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

February 14, 2013

EA-13-034

Louis P. Cortopassi, Site Vice President
Omaha Public Power District
Fort Calhoun Station FC-2-4
P.O. Box 550
Fort Calhoun, NE 68023-0550

Subject: FORT CALHOUN - NRC INTEGRATED INSPECTION REPORT NUMBER 05000285/2012012

Dear Mr. Cortopassi:

On December 31, 2012 the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Fort Calhoun Station. The enclosed inspection report documents the inspection results which were discussed on January 24, 2013, with you and other members of your staff.

The inspections 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.

Two NRC identified findings of very low safety significance (Green) were identified during this inspection and were determined to involve violations of NRC requirements.

One NRC identified finding involving multiple violations of NRC requirements was identified. This finding was determined to be a violation related to a previously issued Yellow finding regarding the ability to mitigate an external flooding event (Inspection Reports 05000285/2010007, 05000285/2010008, and 05000285/2012002; ML101970547, ML102800342, and ML12132A395, respectively). The significance of these findings are bounded by the Yellow finding and therefore were not characterized by color significance. Separate citations will not be issued for these violations of NRC requirements because these items are being evaluated by the NRC under the Manual Chapter 0350 process, "Oversight of Reactor Facilities in a Shutdown Condition Due to Significant Performance and/or Operational Concerns" (EA-13-034).

Three licensee-identified violations which were determined to be of very low safety significance are listed in this report. The NRC is treating these violations as non-cited violations (NCVs) consistent with Section 2.3.2 of the Enforcement Policy.

If you contest these violations, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission,

ATTN: Document Control Desk, Washington DC 20555-0001; with copies to the Regional Administrator, Region IV; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at Fort Calhoun Station.

If you disagree with a cross-cutting aspects assignment in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region IV; and the NRC Resident Inspector at Fort Calhoun Station.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's Agencywide Document Access and Management 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/

Michael Hay
Chief, Project Branch F
Division of Reactor Projects

Docket No.: 50-285
License No.: DPR-40

Enclosure:
NRC Inspection Report 05000285/2012012
w/Attachment: Supplemental Information

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U.S. NUCLEAR REGULATORY COMMISSION

REGION IV

Docket:	05000285
License:	DPR-40
Report:	05000285/2012012
Licensee:	Omaha Public Power District
Facility:	Fort Calhoun Station
Location:	9610 Power Lane Blair, NE 68008
Dates:	November 18 through December 31, 2012
Inspectors:	J. Kirkland, Senior Resident Inspector J. Wingebach, Resident Inspector S. Alferink, Reactor Inspector J. Brand, Reactor Inspector K. Clayton, Senior Operations Engineer R. Deese, Senior Project Engineer P. Elkmann, Senior Emergency Preparedness Inspector A. Klett, Reactor Operations Engineer R. Kumana, Project Engineer J. Melfi, Project Engineer M. Norris, Team Leader F. Ramirez, Resident Inspector, LaSalle
Accompanying Personnel:	V. Ferrarini, Mechanical Contractor, Beckman and Associates O. Mazzoni, Ph.D., Electrical Contractor, Beckman and Associates
Approved By:	Michael Hay, Chief, Project Branch F Division of Reactor Projects

SUMMARY OF FINDINGS

IR 05000285/2012012; 11/18/2012 – 12/31/2012; Fort Calhoun Station (FCS), Integrated Resident and Regional Report; Emergency Plan Biennial; Auxiliary Feedwater Team Inspection; and Fire Protection.

The report covered a 6-week period of inspection by resident inspectors, region and headquarters based inspectors, and two contractors. Two Green NCVs and one finding were identified. The significance of most findings is indicated by their color (Green, White, Yellow, or Red) using Inspection Manual Chapter 0609, "Significance Determination Process." The cross-cutting aspect is determined using Inspection Manual Chapter 0310, "Components Within the Cross-Cutting Areas." Findings for which the significance determination process does not apply may be Green or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 4, dated December 2006.

A. NRC-Identified Findings and Self-Revealing Findings

Cornerstone: Initiating Events

- Green. The inspectors identified a Green non-cited violation (NCV) of Technical Specification 5.8.1.c for the failure to maintain written procedures covering fire protection program implementation. Specifically, the licensee changed the hot work procedure to allow a roving fire watch in lieu of the continuous fire watch required by the fire protection program. The licensee entered this issue into their Corrective Action Program as Condition Report (CR) 2012-19945.

  The failure to maintain adequate written procedures covering fire protection program implementation was a performance deficiency. This finding was more than minor because it was associated with the procedure quality attribute of the Initiating Events cornerstone and it adversely 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. The inspectors evaluated the risk significance of this finding using Manual Chapter 0609, Appendix F, "Fire Protection Significance Determination Process," because the performance deficiency involved a failure to adequately implement fire prevention and administrative controls for hot work activities. A senior reactor analyst performed a limiting Phase 3 evaluation and determined this finding had very low risk significance (Green). The finding did not have a cross-cutting aspect since it was not indicative of present performance. (Section 1R05)

Cornerstone: Mitigating Systems

- N/A. The team identified a finding exemplified by multiple violations for the failure to manage the functionality of the river sluice gates. Specifically, the licensee's preventive maintenance program requirements were not appropriately implemented

for a period of 6 months and as a result, the functionality of the river sluice gates was improperly maintained. The examples were:

- A licensee identified violation of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures and Drawings," for the failure to perform preventive maintenance required to demonstrate the functionality of the river sluice gates.

An NRC identified violation of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures and Drawings," for the failure to accomplish activities affecting quality in accordance with prescribed instructions when in September 2012, the licensee failed to test the C and D river sluice gates in accordance with station procedure SAO-12-001, to properly maintain functionality of the river sluice gates.

- An NRC identified violation of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures and Drawings," for the failure to accomplish activities affecting quality in accordance with prescribed instructions when the licensee failed to test all six gates in October 2012, to maintain functionality of the river sluice gates in accordance with station procedure SAO-12-001.

- An NRC identified violation of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Actions," for the licensee's failure to properly identify and timely enter conditions adverse to quality into the Corrective Action Program following multiple failures of the river sluice gates.

- An NRC identified violation of 10 CFR 50.65, "Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," for the licensee's failure to demonstrate effective control of performance of the circulating water system river sluice gates and failure to place the system in (a)(1) when system performance deteriorated.

- An NRC identified violation of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures and Drawings," for the failure to accomplish activities affecting quality in accordance with prescribed instructions when the licensee failed to make the appropriate functionality assessment when the circulating water river sluice gates failed to close during the August 2012 monthly test.

The licensee entered these issues into their Corrective Action Program under various CRs described in the body of this report.

The team concluded that the failure to manage the functionality of the sluice gates was a performance deficiency that warranted further evaluation. Specifically, the licensee's preventive maintenance program requirements were not appropriately implemented for a period of 6 months and as a result, the functionality of the sluice gates was improperly maintained. Using the guidance in IMC 0612, "Power Reactor Inspection Reports," Appendix B, "Issue Screening," the inspectors determined this finding affected the Mitigating Systems cornerstone. The finding is greater than

minor because it is associated with both of the Mitigating Systems Cornerstone attributes of Equipment Performance and Protection Against External Factors and, it adversely affects the associated cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The significance of this finding is bounded by the significance of a related Yellow finding regarding the ability to mitigate an external flooding event (Inspection Report 05000285/2010008). The inspectors determined the finding had a cross-cutting aspect in the area of problem identification and resolution because the licensee did not take appropriate corrective action to address safety issues and adverse trends in a timely manner, commensurate with their safety significance and complexity [P.1(d)] (Section 4OA4).

- Green. The team identified a Green NCV of 10 CFR 50.65, "Requirements for monitoring the effectiveness of maintenance at nuclear power plants" which states, in part, that "the licensee shall monitor the performance or condition of structures, systems, or components, against licensee-established goals, in a manner sufficient to provide reasonable assurance that these structures, systems, and components are capable of fulfilling their intended functions. These goals shall be established commensurate with safety and, where practical, take into account industry-wide operating experience." Specifically, from March of 2012 until October of 2012, the licensee allowed the maintenance rule program to deteriorate by not performing initial screenings in a timely fashion. In some cases, the initial screenings were being done months later and the actual evaluation of the equipment status was not being performed at all for a period of eight months. Consequently, several components, including electrical relays and electrical load centers, were not being evaluated in accordance with program requirements.

  Additionally, the licensee was not implementing the operating experience program as required by this regulation. The licensee discontinued performance of level 1 and level 2 operating experience evaluations by direction from the senior management in August of 2012 based on resource concerns. Several examples where operating experience was not properly evaluated included the containment spray pump low oil issues (ACA 2008-5695), vendor manual updates, and loose fasteners (both electrical and mechanical) from San Onofre Nuclear Generating Station Licensee Event Reports (LER) 3612007005, 3612007006, and 3612008006. This finding was entered into the licensee's Corrective Action Program as CR 2012-17572.

  The team determined that the failure to adequately implement the maintenance rule was a performance deficiency. The performance deficiency was more than minor, and therefore a finding, because if left uncorrected it could lead to a more serious concern. Using Manual Chapter 0609, Attachment 4, Significance Determination Process router on Table 3, it sends the user to Appendix G for "Shutdown Operations Significance Determination Process." Using Checklist 4 of Appendix G for the given plant conditions, the finding was determined to have very low safety significance (Green) because the finding did not 1) increase the likelihood of a loss of RCS inventory, or 2) degrade the licensee's ability to terminate a leak path or add RCS inventory when needed, or 3) degrade the licensee's ability to recover decay

heat removal once it is lost. This finding was determined to have a cross-cutting aspect in the area of human performance associated with the decision-making component because the licensee did not use conservative assumptions in decision making and did not identify the possible unintended consequences of suspending maintenance rule program activities and the corresponding impact on the program [H.1(b)] (Section 40A5).

B. Licensee-Identified Violations

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

REPORT DETAILS

Summary of Plant Status

The station remained in Mode 5 with the fuel in the spent fuel pool for the entire inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R05 Fire Protection (71111.05)

.1 Fire Inspection

a. Inspection Scope

During review of the licensee's license amendment request to transition to National Fire Protection Association (NFPA) Standard 805, "Performance-Based Standard for Fire Protection for Light-Water Reactor Electric Generating Plants", the NRC staff identified concerns with the licensee's procedures regarding fire watches for hot work activities. Specifically, the staff was concerned that the licensee's procedures governing hot work activities may not have been consistent with the approved fire protection program.

In response to these concerns, the inspectors interviewed the responsible fire protection program engineer and reviewed the licensee's fire protection program, hot work procedures, and procedure change documentation for the hot work procedures. The inspectors verified the requirements for hot work activities contained in the fire protection program and compared those requirements to the implementing procedures.

b. Findings

Introduction. The inspectors identified a Green NCV of Technical Specification 5.8.1.c for the failure to maintain written procedures covering fire protection program implementation. Specifically, the licensee changed the hot work procedure to allow a roving fire watch in lieu of the continuous fire watch required by the fire protection program.

Description. The licensee's fire protection program was described in the Fire Hazards Analysis FHA-EA97-001, "Fire Hazards Analysis Manual," Revision 16, and Standing Order SO-G-102, "Fire Protection Program Plan," dated December 29, 2011. The fire hazards analysis stated that "all welding or flame cutting is monitored by a continuous fire watch who reports to the Shift Manager." Further, the fire hazards analysis also stated that "fire watch personnel have no other duties assigned which will interfere with their primary function."

Standing Order SO-G-102 noted that Standing Order SO-M-9, "Hot Work Operations," provided instructions to prevent fires due to cutting, grinding, and welding operations, and provided instructions to assigned fire watches.

The licensee approved Revision 26a of Standing Order SO-M-9 on February 17, 2005. This version was the first to allow a roving fire watch for hot work activities in lieu of a continuous fire watch. Specifically, the licensee added the following provision to the standing order:

> A roving Firewatch can be assigned to monitor more than one hot work activity in a work area in which the activities cannot be monitored by a stationary Firewatch. When performing Firewatch duties as a roving Firewatch, the Firewatch must ensure the following…While hot work activities are going on, each hot work activity must be monitored at least every five minutes.

The inspectors determined that the current version of Standing Order SO-M-9, Revision 29, continued to allow a roving fire watch for hot work activities, which was contrary to the requirements of the fire protection program. In addition, the inspectors noted that changing the fire protection program to allow a roving fire watch for hot work activities could adversely affect the ability to achieve and maintain safe shutdown in the event of a fire and may require prior staff approval.

The inspectors determined that Standing Order SO-M-9 was revised to facilitate hot work activities during the condenser replacement that occurred between February 15 and May 15, 2005. The inspectors also determined that this provision was likely used by the licensee during the steam generator replacement that occurred between September 1 and December 15, 2006. Finally, the inspectors determined that the provision for a roving fire watch for hot work activities was not routinely used and was likely only used for the two preceding examples.

The licensee planned to address this issue by revising Standing Order SO-M-9.

Analysis. The failure to maintain written procedures covering fire protection program implementation was a performance deficiency. The performance deficiency was more than minor because it was associated with the procedure quality attribute of the Initiating Events cornerstone and it adversely 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.

The inspectors evaluated the significance of this finding using Manual Chapter 0609, Appendix F, "Fire Protection Significance Determination Process," because the performance deficiency involved a failure to adequately implement fire prevention and administrative controls for hot work activities.

Using the guidance in Manual Chapter 0609, Appendix F, Attachment 2, "Degradation Rating Guidance Specific to Various Fire Protection Program Elements," the inspectors

assigned this finding a high degradation rating in the Fire Prevention and Administrative Controls category since it involved the failure to implement a continuous fire watch in positions to observe all areas of vulnerability to a fire from hot work operations.

The inspectors were unable to screen this finding during a Phase 2 evaluation since there were no records that indicated the locations where roving fire watches were used. Since this information was needed in order to develop the specific fire scenarios required for a Phase 2 evaluation, a senior reactor analyst performed a limiting Phase 3 evaluation to determine the risk significance of this finding.

The analyst used the generic fire ignition frequency (FIF) of 2.0E-3/year for hot work activities from Manual Chapter 0609, Appendix F, Table 1.4.2, "Generic Fire Area Fire Frequencies."

The analyst calculated an average change in non-suppression probability for fires from hot work activities that result in damage times of less than 30 minutes using the mean rate constant from Manual Chapter 0609, Appendix F, Attachment 8, Table A8.1, "Non-suppression Probability Values for Manual Fire Fighting Based on Fire Duration (Time to Damage after Detection) and Fire Type Category." The change in non-suppression probabilities were calculated assuming that the five-minute roving fire watch associated with the performance deficiency detected the fires 2.5 minutes after the fire started. The analyst calculated the change in non-suppression probability from the performance deficiency (ΔPNS) to be 0.074.

The analyst calculated a maximum conditional core damage probability using Manual Chapter 0609, Appendix G, "Shutdown Operations Significance Determination Process," since the licensee only used the roving fire watch during shutdown activities. The analyst calculated a maximum conditional core damage probability (CCDP) of 9.03E-2.

The performance deficiency existed since February 2005. Since the roving fire watches were only used for hot work activities for the condenser and steam generator replacement activities, the analyst calculated an effective exposure period by taking the ratio of time the roving fire watches may have been utilized to the time the performance deficiency existed. The analyst calculated an effective exposure period (EXP) of 0.07.

The analyst calculated a limiting change in core damage frequency for this performance deficiency using the following equation:

$$\Delta CDF = FIF * \Delta PNS * CCDP * EXP$$

$$= 2.0E\text{-}3/year * 0.074 * 9.03E\text{-}2 * 0.07$$

$$= 9.36E\text{-}7/year$$

The analyst determined that this finding was of very low safety significance (Green).

The finding did not have a cross-cutting aspect since it was not indicative of present performance.

Enforcement. Technical Specification 5.8.1.c states that written procedures shall be established, implemented, and maintained covering fire protection program implementation. Contrary to the above, from February 17, 2005 to December 20, 2012, the licensee failed to establish, implement, and maintain written procedures covering fire protection program implementation. Specifically, the licensee implemented Revision 26a of Standing Order SO-M-9, "Hot Work Operations," on February 17, 2005. This revision allowed a roving fire watch for hot work activities in lieu of a continuous fire watch, which was contrary to the requirements of the fire protection program.

This violation is being treated as a NCV, consistent with Section 2.3.2 of the Enforcement Policy because it was of very low safety significance and was entered into the licensee's Corrective Action Program as CR 2012-19945. NCV 05000285/2012012-01, "Hot Work Procedures Allowed a Roving Fire Watch."

Cornerstone: Emergency Preparedness

1EP2 Alert Notification System Testing (71114.02)

a. Inspection Scope

The inspectors discussed with licensee staff the operability of offsite siren emergency warning systems and backup alerting methods to determine the adequacy of licensee methods for testing the alert and notification system in accordance with 10 CFR Part 50, Appendix E. The licensees alert and notification system testing program was compared with criteria in NUREG-0654, Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants, Revision 1; Federal Emergency Management Agency (FEMA) Report REP-10, Guide for the Evaluation of Alert and Notification Systems for Nuclear Power Plants, and the licensees current FEMA approved alert and notification system design report, "Design Report for the Outdoor Public Warning System," Revision 1, dated December 9, 2004. The specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of one sample as defined in Inspection Procedure 71114.02-05.

b. Findings

Introduction. The NRC identified an unresolved item related to licensee's performance of annual outdoor warning siren preventative maintenance.

Description. The NRC identified deviations between the licensee's annual preventative maintenance program for outdoor emergency warning sirens and the licensee's commitments as described in their FEMA approved Alert and Notification System design report

The inspectors determined that Section 4.2.2.2 of their FEMA approved, "Design Report for the Outdoor Public Warning System," Revision 1, requires annual inspection and testing according to vendor instructions found in Attachment 6, "Installation, Operation, and Service Manual, Federal Signal Corporation Model DCFCTB," dated October 2003. Service Manual Section 8.2.2, "Annual Inspection," recommends annual performance of the pre-operational testing described in Sections 7.1 through 7.4. Inspectors determined that siren maintenance records did not contain sufficient detail to establish that the licensee conducted the tests described in sections 7.1, Rotation Current Sensor, Chopper Current Sensor, A/C Power Sensor, and Intrusion Sensor, Section 7.2, Battery Voltage Measurement, Section 7.3, Battery Charger Voltage Measurement, or Section 7.4, 2001TR Transformer-Rectifier Testing.

Siren testing, maintenance, and repair is performed by Omaha Public Power District's Corporate Telecommunications Department, located in Omaha, Nebraska, and is not performed by FCS. Licensee staff stated that some tests described in Service Manual Sections 7.1 through 7.4 were performed but lacked knowledge of specific siren maintenance procedures. The licensee appeared to lack a formal siren maintenance procedure or other documents to establish the scope of the preventative maintenance program for the Model DCFCTB outdoor warning siren.

Analysis. Additional information about the actual scope of the licensee's siren maintenance program is required to determine compliance with NRC requirements. In addition, a determination is required from the FEMA whether the licensee's deviations from the approved design report are acceptable [URI 05000285/2012012-05, Failure to Perform Siren Maintenance as required by the Alert and Notification System Design Report].

1EP3 Emergency Response Organization Augmentation Testing (71114.03)

a. Inspection Scope

The inspectors discussed with licensee staff the operability of primary and backup systems for augmenting the on-shift emergency response staff to determine the adequacy of licensee methods for staffing emergency response facilities in accordance with their emergency plan. The inspectors reviewed the documents and references listed in the attachment to this report, to evaluate the licensees ability to staff the primary and alternate emergency response facilities in accordance with the licensee's emergency plan and the requirements of 10 CFR Part 50, Appendix E. The specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of one sample as defined in Inspection Procedure 71114.03-05.

b. Findings

No findings were identified.

1EP4 Emergency Action Level and Emergency Plan Changes (71114.04)

a. Inspection Scope

On November 20, 2012, the NSIR headquarters staff completed an in-office review of the latest revisions of various Emergency Plan Implementing Procedures (EPIPs) and the Emergency Plan located under ADAMS accession number ML12310A090 and ML12318A177 as listed in the Attachment.

The licensee determined that in accordance with 10 CFR 50.54(q), the changes made in the revisions resulted in no reduction in the effectiveness of the Plan, and that the revised Plan continued to meet the requirements of 10 CFR 50.47(b) and Appendix E to 10 CFR Part 50. The NRC review was not documented in a safety evaluation report and did not constitute approval of licensee-generated changes; therefore, this revision is subject to future inspection. The specific documents reviewed during this inspection are listed in the Attachment.

These activities constitute completion of two samples as defined in Inspection Procedure 71114.04-05.

b. Findings

No findings were identified.

1EP5 Correction of Emergency Preparedness Weaknesses and Deficiencies (71114.05)

a. Inspection Scope

The inspectors reviewed licensee records associated with maintaining the emergency preparedness program between May 2010 to November 2012, including:

- Site Procedures
    - NOS-DG-001, “Audit Preparation and Performance,” dated July 31, 2012;
    - NOS-DG-021, “Cycle Performance Assessment and Rating Process,” dated October 31, 2012;
    - EPDM-4, “Conduct of Drills”;
    - EPDM-6, “10CFR50.54(q) Review of Procedure Changes,” Revision 9A; and,
    - EPDM-2, “Emergency Preparedness Test Program”.

- After-action reports;
- Issues entered into the Corrective Action Program;
- Quality Assurance audits and surveillance reports;
- Emergency Preparedness Program assessments;
- Drill and exercise evaluation reports;
- Assessments of the impact of changes to the emergency plan and emergency plan implementing procedures; and,
- Maintenance records for equipment important to emergency preparedness.

The inspectors reviewed work orders for 23 pieces of equipment related to accident assessment and reviewed one work order in detail. The inspectors reviewed summaries of 491 CAP entries assigned to the emergency preparedness department and emergency response organization and selected 27 for detailed review against the program requirements. The inspectors evaluated the response to the corrective action requests to determine the licensees ability to identify, evaluate, and correct problems in accordance with the licensee program requirements, planning standard 10 CFR 50.47(b)(14), and 10 CFR Part 50, Appendix E.

The inspectors reviewed 319 summaries of assessments of changes to the emergency plan and emergency plan implementing procedures, and selected thirteen for detailed review against program requirements. The inspectors also toured and observed the licensee's alternate emergency response facilities, including the proposed alternate location for Technical Support Center while the facility is renovated. The specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of one sample as defined in Inspection Procedure 71114.05-05.

c. Findings

No findings were identified

.4. OTHER ACTIVITIES

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

4OA1 Performance Indicator Verification (71151)

.1 Data Submission

a. Inspection Scope

The inspectors performed a review of the data submitted by the licensee for the Third Quarter 2012 performance indicators for any inconsistencies prior to its public release in accordance with 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.

Drill/Exercise Performance (EP01)

a. Inspection Scope

The inspectors sampled licensee submittals for the Drill and Exercise Performance, performance indicator for the period October 2011 through September 2012 to determine the accuracy of the licensee's reported performance indicator data. The inspectors reviewed the licensee's records associated with the performance indicator to verify that the licensee accurately reported the indicator in accordance with relevant procedures and Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6. Specifically, the inspectors reviewed licensee records and processes including procedural guidance on assessing opportunities for the performance indicator; assessments of performance indicator opportunities during predesignated control room simulator training sessions, performance during the March 2012 biennial exercise, and performance during other drills. The specific documents reviewed are described in the attachment to this report.

These activities constitute completion of the drill/exercise performance sample as defined in Inspection Procedure 71151-05.

b. Findings

No findings were identified.

Emergency Response Organization Drill Participation (EP02)

a. Inspection Scope

The inspectors sampled licensee submittals for the Emergency Response Organization Drill Participation performance indicator for the period October 2011 through September 2012 to determine the accuracy of the licensee's reported performance indicator data. The inspectors reviewed the licensee's records associated with the performance indicator to verify that the licensee accurately reported the indicator in accordance with relevant procedures and Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6. Specifically, the inspectors reviewed licensee records and processes including procedural guidance on assessing opportunities for the performance indicator, rosters of personnel assigned to key emergency response organization positions, and exercise participation records. The specific documents reviewed are described in the attachment to this report.

These activities constitute completion of the emergency response organization drill participation sample as defined in Inspection Procedure 71151-05.

b. Findings

No findings were identified.

Alert and Notification System (EP03)

a. Inspection Scope

The inspectors sampled licensee submittals for the Alert and Notification System performance indicator for the period October 2011 through September 2012 to determine the accuracy of the licensee's reported performance indicator data. The inspectors reviewed the licensee's records associated with the performance indicator to verify that the licensee accurately reported the indicator in accordance with relevant procedures and Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6. Specifically, the inspectors reviewed licensee records and processes including procedural guidance on assessing opportunities for the performance indicator and the results of periodic alert notification system operability tests. The specific documents reviewed are described in the attachment to this report.

These activities constitute completion of the alert and notification system sample as defined in Inspection Procedure 71151-05.

a. Findings

No findings were identified.

4OA2 Problem Identification and Resolution (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 CAP 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 and, as such, did not constitute any separate inspection samples.

b. Findings

No findings were identified.

4OA3 Followup of Events and Notices of Enforcement Discretion (71153)

.1 (Closed) Licensee Event Report 05000285/2012-005-01: Technical Specification Violation Due to Inadequate Testing of Emergency Diesel Fuel Pumps

During a QA review of surveillance procedures, the licensee identified a failure to perform monthly surveillance testing of the full automatic functions of the fuel oil transfer pumps as required by the Technical Specifications. Procedure changes made in 1990s removed the test of the automatic start of the fuel oil transfer pumps on low level in the Emergency Diesel Generator (EDG) day tank. Without full testing of the fuel oil transfer pumps automatic functions, they cannot be considered operable because all auxiliary equipment to support operability has not demonstrated that it is fully capable of performing its safety function. There is reasonable assurance that the EDGs and fuel transfer pumps would function as required as the low level switches are calibrated on a refueling frequency and have functioned correctly during extended EDG surveillances. This licensee modified relevant surveillance testing procedures to test these functions.

This licensee-identified finding involved a violation of Technical Specification 3.7(1)e. and Table 3-2, Item 12. The enforcement aspects of the violation are discussed in Section 4OA7. No additional issues were identified during this review. This LER is closed.

.2 Licensee Event Report 05000285/2012-006-00: Operation of Component Cooling Pumps Outside of the Manufacturers Recommendation

On June 25, 2012, the licensee submitted LER 2012-006, Revision 0, describing that the Component Cooling Water pumps were being operating beyond their pump curves. This LER is described in Inspection Report 05000285/2012004 (ML12276A456).

The licensee notified the NRC via letter LIC-12-0182 (ML12342A321) that it was withdrawing LER 2012-006, Revision 0 because further investigation revealed that the pumps had been operating within design requirments.

The inspectors have yet to verify the historical operation of the Component Cooling Water Pumps, and this LER remains open.

.3 (Closed) Licensee Event Report 05000285/2012-008-00: Technical Specification Violation for Fuel Movement (VA-66)

A review of previously completed cause analyses has identified that FCS has moved fuel while the Spent Fuel Pool Area ventilation charcoal filter (VA-66) was inoperable due to failing the methyliodide penetration surveillance. FCS Technical Specification 2.8.3(4) requires the Spent Fuel Pool Area ventilation system to be in service prior to fuel movement. The Spent Fuel Pool Area ventilation system includes a charcoal filter which prevents the release of radioactive material to the outside atmosphere in the event of a fuel handling accident. However, the fuel handling accident analysis does not credit removal of any radioiodine through operation of the Spent Fuel Pool charcoal filter (VA-

66); offsite radiological consequences are well within the 10 CFR 50.67 requirements without the charcoal filtration. There have been repeated charcoal efficiency test failures since 2005. There was evidence that the charcoal filters were not capable of meeting the 18-month surveillance frequency. Fuel movement was conducted while the Spent Fuel Pool Area charcoal filter was in service, yet potentially not able to meet the adsorption criteria, hence inoperable which is a violation of TS requirements.

A cause analysis is in progress. The results will be published in a supplement to this LER. Corrective actions included a revision of the applicable procedure to ensure that charcoal life is predicted and charcoal filter change out is performed before the charcoal expires.

This event is being reported under 10 CFR 50.73(a)(2)(i)(B), operation or condition prohibited by TS.

The LER is closed. Revision 1 of this LER was submitted on November 29, 2012.

.4 (Open) Licensee Event Report 05000285/2012-008-01: Technical Specification Violation for Fuel Movement (VA-66)

On September 28, 2011, FCS, CR 2011-7800 identified the failure of the spent fuel pool area charcoal filter (VA-66) to pass the elemental iodine removal test. During a subsequent review of this CR by the Recovery Engineering group, it was determined that on June 6, 2012, fuel had been moved during a time when VA-66 was required to be operable. The FCS Technical Specification, 2.8.3(4), requires the Spent Fuel Pool Area ventilation system to be in operation during refueling operations.

A cause analysis determined that a lack of management oversight and the failure of Engineering to take a proactive approach in the prevention of future test failures led to this event. Completed corrective actions include:

1) a revision of the applicable procedure to trend charcoal sample results and predict replacement
2) replacement of the depleted charcoal currently installed, and
3) a change in the frequency of the charcoal test surveillance from eighteen months to 1 year.

.5 (Closed) Licensee Event Report 05000285/2012-012-00: Multiple Safety Injection Tanks Rendered Inoperable

FCS operating procedures allow filling and sluicing multiple safety injection tanks (SITs) while at power, rendering the SITs inoperable during the evolution. The use of this procedure allowed multiple safety injection tanks to be concurrently filled while FCS was at power. FCS Technical Specifications (TS) and accident analysis do not allow more than one SIT to be inoperable. This condition was identified on March 19, 2012, while the unit was in Mode 5, by the NRC during initial license examination preparation.

A cause analysis is in progress. The results of the analysis will be published in a supplement to this LER.

The LER is closed. Revision 1 of this LER was submitted on December 18, 2012.

.6 (Open) Licensee Event Report 05000285/2012-012-01: Multiple Safety Injection Tanks Rendered Inoperable

FCS operating procedures allow filling and sluicing multiple safety injection tanks (SITs) while at power, rendering the SITs inoperable during the evolution. The use of this procedure allowed multiple safety injection tanks to be concurrently filled while FCS was at power. FCS Technical Specifications (TS) and accident analysis do not allow more than one SIT to be inoperable. This condition was identified on March 19, 2012, while the unit was in Mode 5, by the NRC during initial license examination preparation.

The cause of this condition was the failure to recognize that the passive design of the SITs cannot credit the use of active components for operability. The event was entered into the Corrective Action Program and the following corrective actions were taken. Operating Procedure OI-SI-1, the Technical Specification basis, and the USAR have been revised to clearly state the SITs operability requirements.

4OA4 IMC 0350 Inspection Activities (92702)

Inspectors continued the IMC 0350 inspection activities, which include follow-up on the restart checklist contained in CAL 4-12-002 issued June 11, 2012. The purpose of the beginning phase of this inspection is to assess the licensee's performance and progress in addressing its implementation and effectiveness of FCS's Integrated Performance Improvement Plan (IPIP), significant performance issues, weaknesses in programs and processes, and flood restoration activities. This phase of inspection determines whether the depth and breadth of performance concerns are understood.

Inspectors used the criteria described in baseline and supplemental inspection procedures, various programmatic NRC inspection procedures, and IMC 0350 to assess the licensee's performance and progress in implementing its performance improvement initiatives. Inspectors performed on-site and in-office activities, which are described in more detail in the following sections of this report. This report covers inspection activities from November 18 through December 31, 2012. Specific documents reviewed during this inspection are listed in the attachment.

The following inspection scope, assessments, observations, and findings are documented by CAL restart checklist item number.

.1 Causes of Significant Performance Deficiencies and Assessment of Organizational Effectiveness

Section 1 of the restart checklist contains those items necessary to develop a comprehensive understanding of the root causes of safety-significant performance

deficiencies identified at FCS. In addition, Section 1 includes the independent safety culture assessment with the associated root causes and findings. The integration of the assessments under Item 1.f identifies the fundamental aspects of organizational performance in the areas of organizational structure and engagement, values, standards, culture, and human behaviors that have resulted in the protracted performance decline and are critical for sustained performance improvement. Section 1 reviews also include an assessment against appropriate NRC Inspection Procedure 95003 key attributes. These assessments are documented in section 4OA4.5.

.a Flooding Issue – Yellow Finding

Item 1.a is included in the restart checklist for the failure of FCS to maintain procedures and equipment that protects the plant from the effects of a design basis flood. These deficiencies resulted in a yellow (substantial safety significance) finding.

(1) Inspection Scope

Item 1.a is included in the restart checklist because the licensee failed to maintain procedures and equipment that protects the plant from the effects of a design basis flood. These deficiencies resulted in a finding having yellow (i.e., substantial) safety significance. During the inspection period covered by this report, the NRC inspectors assessed, and will continue to assess during upcoming inspection periods, the licensee's root cause, extent of cause, and extent of condition evaluations related to the Yellow finding. In addition, the inspectors continued to verify, that corrective actions are adequate to address the root and contributing causes.

The onsite activities included detailed discussions on Abnormal Operating Procedure (AOP)-1, "Acts of Nature." Specifically, the inspectors focused their reviews on two other sections of AOP-1, in addition to Section I, "Flood," to obtain a better understanding of the licensee's extent of condition review as a result of the Yellow finding associated with flooding. The inspectors reviewed AOP-1, Section IV, "Low River Water Level" and Section V, "Degraded River Level." These reviews included evaluations of frazil ice detection equipment and procedure OI-EW-1, "Extreme Weather." Additionally, the inspectors continued to evaluate maintenance practices associated with the circulating water river sluice gates and reviewed various aspects of maintaining their functionality such as the performance of monthly sluice gates test, their incorporation into the Maintenance Rule program, and the corrective actions associated with the issues surrounding them. Lastly, the inspectors held discussions with licensee Operations and Design Engineering personnel about the basis for the low rive level values specified in Technical Specifications and licensee Design Basis documents.

The in-office activities consisted of reviews of documents associated with the recovery efforts, procedures associated with flooding mitigation strategies, maintenance activities, work orders, system lesson plans, and CRs.

(2) Assessment

The inspectors' review on extent of condition during this inspection period focused mainly on the licensee's readiness to manage a low river level condition and degraded river level condition. The inspectors also reviewed OI-EW-1, the procedure that contains frazil ice mitigating instructions.

The United States Army Corps of Engineers (USACE) manages the flows on the Missouri River dams located upstream of FCS. USACE posted on their public website in spring 2012, that they planned to curtail flows released from the dams in late 2012, to manage the recent drought-like conditions. Also, the licensee had an engineering firm perform a river study after the 2011 flood. In April 2012, the licensee received the results which stated the river level would be lower for equivalent historical discharges from the Gavins Point Dam due to the river bottom being lowered by the 2011 flood. The inspectors noted that the licensee did not initiate a proactive response to the information from USACE. Rather, the licensee initiated a response closer to the date that low river levels were approaching. The licensee formed a low river level action assessment team to troubleshoot options to address this condition. The inspectors concluded that although the licensee was aware of the information earlier in the year (approximately April 2012), it did not assemble the assessment team until October 2012.

Additional issues are discussed in the findings documented below.

(3) Findings

i. Failure to Manage Functionality of the River Sluice Gates

Introduction. The team identified a finding exemplified by five violations for the failure to manage the functionality and operability of the river sluice gates. Specifically, the licensee's preventive maintenance program requirements were not appropriately implemented for a period of 12 months and as a result, the operability of the river sluice gates was improperly maintained.

- A licensee identified violation of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures and Drawings," for the failure to perform preventive maintenance required to demonstrate the operability of the safety related raw water system.

- An NRC identified violation of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures and Drawings," for the failure to accomplish activities affecting quality in accordance with prescribed instructions when in September 2012, the licensee failed to test the C and D river sluice gates in accordance with SAO-12-001, to properly maintain operability of the raw water system.

- An NRC identified violation of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures and Drawings," for the failure to accomplish activities affecting quality in accordance with prescribed instructions when the licensee failed to test all six gates in October 2012, to maintain functionality of the river sluice gates in accordance with SAO-12-001.

- An NRC identified violation of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for the licensee's failure to properly identify and timely enter conditions adverse to quality into the Corrective Action Program following multiple failures of the river sluice gates in accordance with Corrective Action Program procedures.

- An NRC identified violation of 10 CFR 50.65, "Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," for the licensee's failure to demonstrate effective control of performance of the circulating water system river sluice gates and failure to place the system in (a)(1) when system performance deteriorated.

- An NRC identified violation of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures and Drawings," for the failure to accomplish activities affecting quality in accordance with prescribed instructions when the licensee failed to make the appropriate functionality assessment when the circulating water river sluice gates failed to close during the August 2012 monthly test.

Description. Between January and December 2012, the licensee failed to maintain functionality of the river sluice gates. During the course of the inspection, the inspectors noted there were a number of performance deficiencies that involved the sluice gates not being suitably maintained and preventive maintenance not being managed appropriately. The licensee was not consistent in ensuring that the river sluice gates were capable of fulfilling their safety function and did not manage the Corrective Action Program to achieve resolution of the multiple programmatic and operational issues that were experienced over a period of 6 months. As a result, the operability of the safety-related raw water system was challenged during this time. Discussed below are the issues involving maintaining the river sluice gates functional. Due to the number of violations identified by the inspectors and one by the licensee, they are being grouped as a problem in accordance with Section 2.14.8 of the NRC Enforcement Manual.

- Licensee-Identified Failure to Perform River Sluice Gate Testing for 4 months

  Operability Determination SAO-12-001 was written in April 2012 to assess operability of the Raw Water System. One of the compensatory measures listed in the Safety Assessment for Operability (SAO) was to demonstrate functionality of the six river sluice gates, CW-14A through F, by cycling them through the full range of travel on a monthly basis. These compensatory

actions were necessary to justify operability of the safety-related raw water system. In August 2012, Operations personnel identified that the monthly cycling of the sluice gates had not been performed for April, May, June, and July 2012. The licensee wrote CR 2012-09996 to document this condition and proceeded to test the sluice gates. The licensee concluded that the cause of the failure to perform the monthly testing was a lack of communication between various site departments such as Engineering, Operations, and Work Control.

- NRC-Identified Failure to Test the CW-14C and D Sluice Gates in September 2012

  During the inspectors' review of the licensee's practices to maintain functionality of the sluice gates, the inspectors reviewed work orders that delineated instructions for testing the sluice gates. The testing of the sluice gates commenced in August 2012, which is when the licensee discovered they were not being tested on a monthly frequency in accordance with SAO-12-001. For the September 2012 testing, the inspectors reviewed WO 441791-01, "CW-14A-F; Cycle Sluice Gates through Full Range" and CR 2012-13312, which documented the results for that specific month. The inspectors noted that the licensee had only tested gates CW-14A, B, E, and F and had failed to test CW-14C and D. When the inspectors raised the question, the licensee documented the issue in CR 2012-17078. After evaluating the issue, the licensee could not provide a reason as to justify why the two gates were not tested in September.

- NRC-Identified Failure to Test All Six Sluice Gates CW-14A through F in October 2012

  The sluice gates' maintenance and testing activities were evaluated as part of the inspectors' review of the licensee's practices to maintain functionality of the sluice gates. The licensee informed the inspectors that monthly testing did not occur for any of the 6 sluice gates, CW-14A through F, for October 2012. This test was scheduled to occur as specified in WO444244-01. The licensee documented this issue in CR 2012-19645 and attributed the cause to improper communications between the Operations and Maintenance Departments. In this instance, to prepare for the October 2012 monthly test, a work order was written to request that divers be available to clean the intake structure bays of debris and silt that may be encountered during the testing activities. Due to lack of communications between the departments, the divers were dispatched to inspect and clean the bottom of the sluice gates before the testing had occurred as instructed in WO444244-01, "CW14A-F; Cycle Sluice Gates through Full Range." The following day, when a new crew arrived, they noted that the divers had performed activities and inappropriately assumed that the testing was complete. It was not until looking into a related issue raised by the inspectors dealing with the activities that the licensee learned that the testing was never performed for the month

of October. As a result, for the second month in a row, an appropriate test of the sluice gates was not performed and the functionality of the river sluice gates was not justified.

- Failure to properly identify and timely enter conditions adverse to quality to the Corrective Action Program

  During the course of the inspection, the inspectors identified several instances where the licensee did not enter conditions adverse to quality into the Corrective Action Program. The inspectors also concluded that the licensee did not properly use all the tools available in the Corrective Action Program to identify conditions adverse to quality and correct them in a timely manner. For example, when reviewing the maintenance and testing activities associated with the sluice gates, the inspectors identified that during the August and September testing, silt was identified in the area where the sluice gates seat at the bottom floor of the intake structure. Even though the silt was identified and removed by divers, the condition was not entered into the Corrective Action Program when it was discovered, as required by the Corrective Action Program Procedure FCSG-24-1. In addition, although the testing for October did not occur, the divers did encounter silt at the bottom of the intake structure. The licensee failed, again, to enter this condition into the Corrective Action Program, as required by the Corrective Action Program procedure. Collectively, these issues contributed to affecting the operability of the raw water system, and they should have been properly identified as conditions adverse to quality and entered in the Corrective Action Program in a timely manner for evaluation. Furthermore, the inspectors noted that FCSG-24-10, "Corrective Action Program Trending" states that when an emerging or adverse trend is identified, it shall be investigated to a level of detail permitting verification and validation that a trend does exists or identification of factors that refute the validity of a perceived trend. The inspectors noted that regardless of the constant issues surrounding the sluice gates, the licensee did not identify and document a trend CR.

- Failure to Demonstrate Effective Control of Performance of the Circulating Water System Sluice Gates

  The inspectors noted that from August, 2012 to December 2012, the sluice gates had experienced a total of 7 failures Maintenance Preventable Functional Failures (MPFFs), two in August, two in September, two in November, and one in December. As specified by the licensees Maintenance Rule Scoping Document, the licensee established performance criteria as zero failures in a twenty-four month period. Following failures in 2012, the licensee wrote CR 2012-10606 to document the failures of the sluice gates and CR 2012-18892 to track the actions to evaluate the placement of the system in Maintenance Rule a(1) where the licensee would monitor the performance of the sluice gates against licensee-established

goals in a manner sufficient to provide reasonable assurance that the sluice gates would perform their intended safety function.

Nuclear Management and Resources Council (NUMARC) 93-01, "Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," an NRC-endorsed industry standard, states that activities such as cause determinations and moving SSCs from the 10 CFR 50.65(a)(2) to the (a)(1) category must be performed in a timely manner. The licensee had initially scheduled this expert panel review for November, 2012, however, as of the end of the inspection period covered in this inspection report, the evaluation had been postponed twice and it was now scheduled for January 2013. As a result, the licensee failed to demonstrate effective control of performance of the circulating water system sluice gates and failed to place the system in (a)(1) in a timely manner when system performance deteriorated.

- Failure to Make the Proper Functionality Assessment Following the Failure of Sluice Gates CW14C and E During the August 2012 Testing

  On August 14, 2012, when the six circulating water sluice gates were being cycled as part of monthly testing, it was identified that sluice gates CW-14C and E did not fully close when each was cycled. As a result they failed the test. Immediately following these test results, the licensee failed to determine that following the failure to close, the two sluice gates were non-functional. In accordance with procedure NOD-QP-31, "Operability Determinations Process," functionality was not assessed and promptly entered into the Corrective Action Program. The licensee initially incorrectly concluded that the failure was due to an instrument indication problem and that the sluice gates were actually closed. However, upon further evaluation the licensee determined that silt that had accumulated at the bottom of the sluice gates and that was what caused the cycling failure. On August 25, divers removed the sediment and debris from all sluice gate bottoms returning the sluice gates capability of being fully closed in the event of a design basis flood. As a result of the delayed functionality assessment, the issue was not corrected promptly and operability of the raw water system, which is supported by the sluice gates, was not assessed nor maintained.

Analysis. The team concluded that the failure to manage the functionality of the sluice gates was a performance deficiency that warranted further evaluation. Specifically, the licensee's preventive maintenance program requirements were not appropriately implemented for a period of 12 months and as a result, the functionality of the sluice gates was improperly maintained. The examples supporting this performance deficiency are as follows:

(1) Failure to perform preventive maintenance and monthly testing on the river sluice gates for four months

(2) Failure to perform monthly testing on two sluice gates on September 2012

(3) Failure to perform monthly testing on all the sluice gates on October 2012

(4) Failure to properly identify and timely enter conditions adverse to quality into the Corrective Action Program

(5) Failure to demonstrate effective control of performance of the river sluice gates and to place the system in a monitoring program

(6) Failure to make appropriate functionality assessment when the river sluice gates failed the monthly testing during August 2012

The licensee entered these issues into their Corrective Action Program under various CRs.

Using the guidance in IMC 0612, "Power Reactor Inspection Reports," Appendix B, "Issue Screening," the inspectors determined this finding affected the Mitigating Systems cornerstone. The finding is greater than minor because it is associated with both of the Mitigating Systems Cornerstone attributes of Equipment Performance and Protection Against External Factors and, it adversely affects the associated cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The significance of this finding is bounded by the significance of a related Yellow finding regarding the ability to mitigate an external flooding event (Inspection Report 05000285/2010008). The inspectors determined the finding had a cross-cutting aspect in the area of problem identification and resolution because the licensee did not take appropriate corrective action to address safety issues and adverse trends in a timely manner, commensurate with their safety significance and complexity [P.1(d)].

Enforcement. One finding involving five violations were associated with this performance deficiency involving the failure to manage the functionality of the river sluice gates.

A. Title 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures and Drawings," requires, in part that activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings.

Safety Analysis for operability (SAO)-12-001 states, in part, to maintain validity of SAO, cycle gates per monthly PM.

Contrary to the above requirement, the licensee identified that from April to August 2012, they failed to perform monthly tests on the river sluice gates

as required by maintenance procedures and a SAO to demonstrate the functionality of the river sluice gates. Specifically, the licensee did not cycle the gates through the full range of travel to ensure their functionality was maintained.

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

Safety Analysis for operability (SAO)-12-001 states, in part, to maintain validity of SAO, cycle gates per monthly PM.

Contrary to the above requirement, from September 2012 through October 2012, the licensee failed to accomplish activities affecting quality in accordance with the prescribed instructions and procedures. Specifically, during September 2012, two gates, CW-14C and D, were not tested through the full range of travel to ensure their functionality was demonstrated. The licensee could not identify a reason for not performing the monthly surveillance test. During October 2012, all six gates, CW-14A-F were not tested through the full range of travel to ensure the sluice gates functionality was demonstrated. As a result, the functionality of the sluice gates was not demonstrated.

C. Title 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures and Drawings," requires, in part that activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings.

Corrective Action Program procedure FCSG-24-1 states in part, that personnel who discover a problem should initiate a condition report.

Contrary to the above requirement, from August to October 2012, the licensee failed to establish measures to assure that conditions adverse to quality were promptly identified and corrected. The licensee also failed to promptly identify deficiencies and malfunctions and place them in the Corrective Action Program. Specifically, the licensee identified silt blocking the closure of the river sluice gates and did not initiate a CR to document the deficiencies. Additionally, the licensee did not identify the trend of constant failures such that the equipment malfunctions were corrected in a timely manner.

D. Title 10 CFR 50.65, "Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," (a)(1), requires, in part, that the holder of an operating license shall monitor the performance or condition of

structures, systems, or components within the scope of the rule as defined by 10 CFR 50.65(b), against licensee-established goals, in a manner sufficient to provide reasonable assurance that these structures, systems and components, are capable of fulfilling their intended functions. Title 10 CFR 50.65(a)(2) states, in part, that monitoring as specified in 10 CFR 50.65(a)(1) is not required where it has been demonstrated that the performance or condition of a structure, system, or component is being effectively controlled through the performance of appropriate preventive maintenance, such that the structure, system, or component remains capable of performing its intended function.

Contrary to the above, the licensee failed to monitor the performance or condition of structures, systems, or components against licensee established goals, in a manner sufficient to provide reasonable assurance that these structures, systems and components are capable of fulfilling their intended function. Specifically, the Circulating Water System, which encompass the river sluice gates, had been effectively controlled through performance of appropriate maintenance, yet, the river sluice gates were not monitored against licensee-established goals. Between August and December 2012, the sluice gates experienced seven MPFFs, which showed that performance was not being effectively controlled since the performance criterion specified for the system was zero MPFFs in a 24 month period.

E. Title 10 CFR Part 50, Appendix B, Criterion V, “Instructions, Procedures and Drawings,” requires, in part that activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings.

Procedure NOD-QP-31, “Operability Determinations Process,” states, in part, an SSC is functional when it is capable of performing its current license basis function.

Contrary to the above requirement, in August 2012, the licensee failed to accomplish activities affecting quality in accordance with these instructions, procedures, and drawings. Specifically, during the monthly functionality test of the river sluice gates, the licensee failed to make the appropriate functionality assessment when two of the circulating water sluice gates failed to fully close during the cycling test. The licensee did not declare the gates non-functional and did not take appropriate action to correct the deficiency in a timely manner.

The licensee has entered these issues into their Corrective Action Program under various CRs. This finding is related to the Yellow finding issued in October 2010 that dealt with issues related to mitigating a significant external flooding event. This finding and its corrective actions, will be managed by the Manual

Chapter 0350 Oversight Panel. FIN 5000285/2012012-03, “Failure to Properly Manage the Functionality of the River Sluice Gates” (EA-2013-034).

.b Reactor Protection System contact Failure – White Finding

Item 1.b is included in the restart checklist for the failure of FCS to correct a degraded contactor, which subsequently failed, in the reactor protection system. These deficiencies resulted in a white (low to moderate safety significance) finding.

(1) Inspection Scope

The licensee completed revision 2 of the Root Cause Analysis (RCA) for the failed contactor in April 2011. After the station transitioned to Manual Chapter 0350 oversight, the licensee decided to reevaluate the RCA and perform a revision 3.

(2) Assessment

Revision 3 of the RCA was completed on December 31, 2013, and is scheduled to be approved by the station corrective action review board during the first week of January 2013. Upon issuance of the root cause analysis, the inspectors will review and evaluate the analysis.

(3) Findings

No findings or violations of NRC requirements were identified; however, the NRC will continue its assessment of this CAL item.

.c Electrical Bus Modification and Maintenance – Red Finding

Item 1.c is included in the restart checklist for the failure to adequately design, modify, and maintain the electrical power distribution system, resulting in a fire in the safety-related 480 volt electrical switchgear. These deficiencies resulted in a red (high safety significance) finding.

(1) Inspection Scope

During the inspection period, the NRC continued to assess the status of licensee’s root cause, extent of cause, and extent of condition evaluations related to the fire and associated equipment and process failures.

The in-office activities, which were conducted at the inspectors’ normal duty stations, consisted of teleconferences with licensee personnel and reviews of FCS’s electrical distribution design basis documents.

(2) Assessment

On December 17, 2012, the licensee completed its technical review board evaluation of the closure package (i.e., the root causes and corrective actions) for the fire event. The licensee is completing its closure packages for the switchgear refurbishment restart checklist items and the findings from the NRC's previous triennial fire protection inspection before processing the closure packages through its challenge board reviews. The licensee's challenge board reviews of these items are scheduled to take place in January 2013, which means that the packages will likely be finalized for NRC inspection in February 2013. These dates are subject to change.

IR 05000285/2012005 documented several conditions that either contributed to the initiation of the fire event or the unexpected electrical distribution system response. Inspectors continued following up on issues regarding Breaker 1A4-10's trip setpoints, the 480-volt bus separation design, and the separation of DC circuits. Discussions with licensee staff during this inspection period indicated that the inspectors and licensee staff have differing views about FCS's design and licensing basis requirements for its electrical distribution system, which will require additional NRC inspection follow up in January and February 2013.

(3) Findings

No findings or violations of NRC requirements were identified; however, the NRC will continue its assessment of this CAL item.

.f Integrated Organizational Effectiveness Assessment

Item 1.f is included in the restart checklist because organizational effectiveness was identified as a potential key contributor to the overall decline in station performance. The NRC reviewed the licensee's RCA of organizational effectiveness.

(1) Assessment

On 12/28/2012 the inspectors attended the Plant Review Committee (PRC) meeting. SO-G-5, "Fort Calhoun Station Plant Review Committee, states, "The PRC shall function as an advisory committee to the Division Manager-Nuclear Operation (Plant Manager on all station activities specifically related to nuclear safety." During this meeting the PRC reviewed Field Design Change Request (FDCR) 58819. The PRC had multiple concerns with the FDCR and subsequently rejected it. After the meeting the inspectors questioned the PRC members on their knowledge of the corrective actions associated with the fundamental performance deficiency related to CR 2012-08125 Engineering Design & Configuration Control and cause analysis performed relating with the stations ability to effectively implement 10 CFR 50.59 Changes, tests and experiments. Few PRC members were familiar with the causes identified and associated corrective actions. The inspectors questioned how the PRC could be an effective advisory committee without a working level knowledge of the

fundamental programmatic issues that exist at the plant under their purview and the causes. This concern was documented in CR 2013-00071.

(2) Findings

No findings or violations of NRC requirements were identified; however, the NRC will continue its assessment of this CAL item.

.2 Flood Restoration and Adequacy of Structures, Systems, and Components

Section 2 of the Restart Checklist contains those items necessary to ensure that important structures, systems, and components affected by the flood and safety significant structures, systems, and components at FCS are in appropriate condition to support safe restart and continued safe plant operation. Section 2 reviews will also include an assessment of how the licensee appropriately addressed the NRC Inspection Procedure 95003 key attributes as described in Section 5.

.a Flood Recovery Plan Actions Associated With Facility and System Restoration

Item 2.a is the NRC's independent evaluation of FCS's Flood Recovery Plan. An overall flood recovery plan is important to ensure the station takes a comprehensive approach to restoring the facility structures, systems, and components to pre-flood conditions.

On August 30, 2011, FCS issued Revision 1 to the "Fort Calhoun Station Post-Flooding Recovery Action Plan," that provided for extensive reviews of plant systems, structures, and components to assess the impact of the floodwaters.
On September 2, 2011, the NRC issued CAL 4-11-003, listing 235 items described in the FCS FRAP that the licensee committed to complete. These 235 items were broken down into three sections: items to complete prior to exceeding 210 degrees Fahrenheit in the reactor coolant system, items to complete prior to reactor criticality; and items to complete following restart of the plant. On June 11, 2012, the NRC issued CAL 4-12-002. This CAL incorporates all the actions required by CAL 4-11-003.

The areas to be inspected are identified in the CAL. Inspection items are considered complete when the licensee has submitted a closure package that has been satisfactorily reviewed by the inspectors

(1) CAL Action Item 1.2.3.58

i. Inspection Scope

The purpose of Action Item 1.2.3.58 was to repair or replace B.5.b equipment, as necessary. This item was required to be completed following plant startup.

Action item 1.2.1.4 was created to return B.5.b materials to their proper location. This item was verified complete by the inspectors and documented in inspection report 05000285/2012005 (ML12318A341).

All materials were accounted for; however, the fire truck and trailer mounted drafting pumps were damaged, and the licensee procured new pumps.

The inspectors reviewed the FCS calculations that determine the required performance of the pumps for the various strategies. The performance characteristics of the new pumps indicated they are adequate to fulfill the requirements for the various B.5.b strategies.

This activity constitutes completion of Action Item 1.2.3.58 as described in CAL 4-12-002.

ii. Findings

No findings were identified.

(2) CAL Action Items 2.1.1.2; 2.1.1.6; and 2.1.1.7

ii. Inspection Scope

The purpose of Action Items 2.1.1.2; 2.1.1.6, and 2.1.1.7, was to repair any damaged or non-functional fire hydrants located inside the protected area or connected to the main fire protection header ring, restore the exterior fire hose houses impacted by flooding to a functional condition, and verify proper functioning of the fire hose houses. These items were required to be completed prior to exceeding 210 degrees Fahrenheit in the Reactor Coolant System.

There are eight fire hydrants located inside the protected area, all in enclosed houses, and three located just outside the protected area, one of which is in and enclosed house. The licensee performed visual inspections, cycled the hydrant isolation valves, flushed the hydrants, inventoried the houses, and conducted numerous surveillance tests to verify functionality of the fire hydrants. One fire hydrant, FP-3C, exhibited signs of leakage and was replaced.

The inspectors performed independent visual inspections of the fire hydrants, as well as verified that all fire hose station equipment was accounted for. The inspectors also witnessed the performance of OP-ST-0011, “Fire Protection System Hose Station Operability Test,” and reviewed the results of all surveillance tests performed.

As previously discussed FP-3C exhibited signs of leakage below grade and was replaced. The licensee replaced the fire hydrant and its associated isolation valve. The inspectors witnessed portions of the excavation, replacement, and backfill, and post maintenance testing.

The only fire hydrant that required any work other than cleaning was FP-3C. Based on results of the various surveillance tests, the inspectors concluded that all fire hydrants were functional.

This activity constitutes completion of Action Items 2.1.1.2; 2.1.1.6; and 2.1.1.7 as described in CAL 4-12-002.

ii. Findings

No findings were identified.

(3) CAL Action Item 2.2.1.16

iii. Inspection Scope

The purpose of Action Item 2.2.1.16 was to assess the effects of the flood on the RCS and identify actions to restore the system. This item was required to be completed prior to exceeding 210 degrees Fahrenheit in the Reactor Coolant System.

The inspectors independently reviewed the system to identify if there were any temporary modifications in place as a result of the flood, if there were any outstanding preventive maintenance activities that had been deferred due to the flood, and reviewed CRs to determine if there were any deficiencies noted due to the flood. The inspectors reviewed CRs that were related to flooding, written between April 1, 2011 and December 31, 2011. The inspectors also conducted a complete system walkdown to identify any adverse conditions related to flooding. The inspectors compared the results of their independent assessment to those contained in the licensee's "Flooding Recovery Startup System Health Assessment" report.

The primary purpose of the RCS is to remove the heat generated in the fuel and to transfer this heat to the secondary plant via the steam generators where this heat is used to produce steam for use as the prime mover in the main turbine-generator. The secondary purpose is to contain fission products which may be released to the RCS by a fuel element defect and prevent the escape of fission products from the RCS to the environment. The RCS also functions to remove decay heat generated in the fuel due to fission product decay following a reactor shutdown and acts as a carrier for: Soluble neutron poison (boric acid) for reactivity control; Lithium hydroxide for pH control; and Dissolved hydrogen to scavenge oxygen.

The inspectors identified no temporary modifications in place and no preventive or corrective maintenance were deferred because of the flooding. The corrective action search yielded no CRs written related to the flood or flood damage. The independent walkdown performed by the inspectors identified no adverse conditions to the RCS and its individual components.

This activity constitutes completion of Action Item 2.2.1.16 as described in CAL 4-12-002. It should be noted that the purpose of this action item was to assess the effects of the flood on the RCS. A detailed evaluation of the health of the RCS will be conducted prior to plant startup. This evaluation will be conducted and

documented in accordance with section 2.b.1.10 of the FCS Restart Checklist Basis Document.

ii. Findings

No findings were identified.

(4) CAL Action Item 2.2.1.18

iv. Inspection Scope

The purpose of Action Item 2.2.1.18 was to assess the effects of the flood on the Reactor Protective System (RPS) and identify actions to restore the system. This item was required to be completed prior to exceeding 210 degrees Fahrenheit in the Reactor Coolant System.

The inspectors independently reviewed the system to identify if there were any temporary modifications in place as a result of the flood, if there were any outstanding preventive maintenance activities that had been deferred due to the flood, and reviewed CRs to determine if there were any deficiencies noted due to the flood. The inspectors reviewed CRs that were related to flooding, written between April 1, 2011 and December 31, 2011. The inspectors also conducted a complete system walkdown to identify any adverse conditions related to flooding. The inspectors compared the results of their independent assessment to those contained in the licensee's "Flooding Recovery Startup System Health Assessment" report.

The Reactor Protective System (RPS) is designed to rapidly shut down the nuclear chain reaction prior to reaching a condition that could damage the reactor core. The RPS generates a reactor trip signal, which releases the control element assemblies and allows the control rods to fall into the core. The Diverse Scram System (DSS) is a backup system, which augments the RPS by using diverse, independent components to initiate a reactor trip on an overpressurization of the Reactor Coolant System.

The inspectors identified no temporary modifications in place and no preventive or corrective maintenance activities that were deferred because of the flooding. The corrective action search yielded no CRs written related to the flood or flood damage. The independent walkdown performed by the inspectors identified no adverse conditions to the RPS and its individual components.

This activity constitutes completion of Action Item 2.2.1.18 as described in CAL 4-12-002. It should be noted that the purpose of this action item was to assess the effects of the flood on the RPS. A detailed evaluation of the health of the RPS will be conducted prior to plant startup. This evaluation will be conducted and documented in accordance with section 2.b.1.26 of the FCS Restart Checklist Basis Document.

ii. Findings

No findings were identified.

(5) CAL Action Item 2.2.1.19

i. Inspection Scope

The purpose of Action Item 2.2.1.19 was to assess the effects of the flood on the Spent Fuel Pool (SFP) Cooling System and identify actions to restore the system. This item was required to be completed prior to exceeding 210 degrees Fahrenheit in the Reactor Coolant System.

The inspectors independently reviewed the system to identify if there were any temporary modifications in place as a result of the flood, if there were any outstanding preventive or corrective maintenance activities that had been deferred due to the flood, and reviewed CRs to determine if there were any deficiencies noted due to the flood. The inspectors reviewed CRs that were related to flooding, written between April 1, 2011 and December 31, 2011. The inspectors also conducted a complete system walkdown to identify any adverse conditions related to flooding. The inspectors compared the results of their independent assessment to those contained in the licensee's "Flooding Recovery Startup System Health Assessment" report.

The purpose of the SFP Cooling System is to remove decay heat from spent fuel assemblies stored in the storage pool and transfer the heat to the Component Cooling Water System. The system also provides radiation shielding for the fuel bundles stored in the spent fuel pool and for the stored spent fuel bundles.

The inspectors identified no temporary modifications in place and no preventive or corrective maintenance were deferred because of the flooding. The corrective action search yielded no CRs written related to the flood or flood damage. The independent walkdown performed by the inspectors identified no adverse conditions to the SFP Cooling System and its individual components.

This activity constitutes completion of Action Item 2.2.1.19 as described in CAL 4-12-002. It should be noted that the purpose of this action item was to assess the effects of the flood on the SFP Cooling System. A detailed evaluation of the health of the SFP Cooling System will be conducted prior to plant startup. This evaluation will be conducted and documented in accordance with section 2.b.1.3 of the FCS Restart Checklist Basis Document.

ii. Findings

No findings were identified.

(6) CAL Action Item 2.2.1.20

i. Inspection Scope

The purpose of Action Item 2.2.1.20 was to assess the effects of the flood on the Main Steam and Steam Generator System and identify actions to restore the system. This item was required to be completed prior to exceeding 210 degrees Fahrenheit in the RCS.

The inspectors independently reviewed the system to identify if there were any temporary modifications in place as a result of the flood, if there were any outstanding preventive or corrective maintenance activities that had been deferred due to the flood, and reviewed CRs to determine if there were any deficiencies noted due to the flood. The inspectors reviewed CRs that were related to flooding, written between April 1, 2011 and December 31, 2011. The inspectors also conducted a complete system walkdown to identify any adverse conditions related to flooding. The inspectors compared the results of their independent assessment to those contained in the licensee's "Flooding Recovery Startup System Health Assessment" report.

The primary purpose of the Main Steam and Steam Generator System is to generate and deliver high quality steam to the main turbine-generator. It also functions to: establish a barrier between the radioactive RCS and the secondary plant. Provide sealing steam for initial startup of the main turbine; provide natural circulation decay heat removal in the event of loss of reactor coolant flow; provide overpressure protection for the secondary side of the steam generators; remove RCS heat following a turbine and reactor trip; provide for operator control of steam generator pressure and RCS temperature during plant heatup and cooldown; and provide steam to the turbine-driven auxiliary feedwater pump.

The inspectors identified no temporary modifications in place and no preventive or corrective maintenance were deferred because of the flooding. The corrective action search yielded no CRs written related to the flood or flood damage. The independent walkdown performed by the inspectors identified no adverse conditions to the Main Steam and Steam Generator System and its individual components.

This activity constitutes completion of Action Item 2.2.1.20 as described in CAL 4-12-002. It should be noted that the purpose of this action item was to assess the effects of the flood on the Main Steam and Steam Generator System. A detailed evaluation of the health of the Main Steam and Steam Generator System will be conducted prior to plant startup. This evaluation will be conducted and documented in accordance with section 2.b.1.17 of the FCS Restart Checklist Basis Document.

ii. Findings

No findings were identified.

(7) CAL Action Item 2.2.1.21

i. Inspection Scope

The purpose of Action Item 2.2.1.21 was to assess the effects of the flood on the Sampling System and identify actions to restore the system. This item was required to be completed prior to exceeding 210 degrees Fahrenheit in the Reactor Coolant System.

The inspectors independently reviewed the system to identify if there were any temporary modifications in place as a result of the flood, if there were any outstanding preventive or corrective maintenance activities that had been deferred due to the flood, and reviewed CRs to determine if there were any deficiencies noted due to the flood. The inspectors reviewed CRs that were related to flooding, written between April 1, 2011 and December 31, 2011. The inspectors also conducted a complete system walkdown to identify any adverse conditions related to flooding. The inspectors compared the results of their independent assessment to those contained in the licensee's "Flooding Recovery Startup System Health Assessment" report.

The Sampling Systems provide the plant chemist and operators with analyses of plant fluids in the primary and secondary systems, the Waste Disposal System, the Water Plant, and the primary water storage tank and vacuum deaerator.

The inspectors identified no temporary modifications in place and no preventive or corrective maintenance were deferred because of the flooding. The corrective action search yielded no CRs written related to the flood or flood damage. The independent walkdown performed by the inspectors identified no adverse conditions to the Sampling System and its individual components.

This activity constitutes completion of Action Item 2.2.1.21 as described in CAL 4-12-002. It should be noted that the purpose of this action item was to assess the effects of the flood on the Sampling System. A detailed evaluation of the health of the Sampling System will be conducted prior to plant startup. This evaluation will be conducted and documented in accordance with section 2.b.1.4 of the FCS Restart Checklist Basis Document.

ii. Findings

No findings were identified.

(8) CAL Action Item 2.2.1.23

i. Inspection Scope

The purpose of Action Item 2.2.1.23 was to assess the effects of the flood on the Turbine Generator System and identify actions to restore the system. This item was required to be completed prior to exceeding 210 degrees Fahrenheit in the Reactor Coolant System.

The inspectors independently reviewed the system to identify if there were any temporary modifications in place as a result of the flood, if there were any outstanding preventive or corrective maintenance activities that had been deferred due to the flood, and reviewed CRs to determine if there were any deficiencies noted due to the flood. The inspectors reviewed CRs that were related to flooding, written between April 1, 2011 and December 31, 2011. The inspectors also conducted a complete system walkdown to identify any adverse conditions related to flooding. The inspectors compared the results of their independent assessment to those contained in the licensee's "Flooding Recovery Startup System Health Assessment" report.

The main turbine converts steam thermal energy into mechanical energy to turn the main generator. Turbine auxiliaries support turbine operation. The main generator converts turbine mechanical energy into electrical power. Generator auxiliaries provide regulated excitation to maintain generator voltage and power factor; hydrogen cooling to remove electrical heat losses from the generator rotor; stator cooling water to remove electrical heat losses from the generator; and seal oil to prevent the leakage of hydrogen from the generator at the rotor penetration.

The inspectors identified no temporary modifications in place and no preventive or corrective maintenance were deferred because of the flooding. The corrective action search yielded no CRs written related to the flood or flood damage. The independent walkdown performed by the inspectors identified no adverse conditions to the Turbine Generator System and its individual components.

This activity constitutes completion of Action Item 2.2.1.23 as described in CAL 4-12-002. It should be noted that the purpose of this action item was to assess the effects of the flood on the Turbine Generator System. A detailed evaluation of the health of the Turbine Generator System will be conducted prior to plant startup. This evaluation will be conducted and documented in accordance with section 2.b.1.20 of the FCS Restart Checklist Basis Document.

ii. Findings

No findings were identified.

(9) CAL Action Item 2.2.1.24

i. Inspection Scope

The purpose of Action Item 2.2.1.24 was to assess the effects of the flood on the Turbine Plant Cooling Water System and identify actions to restore the system. This item was required to be completed prior to exceeding 210 degrees Fahrenheit in the Reactor Coolant System.

The inspectors independently reviewed the system to identify if there were any temporary modifications in place as a result of the flood, if there were any outstanding preventive or corrective maintenance activities that had been deferred due to the flood, and reviewed CRs to determine if there were any deficiencies noted due to the flood. The inspectors reviewed CRs that were related to flooding, written between April 1, 2011 and December 31, 2011. The inspectors also conducted a complete system walkdown to identify any adverse conditions related to flooding. The inspectors compared the results of their independent assessment to those contained in the licensee's "Flooding Recovery Startup System Health Assessment" report.

The Turbine Plant Cooling Water System, also referred to as bearing cooling water, provides cooling to steam cycle components. The function is similar to the Component Cooling Water System, but the components served are not safety-related, nor potentially contaminated.

The inspectors identified no temporary modifications in place and no preventive or corrective maintenance were deferred because of the flooding. The corrective action search yielded no CRs written related to the flood or flood damage. The independent walkdown performed by the inspectors identified no adverse conditions to the Turbine Plant Cooling Water System and its individual components.

This activity constitutes completion of Action Item 2.2.1.24 as described in CAL 4-12-002. It should be noted that the purpose of this action item was to assess the effects of the flood on the Turbine Plant Cooling Water System. A detailed evaluation of the health of the Turbine Plant Cooling Water System will be conducted prior to plant startup. This evaluation will be conducted and documented in accordance with section 2.b.1.18 of the FCS Restart Checklist Basis Document.

ii. Findings

No findings were identified.

(10) CAL Action Item 2.2.1.25

i. Inspection Scope

The purpose of Action Item 2.2.1.10 was to assess the effects of the flood on the Engineered Safeguards Features (ESF) System and identify actions to restore the system. This item was required to be completed prior to exceeding 210 degrees Fahrenheit in the Reactor Coolant System.

The inspectors independently reviewed the system to identify if there were any temporary modifications in place as a result of the flood, if there were any outstanding preventive or corrective maintenance activities that had been deferred due to the flood, and reviewed CRs to determine if there were any deficiencies noted due to the flood. The inspectors reviewed CRs that were related to flooding, written between April 1, 2011 and December 31, 2011. The inspectors also conducted a complete system walkdown to identify any adverse conditions related to flooding. The inspectors compared the results of their independent assessment to those contained in the licensee's "Flooding Recovery Startup System Health Assessment" report.

The ESF System provides for coordinated automatic actuation of systems which provide safety injection, containment isolation, containment spray, containment atmosphere cooling and filtering, containment ventilation isolation, auxiliary feedwater actuation, and steam generator isolation. The system includes control devices and circuits for automatic initiation, control, supervision, and testing. Secondary protection systems provide emergency boration, main steam isolation, and safety injection room and spent regenerant tank room ventilation.

The inspectors identified no temporary modifications in place and no preventive or corrective maintenance were deferred because of the flooding. The corrective action search yielded no CRs written related to the flood or flood damage. The independent walkdown performed by the inspectors identified no adverse conditions to the ESF System and its individual components.

This activity constitutes completion of Action Item 2.2.1.10 as described in CAL 4-12-002. It should be noted that the purpose of this action item was to assess the effects of the flood on the ESF System. A detailed evaluation of the health of the ESF System will be conducted prior to plant startup. This evaluation will be conducted and documented in accordance with section 2.b.1.23 of the FCS Restart Checklist Basis Document.

ii. Findings

No findings were identified.

(11) CAL Action Item 2.2.1.26

i. Inspection Scope

The purpose of Action Item 2.2.1.26 was to assess the effects of the flood on the Waste Disposal System and identify actions to restore the system. This item was required to be completed prior to exceeding 210 degrees Fahrenheit in the Reactor Coolant System.

The inspectors independently reviewed the system to identify if there were any temporary modifications in place as a result of the flood, if there were any outstanding preventive or corrective maintenance activities that had been deferred due to the flood, and reviewed CRs to determine if there were any deficiencies noted due to the flood. The inspectors reviewed CRs that were related to flooding, written between April 1, 2011 and December 31, 2011. The inspectors also conducted a complete system walkdown to identify any adverse conditions related to flooding. The inspectors compared the results of their independent assessment to those contained in the licensee's "Flooding Recovery Startup System Health Assessment" report.

The Waste Disposal System provides a means to collect, store, process, analyze, monitor, and dispose of radioactive waste (gas, liquid and solid) to protect the plant personnel and public from exposure to radiation.

The inspectors identified no temporary modifications in place and no preventive or corrective maintenance were deferred because of the flooding. The corrective action search yielded no CRs written related to the flood or flood damage. The independent walkdown performed by the inspectors identified no adverse conditions to the Waste Disposal System and its individual components.

This activity constitutes completion of Action Item 2.2.1.24 as described in CAL 4-12-002. It should be noted that the purpose of this action item was to assess the effects of the flood on the Waste Disposal System. A detailed evaluation of the health of the Waste Disposal System will be conducted prior to plant startup. This evaluation will be conducted and documented in accordance with section 2.b.1.8 of the FCS Restart Checklist Basis Document.

ii. Findings

No findings were identified.

(12) CAL Action Item 2.2.1.27

ii. Inspection Scope

The purpose of Action Item 2.2.1.27 was to assess the effects of the flood on the Demineralized Water (DW) and Potable Water (PW) Systems and identify actions to restore the system. This item was required to be completed prior to exceeding 210 degrees Fahrenheit in the Reactor Coolant System.

The inspectors independently reviewed the system to identify if there were any temporary modifications in place as a result of the flood, if there were any outstanding preventive or corrective maintenance activities that had been deferred due to the flood, and reviewed CRs to determine if there were any deficiencies noted due to the flood. The inspectors reviewed CRs that were related to flooding, written between April 1, 2011 and December 31, 2011. The inspectors also conducted a complete system walkdown to identify any adverse conditions related to flooding. The inspectors compared the results of their independent assessment to those contained in the licensee's "Flooding Recovery Startup System Health Assessment" report.

FCS receives influent from the Blair municipal water supply. This influent of clean, filtered water provides potable water to; the Administration Building and the Training Center, the potable water tank in Room 81, and the Fire Protection System for filling and flushing. Also, it is the backup water supply to the reverse osmosis (RO) unit. The normal water supply to the RO unit is a well, located adjacent to the old warehouse. Demineralized water from the reverse osmosis (RO) unit provides pure makeup water for primary and secondary plant loads.

The inspectors identified no temporary modifications in place and no preventive maintenance was deferred because of the flooding.

The corrective action search yielded several CRs written related to the flood or flood damage. The majority of these CRs were related to the Reverse Osmosis Unit Water Storage Tank Inlet and Outlet Pumps, DW-69 and DW-70. These pump motors were damaged after being submerged in flood waters. These pump motors were replaced in accordance with action items 2.3.1.13, 2.3.1.14, 2.3.1.15, and 2.3.1.16, and documented in inspection report 05000285/2012004 (ML12276A456).

The independent walkdown performed by the inspectors identified no adverse conditions to the DW and PW Systems and its individual components.

This activity constitutes completion of Action Item 2.2.1.27 as described in CAL 4-12-002. It should be noted that the purpose of this action item was to assess the effects of the flood on the DW and PW Systems. A detailed evaluation of the health of the DW and PW Systems will be conducted prior to

plant startup. This evaluation will be conducted and documented in accordance with section 2.b.1.11 of the FCS Restart Checklist Basis Document.

ii. Findings

No findings were identified.

(13) CAL Action Items 2.2.1.30; 5.4.2.1; and 5.4.2.2

i. Inspection Scope

The purpose of Action Item 2.2.1.30 was to assess the effects of the flood on the Meteorological Monitoring System (MMS) Systems and identify actions to restore the system. This item was required to be completed prior to exceeding 210 degrees Fahrenheit in the Reactor Coolant System.

The purpose of action items 5.4.2.1 and 5.4.2.2 was to restore the Meteorological Tower (MET tower) and MET tower building. These items were to be completed prior to reactor criticality. The completion of Action Item 2.2.1.30 encompasses completion of these two action items.

Most systems reviewed as part of the flood recovery plan have follow up reviews in conjunction with the restart checklist basis document. The MMS does not, so the review of this system will include a review from just prior to the refueling outage which began in April 2011, through the end of 2012. The inspectors independently reviewed the system to identify any temporary modifications in installed and subsequently reviewed, any outstanding preventive or corrective maintenance activities that had been deferred, and reviewed CRs to determine if there were any deficiencies noted. The inspectors reviewed CRs that were related to flooding, written between April 1, 2011 and December 31, 2012. The inspectors also conducted a complete system walkdown to identify any adverse conditions related to flooding. The inspectors compared the results of their independent assessment to those contained in the licensee's "Flooding Recovery Startup System Health Assessment" report.

The MMS monitors meteorological conditions on the site and provides that information to the control room for operators to monitor. The system aids operators in making decisions regarding plant conditions during operation, and emergency preparedness decisions during events.

The inspectors reviewed a listing of all temporary modifications installed related to the MMS. Only one was identified, which installed an overhead transformer for the Meteorological Tower (Met Tower) emergency power feed. This modification was installed prior to the onset of flooding to allow for power to the Met Tower and the Met Tower building.

The inspectors reviewed the temporary modification and the associated safety-evaluation screening against the system design bases documentation, including the USAR and the technical specifications, and verified that the modification did not adversely affect the system operability/availability. The inspectors also verified that the installation was consistent with the modification documents and that configuration control was adequate. Additionally, the inspectors verified that the temporary modification was identified on control room drawings, appropriate tags were placed on the affected equipment, and licensee personnel evaluated the combined effects on mitigating systems and the integrity of radiological barriers. After the flooding had subsided, the licensee determined that this modification was to be a permanent change,

The corrective action search yielded several CRs written related to the MMS. The majority of these CRs were related to issues during the flood, specifically, the loss of certain parameters. After the floodwaters had receded, the licensee installed new instruments on the tower. The inspectors verified that the instruments were properly installed and calibrated. The inspectors also verified that the instruments were providing correct information to the plant computer.

The licensee performs an annual site survey for cathodic protection to check on the physical integrity of the tower guy wires. The annual survey was completed on October 13, 2011. All six guy wire anchors were tested and found to have a good level of protection.

The inspectors performed an independent walkdown of the MMS after the MET tower work was completed following the floods, and identified no adverse conditions to the DW and PW Systems and its individual components.

This activity constitutes completion of Action Items 2.2.1.30; 5.4.2.1; and 5.4.2.2 as described in CAL 4-12-002.

ii. Findings

No findings were identified.

(14) CAL Action Items 4.3.1.1; 4.3.1.2; 4.3.1.3; and 4.3.1.4

v. Inspection Scope

The purpose of Action Items 4.3.1.1; 4.3.1.2; 4.3.1.3; and 4.3.1.4 was to identify those configuration changes that were installed to combat the flooding, determine which of those would be made permanent, and prioritize and schedule the removal of the remainder. These items were required to be completed prior to exceeding 210 degrees Fahrenheit in the Reactor Coolant System.

There were 105 items that were installed to combat the floods. For the most part, these could be classified as temporary modifications. Of all the items, the licensee decided to keep three of them permanent: the wall system installed

around the main transformers; the gravel parking lot along Highway 75; and the access road from the new gravel parking lot to the switchyard.

The majority of the remaining items were removed in conjunction with another flood recovery action plan, only three items were related to the CAL. Action item 2.1.1.10 to remove plugs placed in the transformer pit area was closed and documented in inspection report 05000285/2012003 (ML12226A630). Additionally, there was an item to repair leakage into the intake structure from Manhole 31, and that will be verified complete by action item 3.2.2.2, and there was also an item to investigate subsurface soil. That will be verified complete in section 2.b.3 of the CAL.

Though most of the configuration changes were unrelated to the CAL, the inspectors verified that all other items were complete.

Even though the items associated with manhole 31 and the subsurface soil have not been verified complete, these action items were created to schedule the completion of removal of the configuration changes. Since the two open items will be verified complete by other items in the CAL, this activity constitutes completion of Action Items 4.3.1.1; 4.3.1.2; 4.3.1.3; and 4.3.1.4 as described in CAL 4-12-002.

ii. Findings

No findings were identified.

.3 Adequacy of Significant Programs and Processes

Section 3 of the Restart Checklist addresses major programs and processes in place at FCS. Section 3 reviews will also include an assessment of how the licensee appropriately addressed the NRC Inspection Procedure 95003 key attributes as described in Section 6.

.a Corrective Action Program

(1) Inspection Scope

The Corrective Action Program and the use of industry Operating Experience at a nuclear power plant is a key element in ensuring the licensee's ability to effectively detect, correct, and prevent problems. A properly functioning Corrective Action Program is also a basis for licensee operation within the Reactor Oversight Process. Based upon observed problems with Corrective Action Program effectiveness, in both multiple examples of significant findings and identified issues in an NRC problem identification and resolution inspection, the licensee is performing a comprehensive review of this program.

The NRC will assess the licensee's review and potential changes to the Corrective Action Program. The NRC will also conduct independent inspections to validate whether the Corrective Action Program is appropriately functioning.

For the assessment period covered by this inspection report, the onsite activities included interviews site personnel associated with the Performance Improvement department to continue to get a better understanding of the site Corrective Action Program processes. The inspectors also observed Corrective Action Program meetings such as Station Corrective Action Review Board (SCARB). Through the performance of other inspections associated with this inspection report, the inspectors continue to make Corrective Action Program observations as well. The in-office activities, which were conducted at the inspectors' regular duty stations, consisted of reviews of root-cause analyses, CRs and procedures associated with the Corrective Action Program.

(2) Assessment

During this assessment period, the inspectors attended one SCARB. To be able to reasonably assess these processes, the inspectors will continue attend more of these meetings and observe more of the Corrective Action Program processes during future on-site inspection weeks. In general, the inspectors noted a general attitude to follow the Corrective Action Program procedures and healthy willingness to express dissenting views during Corrective Action Program meetings.

The inspectors noted an example where the licensee failed to enter conditions adverse to quality in the Corrective Action Program is documented in Section 4OA4.1.a of this report. This section contains a finding documented for the licensee's failure to properly maintain the functionality of the circulating water river sluice gates. There was a Corrective Action Program aspect to that issue where the licensee found multiple deficiencies with the sluice gates that were not entered into the Corrective Action Program and as a result were not corrected in a timely manner.

(3) Findings

No findings of significance were identified.

.b Equipment Design Qualifications

This item of the Restart Checklist verifies that plant components are maintained within their licensing and design basis. Additionally, this item provides monitoring of the capability of the selected components and operator actions to perform their functions. As plants age, modifications may alter or disable important design features making the design bases difficult to determine or obsolete. The plant risk assessment model assumes the capability of safety systems and components to perform their intended safety function successfully.

(1) Inspection Scope

.i Safety-Related Parts Program

A number of instances have been identified where non-safety-related parts have been installed into safety-related applications. FCS will perform reviews to identify conditions where a non-safety-related component or subcomponent was improperly used in a safety-related application. The NRC assesses the licensee's equipment design qualifications review for inconsistent quality classifications. Additionally, the NRC assesses the licensee's review of the use of non-safety-related parts in safety-related applications. This will ensure proper design attributes have been incorporated and implemented.

(2) Assessment

The inspectors reviewed the RCA for CR 2012-05615, "Collective Significance - CQE" with respect to restart checklist item 3.b.1 and found significant deficiencies. The RCA credited the actions in the apparent cause analysis (ACA) for CR 2011-9459 for the stations ability to classify Safety Related systems, structures, and components. Upon review the inspectors noted that the ACA had fundamental weaknesses. Specifically, the apparent cause and contributing cause did not have clear correlation to the problem statement. The analysis is not clearly presented within the ACA as to how the issue is being corrected. The licensee documented this concern in CR 2012-20485.

The RCA for 2012-05615 also contained several weaknesses and several areas that could use clarification. Several statements had no relevance or tie made to the RCA or subject being discussed. The inspectors questioned how the interim corrective actions supported and ensured compliance given the stated problems. The inspectors also noted that the RCA was inadequate in that it did not discuss or define what the licensee was committed to with respect to the current design and licensing basis of the station and how it complied with 10CFR50 Appendix B. The licensee documented the inspector's concerns in CR 2012-20486.

Absent the above information the inspectors were unable to determine the adequacy of the corrective actions for 2011-9459 and 2012-20485 with respect to restart checklist item 3.b.1.

(3) Findings

No findings of significance were identified.

.c Design Changes and Modifications

Modifications to risk-significant structures, systems, and components can adversely affect their availability, reliability, or functional capability. Modifications to one system may also affect the design bases and functioning of interfacing systems. Similar modifications to several systems could introduce potential for common cause failures that affect plant risk. A temporary modification may result in a departure from the design basis and system success criteria. Modifications performed during increased risk configurations could place the plant in an unsafe condition.

This item assesses the effectiveness of the licensee's implementation of changes to facility structures, systems, and components, risk significant normal and emergency operating procedures, test programs, evaluations required by 10 CFR 50.59, and the updated final safety analysis report. The NRC will inspect to provide assurance that changes have been appropriately implemented.

(1) Inspection Scope

.i Vendor Modification Control

NRC inspections indicated that several vendor modification packages did not ensure critical characteristics were identified and properly addressed. To address this issue, FCS will review work performed by vendors. The NRC will evaluate the effectiveness of the vendor program to ensure adequate oversight of vendor work. NRC inspectors interviewed station personnel and contractors that performed the licensee's reviews of the vendor modifications.

.ii 10 CFR 50.59 Screening and Safety Evaluations

NRC inspections indicated that several changes to the facility were not properly screened or evaluated per the requirements 10 CFR 50.59. Plant and procedure modifications will be reviewed to determine if modifications required a 10 CFR 50.59 review. The assessment of Design Changes/Modifications will take into account the key attributes of Inspection Procedure 95003 (Sections 02.03 and 03.03). The NRC will evaluate the effectiveness of the licensee's 10 CFR 50.59 process to ensure proper treatment changes to the facility. NRC inspectors interviewed station personnel and contractors that performed the reviews of 50.59 documents.

(2) Assessment

The licensee's technical review board did not approve its closure package for the vendor modifications restart checklist item because of concerns about interim corrective actions and whether the corrective actions would prevent recurrence of the vendor modification issues that contributed to the red finding. The licensee reviewed operating experience about vendor oversight programs in general. The inspectors expressed concern to the licensee that its operating experience review for the selected modifications lacked a review of possible operating experience directly associated with the specific system or components being modified. In response to this concern, the licensee indicated that the purpose of the review was to focus on programmatic weaknesses to correct going forward rather than perform a design verification review of past modifications.

The licensee's RSAC forms described the scope of vendor modification review as including a focus on the technical adequacy of the modifications. The inspectors interpreted the procedure for the review to mean that the review would also look at

the adequacy of the modification design. The licensee stated that a "technical review" was different than a "design verification review." Additional inspection and discussion on this topic will continue into the next inspection period.

The licensee scheduled its second technical review board for this restart checklist item closure package for January 28, 2013, which means the closure package would likely be ready for NRC inspection in mid to late February 2013. These dates are subject to change.

The licensee scheduled its technical review board for the 50.59 closure package for January 21, 2013, which means the closure package would likely be ready for NRC inspection in mid to late February 2013. These dates are subject to change.

(3) Findings

No findings or violations of NRC requirements were identified; however, the NRC will continue its assessment of these CAL items.

.5 Assessment of NRC Inspection Procedure 95003 Key Attributes

Section 5 of the Restart Checklist is provided to assess the key attributes of NRC Inspection Procedure 95003. Performing aspects of Inspection Procedure 95003 will provide the NRC with supplemental information regarding licensee performance, as necessary to determine the breadth and depth of safety, organizational, and programmatic issues. While the procedure does allow for focus to be applied to areas where performance issues have been previously identified, the procedure does require that some sample reviews be performed for all key attributes of the affected strategic performance areas. The key attributes are listed as separate subsections below. It is intended that the activities in these subsections be conducted in conjunction with reviews and inspections for Sections 1 – 4, rather than a stand-alone review. The NRC will perform a detailed review of the Auxiliary Feedwater System as part of the Inspection Procedure 95003 assessment.

.f Emergency response

Portions of Section 5.f of the Restart Checklist contains those items necessary to ensure that important structures, systems and components affected by the flood and safety significant structures, systems and components at FCS are in appropriate condition to support safe restart and continued safe plant operation.

.1 Flood Recovery Plan Actions Associated With Facility and System Restoration

On August 30, 2011, FCS issued Revision 1 to the "Fort Calhoun Station Post-Flooding Recovery Action Plan," that provided for extensive reviews of plant systems, structures, and components to assess the impact of the floodwaters. On September 2, 2011, the NRC issued CAL 4-11-003, listing 235 items described in the FCS, FRAP that the licensee committed to complete. These 235 items were broken down into three sections: items to complete prior to exceeding 210 degrees

Fahrenheit in the reactor coolant system, items to complete prior to reactor criticality; and items to complete following restart of the plant. On June 11, 2012, the NRC issued CAL 4-12-002. This CAL incorporates all the actions required by CAL 4-11-003.

The areas to be inspected are identified in the CAL. Inspection items are considered complete when the licensee has submitted a closure package that has been satisfactorily reviewed by the inspectors

.a Perform a Full Cycle Test of the Alert and Notification System (Flood Recovery Plan Item 5.1.2.8)

(1) Inspection Scope

The licensee's offsite Alert and Notification System consists of 101 outdoor warning sirens and local emergency alert system radio stations. The licensee's emergency plan provides for an annual system test of the entire siren system to ensure the capability exists to alert members of the public to an emergency condition. The purpose of this flood recovery action item was to ensure the system functioned in accordance with its design after restoration to its pre-flood condition. The inspectors performed an in-office review of the closure verification checklist and supporting documentation for Flood Recovery Action Item 5.1.2.8, Revision 3, dated September 7, 2012, and concluded the action item was completed because the August 28, 2012, test was in the system's pre-flood configuration.

This activity constitutes completion of the Perform a Full Cycle Test action item as described in CAL 4-11-003.

(2) Inspection Scope

No findings were identified.

4OA5 Other Activities

Auxiliary Feedwater System 95003 Team Inspection (IP 95003, IP 92702)

The major purpose of this inspection was to meet the intent of Inspection Procedure 95003, Section 2.03, "Assessment of Performance in the Reactor Safety Strategic Performance Area." This procedure section has guidance on selecting a system and inspecting it against five of the six key attributes for the reactor strategic performance area (design, human performance, procedure quality, equipment performance, and configuration control). Security is the sixth key attribute and is not covered under this inspection activity. The Auxiliary Feedwater System was selected for this inspection by the NRC management team in Region IV based on its high risk for core damage and historical equipment issues. This inspection was performed as a "deep dive", or vertical slice, through the Auxiliary Feedwater System with an emphasis on the key attributes and previous performance issues as listed

below in the scope section with the objective of verifying its capability to perform its intended functions with a sufficient margin of safety.

Inspection Scope

In order to inspect against the key attributes of design, equipment performance, and configuration control, the team inspected both mechanical and electrical design basis attributes for these components. The team also verified that the selected risk significant components and operating procedures were consistent with the design and licensing bases. The team focused more on modifications rather than original system design. The team also independently assessed the extent of risk significant design issues, including a review of the as-built design features of the Auxiliary Feedwater System. The FCS Auxiliary Feedwater System is comprised of one motor-driven pump (FW-6), one turbine-driven pump (FW-10), and one diesel-driven pump (FW-54). There are also several tanks of water available for these pumps as well as several supporting valves required for proper operation. For the design, equipment performance, and configuration control attributes, a detailed review and walkdown of the system was performed.

For procedure quality and human performance attributes, a simulator scenario was developed and ran on a licensed crew with simulated accident conditions requiring auxiliary feedwater. The detailed review and walkdown of various portions of the system also provided insights for the team into these two key attributes.

The NRC Region IV management team provided a detailed scope of items for this inspection that included:

1. Ensure that all corrective actions for the Special Inspection performed on this system in 2010 (documented in Inspection Report 05000285/2010006) are complete and are in accordance with current licensing basis

2. Assess the overall effectiveness of the corrective actions associated with the design and related deficiencies of the system

3. Verify modifications made to the turbine driven auxiliary feedwater pump (AFW) and the overall system comply with 10 CFR 50.59 and current design and licensing basis

4. Verify that the turbine driven AFW cage enclosure is seismically qualified

5. Verify the Auxiliary Feedwater System is being operated in accordance with vendor recommendations and current design and licensing documents

6. Inspect the diesel-driven AFW because it is a non-safety pump and relied upon heavily during emergency operating procedure and abnormal operating procedure conditions

7. Verify that the system is in compliance with the maintenance rule

8. Evaluate the interfaces between engineering, operations, maintenance, and plant support groups

To verify that the selected components would function as required, the team reviewed design basis assumptions, calculations, and procedures. In some instances, the team performed calculations to independently verify the licensee's conclusions. The team also verified that the condition of the components was consistent with the design bases and that the tested capabilities met the required criteria.

The team reviewed maintenance work records, corrective action documents, and industry operating experience records to verify that licensee personnel considered degraded conditions and their impact on the components. For the review of operator actions, the team observed operators during simulator scenarios, as well as during simulated actions in the plant. Equipment reliability issues were also considered in the selection of components for detailed review. These included items such as failed performance test results; significant corrective actions; repeated maintenance; 10 CFR 50.65(a)1 status; operable, but degraded conditions; NRC resident inspector input of problem equipment; system health reports; industry operating experience; and licensee problem equipment lists. Consideration was also given to the uniqueness and complexity of the design, operating experience, and the available defense in-depth margins.

Findings and Observations

Findings

1. Failure to Adequately Implement the Maintenance Rule Program

   Introduction. The team identified a Green NCV of 10 CFR 50.65, “Requirements for monitoring the effectiveness of maintenance at nuclear power plants,” which states, in part, that “the licensee shall monitor the performance or condition of structures, systems, or components, against licensee-established goals, in a manner sufficient to provide reasonable assurance that these structures, systems, and components are capable of fulfilling their intended functions. These goals shall be established commensurate with safety and, where practical, take into account industry-wide operating experience.” Specifically, from March of 2012 until October of 2012, the licensee allowed the maintenance rule program to deteriorate by not performing initial screenings in a timely fashion (some were being done months later) and the actual evaluation of the equipment status was not being done at all for eight months. Consequently, several components including electrical relays for safety injection actuation and an electrical load center were not characterized in a timely fashion.

   Also, the licensee was not implementing the operating experience program as required by this regulation. The licensee chose to stop performance of level 1 and level 2 operating experience evaluations by direction from the senior management in August of 2012 because of personnel resource concerns. Several examples where operating experience was not done correctly that subsequently led to equipment issues included

the containment spray pump low oil issues (ACA 2008-5695), vendor manual updates, and loose fasteners (both electrical and mechanical) from San Onofre Nuclear Generating Station LERs 3612007005, 3612007006, and 3612008006.

Description. The team reviewed CRs related to auxiliary feedwater as part of the inspection and noticed several reports related to pump FW-54, the non-safety diesel-driven feedwater pump. The team asked to see the maintenance rule status of this pump and noticed that in spite of several failures that it had not been placed into a(1) status in the maintenance rule program. After discussions with the maintenance rule program owner, the team discovered that he had written a CR out of concern for maintenance rule program work that had not been performed while he was assigned to the recovery group between March and October of 2012. This report was CR 2012-15674. The team knew from the inspection plan that this pump was used more than the safety-related pumps in emergency procedures as well as during start-up and shutdown plant operations. When the team reviewed the maintenance rule functional failure category for this pump from the "Functional Scoping Data Sheet," Revision 6a, they determined that it required three functional failures for escalation to a(1) status within the maintenance rule. The team continued to review CRs for this pump and found that three failures had occurred in the past 36 months which would have required escalation to a(1) status. This included an event where the alternator arm on the diesel engine portion of the pump was broken and consequently would not have performed its function as described in the scoping document (CR 2009-0976 and CR 2012-11998). The team interviewed various staff members at the station about these failures and there was disagreement as to what constituted a functional failure of the equipment. The team also compared the number of functional failures that the safety-related auxiliary feedwater pumps (FW-6 and FW-10) required for escalation to a(1) status (one functional failure allowed or 1FF) against the number for the non-safety pump (three functional failures or 3FF) and found that the risk did not appear to be managed appropriately based on the use of the non-safety pump FW-54. By design, it is the only pump that can be used to feed the steam generators during start-up and shutdown conditions due to a design issue with the recirculation lines of the main feed pumps (they overheat at low flows which occur during start-up and shutdown). The safety-related pumps FW-6 and FW-10 are not allowed to be used for start-up and shutdown procedurally because of Technical Specification and equipment alignment issues that can occur during this process. Additionally, in the emergency procedures such as EOP-00, "Standard Post-Trip Actions," it is the first pump that the control room is directed procedurally to start. The team concluded that it appears that the functional failure status of FW-54 should not be 3 but should be a 2 or even a 1 such as the two safety-related pumps. The team communicated these concerns to the station during the inspection debrief on November 8, 2012.

An additional concern that the team had with the maintenance rule program implementation was the fact that between March of 2012 until October of 2012, the licensee allowed the maintenance rule program to deteriorate by not performing initial screenings in a timely fashion (some were being done months later) and the actual evaluation of the equipment status was not being done at all for eight months. Consequently, several components including electrical relays and load centers were not

characterized in a timely fashion. The electrical relay failure involved an 86B/SIAS relay that failed in April of 2012 (CR-2012-02219) and the maintenance rule review was not performed until October 24, 2012, with the determination that it's a(1) performance criteria had been exceeded (CR 2012-16318). The load center failure involved a fire in load center MCC-3B3, which was de-energized on May 11, 2012, (CR 2012-04015) and the maintenance rule review was not performed until October 25, 2012, with the determination that it's a(1) performance criteria had been exceeded (CR 2012-16450).

During the inspection, the team noticed that many of the events that occurred at the station might have been prevented if operating experience had been correctly implemented. The team interviewed several staff at FCS that were responsible for implementing this program and noted a number of deficiencies. For example, several staff members were assigned operating experience to review that did not have the required knowledge or experience to perform the review. The qualification cards did not require any prerequisites to be an operating experience reviewer. Consequently, these reviews were not performed adequately. Additionally, the licensee chose to stop performance of level 1 and level 2 operating experience evaluations by direction from the senior management in August of 2012 because of personnel resource limitations. Several examples where operating experience was not adequately evaluated and contributed to equipment issues included the containment spray pump low oil issues (ACA 2008-5695), vendor manual updates, and loose fasteners (both electrical and mechanical) from San Onofre Nuclear Generating Station LERs 3612007005, 3612007006, and 3612008006. This finding was entered into the licensee's Corrective Action Program as CR 2012-15674 for the maintenance rule issues and CRs 2012-16503, CR 2012-14042, and CR 2012-16476 for the operating experience issues. The licensee entered the violation aspects of this finding into the Corrective Action Program as CR 2012-17572.

Analysis. The team determined that the failure to adequately implement the maintenance rule was a performance deficiency. The performance deficiency was more than minor, and therefore a finding, because if left uncorrected it could lead to a more serious concern. Using Manual Chapter 0609, Attachment 4, Significance Determination Process router on Table 3, it sends the user to Appendix G for "Shutdown Operations Significance Determination Process." Using Checklist 4 of Appendix G for the given plant conditions, the finding was determined to have very low safety significance (Green) because the finding did not 1) increase the likelihood of a loss of RCS inventory, or 2) degrade the licensee's ability to terminate a leak path or add RCS inventory when needed, or 3) degrade the licensee's ability to recover decay heat removal once it is lost. This finding was determined to have a cross-cutting aspect in the area of human performance associated with the decision-making component because the licensee did not use conservative assumptions in decision making and did not identify the possible unintended consequences of suspending maintenance rule program activities and the corresponding impact on the program [H.1(b)].

Enforcement. The team identified a Green NCV of 10 CFR 50.65, "Requirements for monitoring the effectiveness of maintenance at nuclear power plants" which states, in part, that "the licensee shall monitor the performance or condition of structures, systems,

or components, against licensee-established goals, in a manner sufficient to provide reasonable assurance that these structures, systems, and components are capable of fulfilling their intended functions. These goals shall be established commensurate with safety and, where practical, take into account industry-wide operating experience." Contrary to the above, the licensee did not monitor the performance or condition of structures, systems, and components between March and October of 2012, in that initial screenings were not done in a timely fashion (some were being done months later) and the actual evaluation of the equipment status was not implemented for approximately eight months. Consequently, several components, including electrical relays and electrical load centers, were not appropriately characterized in accordance with maintenance rule requirements. Also contrary to the above, the licensee did not take into account industry-wide operating experience for equipment based on the decision to suspend performance of level 1 and level 2 operating experience evaluations in August of 2012 based on staff resource concerns. This finding was entered into the licensee's Corrective Action Program as CR 2012-17572. Because this violation was of very low significance (Green) and has been entered into the licensee's Corrective Action Program, this violation is being treated as a NCV consistent with the NRC Enforcement Policy: NCV 05000285/2012012-04, "Failure to Adequately Implement the Maintenance Rule Program."

Observations

1. Key Attribute Review and Results

   The team determined that there were deficiencies in all five of the key attribute areas reviewed as discussed below:

   a. Key Attribute "Design"

      The team identified a minor violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," for failure to ensure that the design bases for the emergency diesel generators were correctly translated into specifications, drawings, procedures, and instructions." Specifically, as of May 24, 2012 (CR 2012-04506), the licensee had two calculations (EA-FC-03382 and calculation EA-FC-92-072) in active status for the emergency diesel generator loading evaluation, thus failing to assure that plant design basis information was captured and recorded in a uniquely identified document. By having the two calculations concurrently active, the licensee left open the possibility for contradictory information to be included in the system design basis. As early as May 24, 2012, the licensee corrective action reports recommended that calculation EA-FC-03382 be superseded, but failed to do so. Calculation EA-FC-03382 was described by the licensee as not being in conformance with the current plant configuration. The finding is minor because it was a clerical mistake and the system owner knew that the old calculation was obsolete but was not timely in removing it from the system.

A second design issue that the team found was the low margin in the direct current circuit calculations. The team reviewed calculation FC-05690, Revision 9, "Battery Load Profile and Voltage Drop Calculation," to verify the adequacy of dc supply to the AFW (FW10) turbine-driven pump oil pump. The review attempted to ascertain if the plant safety-related station batteries were appropriately sized and had sufficient capacity to supply the direct current loads under the required operating conditions without their output voltage dropping below a specified minimum value. Given the time constraints for performing the review, the team focused on conditions exhibiting the lowest margins, which was the 8-Hour Design Basis Accident (DBA). As depicted in the calculation page 71, for battery 1, case 1E, 1F, scenario 4-DBA 8hr+DBA, the margin was 0.075kW/0.6A. As the margins were expressed in kW/A, there was no way to relate them to the original capacity and the team made a calculation to express margin in percent. As there was no way to estimate in which battery loading step the margin relationship could be made, the team considered an average between the margin related to the heaviest loaded step and to the lowest loaded step. This is indicated below:

- From Scenario 4, Table on p.68, Margin related to maximum step loading (T2): 967.49A, then (0.6/967.49) x 100 = 0.062%

- From Scenario 4, Table on p.68, Margin related to minimum step loading (T9): 215.61A, then (0.6/215.61) x 100 = 0.278%

- Average margin related to full loading step: (0.062+0.278)/2 = 0.17%

The team was concerned that little margin was available, as intrinsic computational errors were not considered, and other issues such as contact resistances were disregarded. While two large loads will be removed from the battery by implementation of NRC order EA-12-049, March 12, 2012, the removal of these loads will have an effect on the voltage at the battery for the connected downstream devices. However, since the loads to be removed would normally operate at the beginning of the battery discharge period, the effect on the terminal voltage is not known until a calculation is performed.

A third design issue that the team found was an inconsistency between the design documentation and plant procedures during a station black-out. For station black-out, the team reviewed the plant calculation for the loading conditions for emergency diesel generator DG-1, which will power the motor-driven AFW pump (FW6), connected to class 1E 4160V bus 1A3. If the preferred power source is lost, the bus automatically transfers to the alternate source. If both sources are lost, the emergency diesel generator starts and automatically powers the bus. The motor-driven AFW pump (FW6) is automatically sequenced to the emergency diesel bus upon loss of AC power. The calculation provided a bounding model of the expected loading of each of the emergency diesel generators DG 1 and DG 2 as a result of automatic loading in response to a

design basis accident (a Loss of Coolant Accident -LOCA- coincident with a loss of offsite power). The plant calculation for emergency diesel generator fuel consumption, FC03382 Rev. 19 page 22, states, in part, that "DG-1 operates as lead, DG-2 is shut down after 8.5 hours..." The team noted that procedural guidance could not be identified instructing the operators to shut down DG-2 after 8.5 hours if the accident was still in progress and there was no offsite power available. This issue is discussed in more detail below in the procedure quality attribute section.

During an NRC walkdown the team identified that apparently one of the three rear brackets for the reactor head lift rig storage anchors was only attached to grating. The acceptability of this configuration was questioned. Calculation FC06499 “Evaluation of Reactor Head Lift Rig Storage Anchors” was reviewed. The calculation was performed assuming that only two of the three rear brackets were bolted to structures (the third bracket was only considered to support compression loads; no tensile or shear). The review identified several concerns:

1) The calculation did not address the seismic load factors correctly.

2) The calculation did not transfer the load to the anchors correctly. One leg is supported only in the vertical direction; allowing that leg to potentially "slide" as a result of a seismic event.

3) The calculation simply lists the results of a calculation that was performed to determine the frequency of the lift rig as an input to calculation Fc06499, but does not provide the supporting calculation.

4) The frequencies within the calculation may be incorrect, due to having two of the anchor plates pinned and the other supported only in the vertical direction (the vendor may have assumed all three anchor plates were pinned).

The calculation did not address the seismic load factors correctly resulting in an unconservative seismic load evaluation. The calculation also did not properly transfer the load correctly to the concrete anchor bolts. These resulted in only shear loads and not bending/tension and shear loads on the anchor bolts. Both of these concerns result in an unconservative analysis for the structure and anchor bolts. The team had a further concern with this structure in that the natural frequencies for this structure were calculated by Westinghouse and included as Attachment 1 to the calculation. Attachment 1 only provides the results of the frequency calculation of the structure. Since Attachment 1 does not provide any information to determine if the structural model was supported by three legs as originally designed or by two legs as installed, the two leg analysis will result in lower frequencies. Lower frequencies will result in greater acceleration resulting in larger loads on the structure and anchor bolts. The licensee’s seismic engineer agreed that there were problems with the analysis and wrote CR 2012-17333 to address these issues.

b. Key Attributes “Human Performance” and “Procedure Quality”

These two key attributes were combined because they were linked for several of the issues discussed below.

As stated above, during the review of emergency diesel calculations, the team discovered that procedure guidance is missing to shutdown a running diesel during a design basis loss of offsite power event concurrent with a loss of coolant accident (LOOP/LOCA) as directed and planned within the licensee’s calculation and design basis documents. Calculation EA-FC-92-072 (EA97-072) provides the basis for the seven day supply of fuel oil for the emergency diesel generators. This calculation credits the use of a “fuel conservation strategy” that includes securing one of the operating emergency diesel generators to preserve fuel. However, this fuel conservation strategy was not incorporated into station emergency procedures. Without these steps included in a procedure as credited in the calculation, the validity of the calculation is challengeable, and this calculation and associated fuel strategy is the basis for the amount specified in Technical Specification section 2.7. This strategy is also not included in Emergency Plan Implementing Procedures. Furthermore, if the licensee were to do this (deliberately shutting down a diesel generator while in these conditions), this could potentially escalate the Emergency Action Level response from a Notice of Unusual Event (NOUE) condition to an ALERT condition. The licensee is evaluating this with CR 2012-17451.

Additionally, there were problems noted with procedures needed to transfer fuel oil from the alternate sources to the emergency diesel generator day tanks and between tanks FO-1 and FO-10. The licensee is tracking these procedure issues with CR 2012-09112.

As discussed in other sections of the report, the team noted that the non-safety pump FW-54 was often used as the first priority pump to establish the auxiliary feedwater safety function instead of one of the two safety-related pumps FW-6 or FW-10. Emergency Operating Procedures EOP-00 “Standard Post-Trip Actions” and EOP-02 “Loss of Off-Site Power Loss of Forced Circulation” both use the non-safety pump FW-54 as the first priority pump instead of pumps FW-6 or FW-10.

The team noted that procedure EOP-02 has steps for local throttling of HCV-1107B/1108B valves that are not required or desired in circumstances for this procedure with today’s plant configuration. Also, the operators that were part of the walkdown were asked how they would locally throttle these valves as directed by the control room in these circumstances and they replied that they would use Abnormal Operating Procedure AOP-6 “Fire Emergency,” which has steps for throttling these valves, but this procedure is not applicable for these plant conditions. The team determined that this was a human performance attribute issue and further review was needed. The team created a simulator

scenario with the training staff that included a loss of offsite power sequence with pump FW-54 out of service for the scenario duration. This would force the crew to implement these steps for local throttling of valves HCV-1107B/1108B. Once this scenario was run on a licensed crew in the simulator, they did not follow the procedure steps to locally throttle the valves because they had control in the control room for these valves and therefore it was not necessary or desired to direct local throttling of the valves. The team asked the licensed operators follow-up questions on this topic and the answer provided was that these steps in AOP-6 for local throttling do not apply for the circumstances of a loss of offsite power. The licensed operators and instructors further explained that if local throttling were needed, the proper place for those steps while in the emergency operating procedures would be in a floating step or attachment within the emergency operating procedure framework. The team agreed with this explanation. Overall, the team was concerned that procedural guidance for performing a certain activities would sometimes require use of other procedures that may not apply for the given evolution creating confusion. The team noted the site used a deviation process to overcome poor procedure quality to line-out procedure steps that either do not apply or are incorrect and then proceed with a "skill-of-the-craft" approach to complete a task. In the case of this scenario, the licensed operators ignored the steps to locally throttle the valves because they determined that they did not apply. This is not in alignment with NRC expectations as defined in the plant license and individual licensed operator license conditions that clearly state that "You shall follow all plant procedures." If a procedure is incorrect or missing steps, the NRC expects the station to use the corrective action process to correct procedure deficiencies. In April of 2012, the FCS management team determined that procedure quality was a site-wide problem after an NRC initial exam was completed. The site included procedure quality as part of a larger review at the site to address procedure quality issues with CR and RCA 2012-08136. The licensee is evaluating the items found during this inspection related to procedure quality and human performance with CR 2012-17454.

c. Key Attribute "Equipment Performance"

During the plant walkdown inside containment, the team found loose conduit fittings for AFW valve HCV-1108B. The team was concerned that the valve might not perform as designed with these loose conduit fittings because they could fail to provide adequate protection for the enclosed cables, particularly during design basis events. The licensee issued CR 2012-16160 to address this issue.

The team questioned the adequacy of the emergency feedwater tank's sight glass (FW-19) for a seismic event. In response to the team's question, the licensee performed an evaluation of system interactions which was completed and attached to CR 2012-14517. The licensee and team agreed that the site glass is functional but nonconforming. Action item AI-001 of CR 2012-14517 addressed fixing this problem prior to start up, while action item RE-002

addresses the larger extent of condition, and action item RE-003 addresses prevention of reoccurrence.

The team was asked as part of the scope of this inspection to review all corrective actions related to the violations contained in the NRC Special Inspection report on AFW, IR 05000285/2010006. Corrective action verification for three of the four violations could not be completed because they require a post-modification test to ensure that all corrective actions were appropriate. The post-modification test could not be completed until steam is available to run the turbine-driven AFW pump (FW-10). The corrective action items were reviewed by the team relative to NCV 2010006-01 “Failure to Correct Repeated Tripping of the Turbine-driven Auxiliary Feedwater Pump FW-10” and NCV 201006-02 “Failure to Verify that the Turbine-driven Auxiliary Feedwater Pump Exhaust Backpressure Trip Lever was Fully Latched.” These items were addressed in RCA-2010-813 R2 “Steam Driven AFW (FW-10) Tripped Off” dated 08-02-2010. This RCA review also included information contained in CRs 2009-0905, CR 2009-1611, CR 2010-0813, and CR 2010-0910. Also included in this CR is the Mitigating Systems Performance Indicator (MSPI) “NRC-6” for the Auxiliary Feedwater System, which became red at FCS as a result of the February 17, 2010, trip of FW -10 (Level A CR 2010-0910). This RCA concluded that "Management has not established a culture for applying rigor in the use of the Systematic Approach to Training (SAT) to assure that the organization has the technical knowledge of the FW-10 control systems and operating characteristics."

The licensee performed modifications on the system with EC 48714, Revision 1. The intent of the modification was to increase the probability that FW-10, the Steam Turbine Driven Auxiliary Feedwater Pump, will start and reach the required operating speed and perform its design function. This modification installed a clamp to hold the trip latch and reset levers together at the interface so that they will not unintentionally separate preventing an inadvertent trip of the governor control linkage. The backpressure trip cylinder/plunger (currently tagged FW-64), which pushes upward on the trip latch lever and is actuated by high turbine exhaust housing pressure, will be removed since its function is not needed. Its function was never needed at this station because of the piping configuration at the pump. With the addition of the clamp, this function is also defeated. It is still not clear to the licensee why the backpressure trip was originally specified in the original plant construction and the team could not find any documentation that would substantiate a need for this trip. The ability to hand trip the machine locally, remains. However, the clamp (easily removable) must be removed first.

This modification will apparently eliminate the unintended tripping of turbine-driven AFW Pump FW-10. However, the issue cannot be closed until testing is completed. Testing requires steam which currently plant conditions do not support.

d. Key Attribute "Configuration Control"

The team reviewed modifications performed on the motor of the motor-driven AFW (FW-6) while it was at the rewind shop. The report sent back with the motor revealed that it had non-safety processes applied and non-safety parts installed without adequate justification. This is a potential configuration control issue because an adequate 50.59 process evaluation would need to be done and have proper justification to allow non-safety parts and processes applied to a safety-grade motor. After the team pointed this out to the licensee, they determined that the acceptable level of detail regarding the critical characteristics evaluation was missing from the Engineering Change EC 46260 for refurbishment of this motor. A complete review by the team of this issue was not possible because of the timeliness of the report from the vendor that performed the rewind work and the fact that the licensee's review of the applicable design documents was not complete. The licensee is currently performing an extent of condition review for other safety-related motors that were refurbished with this process to check for other configuration control issues.
CR 2012-17385 was written for this issue.

During a previous NRC inspection the seismic capability of the cage built around the turbine-driven AFW pump FW-10 was a concern. In response to the NRC question a seismic analysis for the cage (Calculation FC07828, revision 0) was performed. The purpose of this calculation was to perform a seismic analysis of the FW-10 surrounding cage. The surrounding cage was built to protect FW-10 from soft targets, inadvertent intrusion, and other seismic interactions. The calculation was reviewed and found to have included the structural frame and attached panels in a "GTStrudl" model. The model of the structural cage was generated with the establishment of the natural frequencies and modes of the cage, the anchorage forces, and the member stresses. Also calculated were the interaction ratios for members. The cage and anchorage were evaluated using class I allowable methodology. A three dimensional model of the cage was generated based on existing drawings augmented by field measurements and observations. During the team walkdown of the pump cage area it was noted that several concrete anchor bolts were missing (bolt holes in the structure frame without anchor bolts). The calculation accounted for these missing bolts in the structural analysis. The calculation concluded that the structure including anchor bolts was adequate for the seismic loading condition. The team agreed with the conclusions of the calculation.

2. Scope Review and Results

a. Ensure that all corrective actions for the Special Inspection performed on this system in 2010 (documented in report 05000285/2010006) are complete and are in accordance with current licensing basis:

The team reviewed most of the corrective actions for the four NCVs from the special inspection but could only verify all corrective actions were complete for

NCV 2010006-03, “Failure to vent control oil following maintenance results in failure of the turbine-driven AFW pump to start.” The other three violations from this inspection report require steam and a post-maintenance test for the turbine driven pump to verify that equipment, training, and human performance issues are resolved. This will have to be done later by another inspection team.

b. Assess the overall effectiveness of the corrective actions associated with the design and related deficiencies of the system:

The team reviewed some items where corrective actions were thorough and prompt but found one case where no action has been taken for two CRs generated on a required calculation for the emergency diesel generators that had two calculations that were active at the same time and each had clearly different information in them. This issue was also not timely (six months open with a closure date in CR 2012-04506 of June 2013).

c. Verify modifications made to the turbine driven AFW and the overall system comply with 10 CFR 50.59 and current design and licensing basis:

The team did not find any issues with the modifications done to the turbine driven pump, however the validation of these efforts will be done when steam is available and the post-maintenance test is completed. The auxiliary operators discussed during interviews a CR that operators had written on the concern about manually tripping the turbine when needed locally at the turbine might be a problem with the modification “clamp” that was installed on the trip linkage. The NRC will follow up with this activity on subsequent inspections when the post-modification test is being performed to ensure that it does not interfere with local manual tripping of the turbine-driven pump FW-10.

The team also reviewed the modifications performed on the motor of the motor-driven pump (FW-6) while it was at the rewind shop and the report sent back with the motor revealed that it had non-safety processes applied and non-safety parts installed without adequate justification. A complete review was not available at the close of this inspection because of the timeliness of the report from the vendor that performed the rewind work. CR 2012-17385 was written for this issue.

d. Verify that the turbine driven AFW cage enclosure is seismically qualified

The team performed a thorough review of the design documentation for this pump cage and did not find any issues regarding seismic qualifications of the cage. See the detailed discussion in the “Configuration Control” attribute section above.

e. Verify the Auxiliary Feedwater System is being operated in accordance with vendor recommendations and current design and licensing documents

The team did not perform a detailed review of vendor recommendations because vendor requirements and recommendations were part of a site-wide improvement program as a result of a large RCA that revealed that many of the vendor manuals had not been updated, including many manuals for this system. This will be inspected as part of other NRC team inspections once all corrective actions are complete for CAL Restart checklist item 3.d.1.

f. Inspect the diesel-driven AFW because it is relied upon heavily during emergency operating procedure and abnormal operating procedure conditions in spite of being a non-safety pump

The licensee uses pump FW-54 as their primary safety pump in the emergency operating procedures even though it is non-safety and does not have the pedigree that pump FW-6 and pump FW-10 have. The design basis uses pump FW-6 and pump FW-10 and if they fail to work then they rely on pump FW-54; however, because of the unique nature of FW-54 (used for startup and shutdown due to main feed pump design issues) and its better reliability record it has been written into the emergency operating procedures as the licensee's first choice in Emergency Operating Procedure EOP-00, although there is even inconsistency within the emergency operating procedures for this issue. As an example, some steps within a given procedure state to "start FW-6 or FW-10" while other steps state to "start FW-54" without any reason for why the other pump would not be used as a first choice (such as some kind of decision tree that clearly established why that pump is not usable or available at that step). The licensee communicated to the team that a new pump has been purchased to replace the old turbine-driven pump FW-10 and its installation was delayed due to current plant recovery priorities until at least the next outage.

g. Verify that the AFW system is in compliance with the maintenance rule

The team found that the licensee missed at least one functional failure in their assessment of AFW-54. The team also believes that the number of failures required to move this pump to a(1) status is too high with 3 failures (versus 1 for FW-6 or -10). If the licensee corrects either of these two issues then pump FW-54 should have been moved to a(1) status within the Maintenance Rule program. Further review of the Maintenance Rule program revealed that it was not being implemented for approximately 8 months with respect to evaluations (See Findings section above).

h. Evaluate the interfaces between engineering, operations, maintenance, and plant support groups

The team noticed at least one disconnect between the different groups. The Equipment Service Life group did not communicate with the Auxiliary Feedwater

System owner for equipment service life items related to this system. When the team communicated this concern to licensee management as an organizational effectiveness issue, they wrote CR 2012-16752 to address the concern. Another interface issue that the team identified was that pump FW-6 motor rewind background information was difficult to get because of a lack of knowledge at the station.

Also, during the Auxiliary Feedwater System walkdowns, the team discovered several issues with the reactor head lift rig. The team believes that these will require a modification to the lift rig and an updated calculation. See the detailed discussion in the "Design" attribute section above. CR 2012-17333 was written to address these issues.

4OA6 Meetings, Including Exit

Exit Meeting Summary

On November 8, 2012, the team leader presented the preliminary inspection results to Mr. L. Cortopassi, Site Vice-President, and other members of the licensee's staff. On November 29, 2012, the team leader conducted a telephonic final exit meeting with Mr. L. Cortopassi, Site Vice-President, and other members of the licensee's staff. The licensee acknowledged the findings during each meeting. While some proprietary information was reviewed during this inspection, no proprietary information was included in this report.

On November 30, 2012, the inspectors presented the results of the onsite inspection of the licensee's emergency preparedness program to Mr. L. Cortopassi, Site Vice President, and other members of the licensee's staff. The licensee acknowledged the issues presented. The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary or sensitive. The licensee identified information related to staff training as sensitive.

On December 20, 2012, the inspectors presented the inspection results to Mr. L. Cortopassi, Site Vice President, and other members of the licensee staff. The licensee acknowledged the issues presented. The inspector asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

On January 24, 2013, the inspectors presented the inspection results to Mr. L. Cortopassi, Site Vice President, and other members of the licensee staff. The licensee acknowledged the issues presented. The inspector asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

4OA7 Licensee-Identified Violations

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

1. LER 05000285/2012-005-01 described a failure to monthly verify the automatic start features of the diesel fuel oil pumps. This was a violation of Technical Specification 3.7(1)e and Table 3-2, Item 12. The performance deficiency was more than minor because it was associated with the procedure quality attribute of the Mitigating Systems Cornerstone and it adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. It was determined to be of very low safety significance since there was not an actual failure of the automatic start features of the diesel fuel oil pumps. This issue was entered into the CAP as CR 2012-01324. This violation is also discussed in Section 4OA3.1.

2. Title 10 of the Code of Federal Regulations, Part 50.47(b)(16), requires, in part, that licensee emergency planners are properly trained. Contrary to the above, two licensee emergency planners were not trained in accordance with station training requirements as described in EPDM 12, “Emergency Planning Staff Training and Qualification Program,” Revision 3. Specifically, one emergency planner was 36 months overdue on five required reading packages and 30 months overdue on four required reading packages, and another emergency planner was 36 months overdue on a required offsite training course. The finding is more than minor because if left uncorrected it could have led to a more significant safety concern and it impacted the Emergency Response Organization Performance attribute. The finding could have led to a more significant safety concern because an untrained licensee emergency planner could have failed to recognize and correct risk-significant emergency preparedness issues. The finding was evaluated using the EP Significance Determination Process and determined to be of very low safety significance (Green) because it was a failure to comply with NRC requirements and was not a lost or degraded planning standard function. The planning standard function was not degraded because the licensee had a formal program for training emergency preparedness department staff, the identified emergency planners had completed some required training activities, and three other emergency planners were current in their training activities. The finding was entered into the licensee’s CAP as CR 2012-10400.

3. A third violation was identified by the licensee for failure to perform preventative maintenance required to demonstrate the functionality of the sluice gates. This violation was included in section 4OA4 of the report as one of the violations supporting the finding for failure to manage the functionality of the river sluice gates.

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

J. Bousum, Manager, Emergency Planning and Administration
R. Cade, Manager, Operations Training
C. Cameron, Supervisor Regulatory Compliance
L. Cortopassi, Site Vice President
K. Ihnen, Manager, Site Nuclear Oversight
K. Kingston, Manager, Chemistry
E. Matzke, Senior Licensing Engineer
J. McManis, Manager, Projects and CDBI Team Lead
S. Miller, Manager, Design Engineering
V. Naschansy, Director, Site Engineering
T. Orth, Director, Site Work Management
A. Pallas, Manager, Shift Operations
E. Plautz, Supervisor, Emergency Planning
M. Prospero, Plant Manager
J. Ruth, Director, Site Training
T. Simpkin, Manager, Site Regulatory Assurance
M. Smith, Manager, Operations
R. Swerczek, Fire Protection Program Engineer

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

05000285/2012012-05	URI	Failure to Perform Siren Maintenance as required by the Alert and Notification System Design Report (Section 1EP2)
05000285/2012-008-01	LER	Technical Specification Violation for Fuel Movement (VA-66) (Section 4OA3.4)
05000285/2012-012-01	LER	Multiple Safety Injection Tanks Rendered Inoperable (Section 4OA3.6)

Opened and Closed

05000285/2012012-01	NCV	Hot Work Procedures Allowed a Roving Fire Watch (Section 1R05)
05000285/2012012-03	FIN	Failure to Properly Manage the Functionality of the River Sluice Gates (Section 4OA4.1)
05000285/2012012-04	NCV	Failure to Adequately Implement the Maintenance Rule Program (Section 4OA5.1)

Closed

05000285/2012-005-01	LER	Technical Specification Violation Due to Inadequate Testing of Emergency Diesel Fuel Pumps (Section 4OA3.1)
05000285/2012-008-00	LER	Technical Specification Violation for Fuel Movement (VA-66) (Section 4OA3.3)
05000285/2012-012-00	LER	Multiple Safety Injection Tanks Rendered Inoperable (Section 4OA3.5)

Discussed

05000285/2012-006-00	LER	Operation of Component Cooling Pumps Outside of the Manufacturers Recommendation(Section 4OA3.2)

LIST OF DOCUMENTS REVIEWED

Section 1R05: Fire Protection

MISCELLANEOUS DOCUMENTS

NUMBER	TITLE	REVISION / DATE
FHA-EA97-001	Fire Hazards Analysis (FHA) Manual	16
SO-G-102	Fire Protection Program Plan	December 29, 2011
SO-M-9	Hot Work Operations	29
	Procedure Change Request for SO-M-9 Revision 26a	February 16,2005

CONDITION REPORTS

2012-19945

Section 1EP2: Alert and Notification System Testing

PROCEDURES

NUMBER	TITLE	REVISION
EPT-1	Alert Notification System Silent Test	18
EPT-2	Alert Notification System Growl Test	23
EPT-3	Alert Notification Complete Cycle Test	16

Section 1EP3: Emergency Response Organization Staffing and Augmentation Testing

PROCEDURES

NUMBER	TITLE	REVISION / DATE
OSC-2	Command and Control Position Actions – Notification	57

Section 1EP3: Emergency Response Organization Staffing and Augmentation Testing

PROCEDURES

NUMBER	TITLE	REVISION / DATE
OSC-7	Emergency Response Organization Activation at the Emergency Operations Facility	3
OSC-15	Communicator Actions	29
1070-302	Instructor Guide: Control Room Communicator	January 20, 2010
PEC 1072562	Performance Evaluation Checklist: Notification to Onsite/ERO Personnel, Revision 2	May 2012
2010-152	Perform Augmentation or Notification Drills	30

Section 1EP4: Emergency Action Level and Emergency Plan Changes

PROCEDURES

NUMBER	TITLE	REVISION / DATE
FC-EPF-42	Emergency Action Levels	8
EPIP-EOF-6	Dose Assessment	46

Section 1EP5: Maintenance of Emergency Preparedness

CONDITION REPORTS (CR)

2010-0893	2010-2599	2010-2851	2010-4257	2010-4258	2010-4570
2010-4598	2010-5808	2010-6505	2010-6575	2010-6671	2011-0130
2011-0361	2011-0926	2011-1080	2011-1093	2011-2132	2011-3432
2011-4812	2011-5446	2011-6121	2011-7838	2012-00016	2012-01357
2012-01396	2012-01532	2012-01550	2012-02131	2012-02824	2012-02962
2012-04075	2012-04083	2012-04410	2012-08128	2012-09213	2012-10400
2012-13559	2012-14416	2012-15318	2012-18580	2012-18795	2012-18832
2012-18853	2012-18855	2012-18865	2012-18922	2012-18923	2012-18925
2012-18926	2012-18927				

PROCEDURES

NUMBER	TITLE	REVISION / DATE
NOS-DG-024	Nuclear Oversight	0

MISCELLANEOUS DOCUMENTS

NUMBER	TITLE	REVISION / DATE
EPT-24	Update of Annual Public Information Brochure	3
EPT-37	Verification of Siren Warning Signs	20
10-QUA-012	Quality Assurance Audit Report Number 4: Emergency Preparedness	March 12, 2010
10-QUA-039	Quality Department Emergent Surveillance Report, Emergency Preparedness	July8, 2010
10-QUA-076	Quality Department Surveillance Report, Emergency Preparedness	December 6, 2010
11-QUA-034	Quality Department Surveillance Report, Emergency Preparedness	May 13, 2011
12-NOS-078	Nuclear Oversight Department Assessment Report: Emergency Preparedness Program	September 28, 2012
12-NOS-093	Nuclear Oversight Cycle Performance Assessment 2012C2, June – September 2012	October 31, 2012
12-QUA-014	Quality Assurance Audit Report Number 4: Emergency Planning	March 23, 2012
RA-2009-0256	Emergency Planning Self Assessment: Use of Corrective Action Program and Performance of Infrequently Performed ERO Tasks	August 20, 2009
AR01428222	NRC Emergency Preparedness Baseline Assessment	October 18, 2012
	Apparent Cause Analysis Report: Condition Report CR 2010-2055	May 27, 2010
	Apparent Cause Analysis Report: Condition Report CR 2010-2174	November 11, 2010
	Apparent Cause Analysis Report: Condition Report CR 2010-4355	October 14, 2010
	Apparent Cause Analysis Report: Condition Report CR 2011-0361	February 18, 2011
	Apparent Cause Analysis Report: Condition Report CR 2011-8179	December 8, 2011
	Apparent Cause Analysis Report: Condition Report CR 2012-1435	April 20, 2012
	Apparent Cause Analysis Report: Condition Report CR 2012-1489	April 11, 2012
	Apparent Cause Analysis Report: Condition Report	June 14, 2012

MISCELLANEOUS DOCUMENTS

NUMBER	TITLE	REVISION / DATE
	CR 2012-4236, Revision 1	
	Apparent Cause Analysis Report: Condition Report CR 2012-7815	August 27, 2012
	Apparent Cause Analysis Report: Condition Report CR 2011-8128, Revision 1	September 24, 2012
EP-10-240	Evaluation Report for the Drill conducted September 28, 2010	October 1, 2010
EP-11-030	Evaluation Report for the Drill conducted February 8, 2011	February 14, 2011
EP-11-110	Evaluation Report for the Drill conducted August 16, 2011	August 19, 2011
EP-12-024	Evaluation Report for the Drill conducted November 10, 2011	January 24, 2012
EP-12-051	Evaluation Report for the Drill conducted February 21, 2012	February 27, 2012
EP-12-081	Evaluation Report for the Drill conducted March 27, 2012	April 2, 2012
EP-12-109	Evaluation Report for the Drill conducted May 22, 2012	May 29, 2012
EP-12-187	Evaluation Report for the Drill conducted July 17, 2012	July 25, 2012
EPT-12	Radiation Protection Drill - Simulated	October 29, 2010
EPT-12	Radiation Protection Drill - Simulated	June 30, 2011
EPT-12	Radiation Protection Drill - Simulated	December 21, 2011
EPT-12	Radiation Protection Drill - Simulated	February 21, 2012
EPT-12	Radiation Protection Drill - Simulated	May 22, 2012
EPT-14	Environmental Monitoring Drill	November 15, 2010
EPT-14	Environmental Monitoring Drill	December 27, 2011
EPT-14	Environmental Monitoring Drill	November 13, 2012
EPT-49	Conduct a Contaminated Injured Medical Drill	March 16, 2010
EPT-49	Conduct a Contaminated Injured Medical Drill	February 8, 2011
EPT-49	Conduct a Contaminated Injured Medical Drill	May 22, 2012

WORK REQUESTS (WR)

178836 447151

Section 4OA1: Performance Indicator Verification

PROCEDURES

NUMBER	TITLE	REVISION
EPDM-14	Emergency Preparedness Performance Indicator Program	11, 13
NOD-QP-37	Performance Indicators Program	

MISCELLANEOUS DOCUMENTS

NUMBER	TITLE	REVISION
EP-24	Drills, Exercises, and Actual Events Performance Indicator Opportunity Evaluation Checklist	
EP-27	NRC Performance Indicator Checklist	

Section 4OA3: Event Follow-Up

CONDITION REPORTS

2012-01324

DRAWINGS

NUMBER	TITLE	REVISION
B120F15503 Sheet 1	Schematic – 480 VAC Auxiliary Systems	16

PROCEDURES

NUMBER	TITLE	REVISION
OP-ST-DG-0001	Diesel Generator 1Check	80
OP-ST-DG-0002	Diesel Generator 2 Check	72

MISCELLANEOUS DOCUMENTS

NUMBER	TITLE	REVISION
SDBD-DG-112	Emergency Diesel Generators	30

Section 4OA4: IMC 0350 Inspection Activities

CONDITION REPORTS (CR)

2008-3078	2009-5356	2009-5453	2009-5780	2011-2482
2011-2493	2011-2515	2011-2676	2011-3143	2011-3239
2011-3533	2011-3543	2011-4104	2011-4160	2011-4209
2011-4220	2011-4278	2011-4408	2011-4418	2011-4487
2011-4517	2011-4589	2011-4673	2011-4677	2011-4830

2011-4846	2011-4917	2011-4939	2011-4950	2011-5007
2011-5103	2011-5129	2011-5174	2011-5197	2011-5239
2011-5339	2011-5369	2011-5425	2011-5460	2011-5599
2011-5608	2011-5624	2011-5649	2011-5662	2011-5695
2011-5813	2011-5822	2011-5854	2011-5867	2011-5883
2011-5885	2011-5999	2011-6061	2011-6246	2011-6389
2011-6394	2011-6555	2011-6631	2011-6722	2011-6730
2011-6811	2011-6814	2011-6825	2011-6947	2011-7039
2011-7111	2011-7171	2011-7202	2011-7317	2011-7318
2011-7366	2011-7428	2011-7482	2011-7689	2011-7784
2011-8123	2011-8347	2011-8606	2011-8682	2011-8683
2011-8955	2011-9128	2011-9186	2011-9894	2011-10047
2011-10088	2011-10125	2011-10247	2011-10261	2011-10283
2011-10493	2012-00224	2012-01329	2012-01601	2012-02098
2012-02131	2012-02250	2012-02252	2012-02515	2012-03078
2012-03474	2012-03749	2012-04240	2012-04267	2012-04638
2012-05431	2012-05509	2012-05615	2012-05656	2012-05751
2012-06078	2012-06079	2012-06303	2012-06303	2012-06305
2012-06306	2012-06308	2012-06510	2012-07340	2012-07481
2012-07724	2012-08330	2012-08348	2012-08787	2012-10002
2012-10401	2012-10612	2012-10737	2012-13030	2012-14265
2012-14424	2012-15194	2012-16864	2012-16884	2012-16891
2012-16901	2012-17488	2012-17533	2012-17578	2012-18840
2012-19787				

<u>WORK ORDERS (WO)</u>

424863	422227	422228	419795	417080
422051				

<u>WORK REQUESTS (WR)</u>

168216	168217	175800

PROCEDURES

NUMBER	TITLE	REVISION
OP-ST-FP-0001A	Fire Protection System Inspection and Test	17
OP-PM-FP-1001B	Monthly Fire Protection System Inspection (Week 2)	33
OP-ST-FP-0011	Fire Protection System Hose Station Operability Test	8
PED-GEI-60	Preparation Substitute Replacement Items	44
PED-GEI-75	Digital Process Systems Design Control	9
PED-GEI-7	Specification of Post-Modification Test Criteria	15
PED-GEI-9	Electrical System Interaction	31
SO-G-74	Fort Calhoun Station EOP/AOP Generation Program	18
FCSG-36	Supplemental Personnel Management Process	12
SO-G-21	Modification Control Standing Order	01-31-12
PED-GEI-3	Preparation of Modifications	85
PED- GEI- 29	Preparation of Facility Changes	55
ERPG-VMOD-01	Engineering Recovery Process Guide Vendor Modification Review	0
PLDBD-CS-56	External Flooding	1
USAR 9.8	Auxiliary Systems: Raw Water System	31
PE-RR-AE-1000	Flood Barrier Inspection and Repair	9
PE-RR-AE-1001	Flood Barrier and Sandbag Staging and Installation	16
PE-RR-AE-1002	Installation of Portable Steam Generator Make-up Pumps	5
FCSG-64	External Flooding of Site	2
AOP-01	Acts of Nature	31
SDBD-STRUC-503	Intake Structure	12

DRAWINGS

NUMBER	TITLE	REVISION
E-4182	Underground Fire Loop	14

MISCELLANEOUS DOCUMENTS

NUMBER	TITLE	REVISION / DATE
	Fire Protection Impairment Permit 2011324	6/1/11
	Fire Protection Impairment Permit 2011329	6/3/11
EC53241	Install Overhead Transformer for Met Tower Emergency Power Feed	5/30/12
	Cathodic Protection Survey and Report	10/28/11
PL DBD-NO1-61	Regulations, Codes, and Standards	16
SDBD-EE-201	AC Distribution	24
EC- 53257		
USAR 9.8	Auxiliary Systems: Raw Water System	31

Section 4OA5: Auxiliary Feedwater System 95003 Team Inspection (IP 95003, IP 92702)

CONDITION REPORTS (CR)

2009-00905	2009-01611	2009-04365	2009-04473	2009-05356
2009-05453	2009-05912	2010-00813	2010-00910	2010-01429
2010-02296	2010-02491	2011-00839	2011-02400	2011-02463
2011-08544	2012-04342	2012-04506	2012-04594	2012-05360
2012-08126	2012-10153	2012-14042	2012-14517	2012-14549
2012-14599	2012-15674	2012-15702	2012-16160	2012-16254
2012-16318	2012-16450	2012-16476	2012-16503	2012-16752
2012-17250	2012-17333	2012-17385		

PROCEDURES

NUMBER	TITLE	REVISION
FCSG-24-4	Condition Report and Cause Evaluation	3
FCSG-24-5	Cause Evaluation Manual	3
NOD-QP-21	Operating Experience Program	36
QAP-1-1	Quality Assurance Plan	1

PMID 1424-03	Preventative Maintenance, Refurbish Motor with Optional Rewind	0
PBD-25	Motor Maintenance and Monitoring Program	4
EOP-02	Loss of Off-site Power	18
EOP-07	Station Blackout	14
OI-ES-1-CL-A	Operating Instruction for thermal Over Loads	28
PMID #00000851-01	Vibration Monitoring, Preventive Maintenance	1
OP-ST-AFW- 3009	Surveillance Test Auxiliary Feedwater Pump FW-6, Recirculation Valve, and Check Valve Tests	1
PMID #0000136-02	Motor Preventative Maintenance	1
PED-CEI-5	Concrete Expansion Anchor Design	7
PLDBD-CS-51	Seismic Criteria	21
SDBD-AUX-502	Auxiliary Building	19
SDBD-AUX-503	Containment	32
EA-FC-94-003	Alternative Seismic Criteria and Methodologies (ASCM)	1

DRAWINGS

NUMBER	TITLE	REVISION
11405-E-45,Sh1	MCC Auto Load Shed Channel "A" Schematic Diagram	36
11405-E-7, Sh2B	480V Primary Plant Motor Control Center One Line P&ID	28
11405-E-1	Main One Line Diagram	49
11405-E-3	4.1 6KV Auxiliary Power One Line Diagram P&ID	19
11405-E-4, Sheet 1	480V Auxiliary Power One Line Diagram P&ID	31
11405-E-5, Sheet 2	480V Auxiliary Power One Line Diagram P&ID	29
11405-E-6, Sheet 1	480V Primary Plant Motor Control Center One Line P&ID	76
11405-E-7,	480V Primary Plant Motor Control Center One Line	62

Sheet #2A

CALCULATIONS

NUMBER	TITLE	REVISION
FC05690	Battery Load Profile and Voltage Drop Calculation	11
EA-FC-92-47	EDG Fuel Requirements	0
FC03382	Diesel Generator LOCA Loads	19
EA92-072	Diesel Generator Loading Transient Analysis	6
EA99-005	FCS System Data Base	6
A90-066	Maximum MCC Loading and MCC Incoming Feeder Analysis	15
EA-FC-90-057	Updated Degraded Voltage Calculation for 41 60/480V	5
EA-FC-9 1-084	Breaker/ Fuse Coordination Study	4
EA-FC-94-047	161kV Transformer Tap Change	2
EA99-006	FCS 4160V Bus Fast Transfer Analysis	5
EA-FC-00-002	Degraded Voltage Protection Analysis	2
FC07828	Evaluation of FW-10 Surrounding Cage	0
FC06499	Evaluation of Reactor Head Lift Rig Storage Anchors	2
Enclosure to LIC-95-0130 For IPEEE	Seismic, Fire, Tornado, Flooding, Transportation and Nearby Facilities Accidents	0
94C2857-C-008	USI A-48/IPEEE, Outlier Resolution and Detailed HCLPF for tank FW-19	0
FW-6 Screening Evaluation Work Sheet (SEWS)	Auxiliary Feedwater Pump (Motor Driven)	0
FW-10 Screening Evaluation Work Sheet (SEWS)	Auxiliary Feedwater Pump (Turbine Driven)	0
FC06904	Category 1 Air-operated Valve (AOV) Operator Margin Analysis	5
FC06081	Tornado Missile Haxard for FW-10 Auxiliary Feedpump Turbine Exhaust	0

MISCELLANEOUS DOCUMENTS

NUMBER	TITLE	REVISION / DATE
EC-52767	Mod - Instrument Additions (2011)	0
EC-46260	Mod - Refurbish Motor Driven AFW Pump FW-6	0
SDBD-FW-116	Feedwater	20
SDBD-FW-AFW-117	Auxiliary Feedwater	43
Stm04_AFW-01	AFW Training Manual	48
FW AFW OCC 9-9-1.xls	Equipment Exceeding Service Life	10/3/2012
FW-AFW Maintenance History	Closed Corrective and Elective Work Orders Since January 2007	10/18/2012
50.59 Screen for EC 48714	FW-10 Governor Trip Latch Clamp	1
RA 2012-4470	AFW CDBI Assessment Report	0
FCS MR FSDS	Fort Calhoun Maint. Rule Functional Scoping Data Sheet	6a
AFW System Health Notebooks	Reviewed from 1Q 2009 through 1Q 2011 (last one done)	Various