



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

May 2, 2013

Rafael Flores, Senior Vice President  
and Chief Nuclear Officer  
Luminant Generation Company, LLC  
Comanche Peak Nuclear Power Plant  
P.O. Box 1002  
Glen Rose, TX 76043

Subject: COMANCHE PEAK NUCLEAR POWER PLANT - NRC INTEGRATED INSPECTION  
REPORT 05000445/2013002 AND 05000446/2013002

Dear Mr. Flores:

On March 27, 2013, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Comanche Peak Nuclear Power Plant, Units 1 and 2, facility. The enclosed inspection report documents the inspection results which were discussed on April 10, 2013, with Mr. K. Peters, Site Vice President, and other members of your staff.

The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

Four NRC-identified findings and two self-revealing findings of very low safety significance (Green) were identified during this inspection. Five of these findings were determined to involve violations of NRC requirements. Further, a licensee-identified violation which was determined to be of very low safety significance is listed in this report. 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 non-cited violations, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region IV; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the Comanche Peak Nuclear Power Plant, Units 1 and 2.

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, Units 1 and 2.

R. Flores

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Sincerely,

***/RA/***

Wayne C. Walker, Chief  
Project Branch A  
Division of Reactor Projects

Docket Nos.: 05000445:05000446

License Nos.: NPF-87; NPF-89

Enclosure: Inspection Report 05000445/2013002 and 05000446/2013002  
w/Attachment: Supplemental Information

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U.S. NUCLEAR REGULATORY COMMISSION

REGION IV

Docket: 50-445, 50-446

License: NPF-87, NPF-89

Report: 05000445/2013002 and 05000446/2013002

Licensee: Luminant Generation Company LLC

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

Location: FM-56, Glen Rose, Texas

Dates: January 1 through March 27, 2013

Inspectors: J. Kramer, Senior Resident Inspector  
B. Tindell, Resident Inspector  
N. Hernandez, Operations Engineer  
D. Strickland, Operations Engineer  
C. Osterholtz, Senior Operations Engineer

Approved By: Wayne Walker, Chief, Project Branch A  
Division of Reactor Projects

## SUMMARY OF FINDINGS

IR 05000445/2013002, 05000446/2013002; 01/01/2013 - 03/27/2013; Comanche Peak Nuclear Power Plant, Units 1 and 2 Integrated Resident and Regional Report; Plant Modifications, Identification and Resolution of Problems, Event Followup, Other.

The report covered a 3-month period of inspection by resident inspectors and announced baseline inspections by region-based inspectors. Five Green non-cited violations and one Green finding were identified. The significance of most findings is indicated by their color (Green, White, Yellow, or Red) using Inspection Manual Chapter 0609, "Significance Determination Process." The cross-cutting aspect is determined using Inspection Manual Chapter 0310, "Components Within the Cross-Cutting Areas." Findings for which the significance determination process does not apply may be Green or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 4, dated December 2006.

### **A. NRC-Identified Findings and Self-Revealing Findings**

Cornerstone: Initiating Events

- Green. The inspectors reviewed a self-revealing finding for the failure to evaluate the effects of vibration on pipe supports in accordance with the design control program when removing the supported pipes. As a result, a pipe support failed due to fatigue and the falling support sheared circulating water tubes causing high sodium levels in the steam generators. The operators manually tripped the reactor as a result of high sodium levels in the steam generators. The licensee entered the finding in the corrective action program as Condition Report CR-2011-006118.

The licensee's failure to evaluate the effects of vibration on pipe supports in accordance with the design control program when removing the supported pipes was a performance deficiency. The finding was more than minor because it was associated with the design control attribute of the Initiating Events cornerstone and adversely affected the cornerstone objective. It increased the likelihood of those events that upset plant stability and challenge critical safety functions during power operations. Specifically, the performance deficiency resulted in a manual reactor trip. Using NRC Manual Chapter 0609, Appendix A, "The Significance Determination Process for Findings At-Power," the finding was determined to be of very low safety significance because the finding did not contribute to both the cause of a reactor trip and affect mitigation equipment. The finding had a human performance cross-cutting aspect associated with decision-making, in that, licensee personnel failed to use conservative assumptions and adopt a requirement to demonstrate that the action was safe in order to proceed rather than a requirement to demonstrate that it was unsafe in order to disapprove the action [H.1b] (Section 1R18).

- Green. The inspectors reviewed a self-revealing non-cited violation of 10 CFR Part 50, Appendix B, Criterion V, for the failure to follow procedures that require initiating a condition report for degradation of equipment. During a maintenance activity, the licensee discovered that the reactor coolant pump

motor lower oil reservoir level was low and failed to enter the condition into the corrective action program. As a result, the cause of the degraded condition was not evaluated. The licensee entered the finding in the corrective action program as Condition Report CR-2012-011607.

The licensee's failure to initiate a condition report for a degraded reactor coolant pump motor lower oil reservoir was a performance deficiency. The finding was more than minor because it was associated with the equipment performance attribute of the Initiating Events cornerstone and adversely affected the cornerstone objective. It increased the likelihood of those events that upset plant stability and challenge critical safety functions during power operations. Using NRC Manual Chapter 0609, Appendix A, "The Significance Determination Process for Findings At-Power," the finding was determined to be of very low safety significance because the finding did not contribute to both the cause of a reactor trip and affect mitigation equipment. The finding had a problem identification and resolution cross-cutting aspect associated with the corrective action program, in that, the licensee did not ensure issues potentially impacting nuclear safety are fully evaluated. Specifically, the licensee did not trend and assess the issues associated with the leaking reactor coolant pump motor oil reservoir [P.1b] (Section 4OA3.5).

#### Cornerstone: Mitigating Systems

- Green. The inspectors identified a non-cited violation of 10 CFR Part 50, Appendix B, Criterion V, for the failure to accomplish an activity affecting quality as prescribed by documented instructions. Specifically, radiation protection personnel installed cameras inside containment and did not have a work order to accomplish the activity because the work order had not been completed and approved. The licensee entered the finding in the corrective action program as Condition Report CR-2013-001723.

The licensee's failure to have documented instructions for installing cameras inside containment was a performance deficiency. The finding was more than minor because if left uncorrected it would have the potential to lead to a more significant safety concern, in that, not using instructions could cause a more significant event and cause the inoperability of safety-related equipment. Using NRC Manual Chapter 0609, Appendix A, "The Significance Determination Process for Findings At-Power," the finding was determined to be of very low safety significance because the finding was not a design or qualification deficiency; did not represent an actual loss of safety function of a system or train; and did not result in the loss of one or more trains of non-technical specification trains of equipment. The finding had a human performance cross-cutting aspect associated with work practices, in that, the licensee did not effectively communicate the expectations regarding the use of the work order when installing cameras inside containment [H.4b] (Section 1R18).

- Green. The inspectors identified a non-cited violation of 10 CFR Part 50, Appendix B, Criterion XVI, for the failure to preclude repetition of a significant condition adverse to quality. Specifically, the Unit 2 train B diesel generator failed to maintain 60 hertz during an isochronous test on April 9, 2011, which was a repeat of a significant condition adverse to quality identified in 2010. As a result,

the capability of the diesel generator to supply emergency power was degraded. The licensee entered the finding in the corrective action program as Condition Report CR-2011-007683.

The licensee's failure to preclude repetition of the Unit 2 train B diesel generator frequency degradation, a significant condition adverse to quality, was a performance deficiency. The finding was more than minor because it was associated with the equipment performance attribute of the Mitigating Systems cornerstone and adversely affected the cornerstone objective to ensure the capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the isochronous diesel frequency degraded from the nominal 60 hertz, which would cause powered equipment to slow down. Using NRC Manual Chapter 0609, Appendix A, "The Significance Determination Process for Findings At-Power," the finding was determined to be of very low safety significance because the finding was not a design or qualification deficiency; did not represent an actual loss of safety function of a system or train; and did not result in the loss of one or more trains of non-technical specification trains of equipment. Although the diesel frequency was degraded, the diesel and all of its powered equipment remained capable of performing their safety functions. The finding had a problem identification and resolution cross-cutting aspect associated with the corrective action program, in that, the licensee failed to thoroughly evaluate problems such that the resolutions address causes and extent of conditions, as necessary [P.1c] (Section 4OA2.3).

- Green. The inspectors identified a non-cited violation of 10 CFR Part 50, Appendix B, Criterion XVI, for the failure to identify and correct a condition adverse to quality. Specifically, the licensee failed to identify and correct an inadequate auxiliary feedwater test line isolation valve preventative maintenance document. As a result, the valve was difficult to operate and was not fully closed following pump testing, causing auxiliary feedwater flow to be diverted away from the steam generators during a plant shutdown. The licensee entered the finding in the corrective action program as Condition Report CR-2013-003095.

The licensee's failure to identify and correct the inadequate preventative maintenance document that led to an auxiliary feedwater flow diversion was a performance deficiency. The finding was more than minor because it was associated with the procedure quality attribute of the Mitigating Systems cornerstone and adversely affected the cornerstone objective to ensure the capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the inadequate maintenance resulted in auxiliary feedwater flow diverted away from the steam generators during a plant shutdown. Using NRC Manual Chapter 0609, Appendix A, "The Significance Determination Process for Findings At-Power," the finding was determined to be of very low safety significance because the finding was not a design or qualification deficiency; did not represent an actual loss of safety function of a system or train; and did not result in the loss of one or more trains of non-technical specification trains of equipment. The finding had a problem identification and resolution cross-cutting aspect associated with the corrective action program, in that, the licensee failed to have a low threshold for identifying issues [P.1a] (Section 4OA2.3).

- Green. The inspectors identified a non-cited violation of 10 CFR Part 50, Appendix B, Criterion V, for the failure to install grout under pipe support base plates for a main steam line in accordance with drawings. As a result, the pipe support's ability to withstand a seismic event was degraded. The licensee entered the finding in the corrective action program as Condition Report CR-2012-008954.

The licensee's failure to install grout under pipe support base plates for a main steam system pipe in accordance with drawings was a performance deficiency. The finding was more than minor because it was associated with the protection against external factors attribute of the Mitigating Systems cornerstone and adversely affected the cornerstone objective to ensure the capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the lack of grout under the pipe support base plates reduced the capability of the support to protect the piping from a seismic event. Using NRC Manual Chapter 0609, Appendix A, "The Significance Determination Process for Findings At-Power," the finding was determined to be of very low safety significance because the finding did not result in the total loss of any safety function that contributes to external event initiated core damage accident sequences. Specifically, despite the degraded condition, the inspectors concluded that the main steam system was capable of performing its safety functions. Since the performance deficiency occurred prior to 1993, the inspectors concluded that the finding was not representative of current licensee performance and no cross-cutting aspect was assigned (Section 4OA5.3).

**B. Licensee-Identified Violations**

A violation of very low safety significance was identified by the licensee and has 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 corrective action tracking numbers are listed in Section 4OA7.



## REPORT DETAILS

### Summary of Plant Status

Unit 1 began the inspection period at approximately 100 percent power and operated at approximately 100 percent power for the entire inspection period.

Unit 2 began the inspection period at approximately 100 percent power and operated at approximately 100 percent power for the entire inspection period.

### 1. REACTOR SAFETY

#### Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

#### 1R04 Equipment Alignments (71111.04)

##### a. Inspection Scope

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

- February 7, 2013, Unit 2 emergency diesel generator 2-01 starting air receiver 1 while starting air receiver 2 was unavailable for maintenance
- March 5, 2013, Unit 2, centrifugal charging pump 2-01 while centrifugal charging pump 2-02 was unavailable for maintenance
- March 5, 2013, Units 1 and 2, uninterruptible power supply air conditioning unit X-01 while emergency fan coil units unavailable for maintenance

The inspectors selected these systems based on their risk significance relative to the reactor safety cornerstones at the time they were inspected. The inspectors focused on discrepancies that could affect the function of the system and, therefore, potentially increase risk. The inspectors reviewed applicable operating procedures, system diagrams, Final Safety Analysis Report, technical specification requirements, outstanding work orders, condition reports, and the impact of ongoing work activities on redundant trains of equipment in order to identify conditions that could have rendered the systems incapable of performing their intended functions. The inspectors also walked down accessible portions of the systems to verify system components and support equipment were aligned correctly and operable. The inspectors examined the material condition of the components and observed operating parameters of equipment to verify that there were no obvious deficiencies. The inspectors also verified that the licensee had properly identified and resolved equipment alignment problems that could cause initiating events or impact the capability of mitigating systems or barriers and entered them into the corrective action program with the appropriate significance characterization.

These activities constitute completion of three partial system walkdown samples as defined in Inspection Procedure 71111.04-05.

b. Findings

No findings were identified.

**1R05 Fire Protection (71111.05AQ)**

.1 Quarterly Fire Inspection Tours (71111.05Q)

a. Inspection Scope

The inspectors conducted fire protection walkdowns in the following risk-significant plant areas:

- March 1, 2013, fire zone SK17A, Unit 1 feedwater penetration area
- March 4, 2013, yard, transformer deluge systems
- March 22, 2013, fire zone EM63, Unit 2 cable spreading room
- March 22, 2013, fire zone EN64, Unit 1 cable spreading room

The inspectors reviewed areas to assess if licensee personnel had implemented a fire protection program that adequately controlled combustibles and ignition sources within the plant; effectively maintained fire detection and suppression capability; maintained passive fire protection features in good material condition; and had implemented adequate compensatory measures for out of service, degraded or inoperable fire protection equipment, systems, or features, in accordance with the licensee's fire plan. The inspectors selected fire areas based on their overall contribution to internal fire risk as documented in the plant's individual plant examination of external events or their potential to affect equipment that could initiate or mitigate a plant transient. The inspectors verified that fire hoses and extinguishers were in their designated locations and available for immediate use, that fire detectors and sprinklers were unobstructed, that transient material loading was within the analyzed limits, and fire doors, dampers, and penetration seals appeared to be in satisfactory condition.

These activities constitute completion of four quarterly fire protection inspection samples as defined in Inspection Procedure 71111.05-05.

b. Findings

No findings were identified.

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

.1 Quarterly Inspection of Licensed Operator Requalification Program (71111.11Q)

a. Inspection Scope

On March 27, 2013, the inspectors observed a crew of licensed operators in the plant's simulator during requalification training. The inspectors assessed the following areas:

- Licensed operator performance
- The ability of the licensee to administer the evaluations
- The modeling and performance of the control room simulator

- The quality of post-scenario critiques
- Follow-up actions taken by the licensee for identified discrepancies

These activities constitute completion of one quarterly inspection of licensed operator requalification program sample as defined in Inspection Procedure 71111.11-05.

b. Findings

No findings were identified.

.2 Quarterly Observation of Licensed Operator Performance (71111.11Q)

a. Inspection Scope

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. The inspectors assessed the operators' adherence to plant procedures and other operations department policies. The inspectors observed the operators' performance of the following activities:

- March 19, 2013, Unit 2, safety injection pump 2-01 surveillance
- March 25, 2013, Unit 1, main steam safety valve surveillances

These activities constitute completion of one quarterly observation of licensed operator performance sample as defined in Inspection Procedure 71111.11-05.

b. Findings

No findings were identified.

.3 Biennial Cycle of Licensed Operator Requalification Program (71111.11B)

The licensed operator requalification program involves two training cycles that are conducted over a two 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. This licensee typically administers the operating test in one training cycle and administers the written examination in the following training cycle. The results of the written examination, which were needed to complete the inspection, were received on March 25, 2013.

a. Inspection Scope

To assess the performance effectiveness of the licensed operator requalification program, the inspectors conducted personnel interviews, reviewed both the operating tests and written examinations, and observed ongoing operating test activities.

The inspectors interviewed 12 licensee personnel, consisting of 11 operators, and one instructor, to determine their understanding of the policies and practices for administering requalification examinations. The inspectors also reviewed operator performance on the written exams and operating tests. These reviews included observations of portions of the operating tests by the inspectors. The operating tests

observed included four job performance measures and three scenarios that were used in the current biennial requalification cycle. 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. The inspectors also reviewed medical records of ten licensed operators for conformance to license conditions and the licensee's system for tracking qualifications and records of license reactivation for three operators.

The results of these examinations were reviewed to determine the effectiveness of the licensee's appraisal of operator performance and to determine if feedback of performance analyses into the requalification training program was being accomplished. The inspectors interviewed members of the training department and reviewed minutes of training review group meetings to assess the responsiveness of the licensed operator requalification program to incorporate the lessons learned from both plant and industry events. Examination results were also assessed to determine if they were consistent with the guidance contained in NUREG 1021, "Operator Licensing Examination Standards for Power Reactors", Revision 9, Supplement 1, and NRC Manual Chapter 0609, Appendix I, "Operator Requalification Human Performance Significance Determination Process."

In addition to the above, the inspectors reviewed examination security measures, simulator fidelity, and existing logs of simulator deficiencies.

These activities constitute completion of one biennial licensed operator requalification program sample as defined in Inspection Procedure 71111.11-05.

b. Findings

No findings were identified.

**1R12 Maintenance Effectiveness (71111.12)**

a. Inspection Scope

The inspectors evaluated the following risk-significant systems, components, and degraded performance issues:

- 6900 Volt breaker 86 relays

The inspectors reviewed events where ineffective equipment maintenance had resulted in failures and independently verified the licensee's actions to address system performance or condition problems in terms of the following:

- Implementing appropriate work practices
- Identifying and addressing common cause failures
- Scoping of systems in accordance with 10 CFR 50.65(b)
- Characterizing system reliability issues for performance
- Charging unavailability for performance
- Trending key parameters for condition monitoring
- Ensuring proper classification in accordance with 10 CFR 50.65(a)(1) or (a)(2)

The inspectors verified appropriate performance criteria for structures, systems, and components classified as having an adequate demonstration of performance through preventive maintenance, as described in 10 CFR 50.65(a)(2), or as requiring the establishment of appropriate and adequate goals and corrective actions for systems classified as not having adequate performance, as described in 10 CFR 50.65(a)(1). The inspectors assessed performance issues with respect to the reliability, availability, and condition monitoring of the system. In addition, the inspectors verified maintenance effectiveness issues were entered into the corrective action program with the appropriate significance characterization. Specific documents reviewed during this inspection are listed in the attachment.

These activities constituted completion of one maintenance effectiveness sample as defined in Inspection Procedure 71111.12-05.

b. Findings

No findings were identified.

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

a. Inspection Scope

The inspectors reviewed the licensee's evaluation and management of plant risk for the maintenance and emergent work activities affecting risk-significant and safety-related equipment listed below to verify that the appropriate risk assessments were performed prior to removing equipment for work:

- February 21, 2013, Units 1 and 2, reactor coolant pump back-seating
- March 19, 2013, Unit 1, service water 1-01
- March 19, 2013, Unit 1, refueling outage

The inspectors selected these activities based on potential risk significance relative to the reactor safety cornerstones. As applicable for each activity, the inspectors verified that licensee personnel performed risk assessments as required by 10 CFR 50.65(a)(4) and that the assessments were accurate and complete. When licensee personnel performed emergent work, the inspectors verified that the licensee personnel promptly assessed and managed plant risk. The inspectors reviewed the scope of maintenance work, discussed the results of the assessment with the licensee's probabilistic risk analyst or shift technical advisor, and verified plant conditions were consistent with the risk assessment. The inspectors also reviewed the technical specification requirements and inspected portions of redundant safety systems, when applicable, to verify risk analysis assumptions were valid and applicable requirements were met.

These activities constitute completion of three maintenance risk assessments and emergent work control inspection samples as defined in Inspection Procedure 71111.13-05.

b. Findings

No findings were identified.

**1R15 Operability Evaluations (71111.15)**

a. Inspection Scope

The inspectors reviewed the following issues:

- CR-2011-010562, Unit 1, hydrazine addition to residual heat removal system caused nitrogen void
- CR-2012-004075, Units 1 and 2, inadequate solder joints on printed cards in inverters
- CR-2012-008719, Unit 2, failed temperature element affected reactor coolant pump thermal barrier isolation signal
- CR-2012-011607, Unit 1, reactor coolant pump motor camera modification

The inspectors selected these operability issues based on the risk significance of the associated components and systems. The inspectors evaluated the technical adequacy of the evaluations to ensure that technical specification operability was properly justified and the subject component or system remained available such that no unrecognized increase in risk occurred. The inspectors compared the operability and design criteria in the appropriate sections of the technical specifications and Final Safety Analysis Report to the licensee's evaluations to determine whether the components or systems were operable. Where compensatory measures were required to maintain operability, the inspectors determined whether the measures in place would function as intended and were properly controlled. The inspectors determined, where appropriate, compliance with bounding limitations associated with the evaluations. Additionally, the inspectors reviewed a sampling of corrective action documents to verify that the licensee was identifying and correcting any deficiencies associated with operability evaluations. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of four operability evaluation inspection samples as defined in Inspection Procedure 71111.15-05.

b. Findings

No findings were identified.

**1R18 Plant Modifications (71111.18)**

a. Inspection Scope

The inspectors reviewed the plant modifications associated with the removal of the piping from the supports inside the Unit 2 main condenser and the installation of cameras inside the Unit 1 containment for monitoring reactor coolant pump motor lower oil reservoir level. The inspectors reviewed final design authorizations, work instructions, and condition reports associated with the modifications.

These activities constitute completion of two plant modifications inspection samples as defined in Inspection Procedure 71111.18-05.

b. Findings

1. Failed Condenser Support Causes Steam Generator Sodium Transient and Manual Reactor Trip

Introduction. The inspectors reviewed a Green self-revealing finding for the failure to evaluate the effects of vibration on pipe supports in accordance with the design control program when removing the supported pipes. As a result, a pipe support failed due to fatigue and the falling support sheared circulating water tubes causing high sodium levels in the steam generators. The operators manually tripped the reactor as a result of high sodium levels in the steam generators.

Description. On May 19, 2011, Unit 2 received indication of high sodium in the steam generators and operators manually tripped the reactor. Troubleshooting revealed that an object had sheared main condenser tubes. The licensee determined that the likelihood of further damage was low, plugged the affected tubes, and restarted the unit. In the subsequent refueling outage, the licensee inspected the interior of the condenser and discovered that an abandoned pipe support had failed and impacted the condenser tubes.

The licensee performed a root cause evaluation in Condition Report CR-2011-006118. The evaluation determined that Final Design Authorization FDA-2011-000054-1-0, which abandoned a pipe support inside the condenser by removing its associated pipe, failed to consider the vibration effects on the support with the pipe removed. The licensee determined that once the pipe was removed, it changed the vibration characteristics of the pipe support, leading to excessive vibrations and fatigue failure.

Procedure ECE-5.01-08, "Electronic Design Change Process," Revision 18, Step 3.1.3.1, states, in part, that the responsible engineer shall consider the design inputs listed in Procedure ECE-5.01, "Design Control Program," Revision 21. Procedure ECE-5.01, Attachment 5, lists design inputs, in part, as dynamic loads, vibration requirements, and structural requirements for pipe supports. The responsible engineer for the final design authorization failed to consider these effects on the pipe support.

The inspectors determined, through document reviews, that the licensee failed to use conservative assumptions when considering the design inputs to the final design authorization.

Analysis. The licensee's failure to evaluate the effects of vibration on pipe supports in accordance with the design control program when removing the supported pipes was a performance deficiency. The finding was more than minor because it was associated with the design control attribute of the initiating events cornerstone and adversely affected the cornerstone objective. It increased the likelihood of those events that upset plant stability and challenge critical safety functions during power operations. Specifically, the performance deficiency resulted in a manual reactor trip. Using NRC Manual Chapter 0609, Appendix A, "The Significance Determination Process for Findings At-Power," the finding was determined to be of very low safety significance

because the finding did not contribute to both the cause of a reactor trip and affect mitigation equipment.

The finding had a human performance cross-cutting aspect associated with decision-making, in that, licensee personnel failed to use conservative assumptions and adopt a requirement to demonstrate that the action was safe in order to proceed rather than a requirement to demonstrate that it was unsafe in order to disapprove the action [H.1b].

Enforcement. This finding does not involve enforcement action because no regulatory requirement violation was identified. The licensee documented the issue in the corrective action program as Condition Report CR-2011-006118. The issue is being characterized as finding FIN 05000446/2013002-01, "Failed Condenser Support Causes Steam Generator Sodium Transient and Manual Reactor Trip."

## 2. Failure to Have Instructions When Performing Activities

Introduction. The inspectors identified a Green non-cited violation of 10 CFR Part 50, Appendix B, Criterion V, for the failure to accomplish an activity affecting quality as prescribed by documented instructions. Specifically, radiation protection personnel installed cameras inside containment and did not have a work order to accomplish the activity because the work order had not been completed and approved.

Description. The inspectors reviewed the licensee's controls for the installation of cameras inside Unit 1 containment for the monitoring of the reactor coolant pump motor lower reservoir levels when the unit was at power. The inspectors identified that the cameras were installed by radiation protection personnel without the use of documented instructions. As a result, the equipment was not placed in the transient equipment report. On January 13, 2013, the licensee completed the work order and the equipment was entered into the transient equipment report.

The inspectors discussed the finding with the licensee and determined that radiation protection personnel rarely use work orders. In the past, radiation protection personnel did not use work orders when installing cameras inside containment during an outage for coverage of radiation protection activities. A work order was initiated prior to the installation of cameras inside containment; however, it was not completed and approved prior to the installation. In addition, the initiation of the work order to install the cameras was not communicated to radiation protection personnel and the radiation protection personnel were not expecting one.

Analysis. The licensee's failure to have documented instructions for installing cameras inside containment was a performance deficiency. The finding was more than minor because if left uncorrected it would have the potential to lead to a more significant safety concern, in that, not using instructions could cause a more significant event and cause the inoperability of safety-related equipment. Using NRC Manual Chapter 0609, Appendix A, "The Significance Determination Process for Findings At-Power," the finding was determined to be of very low safety significance because the finding was not a design or qualification deficiency; did not represent an actual loss of safety function of a system or train; and did not result in the loss of one or more trains of non-technical specification trains of equipment.



The finding had a human performance aspect associated with work practices, in that, the licensee did not effectively communicate the expectations regarding the use of the work order when installing cameras inside containment [H.4b].

Enforcement. Title 10 CFR Part 50, Appendix B, Criterion V, requires, in part, that activities affecting quality shall be prescribed by documented instructions of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions. Contrary to the above, on November 8, 2012, the licensee failed to accomplish an activity affecting quality as prescribed by documented instructions. Specifically, radiation protection personnel installed cameras inside containment and did not use the work order to accomplish the activity because the work order had not been completed and approved. As a result, there was no documented instruction that the activity had been accomplished and the equipment was not placed in the transient equipment report. On January 13, 2013, the licensee completed the work order and the equipment was entered into the transient equipment report. Because the violation was of very low safety significance and was documented in the licensee's corrective action program as Condition Report CR-2013-001723, it is being treated as a non-cited violation, consistent with Section 2.3.2.a of the Enforcement Policy: NCV 05000445/2013002-02, "Failure to Have Instructions When Performing Activities."

#### **1R19 Post-Maintenance Testing (71111.19)**

##### a. Inspection Scope

The inspectors reviewed the following post-maintenance activities to verify that procedures and test activities were adequate to ensure system operability and functional capability:

- January 9, 2013, Unit 2, turbine drive auxiliary feedwater pump main steam line 1 testing following maintenance
- February 27, 2013, Unit 2, diesel generator 2-01 testing following jacket water fitting replacement
- March 19, 2013, Unit 2, safety injection pump 2-01 testing following oil cooler cleaning and breaker maintenance

The inspectors selected these activities based upon the structure, system, or component's ability to affect risk. The inspectors evaluated the activities to ensure the testing was adequate for the maintenance performed, the acceptance criteria were clear, and the test ensured equipment operational readiness.

The inspectors evaluated the activities against technical specifications, the Final Safety Analysis Report, 10 CFR Part 50 requirements, licensee procedures, and various NRC generic communications to ensure that the test results adequately ensured the equipment met the licensing basis and design requirements. In addition, the inspectors reviewed corrective action documents associated with post-maintenance tests to determine whether the licensee was identifying problems and entering them into the corrective action program and that the problems were being corrected commensurate

with their importance to safety. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of three post-maintenance testing inspection samples as defined in Inspection Procedure 71111.19-05.

b. Findings

No findings were identified.

**1R22 Surveillance Testing (71111.22)**

a. Inspection Scope

The inspectors reviewed the Final Safety Analysis Report, procedure requirements, technical specifications, and corrective action documents to ensure that the surveillance activities listed below demonstrated that the systems, structures, and components tested were capable of performing their intended safety functions.

Pump or Valve Inservice Test

- March 25, 2013, Unit 1 main steam safety valve testing in accordance with Procedure MSM-S0-8702, "Main Steam Safety Valve Testing," Revision 4

Routine Surveillance Testing

- February 20, 2013, Unit 1 diesel generator 1-01 fast start in accordance with Procedure OPT-214A, "Diesel Generator Operability Test," Revision 22
- March 5, 2013, Unit 2 inverter U2PC4 testing in accordance with Procedure MSE-C0-5811, "Solidstate Controls 10 Kva Inverter Maintenance and Operability Test," Revision 1

The inspectors either witnessed or reviewed test data to verify that the significant surveillance test attributes were adequate to address the following:

- Preconditioning
- Evaluation of testing impact on the plant
- Acceptance criteria
- Test equipment
- Procedures
- Jumper and lifted lead controls
- Test data
- Testing frequency and method demonstrated technical specification operability
- Test equipment removal
- Restoration of plant systems
- Fulfillment of ASME code requirements
- Updating of performance indicator data
- Reference setting data
- Annunciators and alarms setpoints

Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of three surveillance testing inspection samples (one pump or valve inservice test sample, and two routine surveillance testing samples) as defined in Inspection Procedure 71111.22-05.

b. Findings

No findings were identified.

**Cornerstone: Emergency Preparedness**

**1EP6 Drill Evaluation (71114.06)**

a. Inspection Scope

On March 20, 2013, the inspectors evaluated the conduct of licensee emergency drills to identify any weaknesses and deficiencies in classification, notification, and protective action recommendation development activities. The inspectors observed emergency response operations in the simulator, technical support center, and the emergency operations facility to determine whether the event classification, notifications, and protective action recommendations were performed in accordance with procedures. The inspectors also compared any inspector-observed weakness with those identified by the licensee staff in order to evaluate the critique and to verify whether the licensee staff was properly identifying weaknesses and entering them into the corrective action program.

These activities constituted completion of one emergency preparedness drill sample as defined in Inspection Procedure 71114.06-05.

**4. OTHER ACTIVITIES**

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

**40A1 Performance Indicator Verification (71151)**

.1 Data Submission

a. Inspection Scope

The inspectors performed a review of the data, submitted by the licensee for the fourth quarter 2012 performance indicators, for any obvious inconsistencies. The data is released to the public in accordance with NRC Inspection Manual Chapter 0608, "Performance Indicator Program."

This review was performed as part of the inspectors' normal plant status activities and, as such, did not constitute a separate inspection sample.

b. Findings

No findings were identified.

.2 Unplanned Scrams per 7000 Critical Hours (IE01)

a. Inspection Scope

The inspectors sampled licensee submittals for the unplanned scrams per 7000 critical hours performance indicator for Units 1 and 2 for the period from January through December 2012. To determine the accuracy of the performance indicator data reported during those periods, performance indicator definitions, and guidance contained in Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6, was used. The inspectors reviewed the licensee's operator narrative logs, event reports, and NRC integrated inspection reports to validate the accuracy of the submittals. The inspectors also reviewed the corrective action database to determine if any problems had been identified with the performance indicator data collected or transmitted for this indicator and none were identified. Specific documents reviewed are described in the attachment to this report.

These activities constitute completion of two unplanned scrams per 7000 critical hours samples as defined in Inspection Procedure 71151.05.

b. Findings

No findings were identified.

.3 Unplanned Power Changes per 7000 Critical Hours (IE03)

a. Inspection Scope

The inspectors sampled licensee submittals for the unplanned power changes per 7000 critical hours performance indicator for Units 1 and 2 for the period from January through December 2012. To determine the accuracy of the performance indicator data reported during those periods, performance indicator definitions, and guidance contained in Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6, was used. The inspectors reviewed the licensee's operator narrative logs, maintenance rule records, event reports, and NRC integrated inspection reports to validate the accuracy of the submittals. The inspectors also reviewed the licensee's corrective action database to determine if any problems had been identified with the performance indicator data collected or transmitted for this indicator. Specific documents reviewed are described in the attachment to this report.

These activities constitute completion of two unplanned power changes per 7000 critical hours samples as defined in Inspection Procedure 71151.05.

.4 Unplanned Scrams with Complications (IE04)

a. Inspection Scope

The inspectors sampled licensee submittals for the unplanned scrams with complications performance indicator for Units 1 and 2 for the period from January through December 2012. To determine the accuracy of the performance indicator data reported during those periods, performance indicator definitions, and guidance contained in Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6, was used. The inspectors reviewed the licensee's

operator narrative logs, event reports, and NRC integrated inspection reports to validate the accuracy of the submittals. The inspectors also reviewed the licensee's corrective action database to determine if any problems had been identified with the performance indicator data collected or transmitted for this indicator. Specific documents reviewed are described in the attachment to this report.

These activities constitute completion of two unplanned scrams with complications samples as defined in Inspection Procedure 71151.05.

b. Findings

No findings were identified.

**40A2 Identification and Resolution of Problems (71152)**

.1 Routine Review of Identification and Resolution of Problems

a. Inspection Scope

As part of the various baseline inspection procedures discussed in previous sections of this report, the inspectors routinely reviewed issues during baseline inspection activities and plant status reviews to verify that they were being entered into the licensee's corrective action program at an appropriate threshold, that adequate attention was being given to timely corrective actions, and that adverse trends were identified and addressed. The inspectors reviewed attributes that included: the complete and accurate identification of the problem; the timely correction, commensurate with the safety significance; the evaluation and disposition of performance issues, generic implications, common causes, contributing factors, root causes, extent of condition reviews, and previous occurrences reviews; and the classification, prioritization, focus, and timeliness of corrective actions. Minor issues entered into the licensee's corrective action program because of the inspectors' observations are included in the attached list of documents reviewed.

These routine reviews for the identification and resolution of problems did not constitute any additional inspection samples. Instead, by procedure, they were considered an integral part of the inspections performed during the quarter and documented in Section 1 of this report.

b. Findings

No findings were identified.

.2 Daily Corrective Action Program Reviews

a. Inspection Scope

In order to assist with the identification of repetitive equipment failures and specific human performance issues for follow-up, the inspectors performed a daily screening of items entered into the licensee's corrective action program. The inspectors accomplished this through review of the station's daily corrective action documents.

The inspectors performed these daily reviews as part of their daily plant status monitoring activities, so these reviews did not constitute any separate inspection samples.

b. Findings

No findings were identified.

.3 Selected Issue Follow-up Inspection

a. Inspection Scope

The inspectors performed a review of the following items entered in the licensee's corrective action program:

- Condition Report CR-2011-007683, corrective actions to prevent recurrence were ineffective for diesel generator 2-02 frequency degradation
- Condition Report CR-2011-006162, auxiliary feedwater pump 2-01 flow diversion due to test line isolation valve not fully closed

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, and completed corrective actions in a timely manner commensurate with the safety significance of the issue.

These activities constitute completion of two in-depth problem identification and resolution samples as defined in Inspection Procedure 71152-05.

b. Findings

1. Failure to Correct Diesel Frequency Degradation

Introduction. The inspectors identified a Green non-cited violation of 10 CFR Part 50, Appendix B, Criterion XVI, for the failure to preclude repetition of a significant condition adverse to quality. Specifically, the Unit 2 train B diesel generator failed to maintain 60 hertz during an isochronous test on April 9, 2011, which was a repeat of a significant condition adverse to quality identified in 2010. As a result, the capability of the diesel generator to supply emergency power was degraded.

Description. On July 29, 2010, the inspectors identified that the Unit 2 train B diesel generator had not maintained 60 hertz during isochronous testing from 2006 to 2009. The finding was documented in NRC Inspection Report 05000445/2010004 and 05000446/2010004. The licensee initiated Condition Report CR-2010-003305, which the licensee classified as a significant condition adverse to quality, because the diesel was inoperable while the frequency was degraded.

A significant condition adverse to quality requires a root cause evaluation and corrective actions to prevent recurrence. During the evaluation, the licensee noted that the suspected failure point, an auxiliary switch in a Unit 2 train B offsite power source

breaker cubicle, appeared to be physically misaligned. However, because it had been burnished and had worked correctly multiple times since the last diesel surveillance, the licensee chose to delay further troubleshooting and possible corrective actions until the next refueling outage.

During the refueling outage, the diesel generator again failed to maintain 60 hertz during surveillance testing. The licensee initiated Condition Report CR-2011-007683 to document that the corrective actions to prevent recurrence were ineffective. Subsequently, the licensee discovered that internal binding in the auxiliary switch caused the misalignment of the contacts, which in turn reduced the amount of available surface area for passing current and resulted in the switch malfunction and diesel frequency degradation. The licensee corrected the condition by replacing the auxiliary switch.

The diesel frequency degradation would cause its powered equipment to operate at a reduced frequency. However, the diesel and all of its powered equipment remained capable of performing their safety functions due to operating margin.

The inspectors determined, by reviewing the root cause in Condition Report CR-2011-007683, that the licensee failed to thoroughly evaluate the issue during the previous root cause so that the corrective actions to prevent recurrence addressed the cause of the issue.

Analysis. The licensee's failure to preclude repetition of the Unit 2 train B diesel generator frequency degradation, a significant condition adverse to quality, was a performance deficiency. The finding was more than minor because it was associated with the equipment performance attribute of the Mitigating Systems cornerstone and adversely affected the cornerstone objective to ensure the capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the isochronous diesel frequency degraded from the nominal 60 hertz, which would cause powered equipment to slow down. Using NRC Manual Chapter 0609, Appendix A, "The Significance Determination Process for Findings At-Power," the finding was determined to be of very low safety significance because the finding was not a design or qualification deficiency; did not represent an actual loss of safety function of a system or train; and did not result in the loss of one or more trains of non-technical specification trains of equipment. Although the diesel frequency was degraded, the diesel and all of its powered equipment remained capable of performing their safety functions.

The finding had a problem identification and resolution cross-cutting aspect associated with the corrective action program, in that, the licensee failed to thoroughly evaluate problems such that the resolutions address causes and extent of conditions, as necessary [P.1c].

Enforcement. Title 10 CFR Part 50, Appendix B, Criterion XVI, requires, in part, that for significant conditions adverse to quality, measures shall be established to assure that the cause of the condition is determined and corrective action taken to preclude repetition. Contrary to the above, from July 29, 2010 to April 9, 2011, the licensee failed to follow 10 CFR Part 50, Appendix B, Criterion XVI, and take corrective action to preclude repetition of a significant condition adverse to quality. Specifically, the licensee identified that the Unit 2 train B emergency diesel generator frequency was degraded in isochronous operation in 2010 and took corrective actions to prevent recurrence, but the condition repeated in 2011. The licensee determined that all of the diesel powered equipment remained capable of performing their safety functions. The licensee

corrected the condition by replacing an auxiliary switch in a Unit 2 train B offsite power source breaker cubicle. Since the violation was of very low safety significance and was documented in the licensee's corrective action program as Condition Report CR-2011-007683, it is being treated as a non-cited violation, consistent with Section 2.3.2.a of the Enforcement Policy: NCV 05000446/2013002-03, "Failure to Correct Diesel Frequency Degradation."

## 2. Failure to Identify Inadequate Auxiliary Feedwater Valve Maintenance

Introduction. The inspectors identified a Green non-cited violation of 10 CFR Part 50, Appendix B, Criterion XVI, for the failure to identify and correct a condition adverse to quality. Specifically, the licensee failed to identify and correct an auxiliary feedwater test line isolation valve preventative maintenance document. As a result, the valve was difficult to operate and was not fully closed following pump testing, causing auxiliary feedwater flow to be diverted away from the steam generators during a plant shutdown.

Description. The inspectors reviewed Condition Report CR-2011-006162. The condition report documented that, during a Unit 2 outage, operators discovered the motor driven auxiliary feedwater pump 2-01 test line isolation valve was partially open, diverting flow from the steam generators. The test line diverted approximately 150 gallons per minute from the pump discharge back to the condensate storage tank and not to the steam generators. The licensee corrected the condition by closing the valve. The licensee determined that the valve was not fully closed following the last pump test because the valve was difficult to operate.

The licensee addressed the difficulty of the valve's stroke. Maintenance personnel inspected the condition of the remote operator's grease and determined that a grease fitting for the yoke bushing and bearings was clogged. The licensee unclogged the fitting and greased the valve.

After the licensee completed their evaluation and work, the inspectors reviewed the work history of the valve's remote operator. The inspectors discovered that a routine lubrication of the valve's remote operator had been performed approximately one year prior to the event. Through further document reviews and interviews, the inspectors discovered that the grease fitting that was found clogged was not being greased during the routine lubrications of the remote operator. Therefore, the grease for the yoke bushing and bearings was degraded, causing the difficulty in stroking the valve. Therefore, the inspectors concluded that the preventative maintenance on the valve's remote operator was inadequate, a condition adverse to quality.

The inspectors evaluated the past operability of the auxiliary feedwater system with the diverted flow. The inspectors determined that due to procedural steps following surveillance testing which close the test isolation valve; it was highly unlikely that the flow diversion would be any greater than 150 gallons per minute. In addition, the inspectors determined that even with the reduced flow capability of the system, the pump would still produce the accident analysis required pressure and flow to the steam generators. The inspectors concluded that the auxiliary feedwater system was always operable despite the degraded condition.

The inspectors determined, from interviews, that the licensee failed to identify the inadequate maintenance because maintenance personnel failed to write an additional condition report when they found the valve's grease fitting clogged.



Analysis. The licensee's failure to identify and correct the inadequate preventative maintenance document that led to an auxiliary feedwater flow diversion was a performance deficiency. The finding was more than minor because it was associated with the procedure quality attribute of the Mitigating Systems cornerstone and adversely affected the cornerstone objective to ensure the capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the inadequate maintenance resulted in auxiliary feedwater flow diverted away from the steam generators during a plant shutdown. Using NRC Manual Chapter 0609, Appendix A, "The Significance Determination Process for Findings At-Power," the finding was determined to be of very low safety significance because the finding was not a design or qualification deficiency; did not represent an actual loss of safety function of a system or train; and did not result in the loss of one or more trains of non-technical specification trains of equipment.

The finding had a problem identification and resolution cross-cutting aspect associated with the corrective action program, in that, the licensee failed to have a low threshold for identifying issues [P.1a].

Enforcement. Title 10 CFR Part 50, Appendix B, Criterion XVI, requires, in part, that conditions adverse to quality are promptly identified and corrected. Contrary to the above, from May 22, 2011 to May 29, 2012, the licensee failed to follow 10 CFR Part 50, Appendix B, Criterion XVI, and promptly identify and correct a condition adverse to quality. Specifically, the licensee failed to identify and correct the inadequate maintenance document on the auxiliary feedwater test line isolation valve that led to the flow diversion. Since the violation was of very low safety significance and was documented in the licensee's corrective action program as Condition Report CR-2013-003095, it is being treated as a non-cited violation, consistent with Section 2.3.2.a of the Enforcement Policy: NCV 05000446/2013002-04, "Failure to Identify Inadequate Auxiliary Feedwater Valve Maintenance."

#### **40A3 Event Followup (71153)**

The activities documented below constitute completion of five event followup samples as defined in Inspection Procedure 71153.

.1 (Closed) Licensee Event Report 05000445/2011-001-01, Potential for Steam Voiding Causing Residual Heat Removal System Inoperability

The supplemental licensee event report documented an additional occurrence of steam voiding causing the residual heat removal system to be inoperable that was not included in the original licensee event report. The inspectors evaluated the additional occurrence and concluded that characterization of the issue as documented in NRC Inspection Report 05000445/2012004 and 05000446/2012004 did not change. This licensee event report is closed.

.2 (Closed) Licensee Event Report 05000446/2012-001-00, Power Operator Relief Valve Block Valve Inoperable for Longer than Allowed by Technical Specifications

The licensee event report documented an incident where the Unit 2 pressurizer power operated relief valve block valve was discovered to be inoperable on April 8, 2011, during in-service testing. The inspectors had reviewed the event and documented the enforcement aspect and safety significance in NRC Inspection Report 05000445/2012002 and 05000446/2012002, Sections 1R15 and 4OA7. No new information was identified in the licensee event report. This licensee event report is closed.

.3 (Closed) Licensee Event Report 05000446/2010-002-01, Unit 2 Diesel Generator 2-02 Inoperable Due to Remaining in Droop Verses Isochronous Mode

This supplemental licensee event report updated an incident where diesel generator 2-02 was discovered to be inoperable from September 8, 2008 to September 20, 2009 due to a malfunctioning contact causing the diesel frequency to be below the technical specification minimum. The inspectors reviewed the event and documented the enforcement aspect and safety significance in Section 4OA2.3. This supplemental licensee event report is closed.

.4 (Closed) Licensee Event Report 05000446/2011-002-00, Unit 2 Manual Trip Due to High Steam Generator Sodium Concentration

The licensee event report documented an incident where Unit 2 operators performed a manual reactor trip on May 19, 2011, as a result of a high sodium concentration in all four steam generators. The inspectors reviewed the event and documented the enforcement aspect and safety significance in Section 1R18. This licensee event report is closed.

.5 (Closed) Licensee Event Report 05000445/2012-003-00, Unit 1 Manual Reactor Trip due to Reactor Coolant Pump Low Oil Level

a. Inspection Scope

The licensee event report documented an incident where Unit 1 operators performed a manual reactor trip on November 2, 2012, as a result of a reactor coolant pump high bearing temperature and low oil level. The inspectors reviewed the event and documented the enforcement aspect and safety significance below. This licensee event report is closed.

b. Findings

Introduction. The inspectors reviewed a self-revealing Green non-cited violation of 10 CFR Part 50, Appendix B, Criterion V, for the failure to follow procedures that require initiating a condition report for degradation to equipment. During a maintenance activity, the licensee discovered that the reactor coolant pump motor lower oil reservoir level was low and failed to enter the condition into the corrective action program. As a result, the cause of the degraded condition was not evaluated.

Description. On November 2, 2012, operators performed a manual reactor trip of Unit 1 following the receipt of a reactor coolant pump motor lower radial bearing high/low oil

level alarm coincident with a bearing temperature of 180 degrees Fahrenheit and slowly rising. Following the reactor trip, the operators stopped the reactor coolant pump. The licensee visually inspected the reactor coolant pump and noticed that the lower radial bearing oil level was below the sight glass indication. The licensee determined that the elastomeric couplings in the component cooling water inlet and outlet lines degraded and leaked motor oil from the reservoir.

The inspectors reviewed the licensee's root cause analysis report for the event. The report documented that the reactor coolant pump had an increasing trend in oil loss from the motor lower bearing reservoir for the previous three operating cycles. The work orders documented the low oil reservoir levels, but a condition report was not initiated. Therefore, the trending and assessment of the leaking oil reservoir was not performed.

Analysis. The licensee's failure to initiate a condition report for a degraded reactor coolant pump motor lower oil reservoir was a performance deficiency. The finding was more than minor because it was associated with the equipment performance attribute of the Initiating Events cornerstone and adversely affected the cornerstone objective. It increased the likelihood of those events that upset plant stability and challenge critical safety functions during power operations. Using NRC Manual Chapter 0609, Appendix A, "The Significance Determination Process for Findings At-Power," the finding was determined to be of very low safety significance because the finding did not contribute to both the cause of a reactor trip and affect mitigation equipment. The finding had a problem identification and resolution aspect associated with the corrective action program, in that, the licensee did not ensure issues potentially impacting nuclear safety are fully evaluated. Specifically, the licensee did not trend and assess the issues associated with the leaking reactor coolant pump motor oil reservoir [P.1b].

Enforcement. Title 10 CFR Part 50, Appendix B, Criterion V, requires, in part, that activities affecting quality shall be prescribed by documented instructions of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions. Procedure STA-421, "Initiation of Condition Reports," Revision 18, Attachment 8.A, Step 6.2 required, in part, that equipment malfunctions, damage, or degradation, other than anticipated wear is documented in a condition report. Contrary to the above, on October 3, 2011, the licensee failed to accomplish an activity affecting quality in accordance with document instructions. Specifically, the licensee did not document equipment degradation, a low reactor coolant pump motor lower oil reservoir level, in a condition report. Since the violation was of very low safety significance and was documented in the licensee's corrective action program as Condition Report CR-2012-011607, it is being treated as a non-cited violation, consistent with Section 2.3.2.a of the NRC Enforcement Policy: NRC 05000445/2013002-05, "Failure to Initiate a Condition Report for a Degraded Reactor Coolant Pump Motor Lower Oil Reservoir."

#### **40A5 Other**

##### **.1 World Association of Nuclear Operators Plant Assessment Review**

The inspectors reviewed the final report for the World Association of Nuclear Operators plant assessment for the Comanche Peak Nuclear Power Plant conducted in April 2012. The inspectors reviewed the report to ensure that issues identified were consistent with

the NRC perspectives of licensee performance and to verify if any significant issues were identified that required further NRC followup.

.2 NRC Temporary Instruction 2515/182, "Review of the Implementation of the Industry Initiative to Control Degradation of Underground Piping and Tanks"

Leakage from buried and underground pipes has resulted in ground water contamination incidents with associated heightened NRC and public interest. The industry issued a guidance document, Nuclear Energy Institute 09-14, "Guideline for the Management of Buried Piping Integrity" (ADAMS Accession No. ML1030901420) to describe the goals and required actions (commitments made by the licensee) resulting from this underground piping and tank initiative. On December 31, 2010, Nuclear Energy Institute issued Revision 1 to Nuclear Energy Institute 09-14, "Guidance for the Management of Underground Piping and Tank Integrity," (ADAMS Accession No. ML110700122), with an expanded scope of components which included underground piping that was not in direct contact with the soil and underground tanks. On November 17, 2011, the NRC issued Temporary Instruction 2515/182 "Review of the Industry Initiative to Control Degradation of Underground Piping and Tanks" to gather information related to the industry's implementation of this initiative.

a. Inspection Scope

The inspectors reviewed the licensee's programs for buried pipe, underground piping and tanks in accordance with Temporary Instruction 2515/182 to determine if the program attributes and completion dates identified in Sections 3.3 A and 3.3 B of Nuclear Energy Institute 09-14 Revision 1 were contained in the licensee's program and implementing procedures. For the buried pipe and underground piping program attributes with completion dates that had passed, the inspectors reviewed records to determine if the attribute was in fact complete and to determine if the attribute was accomplished in a manner which reflected good or poor practices in program management. Based upon the scope described above, Phase I was found to meet all applicable aspects of Nuclear Energy Institute 09-14, Revision 1, as set forth in Table 1 of Temporary Instruction 2515/182.

b. Findings

No findings were identified.

.3 (Closed) NRC Temporary Instruction 2515/188, "Inspection of Near-Term Task Force Recommendation 2.3 Seismic Walkdowns"

b. Inspection Scope

The inspectors accompanied the licensee on their seismic walkdowns of the following equipment:

- August 27, 2012, Unit 1, diesel generator 1-02
- September 1, 2012, Unit 1, process protection cabinet, protection set II

The inspectors independently performed a walkdown of the following equipment:

- September 3, 2012, Unit 1, turbine driven auxiliary feedwater pump
- September 3, 2012, Units 1 and 2, service water pipe tunnel
- September 6, 2012, Unit 2, main steam isolation valve 2-03

Additionally, inspectors verified that items that could allow the spent fuel pool to drain down rapidly were walked down by the licensee.

For each walkdown, the inspectors either independently verified or observed the licensee's verification that the following seismic features were free of potential adverse seismic conditions:

- Anchorage was free of bent, broken, missing or loose hardware
- Anchorage was free of corrosion that is more than mild surface oxidation
- Anchorage was free of visible cracks in the concrete near the anchors
- Anchorage configuration was consistent with plant documentation.
- Systems, structures, and components will not be damaged from impact by nearby equipment or structures.
- Overhead equipment, distribution systems, ceiling tiles and lighting, and masonry block walls are secure and not likely to collapse onto the equipment.
- Attached lines have adequate flexibility to avoid damage.
- The area appears to be free of potentially adverse seismic interactions that could cause flooding or spray in the area.
- The area appears to be free of potentially adverse seismic interactions that could cause a fire in the area.
- The area appears to be free of potentially adverse seismic interactions associated with housekeeping practices, storage of portable equipment, and temporary installations (e.g., scaffolding, lead shielding).

b. Findings

Introduction. The inspectors identified a Green non-cited violation of 10 CFR Part 50, Appendix B, Criterion V, for the failure to install grout under pipe support base plates for a main steam line in accordance with drawings. As a result, the pipe support's ability to withstand a seismic event was degraded.

Description. On September 6, 2012, the inspectors independently walked down the unit 2 main steam isolation valve 2-03 in accordance with Temporary Instruction 188, "Inspection of Near-Term Task Force Recommendation 2.3 Seismic Walkdowns." The inspectors were verifying that the licensee had appropriately identified any potential

seismic concerns during their earlier walkdown of the same equipment using Electric Power Research Institute Technical Report, "Seismic Walkdown Guidance," dated June 2012. However, the inspectors identified a seismic concern that the licensee's walkdown team failed to identify.

The inspectors discovered that the pipe support directly beneath main steam isolation valve 2-03 did not have any grout between two pipe support base plates and the concrete floor, leaving a gap of approximately one inch. The grout was required by design drawing MS-2-003-417-S72R, Sheet 2, "Large Bore Pipe Support," Revision CP-2. The inspectors did not observe any damage to the support or concrete from normal plant operation, but a seismic event may cause damage as a result of higher stresses due to the missing grout. Despite the degraded condition, the licensee determined that the main steam isolation valve and main steam system would survive the design basis seismic event due to redundant supports. Therefore, the inspectors concluded that despite the missing grout, the main steam system would still be able to perform its safety functions. The licensee corrected the condition by installing grout on October 25, 2012.

The inspectors determined that the two pipe support base plates should have been grouted before the unit commenced commercial operation in 1993.

Analysis. The licensee's failure to install grout under pipe support base plates for a main steam system pipe in accordance with drawings was a performance deficiency. The finding was more than minor because it was associated with the protection against external factors attribute of the Mitigating Systems cornerstone and adversely affected the cornerstone objective to ensure the capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the lack of grout under the pipe support base plates reduced the capability of the support to protect the piping from a seismic event. Using NRC Manual Chapter 0609, Appendix A, "The Significance Determination Process for Findings At-Power," the finding was determined to be of very low safety significance because the finding did not result in the total loss of any safety function that contributes to external event initiated core damage accident sequences. Specifically, despite the degraded condition, the inspectors concluded that the main steam system was capable of performing its safety functions.

Since the performance deficiency occurred prior to 1993, the inspectors concluded that the finding was not representative of current licensee performance and no cross-cutting aspect was assigned.

Enforcement. Title 10 CFR Part 50, Appendix B, Criterion V, requires, in part, that activities affecting quality shall be accomplished in accordance with documented drawings. Drawing MS-2-003-417-S72R, Sheet 2, "Large Bore Pipe Support," Revision CP-2, prescribed grout under the base plates of pipe support MS-2-003-417-S72R. Contrary to the above, from 1993 to October 25, 2012, the licensee failed to follow 10 CFR Part 50, Appendix B, Criterion V, and accomplish an activity affecting quality in accordance with a documented drawing. Specifically, the licensee failed to install grout under the two pipe support base plates in accordance with drawing MS-2-003-417-S72R, which adversely affected the ability of the pipe support to withstand a potential seismic event. The licensee corrected the condition by installing grout. Since the violation was of very low safety significance and was documented in the licensee's corrective action program as Condition Report CR-2012-008954, it is

being treated as a non-cited violation, consistent with Section 2.3.2.a of the Enforcement Policy: NCV 05000446/2013002-06, "Failure to Install Grout Under Pipe Support Base Plates."

#### **40A6 Meetings**

##### Exit Meeting Summary

On March 27, 2013, the inspectors presented the licensed operator requalification program inspection results to Mr. R. Blankenship, Consulting Engineer. The licensee acknowledged the issues presented. The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

On April 10, 2013, the inspectors presented the resident inspection results to Mr. K. Peters, Site Vice President, and other members of the licensee staff. The licensee acknowledged the issues presented. The inspectors acknowledged review of proprietary material during the inspection. No proprietary information has been included in the report.

#### **40A7 Licensee-Identified Violations**

The following violation of very low safety significance (Green) was identified by the licensee and is a violation of NRC requirements which meets the criteria of the NRC Enforcement Policy for being dispositioned as a non-cited violation.

Title 10 CFR 55.53(e) requires, in part, that to maintain active license status, the licensee shall actively perform the functions of an operator or senior operator on a minimum of seven 8-hour or five 12-hour shifts per calendar quarter. Contrary to the above, on October 23, 2011, an operator stood watch as the Unit 2 control room supervisor, a senior operator position, and failed to stand five 12-hour proficiency watches the previous calendar quarter. The finding was more than minor because if left uncorrected the finding could have become more significant, in that, allowing licensed operators to stand watch in the control room without valid demonstration of appropriate knowledge and abilities by not maintaining conditions of their licenses could be a precursor to a significant event if undetected performance deficiencies develop. Using NRC Manual Chapter 0609, Significance Determination Process, "Phase 1 worksheets, the inspectors were directed to use Appendix I, "Licensed Operator Requalification Significance Determination Process," to process this violation. However, the inspectors determined that NRC Manual Chapter 0609, Appendix I, could not be used to process this finding. Based on direction from headquarters and regional management to use NRC Manual Chapter 0609, Appendix M, "Significance Determination Process Using Qualitative Criteria," the non-cited violation was determined to have very low safety significance. The licensee entered this issue into their corrective action program as Condition Report CR-2011-012886.

## **SUPPLEMENTAL INFORMATION**

### **KEY POINTS OF CONTACT**

#### Licensee Personnel

R. Flores, Senior Vice President and Chief Nuclear Officer  
T. Gilder, Director, Performance Improvement  
D. Goodwin, Director, Work Management  
T. Hope, Manager, Nuclear Licensing  
B. Kidwell, Manager, Emergency Preparedness  
F. Madden, Director, Oversight and Regulatory Affairs  
B. Mays, Vice President, Engineering and Support  
K. Nickerson, Director, Site Engineering  
B. Patrick, Director, Maintenance  
B. Reppa, Director, Engineering Support  
K. Peters, Site Vice President  
S. Sewell, Director, Organizational Effectiveness  
M. Smith, Director, Operations  
S. Smith, Plant Manager  
K. Tate, Manager, Security  
D. Wilder, Director, Plant Support

### **LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED**

#### Opened and Closed

05000446/2013002-01	FIN	Failed Condenser Support Causes Steam Generator Sodium Transient and Manual Reactor Trip (Section 1R18)
05000445/2013002-02	NCV	Failure to Have Instructions When Performing Activities (Section 1R18)
05000446/2013002-03	NCV	Failure to Correct Diesel Frequency Degradation (Section 4OA2.3)
05000446/2013002-04	NCV	Failure to Identify Inadequate Auxiliary Feedwater Valve Maintenance (Section 4OA2.3)
05000445/2013002-05	NCV	Failure to Initiate a Condition Report for a Degraded Reactor Coolant Pump Motor Lower Oil Reservoir (Section 4OA3.5)
05000446/2013002-06	NCV	Failure to Install Grout Under Pipe Support Base Plates (Section 4OA5.3)

#### Closed

05000445/2011-001-01	LER	Potential for Steam Voiding Causing Residual Heat Removal System Inoperability (Section 4OA3.1)
05000446/2012-001-00	LER	Power Operator Relief Valve Block Valve Inoperable for Longer than Allowed by Technical Specifications (Section 4OA3.2)
05000446/2010-002-01	LER	Unit 2 Diesel Generator 2-02 Inoperable Due to Remaining



Closed

		in Droop Verses Isochronous Mode (Section 4OA3.3)
05000446/2011-002-00	LER	Unit 2 Manual Trip Due to High Steam Generator Sodium Concentration (Section 4OA3.4)
05000445/2012-003-00	LER	Unit 1 Manual Reactor Trip due to Reactor Coolant Pump Low Oil Level (Section 4OA3.5)
2515/188	TI	Inspection of Near-Term Task Force Recommendation 2.3 Seismic Walkdowns (Section 4OA5.3)

Discussed

2515/182	TI	Review of the Implementation of the Industry Initiative to Control Degradation of Underground Piping and Tanks (Section 4OA5.2)
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**LIST OF DOCUMENTS REVIEWED**

**Section 1RO4: Equipment Alignments**

DRAWINGS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
M2-0215 Sh. D	Flow Diagram Starting Air Piping CP2-MEDGEE-01	CP-16

CONDITION REPORTS

2013-002193

**Section 1RO5: Fire Protection**

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
FPI-901	Protected Area Yard, Main Fire Protection Underground Loop and Supplies	2
FPI-107A	U1 Safeguards Buildings, Elevation 852'-6" Electrical Equipment Area and Feedwater Penetration Area	4
FIR-PX-3304	Startup Transformer CPX-EPTRST-01/02 Deluge Header Flow Test	1
FIR-P2-3301	Transformer Deluge Flow Test CP2-EPTRMT-01/02 and CP2-EPTRUT-01	1

CONDITION REPORTS

2004-001728      2005-004427      2010-004152

**Section 1R11: Licensed Operator Requalification Program**

MISCELLANEOUS DOCUMENTS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION/DATE</u>
OPT-301-9	Shutdown Margin	8
NTG-104	Implementation	February 1, 2012
NTG-101	Analysis	February 8, 2012
84202a-1	Simulator Evaluation Guide	November 14, 2012
NTG-105	Evaluation	June 16, 2010
NTP-101	Systematic Approach to Training	October 11, 2011
STA-419	Management Oversight of Training Programs	October 18, 2012
TRA-204	Licensed Operator Requalification Training	March 1, 2011

CONDITION REPORTS

2011-012886

**Section 1R12: Maintenance Effectiveness**

CONDITION REPORTS

2009-001527      2012-002531      2012-002549      2013-001243

**Section 1R13: Maintenance Risk Assessments and Emergent Work Control**

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
IPO-010A	Reactor Coolant System Reduced Inventory Operations	18

CONDITION REPORTS

2011-011722      2012-011186

**Section 1R15: Operability Evaluations**

MISCELLANEOUS DOCUMENTS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
DBD-EE-043	118 Volt ac Uninterruptible Power Supply System	14
DBD-ME-229	Component Cooling Water System	38
SOP-102A	Residual Heat Removal System	19
COP-102A	Residual Heat Removal	5

WORK ORDERS

4594773

CONDITION REPORTS

2012-004075      2001-002990      2012-013202      2013-002849      2011-013316  
2012-004909      2012-008182

**Section 1R19: Post-Maintenance Testing**

CONDITION REPORTS

2013-000140      2013-000232      2013-000271

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
OPT-216B	Remote Shutdown Operability Test	11
OPT-214B	Diesel Generator Operability Test	16
OPT-204B	Safety Injection System	12

**Section 1R22: Surveillance Testing**

WORK ORDERS

4453276            4562342

**Section 1EP6: Drill Evaluation**

CONDITION REPORTS

2013-002911	2013-002913	2013-002914	2013-002915	2013-002918
2013-002919	2013-002920	2013-002921	2013-002922	2013-002923
2013-002924	2013-002928	2013-002929	2013-002932	2013-002935

**Section 4OA2: Identification and Resolution of Problems**

CONDITION REPORTS

2012-08413	2010-003305	2011-004598	2011-004184	2011-006162
2012-003237	2012-005422	2010-006325		

**Section 4OA5: Other**

CONDITION REPORTS

2012-008738	2012-008589	2012-009017	2012-008566	2012-008954
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