UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
612 EAST LAMAR BLVD, SUITE 400
ARLINGTON, TEXAS 76011-4125

ML112101634

July 29, 2011

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 05000445/2011003 AND 05000446/2011003

Dear Mr. Flores:

On June 18, 2011, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Comanche Peak Nuclear Power Plant. The enclosed integrated inspection report documents the inspection findings, which were discussed with you and other members of your staff, on June 29, 2011.

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

This report documents four self-revealing and five NRC-identified findings of very low safety significance (Green). Five of these findings were determined to involve violations of NRC requirements. However, because of the very low safety significance and because they were entered into your corrective action program, the NRC is treating these findings as noncited violations, consistent with Section 2.3.2 of the NRC Enforcement Policy. If you contest the noncited violations or the significance of the noncited violations, 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, D.C. 20555-0001, with copies to the Regional Administrator, U.S. Nuclear Regulatory Commission, Region IV, 612 E. Lamar Blvd, Suite 400, Arlington, Texas, 76011-4125; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555-0001; and the NRC Resident Inspector at the Comanche Peak Nuclear Power Plant. In addition, if you disagree with the cross-cutting aspect of the findings in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region IV, and the NRC Resident Inspector at the Comanche Peak Nuclear Power Plant.

In accordance with 10 CFR 2.390 of the NRC's “Rules of Practice,” a copy of this letter, and its enclosure, will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records component of NRC’s document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

/RA/

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

Docket: 50-445: 50-446
License: NPF-87; NPF-89

Enclosure:
NRC Inspection Report 05000445/2011003 and 05000446/2011003
w/Attachment: Supplemental Information

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U.S. NUCLEAR REGULATORY COMMISSION

REGION IV

Docket:	50-445, 50-446
License:	NPF-87, NPF-89
Report:	05000445/2011003 and 05000446/2011003
Licensee:	Luminant Generation Company LLC
Facility:	Comanche Peak Nuclear Power Plant, Units 1 and 2
Location:	FM-56, Glen Rose, Texas
Dates:	March 20 through June 18, 2011
Inspectors:	J. Kramer, Senior Resident Inspector B. Tindell, Resident Inspector D. Proulx, Senior Project Engineer, Project Branch A R. Kopriva, Senior Reactor Inspector, Engineering Branch 1 G. Tutak, Project Engineer, Project Branch B
Approved By:	Wayne Walker, Chief, Project Branch A Division of Reactor Projects

SUMMARY OF FINDINGS

IR 05000445/2011003, 05000446/2011003; 3/20/2011 - 6/18/2011; Comanche Peak Nuclear Power Plant, Units 1 and 2; Adverse Weather Protection, Inservice Inspection Activities, Operability Evaluations, Identification and Resolution of Problems, Event Followup, Other.

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

A. NRC-Identified Findings and Self-Revealing Findings

Cornerstone: Initiating Events

- Green. The inspectors identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion III, for the failure to have adequate external flooding instructions. The licensee’s technical requirements manual included circulating water system stop gates as a flood protection measure. This statement was not accurate for a reservoir level greater than 778 feet. As a result, the licensee failed to provide specific instructions for flood protection during circulating water system maintenance with stop gates in place. In addition, during service water travelling screen replacement, the licensee failed to provide adequate guidance to mitigate debris from entering the service water pump suctions if water level were to increase above 778 feet. As a result, the service water system was susceptible to fouling during a flooding event. The licensee entered the finding into the corrective action program as Condition Report CR-2011-004062.

  The licensee’s failure to have adequate external flooding instructions that resulted in safety related equipment being vulnerable to external flooding was a performance deficiency. The performance deficiency was more than minor because it was associated with the protection against external factors attribute of the initiating events cornerstone and adversely affected the cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Using NRC Manual Chapter 0609, Attachment 4, “Phase 1 - Initial Screening and Characterization of Findings,” the finding was determined to involve equipment designed to mitigate an external flood and could result in a plant trip or affect more than one train of safety equipment and required a Phase 3 analysis. A senior reactor analyst determined that the finding was of very low safety significance because the calculated bounding delta core damage frequency was 1.9E-8. The finding has a human performance crosscutting aspect associated with decision-making because the licensee failed to demonstrate that nuclear safety is an overriding priority when faced with unexpected plant conditions [H.1a] (Section 1R01.1).

- Green. The inspectors reviewed a self-revealing finding for the licensee’s failure to provide adequate instructions to maintenance personnel when installing insulation on feedwater flow sensing lines. As a result, three sensing lines froze and caused a feedwater perturbation that required operators to take control of the system to stabilize the plant. This finding does not involve enforcement action because no regulatory requirement violation was identified. The licensee entered the finding into the corrective action program as Condition Report CR-2011-001224.

The licensee's failure to provide adequate instructions for the installation of insulation on feedwater flow sensing lines was a performance deficiency. The finding was more than minor because it was associated with the equipment performance attribute of the initiating events cornerstone and adversely affected the cornerstone objective, in that, it increased the likelihood of those events that upset plant stability and challenge critical safety functions during power operations. Using NRC Manual Chapter 0609, Attachment 4, "Phase 1 - Initial Screening and Characterization of Findings," the finding was determined to be of very low safety significance because the finding did not contribute to both the likelihood of a reactor trip and the likelihood that mitigating equipment would not be available. The finding did not have a crosscutting aspect because it was not representative of current licensee performance (Section 1R01.2).

- Green. The inspectors identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion V, for the licensee's failure to follow procedure STA-737, "Boric Acid Corrosion Detection and Evaluation," Revision 5. Specifically, the licensee did not track all boric acid leaks until they were repaired or cleaned as required by Procedure STA-737. The licensee entered the finding into the corrective action program as Condition Report CR-2011-004625.

  The licensee's failure to follow the requirements of Procedure STA-737 was a performance deficiency. The finding is more than minor because, if left uncorrected, the issue would have the potential to lead to a more significant safety concern. The finding is associated with the procedure quality attribute of the initiating events cornerstone and affected the cornerstone objective of limiting the likelihood of events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Using Manual Chapter 0609, Attachment 4, "Phase 1 - Initial Screening and Characterization of Findings," the finding was determined to have very low safety significance because the finding did not result in exceeding the technical specification limit for any reactor coolant system leakage and did not affect other mitigation systems resulting in a total loss of their safety function. The finding has a human performance crosscutting aspect associated with the work control component, because the licensee did not appropriately coordinate work activities by incorporating actions to address the impact of changing the schedule to repair boric acid leaks [H.3b] (Section 1R08.3).

- Green. The inspectors reviewed a self-revealing noncited violation of 10 CFR Part 50, Appendix B, Criterion XVI, for the licensee's failure to correct a deficiency with a charging header vent valve. As a result, the valve failed open after an operator attempted to close the valve resulting in a 40 gpm charging system leak. The licensee entered the finding into the corrective action program as Condition Report CR-2011-001876.

The licensee's failure to correct a leaking vent valve was a performance deficiency. The finding was more than minor because it was associated with the equipment performance attribute of the initiating events cornerstone and adversely affected the cornerstone objective, in that, it increased the likelihood of those events that upset plant stability and challenge critical safety functions during power operations. Using NRC Manual Chapter 0609, Attachment 4, "Phase 1 - Initial Screening and Characterization of Findings," the finding was determined to be of very low safety significance because the finding did not contribute to both the likelihood of a reactor trip and the likelihood that mitigating equipment would not be available. The finding did not have a crosscutting aspect because it was not representative of current licensee performance (Section 4OA2.4.b.1).

- Green. The inspectors reviewed a self-revealing finding for the licensee's failure to follow maintenance instructions and properly reassemble a heater drain valve. As a result, the valve unexpectedly closed causing operators to manually initiate a turbine runback. This finding does not involve enforcement action because no regulatory requirement violation was identified. The licensee entered the finding into the corrective action program as Condition Report CR-2011-002716.

  The licensee's failure to follow instructions and properly reassemble a heater drain valve, which resulted in the valve unexpectedly closing, was a performance deficiency. The finding was more than minor because it was associated with the equipment performance attribute of the initiating events cornerstone and adversely affected the cornerstone objective, in that, it increased the likelihood of those events that upset plant stability and challenge critical safety functions during power operations. Using NRC Manual Chapter 0609, Attachment 4, "Phase 1 - Initial Screening and Characterization of Findings," the finding was determined to be of very low safety significance because the finding did not contribute to both the likelihood of a reactor trip and the likelihood that mitigating equipment would not be available. The finding has a human performance crosscutting aspect associated with resources, in that, the licensee failed to ensure that an adequate work package and instructions were available for a maintenance activity [H.2c] (Section 4OA3.1).

Cornerstone: Mitigating Systems

- Green. The inspectors reviewed a self-revealing noncited violation of 10 CFR Part 50, Appendix B, Criterion XVI for the licensee's failure to promptly correct a fuel leak on a diesel generator. As a result, the leak became significantly worse during diesel operation and caused the diesel generator to become inoperable. The licensee entered the finding into the corrective action program as Condition Report CR-2011-005830.

  The licensee's failure to promptly correct a diesel generator fuel line leak was a performance deficiency. The finding was more than minor because it was associated with the equipment performance attribute of the mitigating systems cornerstone and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of the diesel generator to provide emergency power. Using NRC Manual Chapter 0609, Attachment 4, "Phase 1 - Initial Screening and Characterization of Findings," the inspectors determined that a

Phase 3 analysis was required. A senior reactor analyst determined that the finding was of very low safety significance because the calculated delta core damage frequency was 6.0E-7. The finding has a human performance crosscutting aspect associated with work control, in that, the licensee failed to plan and coordinate work activities consistent with the risk significance to the diesel generator [H.3a] (Section 1R15).

- <u>Green</u>. The inspectors identified a finding for the licensee's failure to provide adequate procedure instructions for refueling the alternate power generators. As a result, during a station blackout event, the alternate power generators could have ran out of fuel since the fuel tank was sized for approximately 2.6 hours of operation at full load and instructions for obtaining additional fuel did not exist. This finding does not involve enforcement action because no regulatory requirement violation was identified. The licensee entered the finding into the corrective action program as Condition Report CR-2011-005399.

  The licensee's failure to provide adequate instructions for replenishing the alternate power generators fuel tank was a performance deficiency. The finding was more than minor because it was associated with the procedure quality attribute of the mitigating systems cornerstone and adversely affected the cornerstone objective, in that, the inadequate instructions did not ensure the availability, reliability, and capability of the alternate power generators to electrical power to the units during a station blackout event. Using NRC Manual Chapter 0609, Attachment 4, "Phase 1 - Initial Screening and Characterization of Findings," the finding was determined to be of very low safety significance because the finding did not result in an actual loss safety related equipment for greater than its technical specification allowed outage time and did not represent a loss of equipment designated as risk-significant in the maintenance rule. The finding has a human performance crosscutting aspect associated with resources, in that, the licensee failed to ensure that adequate procedures and equipment were available [H.2d] (Section 4OA5.2.b.2).

Cornerstone: Barrier Integrity

- <u>Green</u>. The inspectors identified a noncited violation of 10 CFR 50.54(hh)(2) for the licensee's failure to develop adequate guidance to restore core and spent fuel cooling capabilities for a postulated loss of large areas of the plant. Specifically, the licensee failed to ensure suction hose size derived from an engineering report was translated into procedures, failed to provide adequate procedure guidance for use of a fire truck to draw water from the reservoir, and failed to stage hoses in the location specified by procedure. The licensee entered the finding into the corrective action program as Condition Report CR-2011-005830.

  The licensee's failure to develop adequate guidance to restore core and spent fuel cooling capabilities for a postulated loss of large areas of the plant was a performance deficiency. The finding was more than minor because it was associated with the procedure quality attribute of the barrier integrity cornerstone and adversely affected the cornerstone objective to provide reasonable assurance that physical design barriers (fuel cladding and containment) protect the public from radionuclide releases caused by accidents or events. Using NRC

Manual Chapter 0609, Appendix L, “B.5.b Significance Determination Process,” the finding was determined to be of very low safety significance because the finding did not affect both the recoverability and availability of an individual mitigating strategy. The finding has a human performance crosscutting aspect associated with resources, in that, the licensee failed to ensure adequate facilities, equipment, and trained personnel were available to ensure nuclear safety is maintained [H.2d] (Section 4OA5.2.b.1).

Cornerstone: Emergency Preparedness

- Green. The inspectors identified a finding for the licensee’s failure to follow procedure guidance and update the severe accident management guidelines. As a result, as of May 16, 2011, the severe accident management guidelines did not incorporate the latest owners’ group guidance, plant hardware changes, and incorporation of extreme damage mitigation guideline actions. This finding does not involve enforcement action because no regulatory requirement violation was identified. The licensee entered the finding into the corrective action program as Condition Report CR-2011-005982.

  The licensee’s failure to follow procedure guidance and update the severe accident management guidelines was a performance deficiency associated with the Emergency Preparedness Cornerstone. The finding was more than minor because if left uncorrected, the finding would have a potential to lead to a more significant safety concern. Using NRC Manual Chapter 0609, Appendix B, “Emergency Preparedness Significance Determination Process,” the finding was determined to be of very low safety significance because the finding was not associated with an emergency preparedness planning standard. The finding has a human performance crosscutting aspect associated with resources, in that, personnel failed to follow expectations regarding procedural compliance and closed a condition report without addressing the deficiencies identified in the condition report [H.4b] (Section 4OA2.4.b.2).

B. Licensee-Identified Violations

None

REPORT DETAILS

Summary of Plant Status

Unit 1 began the inspection period at approximately 100 percent power. On June 4, 2011, operators reduced power to approximately 70 percent for turbine valve testing and returned to approximately 100 percent power the same day. The unit operated at approximately 100 percent power for the remainder of the reporting period.

Unit 2 began the inspection period at approximately 100 percent power. On April 2, 2011, the operators shut down Unit 2 to begin a scheduled refueling outage. On April 26, 2011, the outage ended when the main generator output breakers were closed and Unit 2 was placed on the grid. On April 29, 2011, the unit returned to approximately 100 percent power. On May 19, 2011, operators manually tripped the reactor due to high steam generator sodium levels which was the result of a main condenser tube leak. On May 22, 2011, operators performed a reactor startup and placed the unit on the grid the following day. On May 25, the unit returned to approximately 100 percent power and operated at approximately 100 percent power for the remainder of the reporting period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity, and Emergency Preparedness

1R01 Adverse Weather Protection (71111.01)

.1 External Flooding

a. Inspection Scope

The inspectors evaluated the design, material condition, and procedures for coping with the design basis probable maximum flood. The evaluation included a review to check for deviations from the descriptions provided in the Final Safety Analysis Report for features intended to mitigate the potential for flooding from external factors. The inspectors reviewed the abnormal operating procedure for mitigating the design basis flood to ensure it could be implemented as written. As part of this evaluation, the inspectors performed a walkdown of Unit 2 circulating water work that opened the system below nominal reservoir level to identify potential external flood hazards. Additionally, the inspectors performed a walkdown of service water travelling screen replacement that involved using a stop log to prevent debris from entering the service water pumps' suction.

These activities constitute completion of one external flooding sample as defined in Inspection Procedure 71111.01-05.

b. Findings

Introduction. The inspectors identified a Green noncited violation of 10 CFR Part 50, Appendix B, Criterion III, for the failure to have adequate external flooding instructions. The licensee's technical requirements manual included circulating water system stop gates as a flood protection measure. This statement was not accurate for a reservoir level greater than 778 feet. As a result, the licensee failed to provide specific instructions for flood protection during circulating water system maintenance with stop gates in place. In addition, during service water travelling screen replacement, the licensee failed to provide adequate guidance to mitigate debris from entering the service water pump suctions during a level rise of the safe shutdown impoundment above 778 feet. As a result, the service water system was susceptible to fouling during a postulated flooding event.

Description. On April 6, 2011, the inspectors walked down the Unit 2 circulating water system during maintenance that opened the normally closed system. The licensee had placed stop gates at the circulating water discharge to prevent backflow from the Squaw Creek Reservoir to the discharge tunnel during the maintenance. However, a second opening approximately three feet above normal water level of 775 feet existed. If the reservoir level had increased to the maximum flood height of 790 feet with the circulating water system open for maintenance, it could have flooded both units' turbine buildings, and the lower level of the control building which contains safety related equipment.

The inspectors noted that the Final Safety Analysis Report, Section 3.4.1, "Flood Protection," Amendment 101 and the Technical Requirements Manual, section 13.7.34, "Flood Protection," Revision 76 both stated that the circulating water system could be isolated from Squaw Creek Reservoir by a stop gate to protect from an external flood. The inspectors determined that this statement was not accurate for a lake level greater than 778 feet. The inspectors noted that the specific flooding contingency plan for the maintenance, which was attached to Condition Report CR-2005-001269, did not address an external flood. Therefore, the inspectors concluded that there was inadequate guidance to mitigate external flooding effects on safety-related equipment through an open circulating water system. The licensee documented the inspectors' concern in Condition Report CR-2011-004062.

On April 11, 2011, the inspectors performed a walkdown of the service water travelling screen replacement work. The licensee had placed a stop gate in the flow path of the removed travelling screen to prevent debris from entering the operable pump suctions. However, the inspectors noted that the stop gates only extended to elevation 778 feet, three feet above normal water level. Had the water level increased to the maximum flood level of 790 feet, debris would have been able to overflow the temporary barrier and enter the system. The inspectors determined through interviews that no contingency plan or procedure existed for mitigating external flooding effects on the service water system without a travelling screen. The licensee documented the inspectors' concern in Condition Report CR-2011-004354.

The licensee analyzed the operating requirements of the service water system without a travelling screen in place in Condition Report CR-2009-002038. The condition report focused on a lowering reservoir level and the affects on service water. The condition report also documented the affects of a seismic event on reservoir level. The condition report did not address how external flooding and a rising reservoir level would affect service water.

Analysis. The licensee's failure to have adequate external flooding instructions that resulted in safety related equipment being vulnerable to external flooding was a performance deficiency. The performance deficiency was more than minor because it was associated with the protection against external factors attribute of the initiating events cornerstone and adversely affected the cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Using NRC Manual Chapter 0609, Attachment 4, "Phase 1 - Initial Screening and Characterization of Findings," the finding was determined to involve equipment designed to mitigate an external flood and could result in a plant trip or affect more than one train of safety equipment and required a Phase 3 analysis.

A senior reactor analyst performed a Phase 3 significance determination to evaluate the external flooding effect on the units. The analyst assumed the service water flooding was a bounding event. The analyst used a non-informative prior and set it equal to 0.5 events in 20 years of operation, or 1 event in 40 years for a water level over the 778 foot reservoir level. The licensee was given a 0.1 mitigation credit for planning on performing the activity in clear weather. The time the service water system was vulnerable to debris entering the system due to traveling screen removal was 22 hours. The analyst used the Comanche Peak SPAR model, Revision 8.15, dated August 21, 2010 with a truncation of 1.0E-13 and calculated the conditional core damage probability with a loss of service water at 2.97E-3. Using the above information, the analyst determined that the finding was of very low safety significance because the calculated bounding delta core damage frequency was 1.9E-8.

The finding has a human performance crosscutting aspect associated with decision-making because the licensee failed to demonstrate that nuclear safety is an overriding priority when faced with unexpected plant conditions [H.1a].

Enforcement. Title 10 CFR Part 50, Appendix B, Criterion III, requires, in part, that measures shall be established to assure that applicable regulatory requirements and the design basis are correctly translated into instructions. Contrary to the above, as of April 6, 2011, the licensee failed to assure that applicable regulatory requirements and the design basis were correctly translated into instructions. Specifically, the licensee's instructions failed to adequately address protection of multiple trains of safety-related equipment from external flooding with an open circulating water system and the licensee's instructions failed to address the potential effects of external flooding debris on multiple trains of the service water system with the travelling screens removed. Since the violation was of very low safety significance and was documented in the licensee's corrective action program as Condition Report CR-2011-004062, it is being treated as a noncited violation, consistent with Section 2.3.2 of the NRC Enforcement Policy: NCV 05000445/2011003-01; 05000446/2011003-01, "Inadequate External Flooding Instructions."

.2 Impending Adverse Weather

a. Inspection Scope

February 2, 2011, the inspectors reviewed the licensee's preparations for a severe cold weather that was forecast in the vicinity of the facility. The inspectors evaluated the licensee staff's preparations against the site's procedures. During the inspection, the inspectors focused on plant-specific design features and the licensee's procedures used to respond to specified adverse weather conditions. In addition, the inspectors focused on the operator's response to steam generator flow indications that failed due to the cold weather. The inspectors toured the plant grounds to look for other plant equipment that may be affected by the cold weather. The inspectors reviewed a sample of corrective action program items to verify that the licensee identified adverse weather issues at an appropriate threshold and dispositioned them through the corrective action program in accordance with station corrective action procedures.

These activities constitute completion of one readiness for impending adverse weather condition sample as defined in Inspection Procedure 71111.01-05.

b. Findings

Introduction. The inspectors reviewed a Green self-revealing finding for the failure of the licensee to provide adequate instructions to maintenance personnel when installing insulation on feedwater flow sensing lines. As a result, three sensing lines froze and caused a feedwater perturbation that required operators to take control of the system to stabilize the plant.

Description. On February 2, 2011, one of two channels of the Unit 1 steam generator feedwater flow instrumentation was lost on three of the steam generators. One of the channels that failed was the controlling channel for steam generator 1. Operators were required to take manual control of the feedwater and swap to an alternate channel to stabilize the generator level and avoid a reactor trip. The cause of the instrument malfunction was a result of frozen instrumentation lines that were not properly insulated and heat traced.

The insulation and heat tracing had been removed and then replaced as part of the steam generator replacement outage in the spring of 2007. The work order that provided instructions for the replacement of the insulation directed, in part, to reinstall the insulation in accordance with applicable procedure. The completed step contained a footnote that the insulation was reinstalled per the vendor. The vendor was not provided a drawing that indicated the insulation configuration nor detailed instructions. As a result, the insulation was not correctly installed.

Analysis. The licensee's failure to provide adequate instructions to maintenance personnel when installing insulation on feedwater flow sensing lines, which resulted in frozen sensing lines and a feedwater perturbation, which was a performance deficiency. The finding was more than minor because it was associated with the equipment performance attribute of the initiating events cornerstone and adversely affected the cornerstone objective, in that, it increased the likelihood of those events that upset plant stability and challenge critical safety functions during power operations. Using NRC Manual Chapter 0609, Attachment 4, "Phase 1 - Initial Screening and Characterization of Findings," the finding was determined to be of very low safety significance because the finding did not contribute to both the likelihood of a reactor trip and the likelihood that mitigating equipment would not be available. The finding did not have a crosscutting aspect because it was not representative of current licensee performance.

Enforcement. This finding does not involve enforcement action because no regulatory requirement violation was identified. The licensee documented the finding in the corrective action program as Condition Report CR-2011-001224. The issue is being characterized as finding FIN 05000445/2011003-02, "Failure to Properly Install Insulation Results in Frozen Feedwater Flow Sensing Lines."

1R04 Equipment Alignments (71111.04)

.1 Partial Equipment Walkdowns

a. Inspection Scope

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

- March 31, 2011, service water flows to lube oil coolers following fish impingement on travelling screens
- On April 23, 2011, Unit 2 containment spray system after the refueling outage
- May 11, 2011, diesel generator 2-01 while diesel generator 2-02 was inoperable due to a fuel leak

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

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

b. Findings

No findings were identified.

.2 Complete System Walkdown

a. Inspection Scope

The inspectors performed a complete system walkdown of the Unit 2 safety injection system to verify the functional capability of the system. The inspectors selected this system because it was considered both safety-significant and risk-significant in the licensee’s probabilistic risk assessment. The inspectors walked down the system to review mechanical and electrical equipment line ups, electrical power availability, system pressure and temperature indications, component labeling, component lubrication, component and equipment cooling, hangers and supports, operability of support systems, and to ensure that ancillary equipment or debris did not interfere with equipment operation. The inspectors reviewed a sample of past and outstanding work orders to determine whether any deficiencies significantly affected the system function. In addition, the inspectors reviewed the corrective action program database to ensure that system equipment-alignment problems were being identified and appropriately resolved. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of one complete system walkdown sample as defined by Inspection Procedure 71111.04-05.

b. Findings

No findings were identified.

1R05 Fire Protection (71111.05AQ)

a. Inspection Scope

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

- April 5, 2011, fire zone 1SA1A, Unit 1 emergency core cooling systems train B
- April 6, 2011, fire zone 154, Unit 2 safety chiller rooms
- April 6, 2011, fire zone 1SB2B, Unit 1 train A piping penetration room
- April 7, 2011, fire zone 1SE16, Unit 1, 832 foot switchgear room
- April 20, 2011, Unit 2 containment

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

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

b. Findings

No findings were identified.

1R08 Inservice Inspection Activities (71111.08)

.1 <u>Inspection Activities Other Than Steam Generator Tube Inspection, Pressurized Water Reactor Vessel Upper Head Penetration Inspections, and Boric Acid Corrosion Control (71111.08-02.01)</u>

a. <u>Inspection Scope</u>

The inspectors observed 32 nondestructive examination activities and reviewed one nondestructive examination activity that included four different types of examinations. The licensee did not identify any relevant indications accepted for continued service during the nondestructive examinations.

The inspectors directly observed the following nondestructive examinations:

SYSTEM	IDENTIFICATION	EXAMINATION TYPE
Reactor Coolant System	Pressurizer to Skirt Weld, Sketch TCX-1-2100, Component ID-Weld #10, Report #12 MT-001	Magnetic Particle Examination – Dry Powder
Feedwater System	Feedwater Bypass Line, Piping Support. Sketch TCX-2-2102, Component H6, Report #12 MT-004	Magnetic Particle Examination – Dry Powder
Reactor Coolant System	RCS Loop 1 Bypass Line, Sketch TCX-1-4109, Component ID #4, Report #12 PT-007	Liquid Penetrant Examination – Solvent Removable, Color Contrasting
Reactor Coolant System	RCS Loop 1 Bypass Line, Sketch TCX-1-4109, Component ID #6, Report #12 PT-007	Liquid Penetrant Examination – Solvent Removable, Color Contrasting
Containment	Reactor Building Containment Liner Penetration MI-0011, Sketch CISI-2-Liner	Visual Testing Examination, VT-3
Containment	Reactor Building Containment Liner Penetration MV-0003, Sketch CISI-2-Liner	Visual Testing Examination, VT-3
Containment	Reactor Building Containment Liner Penetration MV-0006, Sketch CISI-2-Liner	Visual Testing Examination, VT-3
Containment	Reactor Building Containment Liner Penetration MV-0009, Sketch CISI-2-Liner	Visual Testing Examination, VT-3
Containment	Reactor Building Containment Liner Penetration MV-0010, Sketch CISI-2-Liner	Visual Testing Examination, VT-3

SYSTEM	IDENTIFICATION	EXAMINATION TYPE
Containment	Reactor Building Containment Liner Penetration MV-0011, Sketch CISI-2-Liner	Visual Testing Examination, VT-3
Containment	Reactor Building Containment Liner Penetration MV-0012, Sketch CISI-2-Liner	Visual Testing Examination, VT-3
Containment	Reactor Building Containment Liner Penetration MV-0013, Sketch CISI-2-Liner	Visual Testing Examination, VT-3
Main Steam	Main Steam Support, Snubber H-1, Drawing MS-2-003-405-C72K	Visual Testing Examination, VT-3
Main Steam	Main Steam Support, Snubber H-3, Drawing MS-2-003-409-C72K	Visual Testing Examination, VT-3
Main Steam	Main Steam Support, Snubber H-4, Drawing MS-2-003-410-C72K	Visual Testing Examination, VT-3
Main Steam	Main Steam Support, Snubber H-7, Drawing MS-2-003-402-C72S	Visual Testing Examination, VT-3
Reactor Coolant System	Pressurizer Circumferential Girth Weld, Sketch TCX-1-2100, Component ID – Weld 1, Data Sheet #12 UT-013A, Examination Angle 45^o	Ultrasonic Testing Examination
Reactor Coolant System	Pressurizer Circumferential Girth Weld, Sketch TCX-1-2100, Component ID – Weld 1, Data Sheet #12 UT-013B, Examination Angle 0^o	Ultrasonic Testing Examination
Reactor Coolant System	Pressurizer Vertical Weld, Sketch TCX-1-2100, Component ID – Weld 6, Data Sheet #12 UT-013A, Examination Angle 45^o	Ultrasonic Testing Examination
Reactor Coolant System	Pressurizer Vertical Weld, Sketch TCX-1-2100, Component ID – Weld 6, Data Sheet #12 UT-013B, Examination Angle 0^o	Ultrasonic Testing Examination
Steam Generator	Steam Generator 1, Channel Head to Tubesheet Weld, Sketch TCX-1-3100, Component ID – Weld 1-1, Data Sheet #12 UT-017A, Examination Angle 60^o	Ultrasonic Testing Examination

SYSTEM	IDENTIFICATION	EXAMINATION TYPE
Steam Generator	Steam Generator 1, Channel Head to Tubesheet Weld, Sketch TCX-1-3100, Component ID – Weld 1-1, Data Sheet #12 UT-017B, Examination Angle 45°	Ultrasonic Testing Examination
Steam Generator	Steam Generator 1, Channel Head to Tubesheet Weld, Sketch TCX-1-3100, Component ID – Weld 1-1, Data Sheet #12 UT-017C, Examination Angle 45°	Ultrasonic Testing Examination
Steam Generator	Steam Generator 1, Channel Head to Tubesheet Weld, Sketch TCX-1-3100, Component ID – Weld 1-1, Data Sheet #12 UT-017D, Examination Angle 0°	Ultrasonic Testing Examination
Steam Generator	Steam Generator 1, Channel Head to Tubesheet Weld, Sketch TCX-1-3100, Component ID – Weld 1-1, Data Sheet #12 UT-017E, Examination Angle 60°	Ultrasonic Testing Examination
Steam Generator	Reactor Coolant System Loop 1, Steam Generator 1, Hot Leg Dissimilar Metal Weld, Sketch TCX-1-4100, Component ID – Weld #4, Data Sheet #12 UT-015	Ultrasonic Testing Examination
Steam Generator	Reactor Coolant System Loop 1, Steam Generator 1, Cold Leg Dissimilar Metal Weld, Sketch TCX-1-4100, Component ID – Weld #5, Data Sheet #12 UT-015	Ultrasonic Testing Examination
Steam Generator	Steam Generator 1, Hot Leg Nozzle Inner Radius Weld Examination, TU Electric CPSES Unit 2, Inservice Inspection Location Isometric TCX-1-3100, Weld #1A, Data Sheet #12 UT-016	Ultrasonic Testing Examination
Steam Generator	Steam Generator 1, Cold Leg Nozzle Inner Radius Weld Examination, TU Electric CPSES Unit 2, Inservice Inspection Location Isometric TCX-1-3100, Weld #1B, Data Sheet #12 UT-016	Ultrasonic Testing Examination
Reactor Coolant System	Pressurizer Head, Safety Valve Nozzle, Weld Overlay 2-001A, TU Electric CPSES Unit 2, Inservice Inspection Location Isometric TCX 1 4501, Weld # 1 OL and 2OL, Data Sheet #12 UT-002A-E	Ultrasonic Testing Examination

SYSTEM	IDENTIFICATION	EXAMINATION TYPE
Reactor Coolant System	Pressurizer Head, Safety Valve Nozzle, Weld Overlay 2-001B, TU Electric CPSES Unit 2, Inservice Inspection Location Isometric TCX-1-4502, Weld #1OL and 2OL, Data Sheet #12 UT-004A-E	Ultrasonic Testing Examination
Reactor Coolant System	Pressurizer Head, Safety Valve Nozzle, Weld Overlay 2-001C, TU Electric CPSES Unit 2, Inservice Inspection Location Isometric TCX-1-4503, Weld #1OL and 2OL, Data Sheet #12 UT-005A-E	Ultrasonic Testing Examination

The inspectors reviewed records for the following nondestructive examination:

SYSTEM	WELD IDENTIFICATION	EXAMINATION TYPE
Reactor Coolant System	Reactor Coolant/CVCS Letdown, Sketch TCX-1-4304, Component ID – Weld #13. Data Sheet #12 UT-010	Ultrasonic Testing Examination

During the review and observation of each examination, the inspectors verified that activities were performed in accordance with the ASME Code requirements and applicable procedures. The inspectors also verified the qualifications of all nondestructive examination technicians performing the inspections were current.

The inspectors observed three welds on the reactor coolant system pressure boundary. The inspectors directly observed portions of the following welding activities:

SYSTEM	WELD IDENTIFICATION	WELD TYPE
Safety Injection	2SI-8819D, Safety Injection to RCS Cold Leg Check Valve, WO #3968941, Drawing SK-0001-BRP-SI-2-RB-060	Tungsten Inert Gas
Safety Injection	2-SI-0004, Safety Injection Test Connection, ¾ inch Globe Valve, Drawing SK-0001-11-000059-01-00	Tungsten Inert Gas
Safety Injection	2-SI-0009, Safety Injection Test Connection, ¾ inch Globe Valve, Drawing SK-0001-11-000059-01-00	Tungsten Inert Gas

The inspectors verified, by review, that the welding procedure specifications and the welders had been properly qualified in accordance with ASME Code, Section IX, requirements. The inspectors also verified, through observation and record review, that essential variables for the welding process were identified, recorded in the procedure qualification record, and formed the bases for qualification of the welding procedure specifications. Specific documents reviewed during this inspection are listed in the attachment.

These actions constitute completion of the requirements for Section 02.01.

b. Findings

No findings were identified.

.2 Vessel Upper Head Penetration Inspection Activities (71111.08-02.02)

a. Inspection Scope

The inspectors observed the licensee perform a visual inspection of pressure-retaining components above the reactor pressure vessel head to verify that there was no evidence of leaks or boron deposits on the surface of the reactor pressure vessel head or related insulation. The inspectors verified that the personnel performing the visual inspection were certified as Level II and Level III VT-2 examiners. Specific documents reviewed during this inspection are listed in the attachment.

The licensee also performed ultrasonic examination of the reactor vessel head penetrations. During the examination, reactor vessel head penetrations 63 and 65 could not be ultrasonically examined. The ultrasonic equipment, the gap scanner tool, could not access the required examination volume, which is defined in ASME Section XI Code Case N-729-1 as amended by 10 CFR 50.55(a). The two heated junction thermal couple penetrations are bell-mouth configurations and were previously examined in Refueling Outage 2RF09 (October, 2006). Calculation ME-CA-000-5468 established the inspection frequency of 6.2 years per the requirements of Table1, Item B4.20 of ASME Code Case N-729-1 and 10 CFR 50.55(a). It was found to be acceptable to postpone the ultrasonic examinations for penetrations 63 and 65 until Refueling Outage 2RF13, which is scheduled for October 2012. There was wear identified on 10 CRDM penetration thermal sleeves at the interface of the thermal sleeve with the CRDM penetrations. Westinghouse document, WCAP-16911-P, “Reactor Vessel Head Thermal Sleeve Evaluation for Westinghouse Domestic Plants,” Revision 0, provided evaluations for continued operation in the event of loose parts. Chapter 7, “Loose Parts Evaluation,” stated, in part, that the purpose of the preceding evaluations are geared toward prevention of loose parts generation such as separated thermal sleeves, guide funnels, or other debris. The licensee noted that the minimum thickness of the thermal sleeves was outside of the bounding analysis. The licensee received a new analysis allowing continued operation with the existing thermal sleeves installed. The inspectors reviewed the revised calculations and did not identify any issues or concerns. The inspectors identified no other concerns or issues during the ultrasonic examinations of the reactor vessel head penetrations.

These actions constitute completion of the requirements for Section 02.02.

b. Findings

No findings were identified.

.3 Boric Acid Corrosion Control Inspection Activities (71111.08-02.03)

a. Inspection Scope

The inspectors evaluated the implementation of the licensee's boric acid corrosion control program for monitoring degradation of those systems that could be adversely affected by boric acid corrosion. The inspectors reviewed the documentation associated with the licensee's boric acid corrosion control walkdown as specified in Procedure STA-737, "Boric Acid Corrosion Detection and Evaluation," Revision 5. The inspectors also reviewed the visual records of the components and equipment. The inspectors verified that the visual inspections emphasized locations where boric acid leaks could cause degradation of safety-significant components. The inspectors reviewed six engineering evaluations for those components where boric acid was identified to ensure that the ASME Code wall thickness limits were properly maintained. The evaluations were reviewed for the causes and corrective actions. The inspectors also reviewed five condition reports to confirm that the corrective actions performed for evidence of boric acid leaks were consistent with requirements of the ASME Code. Specific documents reviewed during this inspection are listed in the attachment.

These actions constitute completion of the requirements for Section 02.03.

b. Findings

Introduction. The inspectors identified a Green noncited violation of 10 CFR Part 50, Appendix B, Criterion V, for the licensee's failure to follow Procedure STA-737, "Boric Acid Corrosion Detection and Evaluation," Revision 5. Specifically, the licensee failed to keep track of two boric acid leaks until they were repaired or cleaned.

Description. On April 13, 2011, the inspectors identified a boric acid leak on safety injection accumulator injection valve 2-8808A and noted that the valve was not included in Work Order 4119515. This was a generic work order that listed the equipment that needed to be cleaned of boric acid during Refueling Outage 2RF12. The unidentified boric acid leak was brought to the attention of the licensee. The licensee showed the inspectors the documentation that confirmed the leak was found during the initial 2RF12 boric acid walkdown on April 2, 2011. The licensee determined this valve was not added to work order 4119515 because it was already located in work order 3452939. This work order involved performing corrective maintenance on the valve and it was scheduled to be completed in Refueling Outage 2RF12. However, in September 2010, the licensee evaluated the boric acid leaks and decided that it would be acceptable to postpone work orders 3452939 and 3810564, which involved corrective maintenance on several boric acid leaks. During the review of work order 3810584, the inspectors identified an additional example of a valve that was initially scheduled to be reworked during Refueling Outage 2RF12, but was postponed until Refueling Outage 2RF13. Residual heat removal to cold leg 2-01 test valve 2-8879A was an additional example of a valve that was not listed in Work Order 4119515.

The inspectors determined that the licensee failed to follow Procedure STA-737, Step 6.6.1, which stated, "All boric acid leakage indications should be tracked until cleaning, repair, and/or replacement has been completed." By losing track of when the valve repairs were going to occur, the licensee failed to follow Procedure STA-737, Step 6.5.2, which stated, "All visible boric accumulation/residue shall be removed." The licensee entered this issue into the corrective action program as Condition Report CR 2011-004625, created work orders to clean the valves in 2RF12, and performed an extent of condition review to look for any other boric acid leaks that might have been left off work order 4119515. Long term corrective actions were initiated by the licensee to develop an improved method of tracking boric acid leakage from initial identification to closure.

Analysis. The licensee's failure to follow the requirements of Procedure STA-737 was a performance deficiency. The finding is more than minor because, if left uncorrected, the issue would have the potential to lead to a more significant safety concern. The finding is associated with the procedure quality attribute of the initiating events cornerstone and affected the cornerstone objective of limiting the likelihood of events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Using Manual Chapter 0609, Attachment 4, "Phase 1 - Initial Screening and Characterization of Findings," the finding was determined to have very low safety significance because the finding did not result in exceeding the technical specifications limit for any reactor coolant system leakage and did not affect other mitigation systems resulting in a total loss of their safety function. The finding has a human performance crosscutting aspect associated with the work control component, because the licensee did not appropriately coordinate work activities by incorporating actions to address the impact of changing the schedule to repair boric acid leaks [H.3b].

Enforcement. Title 10 CFR Part 50, Appendix B, Criterion V, requires 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, or drawings. Contrary to the above, from April 2-13, 2011, the licensee failed to adequately perform activities affecting quality in accordance with procedures appropriate to the circumstances. Specifically, the licensee did not track all boric acid leaks until they were repaired or cleaned as required by Procedure STA-737, "Boric Acid Corrosion Detection and Evaluation," Revision 5. Since the violation was of very low safety significance and was documented in the licensee's corrective action program as Condition Report CR-2011-004625, it is being treated as a noncited violation, consistent with Section 2.3.2 of the NRC Enforcement Policy: NCV 05000446/2011003-03, "Failure to Follow the Requirements of the Boric Acid Program."

.4 Steam Generator Tube Inspection Activities (71111.08-02.04)

a. Inspection Scope

The inspectors assessed the in-situ screening criteria to assure consistency between assumed nondestructive examination flaw sizing accuracy and data from the Electric Power Research Institute examination technique specification sheets. The inspectors assessed the appropriateness of tubes selected for in-situ pressure testing, observed in-situ pressure testing, and reviewed the in-situ pressure test results. Specific documents reviewed during this inspection are listed in the attachment.

The licensee's technical specifications require, in part, that for the Unit 2 model D5 steam generators (Alloy 600 thermally treated) inspect 100 percent of the tubes at sequential periods of 120, 90, and, thereafter, 60 effective full power months. The first sequential period shall be considered to begin after the first inservice inspection of the steam generators. In addition, inspect 50 percent of the tubes by the refueling outage nearest the midpoint of the period and the remaining 50 percent by the refueling outage nearest the end of the period. No steam generator shall operate for more than 48 effective full power months of two refueling outages (whichever is less) without being inspected.

For Refueling Outage 2RF12, the licensee is in the sequential period to perform 100 percent of the tubes every 60 effective full power months. The following inspections were completed:

- 55 percent full length bobbin inspection, including tubes with prior indications and all tubes uninspected in 2RF10
- 50 percent hot leg +Point inspection from 3 inches above to 17 inches below the top of the tube sheet, including all tubes uninspected in 2RF10
- 50 percent U-bend mag-biased mid-range +Point of Rows 1 and 2 including all tubes uninspected in 2RF10
- 50 percent +Point at expanded preheater baffle plate including all tubes uninspected in 2RF1
- 100 percent +Point of ≥ 2 volt dents at H3 tube support plate
- 50 percent +Point of ≥ 5 volt dings and dents in the hot leg, including all such dings and dents uninspected in 2RF10
- Bobbin inspection of tubes at preheater baffle plates
- Special interest rotating pancake coil (freespan signals without historical resolution, bobbin I-code indications)
- Slippage monitoring
- 100 percent tube plug video inspection
- Top of the tubesheet and typical (periphery and T-slot) baffle plate B secondary side video inspection including foreign object search and retrieval
- Upper bundle video inspection (through Access Ports 1 and 2 only) in Steam Generator 4

These actions constitute completion of the requirements of Section 02.04.

b. Findings

No findings were identified.

.5 Identification and Resolution of Problems (71111.08-02.05)

a. Inspection scope

The inspectors reviewed 46 condition reports which dealt with inservice inspection activities and found the corrective actions for inservice inspection issues were appropriate. The specific condition reports reviewed are listed in the documents reviewed section. From this review the inspectors concluded that the licensee has an appropriate threshold for entering inservice inspection issues into the corrective action program and has procedures that direct a root cause evaluation when necessary. The licensee also has an effective program for applying industry inservice inspection operating experience. Specific documents reviewed during this inspection are listed in the attachment.

These actions constitute completion of the requirements of Section 02.05.

b. Findings

No findings were identified.

1R11 Licensed Operator Requalification Program (71111.11)

a. Inspection Scope

On May 23, 2011, the inspectors observed a crew of licensed operations personnel in the plant's simulator to verify that performance was adequate, evaluators were identifying and documenting crew performance problems, and training was being conducted in accordance with licensee procedures. The inspectors evaluated the following areas:

- Licensed operations personnel performance
- Crew's clarity and formality of communications
- Crew's ability to take timely actions in the conservative direction
- Crew's prioritization, interpretation, and verification of annunciator alarms
- Crew's correct use and implementation of abnormal and emergency procedures
- Control board manipulations
- Oversight and direction from supervisors
- Crew's ability to implement appropriate emergency plan actions and notifications

The inspectors compared the crew's performance in these areas to pre-established operator action expectations and successful critical task completion requirements.

These activities constitute completion of one quarterly licensed operations personnel requalification program 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 containment isolation position indication system for maintenance effectiveness. The inspectors reviewed events where ineffective equipment maintenance had resulted in failures and independently verified the licensee's actions to address system performance or condition problems in terms of the following:

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

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

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

b. Findings

No findings were identified.

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

a. Inspection Scope

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

- March 31, 2011, turbine driven auxiliary feedwater pump out of service during switchyard work

- April 20, 2011, Unit 2 reactor coolant system nozzle dam defense in depth strategy

- April 21, 2011, Unit 2 reactor coolant system midloop activities

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

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

b. Findings

No findings were identified.

1R15 Operability Evaluations (71111.15)

a. Inspection Scope

The inspectors reviewed the following issues:

- CR-2010-011240, Units 1 and 2, 6.9kV breaker control device failures
- CR-2011-000069, Unit 1 component cooling water pump seal leakage
- CR-2011-000950, motor operated valve gear box grease
- CR-2011-003605, Units 1 and 2, service water fish impingement
- CR-2011-003722, Unit 2, boric acid corrosion on reactor coolant system snubber
- CR-2011-004633, Unit 2, diesel generator 2-02 fuel leak
- CR-2011-004659, Unit 2, service water train A flow blockage
- CR-2011-004788, Unit 2, bent control rod drive shaft

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

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

b. Findings

Introduction. The inspectors reviewed a Green self-revealing noncited violation of 10 CFR Part 50, Appendix B, Criterion XVI for the failure to promptly correct a fuel leak on a diesel generator. As a result, the leak became significantly worse during diesel operation and caused the diesel generator to become inoperable.

Description. On May 11, 2011, Unit 2, diesel generator 2-02 was shut down because of a significant fuel leak on the crossover header piping approximately 14 hours into a 24 hour loaded run of the diesel generator. On April 15, 2011, the licensee had previously identified a fuel leak on that section of pipe of approximately 12 drops per minute. The licensee concluded that the diesel generator remained operable since the leak was small and the calculated volume of fuel loss would be 4 gallons in a 7 day period of engine operation. The licensee did not promptly correct the deficiency although being aware of the risk significance of the diesel generator.

Analysis. The licensee's failure to correct a diesel generator fuel line leak that ultimately resulted in the diesel generator to becoming inoperable was a performance deficiency. The finding was more than minor because it was associated with the equipment performance attribute of the mitigating systems cornerstone and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of the diesel generator to provide emergency power. Using NRC Manual Chapter 0609, Attachment 4, "Phase 1 - Initial Screening and Characterization of Findings," the inspectors determined that a Phase 3 analysis was required.

A senior reactor analyst performed a Phase 3 significance determination to evaluate the diesel generator fuel line failure. The analyst assumed that the diesel generator 2-02 was required per technical specifications beginning on April 24, 2011, at 5:18 p.m. when the unit entered Mode 4. On May 11, 2001, at 1:39 p.m., the diesel generator failed after developing a fuel line leak 14.5 hours after starting during a surveillance test run. The exposure period ended at 11:59 p.m. on May 11, 2011, when the diesel generator was repaired and returned to a functional status.

The analyst assumed that the entire time from the Mode 4 entry until the failure occurred on May 11 that the diesel generator would have failed to run at 14.5 hours into the run. The fuel line was most likely not degrading during the time that the diesel generator was in standby, so use of a t/2 assumption is not applicable. The exposure for the 14.5 hour run capability is 17.3 days. During the repair time, 10.3 hours, it is assumed that the diesel generator would have failed to start.

The analyst adjusted the frequency of loss of offsite power events to the probability that power would not be recovered in 14.5 hours. The individual offsite power non-recovery probabilities were also adjusted (upward) to account for the conditional probability of not recovering offsite power given that it wasn't recovered in 14.5 hours. Conservatively, core damage time lines were not adjusted to account for a reduction of decay heat.

The Comanche Peak SPAR model did not account for the presence of the alternate power generators. These newly-installed 3 megawatt units provide capability to operate the turbine-driven auxiliary feedwater pump after battery depletion. The analyst used a total failure probability of 0.1 for these units. The licensee PRA model generated a total failure probability of 0.13 for the alternate power generators, but in discussions with the licensee, the analyst considered the licensee number to be conservative. The alternate power generators were only credited in cutsets where the turbine-driven auxiliary feedwater pump was successful and not in any cutsets where a medium or large break loss of coolant accident or a steam generator tube rupture occurred.

The Comanche Peak SPAR model, Revision 8.15, dated August 21, 2010 was used at a truncation of 1.0E-13. Average test and maintenance was assumed. The following delta core damage frequency (ΔCDF) results were obtained:

	ΔCDF
14.5 hour capability for 17.3 days	4.7E-7
Failure to start for 10.3 hours	1.3E-7
Total Internal ΔCDF	6.0E-7

The analyst evaluated the external event risk of the finding.

- Seismic: According the RASP Manual, Volume 2, page A1-3, Table 1, Comanche Peak has a seismically-induced LOOP frequency of 7.78E-06/yr. For an exposure of 17.3 days, the probability of a seismically-induced loss of coolant accident is 3.68E-7. Based on this figure and a qualitative estimate of the risk impact of diesel generator being in a condition where it would fail to run, the analyst concluded that the ΔCDF from seismic events would be less than 1.0E-8, and therefore not a significant contribution.

- Fires: The fires of concern would be those that remove offsite power for at least 14.5 hours and also remove risk-significant equipment on Train A. Fires that cause only a loss of offsite power are already included within the SPAR frequencies for plant and switchyard centered LOOPs. The analyst concluded that most fires that would cause a loss of Train A equipment would also only remove offsite power to that bus, and thus leave Train B energized. Also the frequencies for these fires would be much less than the frequencies within the SPAR model. Further, offsite power would be recovered within 14.5 hours for almost all fires. Based on these considerations, the analyst concluded that fires would only add a negligible increase in the ΔCDF.

- Other external events: No other external events were considered to be significant to the condition.

The analyst evaluated the large early risk. Based on IMC 0609, Appendix H, large early release would not be a concern for this finding. Only inter-system loss of coolant accidents and steam generator tube rupture events would be potential large early release frequency concerns and a review of the core damage cutsets revealed that less than 1 percent of the core damage came from these initiators.

The analyst determined that the finding was of very low safety significance because the calculated ΔCDF was 6.0E-7.

The inspectors concluded the finding has a human performance crosscutting aspect associated with work control, in that, the licensee failed to plan and coordinate work activities consistent with the risk significance to the diesel generator [H.3a].

Enforcement. Title 10 CFR Part 50, Appendix B, Criterion XVI, requires, in part, that measures shall be established to assure that conditions adverse to quality are promptly identified and corrected. Contrary to the above, on April 15, 2011, a condition adverse to quality was not promptly identified and corrected. Specifically, a leaking fuel oil crossover line on diesel generator 2-02 was identified, and the licensee failed to promptly correct the deficiency. As a result, the fuel oil leak became significantly worse during operation, rendering the diesel generator inoperable. Since the violation was of very low safety significance and was documented in the licensee's corrective action program as Condition Report CR-2011-005830, it is being treated as a noncited violation, consistent with Section 2.3.2 of the NRC Enforcement Policy: NCV 05000446/2011003-04, "Failure to Correct Degraded Emergency Diesel Generator Fuel Line."

1R18 Plant Modifications (71111.18)

a. Inspection Scope

The inspectors reviewed the following temporary modifications:

- Temporary Modification 3911464, Unit 1 Team Leak 1RF14-1RF15
- Temporary Modification 4065526, Authorize Use of APDGS on Unit 1

The inspectors reviewed the temporary modifications and the associated safety evaluation screenings against the system design bases documentation, including the Final Safety Analysis Report and the technical specifications, and verified that the modifications did not adversely affect the system operability/availability. The inspectors also verified that the installation and restoration were consistent with the modification documents and that configuration control was adequate. Additionally, the inspectors verified that the temporary modifications were identified on control room drawings, appropriate tags were placed on the affected equipment, and licensee personnel evaluated the combined effects on mitigating systems.

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

b. Findings

No findings were identified.

1R19 Postmaintenance Testing (71111.19)

a. Inspection Scope

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

- March 23, 2011, Unit 1, component cooling water Train A ultrasonic testing following fill and vent

- March 30, 2011, Unit 2, residual heat removal system Trains A and B breaker cycling following control device inspection

- March 31, 2011, Unit 1, train A containment spray pumps 1-01 and 1-03 service water flow adjustment following strainer cleaning

- April 19, 2011, Unit 2, control rod drag force testing following replacement of control rod drive shaft

- May 11, 2011, Unit 2, diesel generator 2-02 testing following fuel line replacement

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

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

These activities constitute completion of five postmaintenance testing inspection samples as defined in Inspection Procedure 71111.19-05.

b. Findings

No findings were identified.

1R20 Refueling and Other Outage Activities (71111.20)

a. Inspection Scope

The inspectors reviewed the outage safety plan and contingency plans for the Unit 1 refueling outage, conducted April 3 through April 27, 2010, to confirm that licensee personnel had appropriately considered risk, industry experience, and previous site-specific problems in developing and implementing a plan that assured maintenance of defense-in-depth. During the refueling outage, the inspectors observed portions of the shutdown and cooldown of the reactor and monitored licensee controls over the outage activities listed below:

- Configuration management, including maintenance of defense-in-depth, is commensurate with the outage safety plan for key safety functions and compliance with the applicable technical specifications when taking equipment out of service

- Clearance activities, including confirmation that tags were properly hung and equipment appropriately configured to safely support the work or testing
- Installation and configuration of reactor coolant pressure, level, and temperature instruments to provide accurate indication, accounting for instrument error
- Status and configuration of electrical systems to ensure that technical specifications and outage safety-plan requirements were met, and controls over switchyard activities
- Monitoring of decay heat removal processes, systems, and components
- Verification that outage work was not impacting the ability of the operators to operate the spent fuel pool cooling system
- Reactor water inventory controls, including flow paths, configurations, and alternative means for inventory addition, and controls to prevent inventory loss
- Controls over activities that could affect reactivity
- Refueling activities including fuel handling
- Startup and ascension to full power operation, tracking of startup prerequisites, walkdown of the containment to verify that debris had not been left which could block emergency core cooling system suction strainers, and reactor physics testing
- Licensee identification and resolution of problems related to refueling outage activities
- Licensee's management of fatigue

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

These activities constitute completion of one refueling outage and other outage inspection sample as defined in Inspection Procedure 71111.20-05.

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

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

Pump or Valve Inservice Test

- June 17, 2011, turbine driven auxiliary feedwater pump check valve reverse flow test in accordance with procedure OPT-530B, "AFW Check Valve Reverse Flow Test," Revision 2

Routine Surveillance Testing

- June 22, 2011, diesel generator 24-hour load test in accordance with Procedure OPT-214B, "Diesel Generator Operability Test," Revision 14

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

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

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

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

b. Findings

No findings were identified.

1EP6 Drill Evaluation (71114.06)

a. Inspection Scope

On March 9 and June 15, 2011, the inspectors evaluated the conduct of licensee emergency drills to identify any weaknesses and deficiencies in classification, notification, and protective action recommendation development activities. The inspectors observed emergency response operations in the simulator and the emergency operations facility to determine whether the event classification, notifications, and protective action recommendations were performed in accordance with procedures. The inspectors also compared any inspector-observed weakness with those identified by the licensee staff in order to evaluate the critique and to verify whether the licensee staff was properly identifying weaknesses and entering them into the corrective action program.

These activities constituted completion two drill evolution samples (one emergency preparedness drill sample and one drill/training evolution sample) as defined in Inspection Procedure 71114.06-05.

b. Findings

No findings were identified.

4OA1 Performance Indicator Verification (71151)

Data Submission Issue

a. Inspection Scope

The inspectors performed a review of the data submitted by the licensee for the first quarter 2011 performance indicators for any obvious inconsistencies prior to its public release in accordance with NRC Inspection Manual Chapter 0608, "Performance Indicator Program."

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

b. Findings

No findings were identified.

4OA2 Identification and Resolution of Problems (71152)

.1 Routine Review of Identification and Resolution of Problems

a. Inspection Scope

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

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

b. Findings

No findings were identified.

.2 Daily Corrective Action Program Reviews

a. Inspection Scope

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

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

b. Findings

No findings were identified.

.3 Semi-Annual Trend Review

a. Inspection Scope

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

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

b. Findings

No findings were identified.

.4 Selected Issue Follow-up Inspection

a. Inspection Scope

During a review of items entered in the licensee’s corrective action program, the inspectors recognized corrective action items documenting a charging system header vent valve leakage and documenting severe accident management guideline deficiencies. The inspectors reviewed documents and interviewed personnel to determine if the licensee completely and accurately identified problems in a timely manner commensurate with its significance, evaluated and dispositioned operability issues, considered the extent of condition, prioritized the problem commensurate with its safety significance, and completed corrective actions in a timely manner commensurate with the safety significance of the issue.

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

b. Findings

1. Failure to Correct a Degraded Charging System Valve

Introduction. The inspectors reviewed a Green self-revealing noncited violation of 10 CFR Part 50, Appendix B, Criterion XVI, for the licensee's failure to correct a deficiency with a charging header vent valve. As a result, the valve failed open after an operator attempted to close the valve and caused a 40 gpm charging system leak.

Description. On February 18, 2011, a reactor operator observed that the volume control tank level had unexpectedly decreased. The control room operators dispatched an equipment operator to look for potential sources of the leakage. The equipment operator observed a steady stream of water leaking from valve 1CS-0204, a charging system header vent valve. An information tag on the valve indicated that the previous valve leakage was 120 drops per minute. The equipment operator was directed to close the vent valve and the operator checked the valve closed with no stem motion. The leakrate suddenly increased significantly. Operators reduced letdown flow to stabilize the plant. The operators ultimately secured normal charging and letdown to isolate the leak and initiated excess letdown and reactor coolant pump seal injection through the alternate seal injection flow path. The licensee later determined that the valve yoke fractured causing the valve to fail open under system pressure.

The inspectors reviewed condition reports for previous failures of similar valves. The licensee had previously initiated several corrective actions for a valve failure in 2004, as documented in Condition Report CR-2004-001193. The actions included identifying a list of 44 critical valves based on their significance and either replace the valve yoke or replace the valve with a different style of valve. Valve 1CS-0204 was not one of the critical valves. In addition, the licensee created a night order detailing the steps to be performed when attempting to seat one of these susceptible valves. The night order allowed operators one attempt to seat a leaking valve and have a contingency plan for the valve if the valve were to fail open. The inspectors reviewed Procedure OWI-206, "Guidelines for Operation on Manual and Power Operated Valves," Revision 19, and identified that the procedure did not address all aspects of the original night order. The procedure only focused on not over torquing the valve.

The inspectors determined that the licensee's corrective actions performed in 2004 were narrowly scoped. The list of critical valves did not include the valve 1CS-0204 that failed in 2011. The actions documented in the night order for manipulation of a leaking valve were not incorporated in procedure guidance. The inspector concluded that had the corrective actions from the 2004 been more thorough, the 2011 operational transient on the plant could have been prevented.

Analysis. The licensee's failure to correct a leaking vent valve was a performance deficiency. The finding was more than minor because it was associated with the equipment performance attribute of the initiating events cornerstone and adversely affected the cornerstone objective, in that, it increased the likelihood of those events that upset plant stability and challenge critical safety functions during power operations. Using NRC Manual Chapter 0609, Attachment 4, "Phase 1 - Initial Screening and Characterization of Findings," the finding was determined to be of very low safety significance because the finding did not contribute to both the likelihood of a reactor trip and the likelihood that mitigating equipment would not be available. The finding did not have a crosscutting aspect because it was not representative of current licensee performance.

Enforcement. Title 10 CFR Part 50, Appendix B, Criterion XVI, requires, in part, that measures shall be established to assure that conditions adverse to quality are promptly identified and corrected. Contrary to the above, as of February 18, 2011, the licensee failed to promptly identify and correct a condition adverse to quality. Specifically, the licensee had failed to correct a deficiency with a charging system vent valve, resulting in the valve failing open causing a 40 gpm charging system leak. Since the violation was of very low safety significance and was documented in the licensee's corrective action program as Condition Report CR-2011-001876, it is being treated as a noncited violation, consistent with Section 2.3.2 of the NRC Enforcement Policy: NCV 05000445/2011003-05, "Failure to Correct a Degraded Charging System Valve."

2. Failure to Update Severe Accident Management Guidelines

Introduction. The inspectors identified a Green finding for the failure of the licensee to follow procedure guidance and update the severe accident management guidelines. As a result, as of May 16, 2011, the severe accident management guidelines did not incorporate the latest owners' group guidance, plant hardware changes, and incorporation of extreme damage mitigation guideline actions.

Description. On May 16, 2011, the inspectors reviewed the severe accident management guidelines and the licensee's readiness to implement them. The inspectors identified that the severe accident management guidelines were not updated to the owners' group Revision 1 which was issued in October 2001. In addition, the severe accident management guidelines did not contain updates for plant hardware changes and did not incorporate relevant procedure changes associated with the extreme damage mitigation guidelines.

Procedure EPP-100, "Maintaining Emergency Preparedness," Revision 9, Attachment 1, "Maintenance of the CPNPP Emergency Plan and Associated Procedures," step 7.0 requires, in part, that severe accident management guidelines should be prepared, reviewed, revised, and approved in accordance with emergency preparedness guidelines. Staff Guideline 001, "Emergency Planning Writers Guide," Revision 18, Section V, step C.2, requires, in part, that the severe accident management guidelines should be technically reviewed biennially and revised as necessary.

In November 2009, the licensee performed a biennial review of the severe accident management guidelines and documented the results in Condition Report CR-2009-004663. The inspectors reviewed the condition report and concluded the review was thorough. However, the inspectors observed that the licensee closed the condition report with no action to address the findings of the review. The inspectors reviewed procedure STA-422, "Processing Condition Reports," Revision 24, Section 6.7, "Closure Reviews," the procedure in effect in 2009, and observed that the personnel did not follow the procedure requirements for closure of a condition report.

Analysis. The licensee's failure to follow procedure guidance and update the severe accident management guidelines which would result in out of date guidance being used during plant emergencies was a performance deficiency associated with the Emergency Preparedness Cornerstone. The finding was more than minor because if left uncorrected, the finding would have a potential to lead to a more significant safety concern. Using NRC Manual Chapter 0609, Appendix B, "Emergency Preparedness Significance Determination Process," the finding was determined to be of very low safety significance because the finding was not associated with an emergency preparedness planning standard. The finding has a human performance crosscutting aspect associated with resources, in that, personnel failed to follow expectations regarding procedural compliance and closed a condition report without addressing the deficiencies identified in the condition report [H.4b].

Enforcement. This finding does not involve enforcement action because no regulatory requirement violation was identified. The licensee documented the finding in the corrective action program as Condition Report CR-2011-005982. The issue is being characterized as finding FIN 05000445/2011003-06; 05000446/2011003-06, "Failure to Update Severe Accident Management Guidelines."

4OA3 Event Followup (71153)

.1 Heater Drain Valve Closure and Manual Turbine Runback

a. Inspection Scope

The inspectors performed a review of the Unit 2 heater drain valve failure. The inspectors reviewed maintenance work orders and the vendor technical manual associated with the valve. The inspectors discussed the previous valve repair activities with maintenance supervision. The inspectors reviewed the corrective action program and condition report associated with this valve.

b. Findings

Introduction. The inspectors reviewed a Green self-revealing finding for the failure of the licensee to follow maintenance instructions and properly reassemble a heater drain valve. As a result, the valve unexpectedly closed causing operators to manually initiate a turbine runback to 900 megawatts electric.

Description. On March 9, 2011, a heater drain pump discharge valve drifted to an almost closed position. This caused a low main feedwater pump suction pressure and the automatic opening of the low pressure feedwater heater bypass valve. As a result, operators performed a manual turbine runback to 900 megawatts electric and stabilized reactor power at approximately 78 percent.

The licensee performed a root cause of the event. The licensee identified that the reason for the valve closure was that the cap screw holding the piston rod of the actuator backed off. The cap screw was required to be torqued to 500 foot-pounds; however, based on the documentation in the work order, the cap screw was likely torqued to a value less than 150 foot-pounds.

The inspectors reviewed work order 3510143 that was used by licensee personnel to perform maintenance on valve 2-LV-2592, heater drain pump discharge valve. The inspectors observed that the work order directed the valve be worked in accordance with the vendor manual. The inspectors observed that, although all the necessary steps for valve work were included in the vendor manual, the manual instructions were not clearly organized. The licensee's root cause of the event concluded that the vendor manual contained less than adequate direction on the proper torquing of the cap screw.

Analysis. The licensee's failure to follow instructions and properly reassemble a heater drain valve, which resulted in the valve unexpectedly closing, was a performance deficiency. The finding was more than minor because it was associated with the equipment performance attribute of the initiating events cornerstone and adversely affected the cornerstone objective, in that, it increased the likelihood of those events that upset plant stability and challenge critical safety functions during power operations. Using NRC Manual Chapter 0609, Attachment 4, "Phase 1 - Initial Screening and Characterization of Findings," the finding was determined to be of very low safety significance because the finding did not contribute to both the likelihood of a reactor trip and the likelihood that mitigating equipment would not be available. The finding has a human performance crosscutting aspect associated with resources, in that, the licensee failed to ensure that an adequate work package and instructions were available for a maintenance activity [H.2c].

Enforcement. This finding does not involve enforcement action because no regulatory requirement violation was identified. The licensee documented the finding in the corrective action program as Condition Report CR-2011-002716. The issue is being characterized as finding FIN 05000446/2011003-07, "Failure to Follow Maintenance Instructions Causes Inadvertent Valve Closure."

.2 Unit 2 Manual Reactor Trip

a. Inspection Scope

On May 19, 2011, operators manually tripped the reactor due to high steam generator sodium levels which was the result of a main condenser tube leak. The inspectors responded to the control room to access the operators' performance and procedure usage. The inspectors performed a walkdown of the control boards to verify appropriate equipment response following the trip. The inspectors discussed the trip with operations management and the control room staff.

b. Findings

No findings were identified.

4OA5 Other

.1 (Open) NRC Temporary Instruction 2515/177, "Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal and Containment Spray Systems (NRC Generic Letter 2008-01)"

As documented in Section 1R04.2 and 1R20, the inspectors confirmed the acceptability of the described licensee's actions. This inspection effort counts towards the completion of Temporary Instruction 2515/177 which will be closed in a future inspection report.

.2 (Closed) NRC Temporary Instruction 2515/183, "Followup to the Fukushima Daiichi Nuclear Station Fuel Damage Event"

The inspectors assessed the activities and actions taken by the licensee to assess its readiness to respond to an event similar to the Fukushima Daiichi nuclear plant fuel damage event. This included (1) an assessment of the licensee's capability to mitigate conditions that may result from beyond design basis events, with a particular emphasis on strategies related to the spent fuel pool, as required by NRC Security Order Section B.5.b issued February 25, 2002, as committed to in severe accident management guidelines, and as required by 10 CFR 50.54(hh); (2) an assessment of the licensee's capability to mitigate station blackout (SBO) conditions, as required by 10 CFR 50.63 and station design bases; (3) an assessment of the licensee's capability to mitigate internal and external flooding events, as required by station design bases; and (4) an assessment of the thoroughness of the walkdowns and inspections of important equipment needed to mitigate fire and flood events, which were performed by the licensee to identify any potential loss of function of this equipment during seismic events possible for the site. Inspection Report 05000445/2011010 and 05000446/2011010 (ML11133A184) documented detailed results of this inspection activity.

a. Inspection Scope

Following issuance of the report, the inspectors conducted additional inspection of selected issues identified in the report. The following are sections in Inspection Report 05000445/2011010 and 05000446/2011010 where the follow-up issues were identified and where the issues are addressed in this report:

- Section 03.01a: suction hoses listed in the extreme damage mitigation procedure for the accident mitigation equipment pump were not in the designated location (addressed in Section 4OA5.2.b.1 below)

- Section 03.01b: the guidance for using the onsite fire truck to draft from the Squaw Creek Reservoir was not specific and the licensee had not trained the fire brigade to draft with the fire truck (addressed in Section 4OA5.2.b.1 below)

- Section 03.02b: the available methods for refueling the alternate power diesel generators in a station blackout were not proceduralized and no training was provided personnel (addressed in Section 4OA5.2.b.2 below)

- Section 03.03a: the licensee did not have adequate guidance to prevent external flooding of the turbine and control buildings through an open circulating water system (addressed in Section 1R01.1)

- Section 03.03a: the licensee did have adequate guidance to prevent debris from overflowing service eater stop gates in case of external flooding during travelling screen replacement (addressed in Section 1R01.1)

b. Findings

1. Failure to Develop Adequate Guidance for Extreme Damage Mitigation Procedures

Introduction. The inspectors identified a Green noncited violation of

10 CFR 50.54(hh)(2) for the failure of the licensee to develop adequate guidance to restore core and spent fuel cooling capabilities for a postulated loss of large areas of the plant. Specifically, the licensee failed to ensure suction hose size derived from an engineering report was translated into procedures, failed to provide adequate procedure guidance for use of a fire truck to draw water from the reservoir, and failed to stage hoses in the specified locations.

Description. The inspectors performed a walkdown of Procedure EDMG 3, "AME Pump Operation and Alternate Water Supplies," Revision 0 on April 20, 2011. The inspectors identified that suction hoses listed in the extreme damage mitigation procedure for the accident mitigation equipment pump were not in the designated locations. The equipment in the procedure did not match the operations inventory that the licensee used to walk down the equipment. The inspectors also determined that hoses provided were smaller than the licensee's engineering report calculations allowed. The licensee entered the observation in Condition Report 2011-004919.

The procedure did not provide sufficient instructions for use of a fire truck to draw water from the reservoir, and fire brigade personnel had not been trained on that evolution. In addition, the inspectors noted that the licensee had never tested use of a fire truck to draw water from the reservoir. The inspectors determined that this water source was unavailable for extreme damage mitigation. The licensee entered this observation in Condition Report 2011-005830. The inspectors concluded that all of the core cooling, spent fuel pool cooling capabilities, and fire fighting strategies were still available because of the multitude of other water sources onsite that were proceduralized and trained on.

Analysis. The licensee's failure to develop adequate guidance to restore core and spent fuel cooling capabilities for a postulated loss of large areas of the plant was a performance deficiency. The finding was more than minor because it was associated with the procedure quality attribute of the barrier integrity cornerstone and adversely affected the cornerstone objective to provide reasonable assurance that physical design barriers (fuel cladding and containment) protect the public from radionuclide releases caused by accidents or events. Using NRC Manual Chapter 0609, Appendix L, "B.5.b Significance Determination Process," the finding was determined to be of very low safety significance because the finding did not affect both the recoverability and availability of an individual mitigating strategy. The finding has a human performance crosscutting aspect associated with resources, in that, the licensee failed to ensure adequate facilities, equipment, and trained personnel were available to ensure nuclear safety is maintained [H.2d].

Enforcement. Title 10 CFR 50.54(hh)(2), requires, in part, that each licensee shall develop guidance intended to maintain or restore core cooling and spent fuel pool cooling capabilities, and strategies in fire fighting. Contrary to the above, as of April 20, 2011, the licensee failed to develop guidance intended to maintain or restore core cooling and spent fuel pool cooling capabilities, and strategies in fire fighting. Specifically, the licensee failed to ensure suction hose size derived from an engineering report was translated into procedures, failed to provide adequate procedure guidance when using the fire truck to draft from the reservoir, and failed to stage hoses in the location specified by procedure. Since the violation was of very low safety significance and was documented in the licensee's corrective action program as Condition Report CR-2011-005830, it is being treated as a noncited violation, consistent with

Section 2.3.2 of the NRC Enforcement Policy: NCV 05000445/2011003-08; 05000446/2011003-08, "Failure to Develop Adequate Guidance for Extreme Damage Mitigation Procedures."

2. Inadequate Alternate Power Generator Procedure

Introduction. The inspectors identified a Green finding for the failure of the licensee to provide adequate procedure instructions for refueling the alternate power generators. As a result, during a station blackout, the alternate power generators may run out of fuel since the capacity of the fuel tank allows for approximately 2.6 hours of operation at full load and instructions for obtaining additional fuel to refuel the supply tanker truck did not exist.

Description. On May 19, 2011, the inspectors completed a review of the licensee's alternate methods for providing power to the facility. The inspectors noted that the available methods for refueling the alternate power generators were not proceduralized and no training was provided to personnel refueling the generators. The alternate power generators had a fuel tank capacity of 2.6 hours at full load operation and therefore, could have required refueling during a station blackout and would have required replenishment of the fuel tank to meet the 24-hour probabilistic risk assessment mission time. Obtaining fuel sources would be challenging to personnel since the refueling methodology is not documented in instructions and electric power to pumps normally used to obtain fuel from the fuel storage tanks would not be available. The licensee documented the observation in Condition Report CR-2011-005399.

The inspectors reviewed Procedure STA-202, "Nuclear Generation Procedure Change Process" Revision 35, Attachment 8.B, "CPNPP Procedure Writers Guide." Step 3.3.10 of Attachment 8.B required, in part, that procedures provide step-by-step instructions in the detail necessary for performing the required task. The level of detail should be geared to the "least qualified individual" who would have used the instruction. The inspectors reviewed Procedure SOP-614A, "Alternate Power Generator Operation," Revision 10 and concluded that the procedure did not provide step-by-step instructions in the detail necessary to successfully replenish the alternate power generators' fuel tanks. The procedure had a general step to notify maintenance personnel ensure backup fuel was available.

Analysis. The licensee's failure to provide adequate instructions for replenishing the alternate power generators fuel tank was a performance deficiency. The finding was more than minor because it was associated with the procedure quality attribute of the mitigating systems cornerstone and adversely affected the cornerstone objective, in that, the inadequate instructions did not ensure the availability, reliability, and capability of the alternate power generators to electrical power to the units during a station blackout. Using NRC Manual Chapter 0609, Attachment 4, "Phase 1 - Initial Screening and Characterization of Findings," the finding was determined to be of very low safety significance because the finding did not result in an actual loss safety related equipment for greater than its technical specification allowed outage time and did not represent a loss of equipment designated as risk-significant in the maintenance rule. The finding has a human performance crosscutting aspect associated with resources, in that, the licensee failed to ensure that adequate procedures and equipment were available [H.2d].

Enforcement. This finding does not involve enforcement action because no regulatory requirement violation was identified. The licensee documented the finding in the corrective action program as Condition Report CR-2011-005399. The issue is being characterized as FIN 05000445/2011003-09; 05000446/2011003-09, "Inadequate Alternate Power Generator Procedure."

.3 (Closed) NRC Temporary Instruction 2515/184, "Availability and Readiness Inspection of Severe Accident Management Guidelines (SAMGs)"

On May 19, 2011, the inspectors completed a review of the licensee's severe accident management guidelines, implemented as a voluntary industry initiative in the 1990's, to determine (1) whether the severe accident management guidelines were available and updated, (2) whether the licensee had procedures and processes in place to control and update its severe accident management guidelines, (3) the nature and extent of the licensee's training of personnel on the use of severe accident management guidelines, and (4) licensee personnel's familiarity with severe accident management guideline implementation.

The results of this review were provided to the NRC task force chartered by the Executive Director for Operations to conduct a near-term evaluation of the need for agency actions following the Fukushima Daiichi fuel damage event in Japan. Plant-specific results for Comanche Peak Nuclear Power Plant were provided as Enclosure 4 to a memorandum to the Chief, Reactor Inspection Branch, Division of Inspection and Regional Support, dated May 26, 2011 (ML111470264).

4OA6 Meetings

Exit Meeting Summary

On April 15, 2011, the inspectors presented the inspection results of the review of inservice inspection activities to Mr. M. Lucas, Site Vice President, and other members of the licensee staff. The licensee acknowledged the issues presented. The inspectors acknowledged that they had received and reviewed materials during the inspection that were considered proprietary. No proprietary information has been included in the report.

On June 29, 2011, the inspectors presented the resident inspection results to Mr. R. Flores, Senior Vice President and 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 has been included in the report.

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

J. Barnette, Engineer, Oversight and Regulatory Affairs
S. Bradley, Manager, Radiation Protection
C. Davies, System Engineer, Steam Generators
R. Flores, Senior Vice President and Chief Nuclear Officer
D. Fuller, Manager, Emergency Preparedness
R. Green, Alloy 600, Programs
J. Henderson, Manager, Systems Engineering
T. Hope, Manager, Nuclear Licensing
J. Howard, Program Engineer, Inservice Inspection Program
D. Kross, Acting Vice President, Nuclear Engineering and Plant Support
M. Lucas, Site Vice President
F. Madden, Director, Oversight and Regulatory Affairs
B. Mays, Vice President, Nuclear Engineering and Plant Support
S. Miller, Boric Acid Engineer, Plant Reliability
R. Moore, Manager, Chemistry
P. Passalugo, Manager, Engineering Programs
B. Patrick, Director, Maintenance
S. Sabo, Nondestructive Examination Level III, WesDyne
S. Sewell, Director, Operations
S. Smith, Plant Manager
K. Tate, Manager, Security
J. Taylor, Manager, Technical Support
C. Tran, Manager, Technical Support
D. Wilder, Director, Plant Support
L. Zimmerman, Manager, Procurement and Programs

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

05000445/2011003-01 05000446/2011003-01	NCV	Inadequate External Flooding Instructions (Section 1R01.1)
05000445/2011003-02	FIN	Failure to Properly Install Insulation Results in Frozen Feedwater Flow Sensing Lines (Section 1R01.2)
05000446/2011003-03	NCV	Failure to Follow the Requirements of the Boric Acid Program (Section 1R08.3)
05000446/2011003-04	NCV	Failure to Correct Degraded Emergency Diesel Generator Fuel Line (Section 1R15)
05000445/2011003-05	NCV	Failure to Correct a Degraded Charging System Valve (Section 4OA2.4.b.1)

Opened and Closed

05000445/2011003-06 05000446/2011003-06	FIN	Failure to Update Severe Accident Management Guidelines (Section 4OA2.4.b.2)
05000446/2011003-07	FIN	Failure to Follow Maintenance Instructions Causes Inadvertent Valve Closure (Section 4OA3.1)
05000445/2011003-08 05000446/2011003-08	NCV	Failure to Develop Adequate Guidance for Extreme Damage Mitigation Procedures (Section 4OA5.2.b.1)
05000445/2011003-09 05000446/2011003-09	FIN	Inadequate Alternate Power Generator Procedure (Section 4OA5.2.b.2)

LIST OF DOCUMENTS REVIEWED

Section 1RO1: Adverse Weather Protection

CONDITION REPORTS

2005-001269	2009-005710	2011-004062	2011-004354
2011-005433			

PROCEDURES

NUMBER	TITLE	REVISION
ABN-907	Acts of Nature	11

DRAWINGS

NUMBER	TITLE	REVISION
2323-S-1106	Circulating Water Discharge Structure Sheet 1	3

WORK ORDERS

2-06-166070

Section 1RO5: Fire Protection

CONDITION REPORTS

2011-004035

Section 1RO8: Inservice Inspection Activities

CONDITION REPORTS

2009-005347	2009-006748	2009-006761	2009-006818
2009-006823	2009-006909	2009-008090	2009-008200

CONDITION REPORTS

2009-008367	2009-008381	2009-008385	2009-008816
2009-008090	2010-000142	2010-000146	2010-000166
2010-000181	2010-000276	2010-000564	2010-000752
2010-000766	2010-000803	2010-000816	2010-000839
2010-001054	2010-001243	2010-001264	2010-001377
2010-001384	2010-001641	2010-001650	2010-001834
2010-001872	2010-001886	2010-002029	2010-002163
2010-002382	2010-002625	2010-002841	2010-002884
2010-002976	2010-003209	2010-003295	2010-003722
2010-003836	2010-004248	2010-004448	2010-004625
2010-004945	2010-005478	2010-005702	2010-005853
2010-005944	2010-006004	2010-006287	2010-006288
2010-006849	2010-006852	2010-007041	2010-007245
2010-009345	2010-010377	2010-010635	2011-000568
2011-001211	2011-001600	2011-002009	2011-002366
2011-002624	2011-004063	2011-004170	2011-004210
2011-004424	2011-004559	2011-004625	2011-004674

PROCEDURES

NUMBER	TITLE	REVISION
EPG-756	Nondestructive Examination Program	3
NDE 1.02	Nondestructive Examination Procedure Qualification and Control	4
NDE 2.01	Liquid Penetrant Examination	5
PCN-WLD-105	Welding Material Storage and Control	6
PCN-WLD-106	ASME/ANSI General Welding Requirements	2
STA-737	Boric Acid Corrosion Detection and Evaluation	5
STA-756	Nondestructive Examination Procedure,	5
STA-760	RCS Materials Management Program	2
TX-OPS-101	Preservice and Inservice Examination Documentation for CPNPP	2
TXU-ISI-302	Ultrasonic Examination of Austenetic Piping Welds	3
TXU-ISI-301	Ultrasonic Examination of Ferritic Piping Welds	4
TXU-ISI-11	Liquid Penetrant Examination for Comanche Peak Steam Electric Station	11

PROCEDURES

NUMBER	TITLE	REVISION
TXU-ISI-70	Magnetic Particle Examination for Comanche Peak Steam Electric Station	10
TXU-ISI-8	VT-1 and VT-3 Examination Procedure for CPSES	6
WLD-102	Preparation and Qualification of Welding Procedure Specification	6
WLD-103	Welder Performance Qualifications	6
WLD-104	Hold Points, Inspections, and Records for Welding	8
WLD-117	Repair Guidelines	0

DRAWINGS

NUMBER	TITLE	REVISION
TCX-1-4100	TU Electric CPSES Unit 2, Inservice Inspection Location Isometric	1
S2-0511, Sht. 1	Reactor Building Containment Liner Details	CP-1
2323-M2-0503	Reactor Containment Penetration & Details, Unit 2	1
TCX-2-2300	TU Electric CPSES Unit 2, Inservice Inspection Location Isometric, Main Steam	3
BRP-MS-2-RB-020 Sht. 1	TU Electric CPSES Unit 2, Inservice Inspection Location Isometric, Main Steam	CP-3
BRP-MS-2-RB-020 Sht. 2	TU Electric CPSES Unit 2, Inservice Inspection Location Isometric, Main Steam	CP-2
MS-2-003-405-C72K; Sht. 1	TU Electric CPSES, Large Bore Pipe Support (Main Steam)	CP-3
MS-2-003-409-C72K; Shts. 1-4	TU Electric CPSES, Large Bore Pipe Support (Main Steam)	CP-2
MS-2-003-410-C72K; Shts. 1-4	TU Electric CPSES, Large Bore Pipe Support (Main Steam)	CP-2
MS-2-003-402-C72K; Shts. 1-3	TU Electric CPSES, Large Bore Pipe Support (Main Steam)	CP-4

MISCELLANEOUS DOCUMENTS

NUMBER	TITLE	REVISION / DATE
	Comanche Peak Nuclear Power Plant – Reactor Vessel Closure Head Visual Examination Plan	4
EVAL-2009-004	CPSES Nuclear Overview Department Evaluation Worksheet - Special Processes - Nondestructive Examination (NDE) & Welding	August 5, 2009

MISCELLANEOUS DOCUMENTS

NUMBER	TITLE	REVISION / DATE
EVAL-2009-004	CPSES Nuclear Overview Department Evaluation Report - Maintenance-M&TE, Special Processes, Material Controls	July 23, 2009
Letter from J. Giitter to M. Evans	Updated commitments and processes for steam generator conference calls and inspection reports	March 12, 2009
SA-2006-043	CPSES Self-Assessment Report - Fluid Leak Management	November 9, 2006
SA-2009-025	Self Assessment Report – Inservice Inspection Processes and Program	July 23, 2009
SA-2010-004	CPSES Self-Assessment Report - Steam Generator	May 21, 2010
TAC NOS. ME0777 AND ME0778	Comanche Peak Steam Electric Station, Units 1 and 2 - Request for Relief to extend the Inservice Inspection interval for the reactor vessel weld examination	December 22, 2009
TR-1000975	Boric Acid Corrosion Guidebook	1

WORK ORDERS

3452939	3471417	3832425	3832432
3968941	4119515	4127379	4127861

Section 1R12: Maintenance Effectiveness

CONDITION REPORTS

2009-000469	2010-001263	2010-004979	2010-008508

Section 1R15: Operability Evaluations

CONDITION REPORTS

2010-004213	2010-011240	2011-004653

Section 1R19: Postmaintenance Testing

CONDITION REPORTS

2011-003246	2011-001537

Section 1EP6: Drill Evaluation

CONDITION REPORTS

2011-006962	2011-006965	2011-006967	2011-006969
2011-006972	2011-006976	2011-006982	2011-006983

CONDITION REPORTS

2011-006984	2011-006962	2011-006989	2011-007033

Section 4OA2: Identification and Resolution of Problems

CONDITION REPORTS

2009-008695	2011-004972	2011-005018	2011-005909

Section 4OA5: Other

PROCEDURES

NUMBER	TITLE	REVISION
EDMG 3	AME Pump Operation and Alternate Water Supplies	0

CONDITION REPORTS

2011-004919