



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

May 7, 2015

Mr. 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 05000445/2015001 and 05000446/2015001

Dear Mr. Flores:

On March 31, 2015, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Comanche Peak Nuclear Power Plant, Units 1 and 2. On April 8, 2015, the NRC inspectors discussed the results of this inspection with you and other members of your staff. Inspectors documented the results of this inspection in the enclosed inspection report.

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

If you contest the violation 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, Units 1 and 2.

If you disagree with a cross-cutting aspect assignment or a finding not associated with a regulatory requirement 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.

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 available electronically for public inspection in the NRC's Public Document Room or from the Publicly Available Records (PARS) component of the NRC's

R. Flores

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Sincerely,

**/RA/**

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

Docket Nos. 50-445 and 50-446  
License Nos. NPF-87 and NPF-89

Enclosure: Inspection Report 05000445/2015001 and 05000446/2015001  
w/ Attachment: 1. Supplemental Information  
2. Request for Information - Occupational Radiation Safety  
Inspection

cc w/ encl: Electronic Distribution

R. Flores

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Letter to Rafael Flores from Wayne Walker dated May 7, 2015

SUBJECT: COMANCHE PEAK NUCLEAR POWER PLANT - NRC INTEGRATED  
INSPECTION REPORT 05000445/2015001 and 05000446/2015001

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Electronic Distribution for Comanche Peak Nuclear Power Plant

**U.S. NUCLEAR REGULATORY COMMISSION  
REGION IV**

Docket: 05000445, 05000446

License: NPF-87, NPF-89

Report: 05000445/2015001 and 05000446/2015001

Licensee: Luminant Generation Company LLC

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

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

Dates: January 1 through March 31, 2015

Inspectors: J. Kramer, Senior Resident Inspector  
J. Josey, Senior Resident Inspector  
R. Kumana, Resident Inspector  
L. Carson II, Senior Health Physicist  
J. O'Donnell, Health Physicist

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

Enclosure

## SUMMARY

IR 05000445/2015001, 05000446/2015001; 01/01/2015 - 03/31/2015; Comanche Peak NPP, Units 1 and 2; Integrated Insp Rpt, Maint Risk Assessmnts, Operability Determinations, Plant Mods, Surv Testing, Prob Identification and Resolution, and Event Follow-up

The inspection activities described in this report were performed between January 1, 2015, and March 31, 2015, by the resident inspectors at the Comanche Peak Nuclear Power Plant and inspectors from the NRC's Region IV office. Seven findings of very low safety significance (Green) are documented in this report. All of these findings involved a violation 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's 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: Initiating Events

- Green. The inspectors identified a non-cited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for two examples of a failure to follow procedure for evaluating and correcting significant conditions adverse to quality. The licensee reduced the screening level of two significant conditions adverse to quality and therefore, failed to perform a root cause evaluation and identify corrective actions to preclude repetition. The licensee entered the finding into the corrective action program as Condition Reports CR-2015-002021 and CR-2015-003442.

The licensee's failure to follow the requirements of Procedure STA-422, "Processing Condition Reports," was a performance deficiency. Specifically, the licensee failed to appropriately screen condition reports, perform root cause analyses, and identify corrective actions to preclude repetition for two significant conditions adverse to quality. The performance deficiency was more than minor because if left uncorrected, it could lead to a more significant safety issue. Specifically, for significant conditions to adverse to quality, the failure to use the appropriate screening criteria for condition report levels could result in failing to determine the cause and take corrective actions to preclude repetition. Because these failures were associated with unplanned reactor trips, this finding affected the Initiating Events cornerstone. Using Inspection Manual Chapter 0609 Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," Exhibit 1, "Initiating Events Screening Questions," dated June 19, 2012, the finding was determined to be of very low safety significance (Green) because the finding did not cause a reactor trip and a loss of mitigation equipment. The finding has a human performance cross-cutting aspect associated with consistent processes because the licensee failed to use a consistent, systematic approach to make decisions to downgrade condition reports [H.13]. (Section 4OA3.1)

## Cornerstone: Mitigating Systems

- Green. The inspectors identified a non-cited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," associated with the licensee's failure to perform adequate operability assessments when disabling hazard barriers during maintenance activities. Specifically, during maintenance activities in the main steam/main feed penetration area, the licensee disabled the high energy line break/environmental qualification door and failed to evaluate operability of the safety-related equipment protected by this door. This issue does not represent an immediate safety concern because, at the time of identification, the doors were shut. The licensee entered the finding into corrective action program as Condition Report CR-2015-001111.

The failure to properly assess and document the basis for operability when creating a degraded or nonconforming condition during a maintenance activity, breaching a high energy line break/environmental qualification barrier, was a performance deficiency. The performance deficiency was more than minor 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. Specifically, the licensee's opening the high energy line break/environmental qualification door resulted in a condition where structures, systems, and components necessary to mitigate the effects of a high energy line break may not have functioned as required. Using Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," Exhibit 2, "Mitigating Systems Screening Questions," dated June 19, 2012, the finding was determined to require a detailed risk evaluation because it was a deficiency affecting the design and qualification of a mitigating structure, system, or component that resulted in a loss of operability or functionality and represented a loss of system and/or function. A senior reactor analyst performed a detailed risk evaluation and determined that the finding was of very low safety significance (Green). The inspectors determined that this finding does not have a cross-cutting aspect because the most significant contributor of this finding occurred in 2011 and does not reflect current licensee performance. (Section 1R13)

- Green. The inspectors identified a non-cited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," associated with the licensee's failure to have an adequate procedure for controlling and processing vendor documents and vendor technical manual updates. This resulted in the licensee's failure to properly implement new torque requirements for the turbine driven auxiliary feedwater pump trunnion bolts, and their subsequent backing out. The licensee performed an operability determination for the loose trunnion bolts that established a reasonable expectation for operability. The licensee entered the finding into the corrective action program as Condition Report CR-2014-009518.

The failure to have an adequate procedure for controlling and processing vendor documents and vendor technical manual updates was a performance deficiency. The performance deficiency was more than minor because it was associated with the procedure quality attribute of the Mitigating Systems cornerstone and affected the cornerstone objective to ensure availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the inadequate procedure allowed a lower torque value to be used on the trunnion bolts for the Unit 2 turbine driven auxiliary feedwater pump which resulted in a condition where the trunnion bolts were loose. Using Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process (SDP) for

Findings At-Power,” Exhibit 2, “Mitigating Systems Screening Questions,” dated June 19, 2012, the finding was determined to be of very low safety significance (Green) because the finding: (1) was not a deficiency affecting the design and qualification of a mitigating structure, system, or component, and did not result in a loss of operability or functionality, (2) did not represent a loss of system and/or function, (3) did not represent an actual loss of function of at least a single train for longer than its allowed outage time, or two separate safety systems out-of-service for longer than their technical specification allowed outage time, and (4) does not represent an actual loss of function of one or more non-technical specification trains of equipment designated as high safety-significant for greater than 24 hours in accordance with the licensee’s maintenance rule program. The inspectors determined that this finding does not have a cross-cutting aspect because the most significant contributor of this finding occurred more than three years ago and does not reflect current licensee performance. (Section 1R15)

- Green. The inspectors identified a non-cited violation of 10 CFR Part 50, Appendix B, Criterion V, “Instructions, Procedures, and Drawings,” associated with the licensee’s failure to follow the requirements of Procedure STI-606.03, “Work Planning,” when developing work instructions for replacing concrete expansion anchors. Specifically, when developing Work Order 4851077 to replace Hilti Kwik-Bolt II expansion anchors with Hilti Kwik-Bolt 3 anchors on Manhole MH-E2B, planners failed to follow the requirements of Procedure STI-606.03. This failure resulted in the wrong anchors being installed in the facility. The licensee performed an operability determination for the affected anchors that established a reasonable expectation for operability. The licensee entered the finding into the corrective action program as Condition Report CR-2015-001579.

The licensee’s failure to follow the requirements of Procedure STI-606.03, “Work Planning,” when developing work instructions was a performance deficiency. The performance deficiency was more than minor 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. Specifically, the failure to follow procedure resulted in incorrect material being installed in the plant which resulted in a condition where a structure necessary to mitigate the effects of a tornado may not have functioned as required. Using Inspection Manual Chapter 0609, Appendix A, “The Significance Determination Process (SDP) for Findings At-Power,” Exhibit 2, “Mitigating Systems Screening Questions,” dated June 19, 2012, the finding was determined to be of very low safety significance (Green) because the finding was a deficiency affecting the design and qualification of a mitigating structure, and did not result in a loss of operability or functionality. The finding has a human performance cross-cutting aspect associated with work management because the licensee failed to implement a process of planning activities such that nuclear safety is the overriding priority [H.5]. (Section 1R18)

- Green. The inspectors identified a non-cited violation of 10 Part CFR 50, Appendix B, Criterion V, “Instructions, Procedures, and Drawings,” for the licensee’s failure to follow procedure during the performance of a surveillance test. Specifically, the licensee failed to ensure applicable prerequisites were met for performing the Unit 1 train A integrated surveillance test procedure by not ensuring component cooling water was properly aligned for operation. This resulted in the overheating and damage to a centrifugal charging pump. The licensee entered the finding into the corrective action program as Condition Report CR-2015-003150.



The licensee's failure to follow the requirements of Procedure STA-201, "Procedure Use and Adherence," to verify all applicable prerequisites were met prior to performing Procedure OPT-430A, "Train A Integrated Test Sequence," was a performance deficiency. The performance deficiency was more than minor because it was associated with the human performance attribute of the Mitigating Systems cornerstone and affected the cornerstone objective to ensure availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, operations personnel's failure to ensure that component cooling water was properly aligned to the minimum flow line resulted in damage to a centrifugal charging pump. Using Inspection Manual Chapter 0609, Attachment 04, "Initial Characterization of Findings," dated June 19, 2012, and Appendix G, "Shutdown Operations Significance Determination Process," Attachment 1 Exhibit 3, "Mitigating Systems Screening Questions," dated May 9, 2014, the finding was determined to be of very low safety significance (Green) because the finding did not represent a loss of safety function of a single required train, did not degrade level indication, and did not involve external events or fire protection. The finding has a human performance cross-cutting aspect associated with avoiding complacency because the licensee failed to plan for latent issues and inherent risk in performing a major test [H.12]. (Section 1R22)

- Green. The inspectors reviewed a self-revealing finding of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures and Drawings" for failure to provide documented instructions of a type appropriate to the circumstances when performing maintenance on the centrifugal charging pump 2-02. As a result, the lubricating oil pump was not correctly installed and decoupled causing the charging pump to become inoperable. The licensee repaired the pump and revised the maintenance procedure. The licensee entered the finding into the corrective action program as Condition Report CR-2014-008651.

The licensee's failure to prescribe documented instructions of a type appropriate to the circumstances when performing maintenance on a charging pump was a performance deficiency. The performance deficiency 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 availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The performance deficiency resulted in an inoperable centrifugal charging pump. Using Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," Exhibit 2, "Mitigating Systems Screening Questions," dated June 19, 2012, the finding was determined to require a detailed risk evaluation because the finding represented an actual loss of function of a single centrifugal charging pump train for greater than its technical specification allowed outage time. A senior reactor analyst performed a detailed risk evaluation and determined that the finding was of very low safety significance (Green). The finding has a human performance cross-cutting aspect associated with training because the licensee failed to ensure the mechanics were adequately trained to understand the procedure and work requirements [H.9]. (Section 4OA3.2)

## Cornerstone: Public Radiation Safety

- Green. The inspectors identified a non-cited violation of 10 CFR 71.5, pursuant to 49 CFR 172.203(d)(3), and 10 CFR 20.2006(b) for the licensee's failure to ship radioactive waste with accurate manifests. Specifically, two radioactive waste shipments departed the site with inaccurate activity information on the manifest shipping papers. After determining that the shipment manifests and the amount of radwaste in the containers were incorrect, the licensee faxed corrected copies of the shipment manifests to the processor, suspended resin shipments, and conducted an apparent cause evaluation. The licensee entered the finding into the corrective action program as Condition Report CR-2015-000124.

The failure to ship radioactive material with an accurate shipping manifest in accordance with 49 CFR 172.203(d) and 10 CFR 20.2006 was a performance deficiency. The performance deficiency was more than minor because it was associated with the program and process (transportation program) attribute of the Public Radiation Safety cornerstone and adversely affected the cornerstone objective. Specifically, incorrect information on shipment documentation could result in incorrect Department of Transportation shipping characterizations or incorrect waste classifications in accordance with 10 CFR 61. Using Inspection Manual Chapter 0609, Appendix D, "Public Radiation Safety Significance Determination Process," dated February 12, 2008, the finding was determined to be of very low safety significance (Green) because: (1) radiation limits were not exceeded, (2) there was no breach of a package during transit, (3) it did not involve a certificate of compliance issue, (4) it was not a low level burial ground nonconformance, and (5) it did not involve a failure to make notifications or provide emergency information. The finding has a human performance cross-cutting aspect associated with avoid complacency because the licensee did not recognize and plan for the possibility of mistakes, latent issues, and inherent risk, even while expecting successful outcomes. Specifically, the licensee's procedure for conducting waste and material characterization did not include precautions related to not accounting for the decay of short lived isotopes or guidance on when it was appropriate to override a default software option to omit decay correction for material sample results [H.12]. (Section 4OA2.2)

## PLANT STATUS

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

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

## REPORT DETAILS

### 1. REACTOR SAFETY

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

#### 1R01 Adverse Weather Protection (71111.01)

##### Readiness to Cope with External Flooding

##### a. Inspection Scope

On March 4, 2015, the inspectors completed an inspection of the station's readiness to cope with external flooding. The inspectors performed a walkdown of the Units 1 and 2 main steam line penetration areas. The inspectors reviewed the licensee's design drawings and supporting calculations, and the periodic maintenance and inspection reports, to verify the systems were constructed and perform as designed. The inspectors verified that drainage systems were adequate to prevent flooding during the probable maximum precipitation event.

These activities constituted one readiness to cope with external flooding sample as defined in Inspection Procedure 71111.01.

##### b. Findings

No findings were identified.

#### 1R04 Equipment Alignment (71111.04)

##### a. Inspection Scope

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

- February 3, 2015, Unit 2, containment spray pumps 2-01 and 2-03 when containment spray pumps 2-02 and 2-04 were unavailable for maintenance
- February 26, 2015, Unit 1, motor driven auxiliary feedwater pumps 1-01 and 1-02 when turbine driven auxiliary feedwater pump 1-01 was unavailable for maintenance
- March 4, 2015, Unit 2, safety injection pump 2-01 when safety injection pump 2-02 was unavailable for maintenance

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

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

b. Findings

No findings were identified.

**1R05 Fire Protection (71111.05)**

a. Inspection Scope

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

- March 4, 2015, Unit 2, fire zone 2SB2A, safety injection pump 2-01 room
- March 8, 2015, Unit 1, fire zone SB6, motor driven auxiliary feedwater pump 1-02 room
- March 9, 2015, Unit 1, fire zone SE18, train B switchgear room
- March 11, 2015, Unit 2, fire zone 2SE18, train B switchgear 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 completion of four quarterly fire protection 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 March 2, 2015, the inspectors observed simulator training for an operating crew. 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 training activity.

These activities constituted 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

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 or risk. In addition, the inspectors assessed the operators' adherence to plant procedures, including the conduct of operations procedure and other operations department policies. The inspectors observed the operators' performance of the following activities:

- January 20, 2015, Unit 2, placing a component cooling water pump in standby from dual pump operation
- March 8, 2015, Units 1 and 2, shift turnover
- March 9, 2015, Unit 1, operation with solid state protection system in an alternate alignment for testing

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

b. Findings

No findings were identified.

**1R12 Maintenance Effectiveness (71111.12)**

a. Inspection Scope

The inspectors evaluated the degraded performance or condition of the following risk-significant structures, systems, or components:

- Failure of containment spray pump 1-01 recirculation valve
- Leak checks of containment spray heat exchangers

The inspectors reviewed the extent of condition of possible common cause structure, system, or component 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 structures, systems, or components. 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 two maintenance effectiveness samples 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

The inspectors reviewed the following risk assessments performed by the licensee prior to changes in plant configuration and the risk management actions taken by the licensee in response to elevated risk:

- January 12, 2015, Units 1 and 2, 138kV switchyard black start diesel unavailable during switchyard work
- January 19, 2015, Unit 1 and 2, disabling hazard barriers for main steam safety valve testing
- January 28, 2015, Unit 2, diesel generator 2-01 unavailable during output breaker maintenance activity
- February 3, 2015, Units 1 and 2, installation of monorail in the service water intake structure
- March 10, 2015, Unit 2, diesel generator 2-02 risk assessment for fuel oil sampling

The inspectors verified that these risk assessments were performed timely and in accordance with the requirements of 10 CFR 50.65 (the Maintenance Rule) and plant procedures. The inspectors reviewed the accuracy and completeness of the licensee's risk assessments and verified that the licensee implemented appropriate risk management actions based on the result of the assessments.

The inspectors also observed portions of one emergent work activity that had the potential to affect the functional capability of mitigating systems. On February 26, 2015, the inspectors observed emergent work associated with Unit 1 turbine driven auxiliary feedwater pump 1-01.

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 structures, systems, and components.

These activities constituted completion of six maintenance risk assessments and emergent work control inspection samples as defined in Inspection Procedure 71111.13.

b. Findings

Introduction. The inspectors identified a Green, non-cited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," associated with the licensee's failure to perform adequate operability assessments when disabling hazard barriers during maintenance activities. Specifically, during maintenance activities in the main steam/main feed penetration area, the licensee disabled the high energy line break/environmental qualification door and failed to evaluate operability of the safety-related equipment protected by this door. This issue does not represent an immediate safety concern because, at the time of identification, the doors were shut.

Description. While reviewing the licensee's method for performing main steam safety valve testing on Units 1 and 2, the inspectors noted that during testing the licensee would leave the watertight doors to the main steam/main feed rooms open for personnel egress. The inspectors questioned this practice because the doors are identified as a high energy line break barriers. The inspectors reviewed the Final Safety Analysis Report and noted that Section 3.11 states, in part, that in addition to high energy line breaks, non-mechanistic cracks in the break exclusion piping in the main steam/main feed penetration area outside of containment are postulated events and evaluated for environmental effects. Section 3.6B.2.5 states, in part, that the penetration area (main steam/main feed room) is isolated from the rest of the safeguards building by a seismic gap, fast closing isolation dampers in the ventilation ducting and pressure resisting watertight doors, and these features preclude a crack in the main steam/main feed piping from producing any detrimental effects on the rest of the plant.

Based on the information the Final Safety Analysis Report, the inspectors questioned the licensee about the operability assessment for the safety-related equipment that was protected by the barriers during the time the doors were open. Engineering personnel provided the inspectors with barrier impairment form Evaluation EV-CR-2011-000038-41 as the basis for the acceptability of leaving the watertight doors open during the maintenance activities. The inspectors reviewed Evaluation EV-CR-2011-000038-41 and noted that it was a probabilistic evaluation which calculated a change in core damage probability based on an initiating event frequency for a pipe crack and assuming the door was open for up to 72 hours. Inspectors determined that this evaluation did not establish a reasonable expectation of the equipment's ability to perform its specified safety function in the event of a high energy line break event, instead it simply calculated the probability of the event occurring. Therefore, inspectors determined that this evaluation was not an appropriate basis for operability of the safety-related equipment protected by the watertight doors and opening these doors appeared to be an unanalyzed condition. Inspectors informed the licensee of their concern and the licensee initiated Condition Report CR-2015-001111 to address this issue in the corrective action program. The inspectors determined that this issue did not represent an immediate safety concern because, at the time of identification, the doors were shut.

Through subsequent discussion with the licensee, inspectors determined that operators had failed to adequately evaluate operability when the watertight doors were left open during the maintenance. Instead, operators inappropriately relied on Evaluation EV-CR-2011-000038-41 as a basis for operability when the doors were open.

Analysis. The failure to properly assess and document the basis for operability when creating a degraded or nonconforming condition during a maintenance activity, breaching a high energy line break/environmental qualification barrier, was a performance deficiency. The performance deficiency was more than minor 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. Specifically, the licensee's opening the high energy line break/environmental qualification door resulted in a condition where structures, systems, and components necessary to mitigate the effects of a high energy line break may not have functioned as required. Using Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," Exhibit 2, "Mitigating Systems Screening Questions," dated June 19, 2012, the finding was determined to require a detailed risk evaluation because it was a deficiency affecting the design and qualification of a mitigating structure, system, or component that resulted in a loss of operability or functionality and represented a loss of system and/or function.

A senior reactor analyst performed a detailed risk evaluation to evaluate the high energy line break concern. The analyst identified the approximate frequency for a steam line piping break. Data from NUREG/CR-6928, "Industry-Average Performance for Components and Initiating Events at U.S. Commercial Nuclear Power Plants," updated in 2010, specified the mean frequency for a large leak pipe fault as  $2.5\text{E-}11/\text{ft-hour}$ . The amount of piping which could initiate the high energy line break event was assumed to be 40 feet. The analyst used an exposure interval of 72 hours as the maximum time the condition was allowed in the plant. Using these inputs yielded an initiating event frequency of  $7.2\text{E-}8/\text{year}$ . From discussions with the inspectors, the analyst confirmed a list of affected equipment. The analyst bounded the scenario by assuming all mitigating equipment would be lost which gave a maximum change in core damage frequency of  $7.2\text{E-}8/\text{year}$ . Since the bounded change in core damage frequency was less than  $1\text{E-}6$ , the finding was of very low safety significance (Green).

The inspectors determined that this finding does not have a cross-cutting aspect because the most significant contributor of this finding occurred in 2011, the licensee had not recently re-evaluated this process, and it does not reflect current licensee performance.

Enforcement. Title 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings, requires, in part, that activities affecting quality shall be accomplished in accordance with documented instructions, procedures, or drawings, of a type appropriate to the circumstances. Procedure STI-442.01, "Operability Determination and Functionality Assessment Program," a procedure that is appropriate to the circumstances of evaluating the operability of safety-related components, required the licensee to properly assess and document the basis for operability when a degraded or nonconforming condition was identified. Contrary to the above, on March 24, 2014, and September 29, 2014, an activity affecting quality was not accomplished in accordance with a procedure that was appropriate to the circumstances. Specifically, operators failed to adequately assess and document the basis for operability when creating a degraded or nonconforming condition during a maintenance activity, breaching a high energy line break/environmental qualification barrier. This issue does not represent an immediate safety concern because, at the time of identification, the doors were shut. Since the violation was of very low safety significance and was documented in the



licensee's corrective action program as Condition Report CR-2015-001111, it is being treated as a non-cited violation, consistent with Section 2.3.2.a of the Enforcement Policy: NCV 05000445/2015001-01; 05000446/2015001-01, "Failure to Evaluate Operability When Breaching Hazard Barriers."

## **1R15 Operability Determinations and Functionality Assessments (71111.15)**

### **a. Inspection Scope**

The inspectors reviewed the following operability determinations and functionality assessments that the licensee performed for degraded or nonconforming structures, systems, or components:

- Condition Report CR-2014-001140, Unit 1, increased generator output
- Condition Report CR-2014-009518, Unit 2, loose turbine driven auxiliary feedwater pump trunnion bolts
- Condition Report CR-2015-001123, Units 1 and 2, potential non-conservative technical specification surveillance requirement
- Condition Report CR-2015-001530, Unit 1, failed resistor in diesel generator 1-01 breaker
- Evaluation EVAL-1999-003223-01-00 for containment spray heat exchanger insulation removal

The inspectors reviewed the timeliness and technical adequacy of the licensee's evaluations. Where the licensee determined the degraded structures, systems, or components 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 structures, systems, or components.

These activities constituted completion of five operability determination and functionality assessment inspection samples as defined in Inspection Procedure 71111.15.

### **b. Findings**

Introduction. The inspectors identified a non-cited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," associated with the licensee's failure to have an adequate procedure for controlling and processing vendor documents and vendor technical manual updates. This resulted in the licensee's failure to properly implement new torque requirements for the turbine driven auxiliary feedwater pump trunnion bolts, and their subsequent backing out. The licensee performed an operability determination for the loose trunnion bolts that established a reasonable expectation for operability.

Description. On August 28, 2014, inspectors identified a thread engagement issue with the trunnion bolts on the Unit 2 turbine driven auxiliary feedwater pump. Specifically, the

bolts were not fully engaged and were backing out. Inspectors informed the licensee of the issue and the licensee initiated Condition Report 2014-009518 to capture the issue in the corrective action program and re-torqued the bolts. The licensee documented an operability determination for the loose trunnion bolts that established a reasonable expectation for operability.

During subsequent review of this issue, the inspectors determined that the last time maintenance had been performed on the Unit 2 turbine driven auxiliary feedwater pump that required the bolts to be torqued was on April 4, 2002. Work Order 4-01-136365 documented that the bolts had been torqued to 300 inch-pounds as required by procedure. However, inspectors noted that, during this maintenance activity, the vendor had been present and had informed the licensee that the torque value that was being used for the trunnion bolts was not correct. The vendor had recommended the licensee torque the bolts to 110 foot-pounds as specified in the vendor torque instructions. The vendor subsequently documented the torque recommendation in a letter sent to the licensee on April 6, 2002, and identified that insufficient torque could result in the trunnion bolts loosening during operation. Inspectors informed the licensee of what they had found.

The licensee subsequently determined that the station had received the vendors letter and recommendation and had processed it in accordance with Procedure STA-206, "Review of Vendor Documents and Vendor Technical Manuals," Revision 20, which was the revision in effect at the time. The licensee determined that this revision of the procedure lacked adequate guidance for processing technical changes such as this. Specifically, the licensee determined that there was not guidance in the procedure to review currently installed equipment to determine if new technical information potentially affected its ability to function. Inspectors determined that the licensee conclusion was correct.

Analysis. The failure to have an adequate procedure for controlling and processing vendor documents and vendor technical manual updates was a performance deficiency. The performance deficiency was more than minor because it was associated with the procedure quality attribute of the Mitigating Systems cornerstone and affected the cornerstone objective to ensure availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the inadequate procedure allowed a lower torque value to be used on the trunnion bolts for the Unit 2 turbine driven auxiliary feedwater pump which resulted in a condition where the trunnion bolts were loose. Using Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," Exhibit 2, "Mitigating Systems Screening Questions," dated June 19, 2012, the finding was determined to be of very low safety significance (Green) because the finding: (1) was not a deficiency affecting the design and qualification of a mitigating structure, system, or component, and did not result in a loss of operability or functionality, (2) did not represent a loss of system and/or function, (3) did not represent an actual loss of function of at least a single train for longer than its allowed outage time, or two separate safety systems out-of-service for longer than their technical specification allowed outage time, and (4) does not represent an actual loss of function of one or more non-technical specification trains of equipment designated as high safety-significant for greater than 24 hours in accordance with the licensee's maintenance rule program. The inspectors determined that this finding does not have a cross-cutting aspect because; the most significant

contributor of this finding occurred more than three years ago and does not reflect current licensee performance.

Enforcement. Title 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings" requires, in part, that activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, and drawings. Contrary to the above, from February 18, 1999, through August 23, 2002, activities affecting quality that were prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances were not accomplished in accordance with these instructions, procedures, and drawings. Specifically, Station Procedure STA-206, "Review of Vendor Documents and Vendor Technical Manuals," Revision 20, a procedure appropriate to the circumstances, provided inadequate guidance for processing technical changes to vendor documents. Since the violation was of very low safety significance and was documented in the licensee's corrective action program as Condition Report CR-2014-009518, it is being treated as a non-cited violation, consistent with Section 2.3.2.a of the Enforcement Policy: NCV 05000446/2015001-02, "Failure to Have an Adequate Procedure for Vendor Information."

#### **1R18 Plant Modifications (71111.18)**

##### **a. Inspection Scope**

On March 17, 2015, the inspectors reviewed one permanent plant modification associated with replacing concrete expansion anchors for manhole MH-E2B. The inspectors reviewed the design and implementation of the modification. The inspectors verified that work activities involved in implementing the modification did not adversely impact operator actions that may be required in response to an emergency or other unplanned event. The inspectors verified that post-modification testing was adequate to establish the operability of the structures, systems, and components as modified.

These activities constituted completion of one permanent modifications sample as defined in Inspection Procedure 71111.18.

##### **b. Findings**

Introduction. The inspectors identified a Green, non-cited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," associated with the licensee's failure to follow the requirements of Procedure STI-606.03, "Work Planning," when developing work instructions for replacing concrete expansion anchors. Specifically, when developing Work Order 4851077 to replace Hilti Kwik-Bolt II expansion anchors with Hilti Kwik-Bolt 3 anchors on Manhole MH-E2B, planners failed to follow the requirements of Procedure STI-606.03. This failure resulted in the wrong anchors being installed in the facility. The licensee performed an operability determination for the affected anchors that established a reasonable expectation for operability.

Description. While reinstalling the manhole cover for Manhole MH-E2B, under Work Order 4791511, the licensee noted that two of the eight concrete anchor bolts failed to torque properly. The manhole cover and the concrete expansion anchors are

safety-related components because they enclose and protect service water pump electrical cables. The licensee initiated Condition Report CR-2014-005855 to address the issue in the corrective action program and document the operability assessment for the identified condition. Subsequently, Work Order 4851077 was generated to correct the deficient condition. The licensee implemented the work order from February 4 through February 9, 2015.

The inspectors reviewed Work Order 4851077 and noted that the licensee replaced all eight of the concrete expansion anchors because the new style anchors would have different torque requirements than those currently installed. The installed anchors were 1/2-inch diameter by 7-inch long Hilti Kwik Bolt Type II anchors and the specified replacement anchors were 1/2-inch diameter by 7-inch long Hilti Kwik Bolt Type 3 anchors. The work order directed that the anchors be replaced in accordance with Procedure MSG-0212, "Concrete Expansion Anchor Installation," Section 8.9, "Replacement Expansion Anchors." While reviewing the Procedure MSG-0212, the inspectors noted that Section 8.9 provided guidance for three separate replacement methods: (1) replacing an anchor with another anchor of the same diameter in accordance with Attachment 10.3 Section 4.9, (2) replacing an anchor with a larger diameter anchor in accordance with Attachment 10.3 Section 4.10, and (3) replacing an anchor with another anchor of the same diameter in accordance with Attachment 10.3 Section 4.11 (for use on manhole covers only).

The inspectors determined that the workers had used the procedure section for replacing an anchor with another anchor of the same diameter in accordance with Attachment 10.3 Section 4.11 for the work activity. The inspectors questioned this because Section 4.1.3 identified that when replacing 1/2-inch diameter Hilti Kwik Bolt Type II anchors with Hilti Kwik Bolt Type 3 anchors, a larger diameter anchor was needed (5/8-inch). Inspectors reviewed the licensee's evaluation associated with the use of Hilti Kwik Bolt Type 3 anchors, Final Design Authorization FDA-2011-000133-14. This evaluation had determined that Hilti Kwik Bolt Type 3 anchors were not direct like-for-like replacements for Hilti Kwik Bolt Type II anchors and had been used to generate the substitution chart contained in Section 4.1.3 of Attachment 10.3 of Procedure MSG-0212.

The inspectors determined that Work Order 4851077 had specified the wrong size replacement expansion anchors for Manhole MH-E2B, which resulted in reduced tensile load capabilities of the anchors. The inspectors informed the licensee of their concerns and the licensee initiated Condition Report CR-2015-001579. The licensee performed an operability determination for the affected anchors that established a reasonable expectation for operability.

Inspectors reviewed Procedure STI-606.03, "Work Planning," and determined that the planner had failed to follow the requirements of Sections 6.2.2 and 6.2.8. Specifically, the planner had failed to determine the correct replacement item requirements, and provide the appropriate work instructions for installation of the replacement anchors.

Analysis. The licensee's failure to follow the requirements of Procedure STI-606.03, "Work Planning," when developing work instructions was a performance deficiency. The performance deficiency was more than minor 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. Specifically, the failure to follow procedure resulted in incorrect material being installed in the plant which resulted in a condition where a structure necessary to mitigate the effects of a tornado may not have functioned as required. Using Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," Exhibit 2, "Mitigating Systems Screening Questions," dated June 19, 2012, the finding was determined to be of very low safety significance (Green) because the finding was a deficiency affecting the design and qualification of a mitigating structure, and did not result in a loss of operability or functionality. The finding has a human performance cross-cutting aspect associated with work management because the licensee failed to implement a process of planning activities such that nuclear safety is the overriding priority [H.5].

Enforcement. Title 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings requires, in part, that activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, and drawings. Procedure STI-606.03, "Work Planning," Sections 6.2.2 and 6.2.8 required the planner to determine the correct replacement item requirements, and provide the appropriate work instructions for installation of the replacement anchors. Contrary to the above, on February 9, 2014, activities affecting quality that were prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances were not accomplished in accordance with these instructions, procedures, and drawings. Specifically, the licensee failed to follow the requirements of Sections 6.2.2 and 6.2.8 of Procedure STI-606.03, "Work Planning," when developing work instructions for replacing concrete expansion anchors. The licensee performed an operability determination for the affected anchors that established a reasonable expectation for operability. Since the violation was of very low safety significance and was documented in the licensee's corrective action program as Condition Report CR-2015-001579, it is being treated as a non-cited violation, consistent with Section 2.3.2.a of the Enforcement Policy: NCV 05000445/2015001-03, "Failure to Follow Work Planning Procedure."

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

### **a. Inspection Scope**

The inspectors reviewed the following post-maintenance activities that affected risk-significant structures, systems, or components:

- October 28, 2014, Unit 1, pressurizer spray valve testing following internal component replacement
- January 11, 2015, Units 1 and 2, control room air conditioning unit X-03 testing following maintenance and inspection
- February 3, 2015, Unit 2, containment spray pumps 2-02 and 2-04 testing following pump oil change and cooler cleaning

The inspectors reviewed licensing and design basis documents for the structures, systems, or components 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 structures, systems, or components.

These activities constituted completion of three post-maintenance testing 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 the following risk-significant surveillance tests and reviewed test results to verify that the tests adequately demonstrated that the structures, systems, and components were capable of performing their safety functions:

Pump or Valve Inservice Test

- March 4, 2015, Unit 2, test of safety injection pump 2-02 in accordance with Procedure OPT-204B, "SI System," Revision 12

Other Surveillance Testing

- October 8, 2014, Unit 1, test of safety injection actuation and response time in accordance with Procedure OPT-430A, "Train A Integrated Test Sequence," Revision 7
- March 9, 2015, Unit 1, test of the solid state protection system actuation logic in accordance with Procedure OPT-448A, "Mode 1, 3 and 4 Train B SSPS Actuation Logic Test," Revision 9
- February 26, 2015, Unit 2, test of the blackout sequencer in accordance with Procedure OPT414B, "SI/Blackout Sequencers," Revision 3

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 structures, systems, and components following testing.

These activities constituted completion of four surveillance testing inspection samples (one pump or valve inservice testing sample, and three other surveillance testing samples) as defined in Inspection Procedure 71111.22.

b. Findings

Introduction. The inspectors identified a Green, non-cited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for the licensee's failure to follow procedure during the performance of a surveillance test. Specifically, the licensee failed to ensure applicable prerequisites were met for performing the Unit 1 train A integrated surveillance test procedure by not ensuring component cooling water was properly aligned for operation, resulting in the overheating and damage to a centrifugal charging pump.

Description. On October 8, 2014, while Unit 1 was shut down in mode 6 with the reactor vessel cavity flooded, the licensee performed a train A engineering safety feature actuation system test using Procedure OPT-430A, "Train A Integrated Test Sequence." This procedure tests the response of the plant to a safety injection signal, including an automatic start of the associated emergency core cooling systems. During this test, the operators discovered elevated temperatures on both centrifugal charging pumps. The operators stopped the pumps and discontinued the test. The centrifugal charging pumps were not required to be operable in mode 6, but were required to function to provide a source of borated water to the shutdown reactor. The licensee took immediate steps to ensure that safety injection pump 1-02 was able to provide borated water to the reactor. The operators determined that both centrifugal charging pumps overheated due to a lack of cooling water to the charging pump minimum flow line. This flow path directs pump discharge flow through the reactor coolant pump seal water heat exchanger, which cools the water before it returns to the pump suction. The seal water heat exchanger is cooled by the non-safeguards loop of component cooling water. On October 7, 2014, the licensee removed the non-safeguards loop of component cooling water from service for planned maintenance. The operation of the centrifugal charging pumps without adequate cooling flow resulted in overheating of both pumps and damage to one pump and other components in the chemical and volume control system. The licensee replaced the damaged pump and components as part of the corrective actions prior to restarting the unit.

The licensee entered the issue into the corrective action program as Condition Report CR-2014-011016 and performed an apparent cause evaluation for this event. The inspectors reviewed the work orders, procedures, and the apparent cause evaluation. The licensee identified that the cause of the event was that the test had not been scheduled appropriately. The inspectors determined that Procedure OPT-430A Section 8.1 required prerequisites to be completed per Section 6.2. One of the prerequisites of Section 6.2 is for the centrifugal charging pump 1-01 to be in standby per Procedure SOP-103A, "Chemical and Volume Control System." Procedure SOP-103A Section 5.2.9 provides instructions for placing the pumps in standby readiness. This section requires prerequisites of Section 2.6 to be met. These prerequisites include system alignments that, among other things, require the component cooling water system to be aligned to support chemical and volume system operation. Due to the maintenance being performed on the system, the component cooling water system was not aligned to provide flow to the seal water heat exchanger, and therefore, was not aligned to support chemical and volume control system operation.

The inspectors reviewed Procedure STA-201, "Procedure Use and Adherence," Revision 17, and Procedure ODA-407, "Operations Department Procedure Use and

Adherence,” Revision 15, and determined that those procedures require that the licensee verify applicable prerequisites or have a documented evaluation performed by the shift manager for not meeting them. The licensee did not verify the applicable prerequisite for ensuring component cooling water was aligned and did not document an evaluation for not meeting that prerequisite. The inspectors determined that the licensee’s cause evaluation had failed to identify and implement corrective actions the failure to follow Procedure STA-201 and Procedure ODA-407; therefore, the violation is NRC identified. The inspectors discussed the failure to follow procedure with licensee managers. The inspectors determined that the operators assumed that the prerequisites of Procedures OPT-430A and SOP-103A were not applicable to the test, and did not consider the potential impacts of not verifying them. Subsequently, the licensee entered the failure to follow procedure into the corrective action program.

Analysis. The licensee’s failure to follow the requirements of Procedure STA-201, “Procedure Use and Adherence,” to verify all applicable prerequisites were met prior to performing Procedure OPT-430A, “Train A Integrated Test Sequence,” was a performance deficiency. The performance deficiency was more than minor because it was associated with the human performance attribute of the Mitigating Systems cornerstone and affected the cornerstone objective to ensure availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, operations personnel’s failure to ensure that component cooling water was properly aligned to the minimum flow line resulted in damage to a centrifugal charging pump. Using Inspection Manual Chapter 0609, Attachment 04, “Initial Characterization of Findings,” dated June 19, 2012, and Appendix G, “Shutdown Operations Significance Determination Process,” Attachment 1 Exhibit 3, “Mitigating Systems Screening Questions,” dated May 9, 2014, the finding was determined to be of very low safety significance (Green) because the finding did not represent a loss of safety function of a single required train, did not degrade level indication, and did not involve external events or fire protection. The finding has a human performance cross-cutting aspect associated with avoiding complacency because the licensee failed to plan for latent issues and inherent risk in performing a major test [H.12].

Enforcement. Title 10 CFR Part 50, Appendix B, Criterion V, “Instructions, Procedures, and Drawings,” 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-201, “Procedure and Work Instruction Use and Adherence,” Step 6.2.6 requires, in part, that when a procedure branches to another document, the applicable prerequisites of a reference document be satisfied. Contrary to the above, on October 8, 2014, the licensee failed to accomplish an activity affecting quality in accordance with documented instructions of a type appropriate to the circumstances. Specifically, personnel failed to follow Procedure STA-201, “Procedure and Work Instruction Use and Adherence” and ensure applicable prerequisites were completed when a procedure branches to another document while performing Procedure OPT-430A, “Train A Integrated Test Sequence.” The licensee performed immediate actions to stop the affected pumps, restore a source of borated water, and replace the damaged centrifugal charging pump. Since the violation was of very low safety significance and was documented in the licensee’s corrective action program as Condition Report CR-2015-003150, it is being treated as a non-cited violation, consistent with Section 2.3.2.a of the Enforcement Policy: NCV 05000445/2015001-04, “Failure to Follow Procedure Damages a Centrifugal Charging Pump.”



## **2. RADIATION SAFETY**

### **Cornerstones: Public Radiation Safety and Occupational Radiation Safety**

#### **2RS2 Occupational ALARA Planning and Controls (71124.02)**

##### **a. Inspection Scope**

The inspectors assessed licensee performance with respect to maintaining occupational individual and collective radiation exposures as low as is reasonably achievable (ALARA). During the inspection, the inspectors interviewed licensee personnel and reviewed licensee performance in the following areas:

- Site-specific ALARA procedures and collective exposure history, including the current 3-year rolling average, site-specific trends in collective exposures, and source-term measurements
- ALARA work activity evaluations/post-job reviews, exposure estimates, and exposure mitigation requirements
- The methodology for estimating work activity exposures, the intended dose outcome, the accuracy of dose rate and man-hour estimates, and intended versus actual work activity doses and the reasons for any inconsistencies
- Records detailing the historical trends and current status of tracked plant source terms and contingency plans for expected changes in the source term due to changes in plant fuel performance issues or changes in plant primary chemistry
- Radiation worker and radiation protection technician performance during work activities in radiation areas, airborne radioactivity areas, or high radiation areas by reviewing condition reports and performance audits
- Audits, self-assessments, and corrective action documents related to ALARA planning and controls since the last inspection

These activities constituted completion of one occupational ALARA planning and controls sample as defined in Inspection Procedure 71124.02.

##### **b. Findings**

No findings were identified.

#### **2RS4 Occupational Dose Assessment (71124.04)**

##### **a. Inspection Scope**

The inspectors evaluated the accuracy and operability of the licensee's personnel monitoring equipment, verified the accuracy and effectiveness of the licensee's methods for determining total effective dose equivalent, and verified that the licensee was

appropriately monitoring occupational dose. The inspectors interviewed licensee personnel, walked down various portions of the plant, and reviewed licensee performance in the following areas:

- External dosimetry accreditation, storage, issue, use, and processing of active and passive dosimeters
- The technical competency and adequacy of the licensee's internal dosimetry program
- Adequacy of the dosimetry program for special dosimetry situations such as declared pregnant workers, multiple dosimetry placement, and neutron dose assessment
- Audits, self-assessments, and corrective action documents related to dose assessment since the last inspection

These activities constituted completion of one of occupational dose assessment sample defined in Inspection Procedure 71124.04.

b. Findings

No findings were identified.

**4. OTHER ACTIVITIES**

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

**4OA1 Performance Indicator Verification (71151)**

.1 Unplanned Scrams per 7000 Critical Hours (IE01)

a. Inspection Scope

The inspectors reviewed licensee event reports for the period of January through December 2014 to determine the number of scrams that occurred. The inspectors compared the number of scrams reported in the licensee event reports to the number reported for the performance indicator. Additionally, the inspectors sampled monthly operating logs to verify the number of critical hours during the period. 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 data reported.

These activities constituted verification of two unplanned scrams per 7000 critical hours samples, one per unit, as defined in Inspection Procedure 71151.

b. Findings

No findings were identified.

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

a. Inspection Scope

The inspectors reviewed operating logs and monthly operating reports for the period of January through December 2014 to determine the number of unplanned power changes that occurred. The inspectors compared the number of unplanned power changes documented to the number reported for the performance indicator. Additionally, the inspectors sampled monthly operating logs to verify the number of critical hours during the period. 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 data reported.

These activities constituted verification of two unplanned power changes per 7000 critical hours samples, one per unit, as defined in Inspection Procedure 71151.

b. Findings

No findings were identified.

.3 Unplanned Scrams with Complications (IE04)

a. Inspection Scope

The inspectors reviewed the licensee's basis for including or excluding in this performance indicator each scram that occurred between January through December 2014. 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 data reported.

These activities constituted verification of two unplanned scrams with complications samples, one per unit, 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 Annual Follow-up of Selected Issues

The following activities constituted completion of two annual follow-up of selected issues samples as defined in Inspection Procedure 71152.

a. Inspection Scope

The inspectors performed an in-depth follow-up of the failure of heater drain pump discharge valve seal ring shims. The inspectors reviewed the licensee's corrective actions, design modifications, and plan for conducting long term inspections of the main feedwater and steam generator systems.

The inspectors reviewed a corrective action program document related to radwaste shipments and radioactive materials being stored in the low level radwaste storage facility in 2014. Inspectors verified that the licensee was identifying issues at an appropriate threshold and entering them into the corrective action program. The effectiveness of the licensee's problem identification and resolution processes was evaluated with respect to radwaste shipment activities in accordance with Inspection Procedure 71124.08, "Radioactive Solid Waste Processing and Radioactive Material Handling, Storage, and Transportation."

b. Findings

Introduction. The inspectors identified a Green non-cited violation of 10 CFR 71.5, pursuant to 49 CFR 172.203(d)(3), and 10 CFR 20.2006(b) for failure to ship radioactive waste with an accurate manifest. Specifically, two radioactive waste shipments departed the site with inaccurate activity information on the manifest shipping papers. After determining that the shipment manifests and the amount of radwaste in the containers were incorrect, the licensee faxed corrected copies of the shipment manifests to the processor, suspended resin shipments, and conducted an apparent cause evaluation.

Description. In December 2014, inspectors questioned the amount of radioactivity being stored on-site in vaults in the low level radwaste storage facility. Specifically, the inspectors raised questions regarding the calculation method used for estimating the amount of cobalt-60 in vault-18 stored in the low level radwaste storage facility. In response to the questions, the licensee discovered that they had miscalculated the isotopic activity in vault-18 as a result of incorrect decay data. The inspectors then asked the licensee if they had used the same calculation method for radwaste shipments in 2013 and 2014. The licensee determined that two shipments in March 2014 to Waste Control Specialists in Andrews, Texas, had been miscalculated. Radioactive waste shipments 2014-016 and 2014-019 departed the site with inaccurate total radioactivity and radioisotopic amounts recorded on the waste manifest shipping papers (NRC Forms 540 and 541).

The waste manifests accompanying the shipments indicated the following:

- Shipment 2014-016 (March 14, 2014) contained 99.8 curies, including 8.02 curies of cobalt-60 and 3.71 curies of cesium-137
- Shipment 2014-019 (March 18, 2014) contained 75.1 curies, including 6.22 curies of cobalt-60 and 9.83 curies of cesium-137

As a result of the inspectors' questions, the licensee recalculated the activities contained in these two shipments. The licensee determined that the correct activities for the shipments were the following:

- Shipment 2014-016 (March 14, 2014) contained 141 curies, including 12.2 curies of cobalt-60 and 7.29 curies of cesium-137
- Shipment 2014-019 (March 18, 2014) contained 109 curies, including 8.97 curies of cobalt-60 and 22.9 curies of cesium-137

The actual cobalt-60 activity in both shipments exceeded the 49 CFR 172.800 radioactive material quantity of concern value of 8.1 curies. In spite of the miscalculation of the cobalt-60 activity, the licensee's March 2014 manifests indicated that both shipments contained radioactive material quantity of concern.

Waste Control Specialists had accepted the shipments for waste processing and disposal in March 2014. After the licensee reviewed the shipment manifests and determined that the activity of radwaste specified was incorrect, they notified Waste Control Specialists. The licensee's immediate corrective actions were to fax corrected copies of the shipment manifests to the processor on January 14, 2015, suspend resin shipments, and conduct an apparent cause investigation. The cause of this event stemmed from data entry errors in the radwaste software that impacted the radioisotopic half-life calculations.

Analysis. The failure to ship radioactive material with an accurate shipping manifest in accordance with 49 CFR 172.203(d) and 10 CFR 20.2006 was a performance deficiency. The performance deficiency was more than minor because it was associated with the program and process (transportation program) attribute of the Public Radiation Safety cornerstone and adversely affected the cornerstone objective. Specifically, incorrect information on shipment documentation could result in incorrect Department of Transportation shipping characterizations or incorrect waste classifications in accordance with 10 CFR 61. Using Inspection Manual Chapter 0609, Appendix D, "Public Radiation Safety Significance Determination Process," dated February 12, 2008, the finding was determined to be of very low safety significance (Green) because: (1) radiation limits were not exceeded, (2) there was no breach of a package during transit, (3) it did not involve a certificate of compliance issue, (4) it was not a low level burial ground nonconformance, and (5) it did not involve a failure to make notifications or provide emergency information. The finding has a human performance cross-cutting aspect associated with avoid complacency because the licensee did not recognize and plan for the possibility of mistakes, latent issues, and inherent risk, even while expecting successful outcomes. Specifically, the licensee's procedure for conducting waste and material characterization did not include precautions related to not accounting for the

decay of short lived isotopes or guidance on when it was appropriate to override a default software option to omit decay correction for material sample results [H.12].

Enforcement. Title 10 CFR 71.5, "Transportation of Licensed Material," states, in part, each licensee who transports licensed material outside the site of usage shall comply with the applicable requirements of the Department of Transportation regulations in 49 CFR Parts 171 through 180. Department of Transportation regulation 49 CFR 172.203(d) requires, in part, that the description for a shipment of a Class 7 (radioactive) material include the known radionuclide activity contained in each package of the shipment. Title 10 CFR 20.2006(b) requires, in part, that licensees shipping radwaste intended for ultimate disposal at a licensed land disposal facility to document the information required on NRC's Uniform Low-Level Radioactive Waste Manifest, and transfer this recorded manifest information to the intended consignee in accordance with Appendix G to 10 CFR Part 20. Appendix G, Section I.B, requires, in part, that the shipper of the radioactive waste provide the following information regarding the shipment on the uniform manifest: the total radionuclide activity in the shipment.

Contrary to the above, in March 2014, the licensee failed to provide accurate total radionuclide activity on the uniform manifest for radioactive waste Shipments 2014-016 and 2014-019. Specifically, the manifest for Shipment 2014-016 on March 14, 2014, stated that it contained 99.8 curies rather than the actual activity of 141 curies, and Shipment 2014-019 on March 18, 2014, stated that it contained 75.1 curies rather than the actual activity of 109 curies. Since the violation was of very low safety significance and was documented in the licensee's corrective action program as Condition Report CR-2015-000124, it is being treated as a non-cited violation, consistent with Section 2.3.2.a of the Enforcement Policy: NCV 05000445/2015001-05; 05000446/2015001-05, "Failure to Provide an Accurate Shipping Manifest."

#### **4OA3 Follow-up of Events and Notices of Enforcement Discretion (71153)**

The following activities constituted completion of follow-up of two events and notices of enforcement discretion samples as defined in Inspection Procedure 71153.

.1 (Closed) Licensee Event Report 05000446/2013-002-00, Unit 2 Reactor Trip Due to Relay Actuation

a. Inspection Scope

The inspectors reviewed a licensee event report documenting an equipment failure that occurred on November 1, 2013, and resulted in an unplanned turbine trip, reactor trip, and loss of main feedwater. The inspectors examined associated procedures, work orders, condition reports, and the licensee's apparent cause analysis of the event. The inspectors determined that the equipment failure that caused the trip was the result of a latent design flaw in a non-safety-related system that was not reasonably within the licensee's ability to foresee and correct. Therefore, the design flaw that caused the trip does not constitute a performance deficiency. However, the inspectors identified that the licensee's evaluation and resolution of the condition resulting in the trip did not meet regulatory requirements.

b. Findings

Introduction. The inspectors identified a Green, non-cited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for two examples of a failure to follow procedure for evaluating and correcting significant conditions adverse to quality. The licensee reduced the screening level of two significant conditions adverse to quality and therefore, failed to perform a root cause evaluation and identify corrective actions to preclude repetition.

Description. On November 1, 2013, the licensee was performing slave relay testing of the solid state protection system. While turning a test switch to place the turbine and feedwater pump trip circuit in the test configuration, the worker performing the test depressed the switch slightly, which caused the circuit to actuate and trip the main turbine and both main feedwater turbines. These trips resulted in an automatic reactor trip and start of the auxiliary feedwater pumps. The licensee recovered from the trip and entered the event into the corrective action program as Condition Report CR-2013-011215. The inspectors reviewed the licensee's cause evaluation for the reactor trip. The licensee had determined that the circuit was not designed to block a trip from the test switch prior to the isolating the test signal from the trip circuit. This flaw allowed a spurious trip signal to be generated if the test switch was slightly pushed in while it was being turned.

The inspectors noted that the licensee had downgraded the condition report from level "A" to level "B". The inspectors determined that the licensee's Procedure STA-422, "Processing Condition Reports," Revision 31, Section 6.5.1, requires condition reports be assigned a level based on the screening criteria in Attachment 8.A. Attachment 8.A specifies level "A" for significant conditions adverse to quality. Procedure STA-422 Step 4.1.59 defines an equipment failure resulting in an unplanned reactor trip as a significant condition adverse to quality. Procedure STA-422 Step 6.15.6 requires, for significant conditions adverse to quality, that the cause of the condition be determined and corrective actions to preclude repetition be implemented. The licensee's corrective action program accomplishes these actions by performing a root cause analysis in accordance with Procedure CAP-103, "Root Cause Analysis," for level "A" condition reports. The inspectors determined that the licensee's corrective action review board downgraded the condition report associated with the reactor trip on November 13, 2013, because the corrective action review board considered the condition to be an unplanned plant transient of greater than 10 percent change in reactor power. However, Procedure STA-422 does not allow the downgrade of a significant condition adverse to quality to a level "B" condition report.

The inspectors reviewed other recent reactor trips to determine whether the licensee had downgraded other significant conditions adverse to quality. The inspectors determined that Condition Report CR-2014-000579, which documented an unplanned Unit 1 reactor trip on January 18, 2014, had also been downgraded by the licensee's corrective action review board from level "A" to level "B" on January 22, 2014. The licensee did not document the justification. The inspectors discussed the issues with licensee personnel and determined that the licensee was not evaluating conditions against all applicable screening criteria in their procedure when exercising the option to downgrade condition reports. In particular, the licensee was using criteria that appeared to apply to reactor trips without recognizing them as significant conditions adverse to quality. The inspectors determined that the licensee failed to follow a consistent process for

determining the level of condition reports submitted to the corrective action review board. In these two instances, the licensee used the wrong criteria to justify downgrading the condition reports and failed to take the appropriate actions required by the corrective action program.

Analysis. The licensee's failure to follow the requirements of Procedure STA-422, "Processing Condition Reports," was a performance deficiency. Specifically, the licensee failed to appropriately screen condition reports, perform root cause analyses, and identify corrective actions to preclude repetition for two significant conditions adverse to quality. The finding was more than minor because if left uncorrected, it could lead to a more significant safety issue. Specifically, for significant conditions adverse to quality, the failure to use the appropriate screening criteria for condition report levels could result in failing to determine the cause and take corrective actions to preclude repetition. Because these failures were associated with unplanned reactor trips, this finding affected the Initiating Events cornerstone. Using Inspection Manual Chapter 0609 Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," Exhibit 1, "Initiating Events Screening Questions," dated June 19, 2012, the finding was determined to be of very low safety significance (Green) because the finding did not cause a reactor trip and a loss of mitigation equipment. The finding has a human performance cross-cutting aspect associated with consistent processes because the licensee failed to use a consistent, systematic approach to make decisions to downgrade condition reports [H.13].

Enforcement. Title 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," 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-422, "Processing Condition Reports," Step 4.1.59 defines an equipment failure resulting in an unplanned reactor trip as a significant condition adverse to quality, and Step 6.15.6 requires, in part, that for significant conditions adverse to quality, the cause of the condition be determined and corrective actions to preclude repetition be implemented. Contrary to the above, on November 13, 2013, and January 22, 2014, the licensee failed to accomplish an activity affecting quality in accordance with documented instructions of a type appropriate to the circumstances. Specifically, personnel failed to process two condition reports, documenting unplanned reactor trips, as significant conditions adverse to quality in accordance with the licensee's quality related Procedure STA-422, "Processing Condition Reports." The licensee entered this issue into the corrective action program. Since this violation was of very low safety significance and was documented in the licensee's corrective action program as Condition Reports CR-2015-002021 and CR-2015-003442, it is being treated as a non-cited violation, consistent with Section 2.3.2.a of the Enforcement Policy: NCV 05000445/2015001-06; 05000446/2015001-06, "Failure to Follow Procedure for Addressing Significant Conditions Adverse to Quality."

.2 (Closed) Licensee Event Report 05000446/14-005-00, Centrifugal Charging Pump Inoperable For Longer Than Allowed by Technical Specifications

a. Inspection Scope

The inspectors reviewed a licensee event report that documented the decoupling of the main lubricating oil pump from the centrifugal charging pump 2-02 and the past



operability of the charging pumps. The inspectors reviewed the associated procedures, work orders, condition reports, and the licensee's root cause analysis of the event.

b. Findings

Introduction. The inspectors reviewed a Green, self-revealing finding of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures and Drawings" for failure to provide documented instructions of a type appropriate to the circumstances when performing maintenance on the centrifugal charging pump 2-02. As a result, the lubricating oil pump was not correctly installed and decoupled causing the charging pump to become inoperable.

Description. On August 3, 2014, operators started centrifugal charging pump 2-02 as part of a biweekly equipment rotation. Following start of charging pump 2-02, the auxiliary lube oil pump remained in operation and the main lube oil pump did not start. Operators then secured the charging pump for troubleshooting. The licensee determined that the pins coupling the main lube oil pump to the charging pump drive hub had been pushed back and disengaged, and therefore the main lube oil pump would not run. The licensee determined that this condition caused centrifugal charging pump 2-02 to be inoperable from July 6, 2014, the time of its last start, until August 3, 2014, as it would fail to restart if tripped. The licensee entered this into the corrective action program as Condition Report CR-2014-008651.

The licensee determined the decoupling of the oil pump was caused by inadequate maintenance performed on October 19, 2012, during the performance of Procedure MSM-P0-4703, "Centrifugal Charging Pump Speed Increaser Lube Oil Pump Coupling Inspection," Revision 2. The maintenance involved a replacement of the drive pins. Because the drive hub of the speed increaser is recessed, verification of the fit of the pins cannot be determined visually. The causal analysis indicated that the improper installation of the drive pins forced the shaft back slightly. Upon the test run following the maintenance, it appears the greased pins slid along the drive hub until the speed increaser gear centered with the drive pinion, resulting in the edges of the pins catching the holes on the drive hub and thus a partial coupling of the charging pump and lube oil pump was achieved. Wear and pump starts and stops for biweekly train swaps over the ensuing months then beveled the pins to the point where they could no longer remain in the holes on the drive hub.

The inspectors reviewed the licensee event report, procedures, the licensee's cause evaluation, work orders, and associated documentation. The licensee documented, in the root cause, that the personnel performing the maintenance activity were performing it for the first time. In addition, the licensee noted that a lack of proficiency of the personnel assigned to the reattachment of the main lube oil pump led to their not recognizing the improper assembly. The inspectors concluded that the procedure, in combination with the lack of proficiency and training of the maintenance staff, was inadequate to ensure the activity could be performed properly. The licensee revised the procedure, requiring the use of guide pins to aid in the blind fit and limited the acceptance criteria to the length of the drive pins to preclude force from backing the drive pins off the shaft. The licensee also developed design changes to be implemented in order to ensure the drive pins cannot back out of the drive hub, and arranged for a pool of subject matter experts to oversee charging pump maintenance in the interim.

Analysis. The licensee's failure to prescribe documented instructions of a type appropriate to the circumstances when performing maintenance on a charging pump was a performance deficiency. The performance deficiency 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 availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The performance deficiency resulted in an inoperable centrifugal charging pump. Using Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," Exhibit 2, "Mitigating Systems Screening Questions," dated June 19, 2012, the finding was determined to require a detailed risk evaluation because the finding represented an actual loss of function of a single centrifugal charging pump train for greater than its technical specification allowed outage time.

A senior reactor analyst performed a detailed risk evaluation and determined that the finding was of very low safety significance (Green). Centrifugal charging pump 2-02 was assumed to be unavailable for 28 days and the potential for common cause failure on centrifugal charging pump 2-01 was assumed. This resulted in a change in core damage frequency of  $4.6E-8$ . Medium break loss of coolant accident comprised the most dominant core damage sequences. The emergency core cooling system accumulators and the auxiliary feed water system remained available for mitigation of the dominant sequences. The analyst used the Comanche Peak standardized plant analysis risk model, Revision 8.28, dated May 20, 2014, to calculate the conditional core damage probability using a cutset truncation of  $1.0E-11$ .

The finding has a human performance cross-cutting aspect associated with training because the licensee failed to ensure the mechanics were adequately trained to understand the procedure and work requirements [H.9].

Enforcement. Title 10 CFR Part 50, Appendix B, Criterion V, "Inspections, Procedures and Drawings," requires, in part, activities affecting quality shall be prescribed by documented instructions of a type appropriate to the circumstances. Procedure MSM-P0-4703, "Centrifugal Charging Pump Speed Increaser Lube Oil Pump Coupling Inspection," Revision 2, Procedure Change Number 3, Section 8.8 provided documented instructions for the installation of the lubricating oil pump, an activity affecting quality. Contrary to the above, on October 19, 2012, the licensee failed to perform an activity affecting quality with documented instructions of a type appropriate to the circumstances. Specifically, licensee personnel followed Procedure MSM-P0-4703, section 8.8 to install a lubricating oil pump and failed properly install the pump as a result of inappropriate documented instructions. As a result, the charging pump lubricating oil pump decoupled from its drive shaft and failed to provide lubricating oil flow. The licensee repaired the pump and revised the maintenance procedure. Since the violation was of very low safety significance and was documented in the licensee's corrective action program as Condition Report CR-2014-008651, it is being treated as a non-cited violation, consistent with Section 2.3.2.a of the Enforcement Policy: NCV 05000446/2015001-07, "Inadequate Centrifugal Charging Pump Lubricating Oil Pump Installation Procedure."

#### **4OA5 Other Activities**

##### **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.

##### **b. Findings**

No findings were identified.

#### **4OA6 Meetings, Including Exit**

##### **Exit Meeting Summary**

On February 6, 2015, the inspectors presented the radiation safety inspection results to Mr. K. Peters, Site Vice President, and other members of the licensee staff. The licensee acknowledged the issues presented. The licensee confirmed that any proprietary information reviewed by the inspectors had been returned or destroyed.

On April 8, 2015, the inspectors presented the resident inspection results to Mr. R. Flores, Chief Nuclear Officer, 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 was documented in the report.

## **SUPPLEMENTAL INFORMATION**

### **KEY POINTS OF CONTACT**

#### **Licensee Personnel**

R. Flores, Senior Vice President and Chief Nuclear Officer  
D. Farnsworth, Director, Performance Improvement  
D. Goodwin, Director, Work Management  
T. Hope, Manager, Regulatory Affairs  
J. Hull, Manager, Emergency Preparedness  
F. Madden, Director, External Affairs  
B. Mays, Assistant Chief Nuclear Officer  
T. McCool, Vice President, Engineering and Support  
D. McGaughey, Director, Operations  
D. O'Connor, Manager, Radiation Protection  
K. Peters, Site Vice President  
B. St. Louis, Director, Nuclear Training  
S. Sewell, Plant Manager  
M. Stakes, Director, Maintenance  
J. Taylor, Director, Site Engineering

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

#### **Opened and Closed**

05000445/2015001-01	NCV	Failure to Evaluate Operability When Breeching Hazard
05000446/2015001-01		Barriers (Section 1R13)
05000446/2015001-02	NCV	Failure to Have an Adequate Procedure for Vendor
		Information (Section 1R15)
05000445/2015001-03	NCV	Failure to Follow Work Planning Procedure (Section 1R18)
05000445/2015001-04	NCV	Failure to Follow Procedure Damages a Centrifugal
		Charging Pump (Section 1R22)
05000445/2015001-05	NCV	Failure to Provide an Accurate Shipping Manifest
05000446/2015001-05		(Section 4OA2.2)
05000445/2015001-06	NCV	Failure to Follow Procedure for Addressing Significant
05000446/2015001-06		Conditions Adverse to Quality (Section 4OA3.1)
05000446/2015001-07	NCV	Inadequate Centrifugal Charging Pump Lubricating Oil Pump
		Installation Procedure (Section 4OA3.2)

#### **Closed**

05000446/2013-002-00	LER	Unit 2 Reactor Trip Due to Relay Actuation (Section 4OA3.1)
05000446/2014-005-00	LER	Centrifugal Charging Pump Inoperable For Longer Than
		Allowed by Technical Specifications (Section 4OA3.2)

## LIST OF DOCUMENTS REVIEWED

### Section 1R01: Adverse Weather

#### Condition Report

2015-002009

#### Drawing

<u>Number</u>	<u>Title</u>	<u>Revision</u>
M1-3000-03	Environmental Data Outside Containment	CP-9

#### Miscellaneous Document

<u>Number</u>	<u>Title</u>	<u>Revision</u>
DBD-CS-071	Probable Maximum Flood (PMF)	12

### Section 1R05: Fire Protection

#### Condition Report

2015-002017

#### Drawing

<u>Number</u>	<u>Title</u>	<u>Revision</u>
E1-2020-T	Safeguard Building Fire Detection plan EL 773'-0", 790'-6" and 800'-6"	CP-2

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

#### Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
SOP-502B	Component Cooling Water System	12
ABN-915	Security Events	17

#### Miscellaneous Document

<u>Number</u>	<u>Title</u>	<u>Date</u>
LO44.ABN.915	Simulator Exercise Guide	February 11, 2015

## **Section 1R12: Maintenance Effectiveness**

### Condition Report

2014-003320

### Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
PPT-S0-6004	Motor Operated Rising Stem Valve Risk-Informed IST Testing	5
MSE-P0-8349	Limiterorque Actuator Periodic Electrical and Mechanical Inspection	9

### Work Order

4030422          4782167

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

### Condition Report

2015-000102

### Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
STA-744	Maintenance Effectiveness Monitoring Program	7
STI-604.02	Maintenance Risk Assessment	0
ABN-907	Acts of Nature	15
COP-609B	Diesel Generator	6

### Work Orders

4753264          5015034

## **Section 1R15: Operability Determinations and Functionality Assessments**

### Condition Reports

2009-003927          2015-000563

### Drawing

<u>Number</u>	<u>Title</u>	<u>Revision</u>
E1-0031-21	6.9 kV Switchgear Bus 1EA1 Diesel Gen Bkr 1EG1 Schematic Diagram	CP-11

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

### Condition Reports

2015-001960	2015-002925	2015-000969	2014-013003	2014-013131
2014-001878	2014-008602	2013-007628	2013-009973	2013-002861
2010-004905				

### Work Orders

4709775	4993542	4802964	4802925	4691920
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### Miscellaneous Documents

<u>Number</u>	<u>Title</u>	<u>Revision</u>
DBD-ME-229	Component Cooling Water System	40
	Post-Work Test Guide	12
MSM-C0-8705	Fisher Vee Ball Valve Maintenance (Type SS-84)	2

### Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
OPT-116	CR AC System	5
MSM-P0-7308	Containment Spray Pump Lube Oil Maintenance	0
MSM-G0-0203	Flange Alignment and Fastener Torque Data	7
SOP-204B	Containment Spray System	6
STA-694	Station Verification Activities	7

## **Section 1R22: Surveillance Testing**

### Calculations

<u>Number</u>	<u>Title</u>	<u>Revision</u>
ME(B)-116	Temperature Rise in Charging Pump Recirculation Line After Loss of Coolant Water to Seal Water Heat Exchanger	1
EE-EDG-LOAD-METHODOLOGY	EDG Loading Methodology Calculation	4
EE-EDG-LOAD-UNIT-1	Unit 1 EDG loading calculation	4

Condition Reports

2015-002152	2015-002154	2015-001977	2008-001055	2014-011016
2014-011024	2014-011864	2014-011019	2003-001964	2015-002774

Drawing

<u>Number</u>	<u>Title</u>	<u>Revision</u>
1084H36-23A	Semi-Automatic Tester Switches Unit 1	CP-1

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
OPT-448A	Mode 1, 3 and 4 Train B SSPS Actuation Logic Test	9
OPT-430A	Train A Integrated Test Sequence	7
ODA-407	Guideline on Use of Procedures	12
ODA-407	Operations Department Procedure Use and Adherence	15
SOP-103A	Chemical and Volume Control System	18

Work Orders

4982432	4260558
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**Section 2RS2: Occupational ALARA Planning and Controls**Condition Reports

2014-000368	2014-004406	2014-006488	2014-003211	2014-008152
2015-000124				

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
RPI-606	Radiation Work and General Access Permits	31
RPI-608	Control of Shielding	14
RPI-629	Radiological Risk Management	03
STA-651	ALARA Program	12
STA-657	ALARA Job Planning/Debriefing	18



### Radiation Work Permit Packages

<u>Number</u>	<u>Title</u>	<u>Revision</u>
20142215	2RF14 Scaffold Activities	01
20141215	1RF17 Scaffold Activities	04
20142504	Pre-Resin Outage Transfers	01
20142300	Steam Generator Secondary Side	03
20142400	Steam Generator Primary Side	01
20141600	1RF16 Westinghouse (WEC) Refueling Activities	
20141600	2RF14 Westinghouse (WEC) Refueling Activities	01

### Audits, Self-Assessments, and Surveillances

<u>Number</u>	<u>Title</u>	<u>Date</u>
EVAL-2013-003	CPNPP Nuclear Oversight Evaluation Report	June 13, 2013
	Tactical Self-Assessment of the ALARA Program,	July 21, 2014

### Miscellaneous Documents

<u>Number</u>	<u>Title</u>	<u>Date</u>
2015-2019	CPNPP Five Year Dose Reduction Plan 2015-2019	January 2015
1RF17	CPNPP RP Outage Report	February 2, 2015
2RF14	CPNPP RP Outage Report	June 10, 2014
	CPNPP Dose Report	December 31, 2014
SAC 2014-02	ALARA Committee Meeting	February 20, 2014
SAC 2014-05	ALARA Committee Meeting	April 8, 2014
SAC 2014-06	ALARA Committee Meeting	April 12, 2014
SAC 2014-07	ALARA Committee Meeting	April 15, 2014
SAC 2014-08	ALARA Committee Meeting	April 18, 2014

### **Section 2RS04: Occupational Dose Assessment**

#### Condition Reports

2012-010400	2013-005883	2013-007586	2014-002197	2014-004944
2014-004974	2014-009978	2014-009980	2015-000326	

### Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
RPI-402	Personnel Decontamination	27
RPI-500	Bioassay Program	14
RPI-503	Operation of the Stand-Up Whole Body Counter	21
RPI-509	Personnel Dosimetry Program	15
RPI-515	Neutron Dose Measurement and Recording	18
RPI-528	Multiple Dosimetry Badging	11
STA-650	General Health Physics Plan	7
STA-655	Exposure Monitoring Program	21

### Self-Assessment

<u>Number</u>	<u>Title</u>	<u>Date</u>
EVAL-2013-003	Radiation Protection Audit	June 20, 2013

### Miscellaneous Documents

<u>Number</u>	<u>Title</u>	<u>Date</u>
	Mirion Technologies Quality Assurance Manual	April 10, 2014
100555-0	NVLAP Accreditation Certificate (Mirion)	July 1, 2014
2013-0005	Fuel Building Wet Cask Pit Sample Data	May 16, 2013
2013-0008	Unit 1 RCS Filter Sample Data	October 30, 2013
2013-0009	Unit 2 RCS Filter Sample Data	October 30, 2013
2014-0006	Dry Active Waste Sample Data	June 30, 2014

### **Section 4OA1: Performance Indicator Verification**

#### Condition Reports

2015-000907      2014-001164      2015-000124

### **Section 4OA2: Problem Identification and Resolution**

#### Condition Reports

2014-011850      2014-011968      2014-011973      2014-004278      2014-010924  
2013-003456      2012-010893      2014-004051      2014-005332

## Audits, Self-Assessments, and Surveillances

### Title

### Date

Apparent Cause Evaluation: LT-CR-2015-00124 Methodology for  
Radioactive Material/Waste Characterization was Non-Conservative

February 27, 2015

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

### Condition Reports

2015-002021	2014-000579	2013-011215	2013-011217	2013-011218
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### Drawings

#### Number

#### Title

#### Revision

E1-0037-52	Main Turbine Trip and Test Channel 1 and 2 Schematic Diagrams	CP-4
E1-0037-50	Main and Feedwater Pump Turbines Trip Channel I Test Circuit Schematic Diagram	CP-5

### Procedures

#### Number

#### Title

#### Revision

STA-422	Processing Condition Reports	32
STA-421	Initiation of Condition Reports	19
OPT-406B	Safeguards Slave Relay with Blocking Circuit Test	4
EOP-0.0B	Reactor Trip or Safety Injection	8

### Miscellaneous Documents

#### Number

#### Title

#### Revision/Date

	Minutes of Corrective Action Review Board	January 22, 2014
	Minutes of Corrective Action Review Board	November 13, 2013
DBD-EE-021	Reactor Protection and NSSS Related Control Systems	32

## REQUEST FOR INFORMATION – OCCUPATIONAL RADIATION SAFETY INSPECTION

From February 2, 2015, to February 6, 2015, the inspectors will perform an occupational radiation inspection. Inspection areas are listed in the attachment below. Please provide the requested information on or before January 19, 2015. Please submit this information using the same lettering system as below. For example, all contacts and phone numbers for Inspection Procedure 71124.01 should be in a file/folder titled “1-A,” applicable organization charts in file/folder “1- B,” etc. If information is placed on *ims.certrec.com*, please ensure the inspection exit date entered is at least 30 days later than the on-site inspection dates, so the inspectors will have access to the information while writing the report. In addition to the corrective action document lists provided for each inspection procedure listed below, please provide updated lists of corrective action documents at the entrance meeting. The dates for these lists should range from the end dates of the original lists to the day of the entrance meeting. Since more than one inspection procedure is to be conducted and if the information requests appear to be redundant, there is no need to provide duplicate copies. Enter a note explaining in which file the information can be found. If you have any questions or comments, please contact John O'Donnell at (817) 200-1441 or [john.odonnell@nrc.gov](mailto:john.odonnell@nrc.gov).

### 1. Occupational ALARA Planning and Controls (71124.02)

Date of Last Inspection: April 7, 2014

- A. List of contacts and telephone numbers for ALARA program personnel
- B. Applicable organization charts
- C. Copies of audits, self-assessments, and licensee event reports, written since date of last inspection, focusing on ALARA
- D. Procedure index for ALARA program
- E. Please provide specific procedures related to the following areas noted below. Additional specific procedures may be requested by number after the inspectors review the procedure indexes.
  - ALARA program
  - ALARA committee
  - Radiation work permit preparation
- F. A summary list of corrective action documents (including corporate and sub-tiered systems) written since date of last inspection, related to the ALARA program. In addition to ALARA, the summary should also address radiation work permit violations, electronic dosimeter alarms, and radiation work permit dose estimates.

NOTE: The lists should indicate the significance level of each issue and the search criteria used. Please provide in document formats which are searchable.
- G. List of work activities greater than 1 rem, since date of last inspection. Include original dose estimate and actual dose.
- H. Site dose totals and 3-year rolling averages for the past 3 years (based on dose of record)

- I. Outline of source term reduction strategy
- J. If available, provide a copy of the ALARA outage report for the *most recently* completed outages for each unit
- K. Please provide your most recent Annual ALARA Report.

#### **4. Occupational Dose Assessment (Inspection Procedure 71124.04)**

Date of Last Inspection: December 9, 2013

- A. List of contacts and telephone numbers for dose assessment personnel
- B. Applicable organization charts
- C. Audits, self-assessments, vendor or NUPIC audits of contractor support, and licensee event reports written since the last inspection related to occupational dose assessment
- D. Procedure indexes for the following areas: occupational dose assessment
- E. Please provide specific procedures related to the following areas noted below. Additional specific procedures will be requested by number after the inspector reviews the procedure indexes.
  - Radiation protection program
  - Radiation protection conduct of operations
  - Personnel dosimetry program
  - Radiological posting and warning devices
  - Air sample analysis
  - Performance of high exposure work
  - Declared pregnant worker
  - Bioassay program
- F. List of corrective action documents (including corporate and sub-tiered systems) written since date of last inspection, associated with:
  - National voluntary laboratory accreditation program
  - Dosimetry (TLD/OSL, etc.) problems
  - Electronic alarming dosimeters
  - Bioassays or internally deposited radionuclides or internal dose
  - Neutron dose

NOTE: The lists should indicate the significance level of each issue and the search criteria used. Please provide in document formats which are searchable.

- G. List of positive whole body counts since date of last inspection, names redacted if desired
- H. Part 61 analyses/scaling factors
- I. The most recent national voluntary laboratory accreditation program report or, if dosimetry is provided by a vendor, the vendor's most recent results