEAR POWER PLANT – NRC INTEGRATED INSPECTION REPORT
AND INDEPENDENT SPENT FUEL STORAGE INSTALLATION (ISFSI) INSPECTION
REPORT 05000445/2016004 and 05000446/2016004 AND 07200074/2016001 DATED
FEBRUARY 3, 2017

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U.S. NUCLEAR REGULATORY COMMISSION

REGION IV

Docket: 05000445, 05000446, 07200074

License: NPF-87, NPF-89

Report: 05000445/2016004 and 05000446/2016004 and 07200074/2016001

Licensee: TEX Operations Company, LLC

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

Location: 6322 N. FM-56, Glen Rose, Texas

Dates: October 1 through December 31, 2016

Inspectors: J. Josey, Senior Resident Inspector
R. Kumana, Acting Senior Resident Inspector
W. Gardner, Acting Resident Inspector
L. Brandt, Project Engineer
K. Clayton, Senior Operations Engineer
T. Farina, Senior Operations Engineer
E. Simpson, Lead ISFSI Inspector, FCDB
J. Tapp, ISFSI Vendor Inspector, NMSS/DSFM

Approved By: Jeremy R. Groom
Chief, Project Branch A
Division of Reactor Projects

Enclosure

SUMMARY

IR 05000445/2016004 and 05000446/2016004 and 07200074/2016001; 10/01/2016 – 12/31/2016; Comanche Peak Nuclear Power Plant and Independent Spent Fuel Storage Installation; Equipment Alignment; Maintenance Effectiveness

The inspection activities described in this report were performed between October 1 and December 31, 2016, by the resident inspectors at the site and inspectors from the NRC's Region IV office and other NRC offices. Two findings of very low safety significance (Green) are documented in this report. Both of these findings involved violations of NRC requirements. The significance of inspection findings is indicated by their color (Green, White, Yellow, or Red), which is determined using Inspection Manual Chapter 0609, "Significance Determination Process." Their cross-cutting aspects are determined using Inspection Manual Chapter 0310, "Aspects within the Cross-Cutting Areas." Violations of NRC requirements are dispositioned in accordance with the NRC Enforcement Policy. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process."

Cornerstone: Mitigating Systems

- Green. The inspectors identified a non-cited violation of 10 CFR 50.65(b)(2) associated with the licensee's failure to scope the containment ventilation system into the maintenance rule program. Specifically, the containment ventilation system, a non-safety related system that is relied upon to mitigate accidents or transients and used in emergency operating procedures, was not included in the scope of the monitoring program specified in 10 CFR 50.65(a)(1). In response to this issue the licensee scoped the system in the plants' maintenance rule monitoring program, and placed the equipment under 10 CFR 50.65(a)(1) monitoring requirements pending further review. The licensee entered this issue into the corrective action program as CR-2016-008491.

The failure to monitor the performance and condition of a system that meets the maintenance rule scoping criteria of 10 CFR 50.65(b)(2) is the performance deficiency. The performance deficiency was more than minor, and therefore a finding, because it was associated with 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. Using Inspection Manual Chapter 0609, Attachment 04, "Initial Characterization of Findings," dated July 1, 2012, and Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," dated October 7, 2016, Exhibit 2, "Mitigating Systems Screening Questions," the inspectors determined the finding affected the Mitigating Systems cornerstone and was of very low safety significance (Green), because the finding did not represent a loss of system function and the system was not designated as high safety-significant in accordance with the licensee's maintenance rule program. The finding has a human performance cross-cutting aspect associated with avoiding complacency, in that, the licensee failed to ensure that individuals recognized and planned for the possibility of mistakes and latent issues when re-evaluating the basis for excluding the system [H.12]. (Section 1R12)

Cornerstone: Barrier Integrity

- Green. The inspectors identified a non-cited violation of 10 CFR 50, Appendix B, Criterion XI, "Test Control," for the licensee's failure to evaluate inservice testing results of a power operated relief valve (PORV). Specifically, the licensee restored a unit 1 PORV to service that did not meet its specified opening time, which resulted in the inoperability of the low temperature overpressure protection (LTOP) system. Following maintenance on PORV 1-PCV-455A during October 2014, the licensee performed stroke time testing on the valve, but failed to recognize that the valve exceeded its test acceptance criteria until it failed again in May 2016. The licensee entered this issue into the corrective action program as CR-2016-003920.

The failure to evaluate test results to ensure they met test requirements is a performance deficiency. The performance deficiency was more than minor, and therefore a finding, because it was associated with the Reactor Coolant System Equipment and Barrier Performance attribute of the Barrier Integrity cornerstone and affected the cornerstone objective to provide reasonable assurance that physical design barriers protect the public from radionuclide releases caused by accidents or events. Using Inspection Manual Chapter 0609, Attachment 04, "Initial Characterization of Findings," dated October 7, 2016, Inspection Manual Chapter 0609, Appendix G, "Shutdown Operations Significance Determination Process," dated May 9, 2014, and Appendix G Attachment 1, "Phase 1 Initial Screening and Characterization of Findings," Exhibit 4, "Barrier Integrity Screening Questions," the inspectors determined the finding affected the Barrier Integrity cornerstone and required a detailed risk evaluation because the finding involved the unavailability of a PORV during LTOP operations. Using the assumption that the slow opening time prevents the PORV from fulfilling its LTOP system function, a senior reactor analyst performed a bounding qualitative assessment, using Inspection Manual Chapter 0609, Appendix G, "Shutdown Operations Significance Determination Process." The influential assumptions used by the senior reactor analyst included an exposure time of approximately 9 hours and that the licensee maintained the availability of a single additional relief valve with capability sufficient to mitigate an LTOP event as described in the final safety analysis report. Using these assumptions, the senior reactor analyst determined that a bounding increase in core damage frequency for this issue was $1.45\text{E-}8$ per year and was therefore, of very low safety significance (Green). The finding has a human performance cross-cutting aspect associated with work management, in that, the licensee failed to ensure that the work process includes the need for coordination with different groups or job activities [H.5]. (Section 1R04)

Licensee-Identified Violations

Violations of very low safety significance that were identified by the licensee have been reviewed by the inspectors. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program. These violations and associated corrective action tracking numbers are listed in Section 4OA7 of this report.

PLANT STATUS

Unit 1 began the inspection period at full power. On November 19, 2016, unit 1 reduced power to 70 percent reactor power due to turbine overspeed protection system testing. Unit 1 was returned to full power 10 hours later on the same date, and operated at or near full power for the remainder of this inspection period.

Unit 2 began the inspection period at 70 percent power. On September 30, 2016, unit 2 reduced power to 70 percent reactor power due to turbine overspeed protection system testing. Unit 2 was returned to full power 5 hours later on October 1, 2016, and operated at or near full power for the remainder of this inspection period.

REPORT DETAILS

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather Protection (71111.01)

.1 Readiness for Seasonal Extreme Weather Conditions

a. Inspection Scope

On December 22, 2016, the inspectors completed an inspection of the station's readiness for seasonal extreme weather conditions. The inspectors reviewed the licensee's adverse weather procedures for seasonal low temperatures and evaluated the licensee's implementation of these procedures. The inspectors verified that prior to the onset of cold weather, the licensee had corrected weather-related equipment deficiencies identified during the previous cold weather season.

The inspectors selected three risk-significant systems that were required to be protected from cold weather:

- Emergency diesel generators
- Primary plant ventilation
- Service water

The inspectors reviewed the licensee's procedures and design information to ensure the systems would remain functional when challenged by adverse weather. The inspectors verified that operator actions described in the licensee's procedures were adequate to maintain readiness of these systems. The inspectors walked down portions of these systems to verify the physical condition of the adverse weather protection features.

These activities constituted one sample of readiness for seasonal adverse weather, as defined in Inspection Procedure 71111.01.

b. Findings

No findings were identified.

1R04 Equipment Alignment (71111.04)

.1 Partial Walkdown

a. Inspection Scope

The inspectors performed partial system walk-downs of the following risk-significant systems:

- May 2, 2016, unit 1 low temperature overpressure protection system with one failed power operated relief valve
- December 1, 2016, unit 1 motor-driven auxiliary feedwater pumps with turbine-driven auxiliary feedwater pump out of service for maintenance
- December 4, 2016, unit 2 pressurizer level instrument system with one channel isolated

The inspectors reviewed the licensee's procedures and system design information to determine the correct lineup for the systems. They visually verified that critical portions of the systems or trains were correctly aligned for the existing plant configuration.

These activities constituted three partial system walk-down samples as defined in Inspection Procedure 71111.04.

b. Findings

Introduction. The inspectors identified a Green non-cited violation of 10 CFR 50, Appendix B, Criterion XI, "Test Control," for the licensee's failure to evaluate inservice testing results of a power operated relief valve (PORV). Specifically, the licensee restored a PORV to service on unit 1 that did not meet its specified opening time, which resulted in the inoperability of the low temperature overpressure protection (LTOP) system.

Description. During the unit 1 refueling outage in May 2016, the licensee tested the stroke time of PORV 1-PCV-455 as part of their inservice testing program. The valve opened in 2.30 seconds, which exceeded the two-second acceptance criteria for opening. The inspectors reviewed the system alignment for the licensee's LTOP system to determine whether the valve's failure affected the ability to protect the reactor vessel from overpressure events. The inspectors determined that, in October 2014, the licensee performed significant maintenance on PORV 1-PCV-455, including a replacement of the stem and plug assembly to correct previously identified seat leakage. The PORVs are Copes-Vulcan reverse-acting air-operated valves that use air pressure to lift the diaphragm assembly and stem assembly together to open the valve. To address the seat leakage, the maintenance personnel installed the new plug and stem with a slightly greater stem length in order to increase the seating force of the valve. The maintenance personnel also verified the clearance between the diaphragm assembly and the valve body was within the allowed specifications. However, the maintenance personnel did not realize that by increasing the seating force to the higher end of the allowed range, they also affected the time required to generate sufficient force in the diaphragm assembly to open the valve.

Following the October 2014 maintenance, the licensee performed stroke time testing on PORV 1-PCV-455, but failed to recognize that the valve exceeded its test acceptance criteria because the maintenance personnel were unaware of the required surveillance limit. The licensee performed an initial test on October 25, 2014, in which the valve opened at 2.38 seconds. The licensee's inservice test engineer considered this test to be a re-baselining of the valve's stroke time. However, the licensee operations personnel retested the valve on October 28, 2014, using two individuals to time the valve. One timer recorded a time of 2.00 seconds, but the other recorded a time of 2.16 seconds. Because the licensee considered the person who recorded 2.00 seconds to be the "primary" timer, the licensee documented the 2.00 second time as a successful test, and restored the valve to service on November 3, 2014, without taking additional actions to correct the slow opening stroke time.

The two-second opening stroke time is a key input assumption used in the vendor analysis for determining LTOP set points, and is a required safety specification for the valve when used as part of the LTOP system. The plant's technical specification in Limiting Condition for Operation 3.4.15, "Low Temperature Overpressure Protection (LTOP) System" requires pressure relief capability from two of four possible valves, either the residual heat removal suction relief valves or the PORVs, to be considered operable. Therefore, although the valve failed its test and was unable to support its LTOP system function from October 2014 to May 2016, the LTOP system was only inoperable when two of the three remaining valves were also unavailable. The licensee provided data on the history of the other valves and determined that the LTOP system was inoperable for two periods in 2014, totaling approximately nine hours. While the allowable outage time for the LTOP system under the plant conditions was 24 hours, the licensee failed to recognize that the LTOP system was inoperable until this was identified by the inspectors.

Following the failure in 2016, the licensee adjusted the clearance between the diaphragm and the valve body to ensure the air operator would generate enough force to open the valve within its surveillance limit. The inspectors reviewed the licensee's evaluation and determined that the licensee had indication that the valve would not meet its test acceptance criteria, but failed to evaluate the results and determine that the valve failed during testing in 2014. Specifically, the inservice testing engineer failed to recognize that the valve had a safety function to open within two seconds, and the maintenance personnel did not verify the valve's operation prior to releasing it to operations personnel. The licensee's maintenance, engineering, and operations personnel did not coordinate to ensure the valve was properly restored to service.

Analysis. The failure to evaluate test results to ensure they met test requirements was a performance deficiency. The performance deficiency was more than minor, and therefore a finding, because it was associated with the reactor coolant system equipment and barrier performance attribute of the Barrier Integrity cornerstone and affected the cornerstone objective to provide reasonable assurance that physical design barriers protect the public from radionuclide releases caused by accidents or events. Using Inspection Manual Chapter 0609, Attachment 04, "Initial Characterization of Findings," dated October 7, 2016, Inspection Manual Chapter 0609, Appendix G, "Shutdown Operations Significance Determination Process," dated May 9, 2014, and Appendix G Attachment 1, "Phase 1 Initial Screening and Characterization of Findings," Exhibit 4, "Barrier Integrity Screening Questions," the inspectors determined the finding

affected the Barrier Integrity cornerstone and required a detailed risk evaluation because the finding involved the unavailability of a PORV during LTOP operations.

Using the assumption that the slow opening time prevents the PORV from fulfilling its LTOP system function, a senior reactor analyst performed a bounding qualitative assessment, using Inspection Manual Chapter 0609, Appendix G, "Shutdown Operations Significance Determination Process." The influential assumptions used by the senior reactor analyst included an exposure time of approximately 9 hours and that the licensee maintained the availability of a single additional relief valve with capability sufficient to mitigate an LTOP event as described in the final safety analysis report. Using these assumptions, the senior reactor analyst determined that a bounding increase in core damage frequency for this issue was $1.45\text{E}-8$ per year and was therefore, of very low safety significance (Green). The finding has a human performance cross-cutting aspect associated with work management, in that, the licensee failed to ensure that the work process includes the need for coordination with different groups or job activities [H.5].

Enforcement. Title 10 CFR 50, Appendix B, Criterion XI, "Test Control" requires, in part, that test results shall be evaluated to ensure that test requirements have been satisfied. Contrary to the above, from November 3, 2014, to May 3, 2016, the licensee failed to evaluate test results to ensure that test requirements have been satisfied. Specifically, the licensee failed to ensure that stroke time test requirements for power operated relief valve 1-PCV-455 were satisfied. The licensee took actions to restore the valve to service and appropriately test its operation to ensure test requirements were met. Since this violation was of very low safety significance (Green) and has been entered into the corrective action program as Condition Report CR-2016-003920, this violation is being treated as a non-cited violation consistent with Section 2.3.2 of the NRC Enforcement Policy. (NCV 05000445/2016004-01, Failure to Evaluate Inservice Testing Results of Power Operated Relief Valve)

.2 Complete Walkdown

a. Inspection Scope

On December 11, 2016, the inspectors performed a complete system walk-down inspection of the offsite power system. The inspectors reviewed the licensee's procedures and system design information to determine the correct offsite power lineup for the existing plant configuration. The inspectors also reviewed outstanding work orders, open condition reports, in-process design changes, temporary modifications, and other open items tracked by the licensee's operations and engineering departments. The inspectors then visually verified that the system was correctly aligned for the existing plant configuration.

On December 29, 2016, the inspectors performed a complete system walk-down inspection of the unit 2 safety chilled water system. The inspectors reviewed the licensee's procedures and system design information to determine the correct safety chilled water lineup for the existing plant configuration. The inspectors also reviewed outstanding work orders, open condition reports, in-process design changes, temporary modifications, and other open items tracked by the licensee's operations and engineering departments. The inspectors then visually verified that the system was correctly aligned for the existing plant configuration.

These activities constituted two complete system walk-down samples, as defined in Inspection Procedure 71111.04.

b. Findings

No findings were identified.

1R05 Fire Protection (71111.05)

.1 Quarterly Inspection

a. Inspection Scope

The inspectors evaluated the licensee's fire protection program for operational status and material condition. The inspectors focused their inspection on four plant areas important to safety:

- December 28, 2016, Fire area SC7, unit 1 turbine driven auxiliary feedwater pump room
- December 12, 2016, Fire area AA153, unit 1 safety chiller room
- December 12, 2016, Fire area AA154, unit 2 safety chiller room
- December 13, 2016, Fire area EQ149, common train "B" uninterruptible power supply (UPS) air conditioning (AC) unit room

For each area, the inspectors evaluated the fire plan against defined hazards and defense-in-depth features in the licensee's fire protection program. The inspectors evaluated control of transient combustibles and ignition sources, fire detection and suppression systems, manual firefighting equipment and capability, passive fire protection features, and compensatory measures for degraded conditions.

These activities constituted four quarterly inspection samples, as defined in Inspection Procedure 71111.05.

b. Findings

No findings were identified.

1R11 Licensed Operator Requalification Program and Licensed Operator Performance (71111.11)

.1 Review of Licensed Operator Requalification

a. Inspection Scope

On October 20, 2016, the inspectors observed a portion of an annual requalification test for licensed operators. The inspectors assessed the performance of the operators and the evaluators' critique of their performance. The inspectors also assessed the modeling and performance of the simulator during the requalification activities.

These activities constitute completion of one quarterly licensed operator requalification program sample, as defined in Inspection Procedure 71111.11.

b. Findings

No findings were identified.

.2 Review of Licensed Operator Performance

a. Inspection Scope

On November 1, 2016, the inspectors observed the performance of on-shift licensed operators in the plant's main control room. At the time of the observations, the plant was in a period of heightened activity due to unit 1 control rod repositioning.

In addition, the inspectors assessed the operators' adherence to plant procedures, including the conduct of operations procedure and other operations department policies.

These activities constitute completion of one quarterly licensed operator performance sample, as defined in Inspection Procedure 71111.11.

b. Findings

No findings were identified.

.3 Biennial Review of Regualification Program

a. Inspection Scope

The licensed operator requalification program involves two training cycles that are conducted over a 2-year period. In the first cycle, the annual cycle, the operators are administered an operating test consisting of job performance measures and simulator scenarios. In the second part of the training cycle, the biennial cycle, operators are administered an operating test and a comprehensive written examination. For this cycle, the licensee is completing the second, or biennial, cycle. The cycle ends at the end of March 2017; however, this report documents the on-site observations of the operating tests and the associated parts of the program discussed below. The licensee is administering the written examinations to all crews in February 2017, so these inspection activities will be completed once those items are complete and are available for inspection. The written examination inspections and results will be documented in a 2017 quarterly report.

To assess the performance effectiveness of the licensed operator requalification program, the inspectors reviewed the operating test quality and observed licensee administration of an annual requalification test while on-site. The operating tests observed included three job performance measures and five scenarios that were used in the current biennial requalification cycle for two crews. These observations allowed the inspectors to assess the licensee's effectiveness in conducting the operating test to ensure operator mastery of the training program content and to determine if feedback of performance analyses into the requalification training program was being accomplished.

On December 1, 2016, the licensee informed the inspectors that there were two possible crew failures for that week and there were three more weeks of operating tests to administer and grade. Since the significance determination process for the operating tests and written exams are cumulative, the final totals for all failures would be needed in April 2017 (after all written examinations were administered and graded) to completely assess crew performance on the biennial examinations.

The individuals that failed portions of their operating tests while the NRC was on-site were remediated, retested, and passed their retake operating tests.

The inspectors observed examination security measures in place during administration of the operating tests (including controls and content overlap) and reviewed any remedial training and re-examinations up to this point in the inspection. The inspectors also reviewed medical records of seven licensed operators for conformance to license conditions and the licensee's system for tracking qualifications and records of license reactivation for one operator. The inspectors interviewed five licensed operators.

The inspectors reviewed simulator performance for fidelity with the actual plant and the overall simulator program of maintenance, testing, and discrepancy correction.

The inspectors completed one inspection sample of the biennial licensed operator requalification program.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12)

.1 Routine Maintenance Effectiveness

a. Inspection Scope

The inspectors reviewed four instances of degraded performance or condition of safety-significant structures, systems, and components (SSCs):

- November 17, 2016, common containment ventilation system, failures and unavailability of ventilation chillers
- December 11, 2016, unit 1 480 VAC power system, circuit breaker failures
- December 13, 2016, unit 1 reactor trip switchgear, reactor trip breaker failures
- December 30, 2016, common plant communications system, area specific circuit failures

The inspectors reviewed the extent of condition of possible common cause SSC failures and evaluated the adequacy of the licensee's corrective actions. The inspectors reviewed the licensee's work practices to evaluate whether these may have played a role in the degradation of the SSCs. The inspectors assessed the licensee's

characterization of the degradation in accordance with 10 CFR 50.65 (the Maintenance Rule), and verified that the licensee was appropriately tracking degraded performance and conditions in accordance with the Maintenance Rule.

These activities constituted completion of four maintenance effectiveness samples, as defined in Inspection Procedure 71111.12.

b. Findings

Introduction. The inspectors identified a Green, non-cited violation of 10 CFR 50.65(b)(2) associated with the licensee's failure to scope the containment ventilation system into the maintenance rule program. Specifically, the licensee failed to recognize that the containment ventilation system is used in emergency operating procedures and relied upon to mitigate a loss of offsite power event. Therefore, the system is required to be monitored under the maintenance rule.

Description. During 2015, the ventilation chilled water system, a non-safety related system, experienced a large number of equipment failures. The inspectors reviewed the system's performance under the maintenance rule, and discovered that the licensee had excluded it from the scope. The inspectors determined that the class 1E buses power four of the nine chillers in the system and the chillers automatically load on the emergency diesel generators during a loss of offsite power. The inspectors also determined that these chillers were designed to cool the containment ventilation system. Because these chillers are used to cool the containment building and used in certain emergency procedures, the inspectors questioned why the system was not monitored under the NRC's maintenance rule.

In response to the inspectors' questions, the licensee performed an engineering evaluation of the system to determine its function in early 2016 and concluded that the system did not perform any mitigating function. The licensee believed, based on their evaluation, that the original scoping was correct and that the basis for designing the system to start during a loss of offsite power was for economic reasons.

The inspectors reviewed NUREG 0797, "Safety Evaluation Report Related to the Operation of Comanche Peak Steam Electric Station, Units 1 and 2," Supplement 22, dated January 1990, and identified that the containment ventilation system was credited with a mitigation function to meet the review standards in NRC Branch Technical Position RSB 5-1, "Design Requirements of the Residual Heat Removal System." Specifically, during initial licensing, the licensee informed the NRC that:

"...electrical components for the [power operated relief valve] (PORV) operators are located inside containment, and the PORVs are located in a compartment within containment. The containment atmosphere is maintained within design conditions by the containment ventilation system. If offsite power should be lost, the ventilation system would be automatically loaded onto the emergency diesel generator buses...the containment ventilation system will control the containment atmosphere to reduce the harsh environmental effects on the electrical components of the valve."

Based on the conclusion made by the NRC in NUREG 0797, Supplement 22, the inspectors determined the system was credited with maintaining an acceptable

containment environment following a loss of offsite power to prevent a failure of the PORVs, which are necessary to depressurize the reactor coolant system in order to achieve cooldown with normal AC power unavailable. The inspectors also noted that the containment ventilation system is used in emergency operating procedure (EOP)-0.0A and EOP-0.0B, "Reactor Trip or Safety Injection," and procedures ECA-0.1A and ECA-0.1B, "Loss of All AC Power Recovery Without SI Required." The procedures direct restarting the ventilation chilled water system to restore containment ventilation after a safety injection or station blackout. Therefore, the inspectors determined that the inclusion of the containment ventilation system in the scope of the maintenance rule was necessary because the system is relied upon to mitigate a loss of offsite power, and is used in plant EOP-0.0A/B, "Reactor Trip or Safety Injection," and ECA-0.1A/B, "Loss of All AC Power Recovery Without SI Required."

The inspectors reviewed the licensee's corrective action reports and work history and identified that, from August 2014 to July 2016, the ventilation chilled water system had over ten condition reports indicating a failure of a ventilation chiller to start or run, and several long periods of chiller unavailability, including a five-month period when chiller X-02 was out of service. The licensee reviewed the system at a maintenance rule expert panel meeting and determined the effective preventive maintenance had not been demonstrated for the system, and recommended placing the system in (a)(1) status. The inspectors determined that, since the licensee made the same decision regarding scoping of the system in the maintenance rule in 2016 that they made during their original implementation, that the performance deficiency was reflective of current performance. The inspectors determined that the licensee failed to consider the possibility of a mistake in their original evaluation.

Because of concern related to extended unavailability of these chillers, the licensee performed an evaluation that demonstrated the PORV function would be maintained, provided that certain maintenance and aging management actions were implemented. The inspectors verified that the licensee had implemented the appropriate maintenance and aging management actions to support PORV functionality. The licensee entered this issue into the corrective action program as Condition Report CR-2016-008491.

Analysis. The failure to monitor the performance and condition of a system that meets the maintenance rule scoping criteria of 10 CFR 50.65(b)(2) was a performance deficiency. The performance deficiency was more than minor, and therefore a finding, because it was associated with 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. Using Inspection Manual Chapter 0609, Attachment 04, "Initial Characterization of Findings," dated July 1, 2012, and Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," dated October 7, 2016, Exhibit 2, "Mitigating Systems Screening Questions," the inspectors determined the finding affected the Mitigating Systems cornerstone and was of very low safety significance (Green), because the finding did not represent a loss of system function and the system was not designated as high safety-significant in accordance with the licensee's maintenance rule program. The finding has a human performance cross-cutting aspect associated with avoiding complacency, in that, the licensee failed to ensure that individuals recognized and planned for the possibility of mistakes and latent issues when re-evaluating the basis for excluding the system [H.12].

Enforcement. Title 10 CFR 50.65(b)(2) requires, in part, that the scope of the monitoring program specified in paragraph (a)(1) include non-safety related structures, systems, and components that are relied upon to mitigate accidents or transients or are used in plant emergency operating procedures (EOPs). Contrary to the above, from initial maintenance rule scoping in 1996 to September 8, 2016, the containment ventilation system, a non-safety related system that is relied upon to mitigate accidents or transients and is used in EOPs, was not included in the scope of the monitoring program specified in 10 CFR 50.65(a)(1). In response to this issue the licensee scoped the system in the plants maintenance rule monitoring program, and placed the equipment under 10 CFR 50.65(a)(1) monitoring requirements pending further review. Since this violation was of very low safety significance (Green) and has been entered into the corrective action program as Condition Report CR-2016-008491, this violation is being treated as a non-cited violation consistent with Section 2.3.2 of the NRC Enforcement Policy. (NCV 05000445/2016004-02; 05000446/2016004-02, Failure to Scope the Containment Ventilation System in the Maintenance Rule Program)

.2 Quality Control

a. Inspection Scope

On October 20, 2016, the inspectors reviewed the licensee's quality control activities through a review of parts installed in power operated relief valve block valve power supply that were purchased as commercial-grade parts but were dedicated prior to installation in a quality-grade application.

These activities constituted completion of one quality control sample, as defined in Inspection Procedure 71111.12.

b. Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13)

a. Inspection Scope

On November 8, 2016, the inspectors observed portions of one emergent work activity that had the potential to affect the functional capability of mitigating systems, or to impact barrier integrity. The inspectors observed emergent work on the unit 1 emergency diesel generator 1-02 due to a voltage regulator failure.

The inspectors verified that the licensee appropriately developed and followed a work plan for these activities. The inspectors verified that the licensee took precautions to minimize the impact of the work activities on unaffected SSCs.

These activities constitute completion of one maintenance risk assessment and emergent work control inspection sample, as defined in Inspection Procedure 71111.13.

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessments (71111.15)

a. Inspection Scope

The inspectors reviewed one operability determination that the licensee performed for degraded or nonconforming SSCs:

- November 11, 2016, operability determination of the emergency diesel generator 1-01 air receiver with a drain valve leak

The inspectors reviewed the timeliness and technical adequacy of the licensee's evaluations. Where the licensee determined the degraded SSC to be operable or functional, the inspectors verified that the licensee's compensatory measures were appropriate to provide reasonable assurance of operability or functionality. The inspectors verified that the licensee had considered the effect of other degraded conditions on the operability or functionality of the degraded SSC.

These activities constitute completion of one operability and functionality review sample, as defined in Inspection Procedure 71111.15.

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19)

a. Inspection Scope

The inspectors reviewed eight post-maintenance testing activities that affected risk-significant SSCs:

- October 5, 2016, unit 2 train "A" blackout sequencer testing following undervoltage relay replacement
- October 11, 2016, unit 2 residual heat removal system valve 2-8812B testing following major inspection of valve actuator
- October 12, 2016, unit 1 positive displacement charging pump testing following work on fluid drive
- October 12, 2016, unit 2 train "A" diesel generator testing following tachometer replacement
- October 17, 2016, unit 1 pressurizer heater group "C" testing following control panel replacement
- October 20, 2016, unit 1 power operated relief valve block valve 2-8000B testing following breaker replacement
- October 21, 2016, unit 1 train "B" diesel generator testing following bearing temperature relay replacement

- December 17, 2016, common control room AC unit X-04 testing following replacement of shaft seal

The inspectors reviewed licensing- and design-basis documents for the SSCs and the maintenance and post-maintenance test procedures. The inspectors observed the performance of the post-maintenance tests to verify that the licensee performed the tests in accordance with approved procedures, satisfied the established acceptance criteria, and restored the operability of the affected SSCs.

These activities constitute completion of eight post-maintenance testing inspection samples, as defined in Inspection Procedure 71111.19.

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

The inspectors observed two risk-significant surveillance tests and reviewed test results to verify that these tests adequately demonstrated that the SSCs were capable of performing their safety functions:

Other surveillance tests:

- November 4, 2016, unit 1, test of the centrifugal charging pump 1-01
- December 30, 2016, unit 2, slow start of the emergency diesel generator 2-01

The inspectors verified that these tests met technical specification requirements, that the licensee performed the tests in accordance with their procedures, and that the results of the test satisfied appropriate acceptance criteria. The inspectors verified that the licensee restored the operability of the affected SSCs following testing.

These activities constitute completion of two surveillance testing inspection samples, as defined in Inspection Procedure 71111.22.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity, Emergency Preparedness, Public Radiation Safety, Occupational Radiation Safety, and Security

4OA1 Performance Indicator Verification (71151)

.1 Mitigating Systems Performance Index: Residual Heat Removal Systems (MS09)

a. Inspection Scope

The inspectors reviewed the licensee's mitigating system performance index data for the period of October 1, 2015, through September 30, 2016, to verify the accuracy and completeness of the reported data. The inspectors used definitions and guidance contained in Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, to determine the accuracy of the reported data.

These activities constituted verification of the mitigating system performance index for residual heat removal systems for units 1 and 2, as defined in Inspection Procedure 71151.

b. Findings

No findings were identified.

.2 Mitigating Systems Performance Index: Cooling Water Support Systems (MS10)

a. Inspection Scope

The inspectors reviewed the licensee's mitigating system performance index data for the period of October 1, 2015, through September 30, 2016, to verify the accuracy and completeness of the reported data. The inspectors used definitions and guidance contained in Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, to determine the accuracy of the reported data.

These activities constituted verification of the mitigating system performance index for cooling water support systems for units 1 and 2, as defined in Inspection Procedure 71151.

b. Findings

No findings were identified.

40A2 Problem Identification and Resolution (71152)

.1 Routine Review

a. Inspection Scope

Throughout the inspection period, the inspectors performed daily reviews of items entered into the licensee's corrective action program and periodically attended the licensee's condition report screening meetings. The inspectors verified that licensee personnel were identifying problems at an appropriate threshold and entering these problems into the corrective action program for resolution. The inspectors verified that the licensee developed and implemented corrective actions commensurate with the significance of the problems identified. The inspectors also reviewed the licensee's problem identification and resolution activities during the performance of the other inspection activities documented in this report.

b. Findings

No findings were identified.

.2 Semiannual Trend Review

a. Inspection Scope

The inspectors reviewed the licensee's corrective action program and associated documents to identify trends that could indicate the existence of a more significant safety issue. The inspectors focused on the stations 10 CFR 50.59 modification process. The inspectors reviewed documents and interviewed personnel to determine if the licensee completely and accurately identified problems in a timely manner commensurate with its significance, evaluated and dispositioned operability issues, considered the extent of condition, prioritized the problem commensurate with its safety significance, identified appropriate corrective actions, and completed corrective actions in a timely manner commensurate with the safety significance of the issue.

These activities constitute completion of one semi-annual trend review inspection sample as defined in Inspection Procedure 71152-05.

b. Findings

No findings were identified.

40A3 Follow-up of Events and Notices of Enforcement Discretion (71153)

.1 (Closed) Licensee Event Report 05000445/2016-001-00, Safety Chiller Inoperable for Longer Than Allowed by Technical Specifications

a. Inspection Scope

On June 9, 2019, the licensee identified through thermography that electrical connections on the unit 1, train "A" safety chiller were exhibiting elevated temperatures. The licensee shut down the chiller and inspected the connections. The licensee determined that three out six electrical connections were not torqued to the required

value during maintenance performed on May 10, 2016. The licensee determined that the chiller had been inoperable since May 28, 2016, when it was required to be in service upon entering Mode 4, until restored on June 9. The licensee determined that the cause of the inadequate torque was a failure to follow maintenance work instructions.

The inspectors reviewed the licensee's evaluation and corrective actions. The inspectors determined that the inadequate torque was identified as a result of deliberate observation by licensee personnel and that the licensee took appropriate corrective actions to correct the defect. An associated licensee-identified violation is documented in section 4OA7.

The inspectors also determined that the licensee failed to retain the quality record of the torqued connections from the maintenance performed on May 10, 2016. The inspectors determined this was a violation of 10 CFR 50, Appendix B, Criterion XVII, "Quality Assurance Records." The violation was minor because the failure to retain the record would not lead to a more significant safety concern or impact a cornerstone objective. This failure to comply with 10 CFR 50, Appendix B, Criterion XVII, "Quality Assurance Records," constitutes a minor violation that is not subject to enforcement action in accordance with the NRC's Enforcement Policy. This LER is closed.

b. Findings

No findings were identified.

These activities constitute completion of one event follow-up sample, as defined in Inspection Procedure 71153.

4OA5 Other Activities

.1 Impact of Financial Conditions on Continued Safe Performance

a. Inspection Scope

The inspectors evaluated the impact of financial conditions on continued safe performance at Comanche Peak. In that the licensee's parent company, Energy Future Holdings, was under bankruptcy protection/reorganization during the inspection period, NRC Region IV conducted special reviews of processes at Comanche Peak. The inspectors evaluated several aspects of the licensee's operations to determine whether the financial condition of the station impacted plant safety. The factors reviewed included: (1) impact on staffing, (2) corrective maintenance backlog, (3) changes to the planned maintenance schedule, (4) corrective action program implementation, and (5) reduction in outage scope, including risk-significant modifications. In particular, the inspectors verified that licensee personnel continued to identify problems at an appropriate threshold and enter these problems into the corrective action program for resolution. The inspectors also verified that the licensee continued to develop and implement corrective actions commensurate with the significance of the problems identified.

The special review of processes at Comanche Peak included continuous reviews by the Resident Inspectors, as well as the specialist-led baseline inspections completed during the inspection period which are documented previously in this report.

On October 4, 2016, the licensee's parent company, Energy Future Holdings, reorganized its subsidiary, Texas Competitive Electric Holdings Company, as a standalone company. As part of this reorganization, the licensee submitted a license amendment request to transfer the facility license from Luminant to TEX Operations Company LLC. NRC Headquarters staff reviewed the amendment request to determine, in part, whether the reorganization impacted plant safety, and subsequently issued the conforming amendments to authorize transfer of the license to TEX Operations Company on October 3, 2016 (ADAMS Accession No. ML16266A005). Additionally, the inspectors verified that changes associated with the new organization continued to support the safe operation of the plant. This concludes the special review inspection conducted by NRC Region IV for Post-Bankruptcy Declaration for Comanche Peak, Units 1 and 2.

b. Findings

No findings were identified.

.2 Operation of an Independent Spent Fuel Storage Facility at Operating Plants (60855.1)

a. Inspection Scope

A routine Independent Spent Fuel Storage Installation (ISFSI) inspection was conducted of the Comanche Peak Nuclear Power Plant (CPNPP) ISFSI on November 14-18, 2016, by an NRC Region IV Division of Nuclear Materials Safety inspector and a Division of Spent Fuel Management inspector from NRC Headquarters. The inspectors observed and evaluated select licensee loading, processing, and heavy load procedures associated with the licensee's current dry fuel storage loading campaign. The inspectors performed a review of the dry fuel storage records for seven casks loaded at the ISFSI since the last NRC inspection to verify that the licensee had loaded fuel in accordance with the Certificate of Compliance (CoC) Technical Specification (TS) approved contents. Documents reviewed included multi-purpose canister (MPC) loading maps and records containing fuel assembly specific information, such as assembly identification markings, decay heat (kW), cooling time (years), average U-235 enrichment (%), burn-up values (MWd/MTU), and other information. The canister contents reviewed during the inspection were found to meet all fuel requirements specified in the Holtec CoC.

The inspectors requested documentation related to maintenance of the cask handling crane, the annual maintenance of the licensee's special lifting devices, and the calibration records for pressure gauges associated with fuel processing for dry cask storage. Documents were provided that demonstrated the cask handling crane was inspected on an annual basis in accordance with the requirements of the American Society of Mechanical Engineers (ASME) B30.2 standards prior to the 2016 dry fuel loading campaign. The annual maintenance as required by American National Standards Institute (ANSI) N14.6 standards for special lifting devices was completed for the following special lifting devices: the HI-TRAC lifting trunnions, lift yoke, HI-STORM lifting brackets, and various associated lifting pins. All equipment passed visual

inspection, dimensional testing, and magnetic particle or liquid penetrant non-destructive examinations (NDE) as required by ANSI N14.6.

The CPNPP ISFSI was located outside of the reactor site protected area (PA) and resided within its own PA, approximately 0.6 miles east-southeast of the reactor site. Inspectors reviewed the radiological conditions at the Comanche Peak ISFSI through a document review of the most recent radiological survey and two years of thermoluminescent dosimeter (TLD) monitoring data from around the ISFSI pad. A dry cask loading project manager, radiation protection (RP) technician, and others accompanied the NRC inspectors during the inspection of the ISFSI pad and storage casks. The pad was properly posted as a radiation area. A radiological survey was performed by the RP technician with a Geiger-Mueller detector. The NRC inspectors carried a Ludlum Model-19 sodium-iodide survey meter (NRC #033906, calibration due July 13, 2017) and recorded confirmatory measurements on the ISFSI pad. The radiological conditions in and around the ISFSI were as expected for the age and heat-load of the 28 currently loaded spent fuel storage casks. All accessible areas of the ISFSI fell below the 10 CFR 20.1502(a)(1) limit for unmonitored individuals, which is 500 mrem per year. Annual Radiological Environmental Operating Reports (AREORs) for Comanche Peak were reviewed for the previous two years. The AREORs were produced by the Radiological Environmental Monitoring Program (REMP). Comanche Peak's REMP is responsible for measuring direct radiation impacts at 43 TLD monitoring locations. The TLD monitoring location with closest proximity to the ISFSI at the site boundary documented the dose equivalent to any real individual located outside the site controlled area as being well below the 10 CFR 72.104(a)(2) requirement of less than 25 mrem per year above background due to the influence of the ISFSI.

An on-site review of the Quality Assurance (QA) audit and QA surveillance reports related to dry cask storage activities at the Comanche Peak was performed by NRC inspectors. The QA audit reports and surveillances resulted in several Condition Reports (CRs). NRC inspectors reviewed the corrective actions resulting from the CRs to ensure that the identified deficiencies were properly categorized based on their safety significance and properly resolved. All audit identified deficiencies had been properly categorized and resolved by the licensee. In addition, inspectors reviewed a list of cask handling crane and ISFSI operations related CRs that were issued since the previous inspection in April 2015. Of the list, 14 CRs were selected for further review. Condition Reports reviewed by inspectors were related to a variety of problems that arose during routine ISFSI operations. The CRs reviewed were well documented and properly categorized based on the safety significance of the problems identified. The corrective actions taken were appropriate for the situations. Based on the types of issues raised, the licensee demonstrated a high attention to detail in regard to the maintenance and operation of their ISFSI program and cask handling crane. No NRC safety concerns were identified related to the audit reports or CRs reviewed.

The inspectors reviewed three randomly selected weeks of HI-STORM 100S daily vent surveillance records to ensure that the Holtec CoC TS 3.1.2 requirements were being met for fuel stored on the ISFSI pad. All documentation reviewed demonstrated the licensee performed the required temperature surveillances or verified that the inlet and outlet vents were unblocked during the periods reviewed with no abnormalities reported.

The licensee's 10 CFR 72.212 Evaluation Report was reviewed to verify site characteristics were still bounded by the Holtec HI-STORM 100S cask system's

design basis. Comanche Peak's 72.212 Evaluation Report at the time of the inspection was Revision 9, dated January 20, 2016. One revision had been performed to the 72.212 Evaluation Report since the last NRC routine ISFSI inspection and was reviewed during this inspection. The associated 10 CFR 72.48 screening was reviewed. The screening was determined to be adequate and the change to the 72.212 Evaluation Report was found to be still bound by the Holtec design basis.

The licensee's 10 CFR 72.48 screenings and evaluations for ISFSI program changes since the last NRC routine ISFSI inspection were reviewed to determine compliance with regulatory requirements. The 72.48 screens were primarily for maintenance activities associated with the ISFSI. Comanche Peak had not performed any 72.48 full evaluation or cask handling crane related 50.59 safety evaluations since the last NRC inspection. The inspectors determined that the licensee had made one modification to the cask handling crane. A modification was made to replace a defective brake rectifier cabinet. The replacement did not affect any safety assessments for the crane. NRC determined that all 72.48 and crane related 50.59 screens were adequately evaluated by the licensee.

b. Findings

No findings were identified.

40A6 Meetings, Including Exit

Exit Meeting Summary

On November 17, 2016, the inspectors presented the ISFSI inspection results to Mr. John Dreyfuss, Plant Manager and other members of the licensee's staff. Licensee personnel acknowledged the information presented. The inspector asked the licensee whether any materials examined during the inspection should be considered proprietary. No propriety information was identified.

On December 1, 2016, the inspectors briefed Mr. T. McCool, Site Vice-President, and other members of the licensee's staff of the partial results of the licensed operator requalification program inspection. A final exit will be performed in April 2017 once all the written exams have been administered, graded, and reported to the NRC with the final results. All proprietary information was returned before the inspectors left the site.

On January 5, 2017, the inspectors presented the inspection results to Mr. Steven Sewell, Senior Director for Engineering and Regulatory Affairs, and other members of the licensee staff. The licensee acknowledged the issues presented. The inspectors reviewed proprietary information during the inspection, but did not document any in the report.

40A7 Licensee-Identified Violations

The following violations of very low safety significance (Green) were identified by the licensee and are violations of NRC requirements which meet the criteria of the NRC Enforcement Policy for being dispositioned as non-cited violations.

- Title 10 CFR 50.65(a)(2), requires, in part, that monitoring of system performance under 10 CFR 50.65(a)(1) is not required where it has been demonstrated that performance of

the system is being effectively controlled through appropriate preventive maintenance. Contrary to the above, from June 2014 to May 2016, the licensee failed to demonstrate that performance of the 480 Volt AC system, a system not being monitored under 10 CFR 50.65(a)(1), was being effectively controlled by preventive maintenance. Specifically, the 480 Volt AC system exceeded the established performance criteria in June 2014, and the licensee failed to evaluate its performance. The licensee discovered in May 2016 through an engineering review that the system had exceeded its criteria in 2014 and should have been placed in (a)(1) monitoring status. The licensee evaluated the system performance and ensured appropriate corrective action had been taken. The violation is more than minor because it affected the equipment performance attribute of the Mitigating Systems cornerstone and impacted the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Using Inspection Manual Chapter 0609, Attachment 04, "Initial Characterization of Findings," and Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process for Findings At-Power," the inspectors determined that the violation is of very low safety significance (Green) because the finding did not represent a loss of system or function, and did not represent a loss of function of a single train for greater than its technical specification allowed outage time. The violation was entered into the licensee's corrective action program as CR-2016-009963.

- Title 10 CFR 50 Appendix B, Criterion V, requires, in part, that licensees shall perform activities affecting quality in accordance with instructions appropriate to the circumstances. Contrary to the above, on May 10, 2016, the licensee failed to perform safety chiller maintenance, a quality related activity, in accordance with the approved instructions. Specifically, licensee personnel failed to torque electrical connections on overload relays on the unit 1 train A safety chiller as required by the licensee's work instructions. The inadequate torque was present until June 9, 2016, when the licensee performed thermography on the chiller electrical connections. The licensee discovered elevated temperatures, shut down the chiller, and replaced and torqued the affected components. The licensee determined that the chiller was inoperable from May 28, 2016, when it was required to be in service due to the unit entering Mode 4, until the chiller was restored on June 9. The violation is more than minor because it affected the equipment performance attribute of the Mitigating Systems cornerstone and impacted the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Using Inspection Manual Chapter 0609, Attachment 04, "Initial Characterization of Findings," and Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process for Findings At-Power," the inspectors determined that the violation required a detailed risk evaluation (DRE) because the finding represented a loss of function of a single train for greater than its technical specification allowed outage time. A senior reactor analyst from Region IV performed the risk evaluation. The licensee provided an analysis demonstrating that the chiller would be able to perform its safety function for at least 24 hours. Based on that demonstration, the analyst was able to determine that the risk was of very low safety significance (Green). The violation was entered into the licensee's corrective action program as CR-2016-005798.

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

K. Peters, Senior Vice President and Chief Nuclear Officer
T. McCool, Site Vice President
S. Sewell, Senior Director, Engineering and Regulatory Affairs
J. Dreyfuss, Plant Manager
D. Goodwin, Director, Work Management
B. St. Louis, Director, Operations
M. Stakes, Director, Maintenance
J. Taylor, Director, Site Engineering
D. Farnsworth, Director, Nuclear Oversight
H. Winn, Director, Performance Improvement
D. Christiansen, Director, Nuclear Training
T. Hope, Manager, Regulatory Affairs
J. Lloyd, Manager, Operations Support
C. Tran, Manager, Engineering Programs
J. Gumnick, Manager, Radiation Protection
J. Hull, Manager, Nuclear Emergency Preparedness
M. McNally, Manager, Nuclear Security
G. Merka, Consulting Nuclear Technologist, Regulatory Affairs
J. Barnette, Consulting Nuclear Technologist, Regulatory Affairs
J. Hicks, Consulting Nuclear Engineer, Regulatory Affairs
M. Ragan, Dry Cask Coordinator
B. Henley, Consulting Engineer
J. Wise, Acting Supervisor, Licensed Operator Requalification Training
J. Ruby, Examination Lead, Licensed Operator Requalification Training

NRC Personnel

R. Deese, Senior Reactor Analyst
L. Brandt, Project Engineer

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

05000445/2016004-01	NCV	Failure to Evaluate Inservice Testing Results of Power Operated Relief Valve (Section 1R04)
05000445/2016004-02; 05000446/2016004-02	NCV	Failure to Scope the Containment Ventilation System in the Maintenance Rule Program (Section 1R12)

Closed

05000445-2016-001-00	LER	Safety Chiller Inoperable for Longer Than Allowed by Technical Specifications (Section 4OA3)
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LIST OF DOCUMENTS REVIEWED

Section 1R01: Adverse Weather Protection

Condition Reports

CR-2016-001817 TR-2016-009378 CR-2016-010554

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
ABN-613	25 kV Malfunction	6
ABN-912	Extreme Cold Weather/Heat Tracing and Freeze Protection System Malfunction	8
OWI-912	Cold Weather	4
SOP-904	Fire Protection Main Water Supply and Fire Pump System	16
STA-634	Extreme Temperature Equipment Protection Program	6

Section 1R04: Equipment Alignment

Condition Reports

CR-2016-005216 CR-2015-011795 CR-2016-001676 CR-2015-008949 CR-2014-011879
 CR-2014-012081 CR-2016-009100 CR-2016-005294 CR-2016-003920 CR-2014-011805
 CR-2015-009109 CR-2016-009287 CR-2016-005510 CR-2016-004333 CR-2016-008590
 CR-2016-010133 CR-2016-010452 CR-2016-003541 CR-2016-008591 CR-2016-010452

Drawings

<u>Number</u>	<u>Title</u>	<u>Revision</u>
MI-0202	Flow Diagram: Main Steam Reheat and Steam Dump	2
MI-0206	Flow Diagram: Auxiliary Feedwater System	21
MI-0206 Sh. 1	Flow Diagram: Auxiliary Feedwater System Pump Trains	19
MI-0206 Sh. 2	Flow Diagram: Auxiliary Feedwater System Yard Layout	2
M2-0311	Flow Diagram Ventilation Safety Chilled Water System	3
M2-0311-A	Flow Diagram Ventilation Safety Chilled Water System	3
M2-0311-B	Flow Diagram Ventilation Safety Chilled Water System	3

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
ABN-104	Residual Heat Removal System Malfunction	9
ECA-0.0A	Loss of All AC Power	9
INC-2016	Valve Calibration Copes Vulcan Air-to-Open and Air-to-Open with Backseat	3
MSM-P0-4314	Terry Turbine Governor Valve Manual Stroke Test	0
OPT-206A	AFW System	30
OPT-206A-1	MDAFW PMP 1-01 Valve Position Verification Data Sheet	15
OPT-206A-2	MDAFW PMP 1-02 Valve Position Verification Data Sheet	15
OPT-215	Class 1E Electrical Systems Operability	15
SOP-304A-AF-V01	Unit 1 Train A MDAFW Pump Lineup	3
SOP-304A-AF-V02	Unit 1 Train B MDAFW Pump Lineup	3
SOP-815B	Safety Chilled Water System	11

Miscellaneous Documents

<u>Number</u>	<u>Title</u>	<u>Revision</u>
TS 3.7.5	Auxiliary Feedwater (AFW) System	150
TSB 3.7.5	Auxiliary Feedwater (AFW) System	73
FSAR 10.4.9	Auxiliary Feedwater System	107

Work Orders

5344383	5266713	4615870	4552167	4953076
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Section 1R05: Fire Protection

Drawings

<u>Number</u>	<u>Title</u>	<u>Revision</u>
FPI-102A	Fire Protection Instruction Manual, Unit 1 Safeguards Building Elevation 790'-6"	3
FPI-501	Fire Protection Instruction Manual, Unit 1 Electrical Control Building 778'-0	5
FPI-501	Fire Protection Instruction Manual, Unit 2 Electrical Control Building 778'-0	5

Miscellaneous Documents

<u>Number</u>	<u>Title</u>	<u>Revision</u>
--	Fire Protection Report	30

Section 1R11: Licensed Operator Requalification Program and Licensed Operator Performance

Condition Reports

CR-2015-002180 CR-2015-002761 CR-2015-006214 CR-2015-008403 CR-2015-006785

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
NTP-603	Simulator Certification Management	14
ODA-121	Licensed Operator Physicals and Application Process	4
ODA-315	Licensed Operator Maintenance Tracking	7
OTG-201	Audit and NRC License Exam Guidelines: Overview and Generic Exam Activities	January 21, 2016
OTG-210	NRC Requalification Exam Development Process	0
SOMI-009	Simulator Configuration Management	11
SOMI-010	Simulator Testing Program	17
STA-422	Processing Condition Reports	July 29, 2015
TRA-204	Licensed Operator Requalification Training	March 1, 2011

Miscellaneous Documents

<u>Number</u>	<u>Title</u>	<u>Date</u>
ANS/ANSI-3.4	American National Standard NS for Medical Certification and Monitoring of Personnel Requiring Operator Licenses at Nuclear Power Plants	1983
ANS/ANSI-3.5	American National Standard Nuclear Power Plant Simulators for Use in Operator Training	1985
JPMs	2016 Exam -Weeks 1-6	November 2016
None	All Training Attendance Records for cycle 15 and 16	October 13, 2016

Miscellaneous Documents

<u>Number</u>	<u>Title</u>	<u>Date</u>
None	2016 Dynamic Simulator Scenario Malfunction Chart	December 28, 2016
None	Entire Simulator Annual Performance Test Book	December 13, 2015
NTG-101-1	Needs/Performance Analysis Worksheet, 2015-06214	September 8, 2015
NTG-101-1	Needs/Performance Analysis Worksheet, 2016-1066-11	March 8, 2016
OTG-301-8	LORT Operational Exam Remedial Training Plan – Crew 11 Group 1	November 30, 2016
OTG-301-8	LORT Operational Exam Remedial Training Plan – Staff Group 2	November 30, 2016
Scenarios	2016 Exam -Weeks 1-6	November 2016

Section 1R12: Maintenance Effectiveness

Calculations

<u>Number</u>	<u>Title</u>	<u>Revision</u>
X-EB-307-10	Heat Injection Rates from the NNS CHW Chillers to CCW and CW	4
3-A-1 #003	Containment Temperature Following Station Blackout	0

Condition Reports

CR-2016-008993 CR-2013-003691 CR-2016-003976 CR-2014-006898 IR-2016-009767
CR-2016-008491 CR-2016-009468 CR-2016-009517 TR-2016-008018 CR-2016-000396
CR-2015-006829 CR-2015-006302 CR-2015-006335

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
ECE-5.01-04	Technical Evaluation of Replacement Items	10
ECA-0.1A	Loss of all AC Power Recovery Without SI Required	9
SOP-814	Ventilation Chilled Water System	20

Miscellaneous Documents

<u>Number</u>	<u>Title</u>	<u>Revision</u>
EVAL-2005-001345-001		

Work Orders

5059724

Section 1R15: Operability Determinations and Functionality Assessments

Condition Reports

CR-2016-009883

Section 1R19: Post-Maintenance Testing

Condition Reports

CR-2016-008917 CR-2015-003360 CR-2016-008688 CR-2016-008842 CR-2016-009131

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
OPT-116	CR AC System	5
SOP-802	Control Room Ventilation System	13

Work Orders

5059724	5033471	4719363	5327673	5040663
5349672	5345343	5024930		

Section 1R22: Surveillance Testing

Condition Reports

CR-2016-010025 CR-2016-010037

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
OPT-201A	Charging System	OT1
OPT-214B	Diesel Generator Operability Test	16

Miscellaneous Documents

<u>Number</u>	<u>Title</u>	<u>Revision/</u>
OPT-214B-3	Train A Diesel Generator Electrical Lineup Independent Verification Data Sheet	2
OPT-214B-2	Train A Diesel Generator Handswitch Position Independent Verification Data Sheet	2
OPT-214B-1	Train A Diesel Generator Operability Data Sheet	15

Work Orders

5318121 5354545

Section 40A2: Problem Identification and Resolution

Condition Reports

2015-010893

Section 40A3: Follow-up of Events and Notices of Enforcement Discretion

Condition Reports

CR-2016-005798 CR-2016-005931

Miscellaneous Documents

<u>Number</u>	<u>Title</u>	<u>Revision/</u>
DBD-ME-311	Safety Chilled Water System	18

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
MSE-P0-7333	Centrifugal Water Chiller Maintenance	3
SOP-815A	Safety Chilled Water System	16

Work Orders

4948025

Section 40A5: Other Activities

10 CFR 72.48/50.59 Screens/Evaluations Reviewed (associated CRs and ECO)

CR-2015-001717 CR-2015-008469 CR-2016-000543 ECO-5014-196

Condition Reports

CR-2015-004273 CR-2015-006557 CR-2015-008287 CR-2015-010706 CR-2015-011978
CR-2015-012021 CR-2016-000229 CR-2016-002743 CR-2016-003966 CR-2015-006474
CR-2016-008890 CR-2016-009279 TR-2016-004429 TR-2016-005707

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
DCS-201	Transporting Loaded and Unloaded HI-STORM	7
DCS-205	Stack-Up and Transfer of Loaded MPC	7
EM-SC-112	PCI Closure Weld Head – System Configuration	6
GQP-1.0	PCI Project Organization and Documentation	20
GQP-1.1	PCI QA Orientation and Project Training	17
GQP-12.0	PCI Control of Measuring and Test Equipment	20
GQP-15.0	PCI Nonconforming Items	19
GQP-7.1	PCI Receipt, Storage, and Issue of Weld Materials	7
GQP-7.2	PCI Receipt, Storage, and Issue of Weld Materials	7
GQP-8.1	PCI Process Traveler	19
GQP-9.0	PCI Qualification for NDE	16
GQP-9.2	PCI Liquid Penetrant Examination	0
GQP-9.6	PCI Visual Examination of Welds	15
H2-01	PCI Hydrogen Monitoring	5
MSE-PX-2017	Fuel Building Overhead Crane Electrical Inspection	4
MSLT-MPC	Helium Leak Test	1
MSM-PX-2017	Fuel Building Overhead Crane Mechanical Inspection	2
NUC-212	Spent Fuel Limits for Dry Cask Operations	11
OP-CP-H-01	PCI Closure Welding of MPC	0
OPT-102A	Operations Shiftly Routine Tests	15
RFO-106	Fuel Shuffle Sequence Plans	27
RFO-302	Handling of Fuel Assemblies	19
RPI-521	General Area Monitoring Program	13
STA-421	Control of Issue Reports	21
STA-422	Corrective Action Program	34
STA-707	10 CFR 50.59/72.48 Reviews	21

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
STI-421.01	Initiation of Issue Reports	0
STI-421.02	Issue Report Reviews	0
STI-422.02	Compensatory Actions...	1
STI-422.03	Performing Coaching and Cause Analyses	0
STI-707	Reviews Applicability Determinations	1

Miscellaneous Documents

<u>Number</u>	<u>Title</u>	<u>Revision/ Date</u>
	VSDS Standard Map Survey Report	October 10, 2016
EVAL-15-004	CPNPP Nuclear Oversight Evaluation Plan	April 1, 2015
EVAL-16-002	CPNPP Nuclear Oversight Audit Report	March 1, 2016
	CPNPP 10 CFR 72.212 Evaluation Report	9
DC2014-003	Applicability Determination	N/A
DC2014-003	72.48 Screen	N/A
OPT-102A-3	Mode 3 Shiftly Surveillances (several)	25
RPI-521-1	General Area Monitoring Badge Location Sheet	6
NUC-212-4	Cask Acceptability Report (several)	5
NUC-212-5	Comprehensive Assembly Specifications Supplement	1

Work Orders

5031662	5032998	5033005	5040120	4889548
4997352	5330759	5145323		