Fort Calhoun
2Q/2010 Plant Inspection Findings

Initiating Events

Significance: SL-IV Dec 31, 2009
Identified By: NRC
Item Type: NCV NonCited Violation
Failure to Update Intake Structure Design
SL-IV. The team identified a Severity Level IV, noncited violation for failure to update the final (updated) safety analysis report in accordance with 10 CFR 50.71(e). Specifically, the licensee failed to update Section 9.8, “Raw Water Systems,” of the Fort Calhoun Station Updated Safety Analysis Report after constructing a sheet pile alignment wall alongside the intake structure in 1982. Furthermore, this modification removed the slope from the river bottom. Additionally, recent sounding records indicate the river bottom near the intake structure is approximately the same depth as the center of the channel, thus, invalidating the updated safety analysis report statement. The licensee entered this condition into the corrective action program as CR 2009-3927.

The finding is more than minor because the finding is determined to have a material impact on safety. Specifically, with the new sheet pile alignment wall, it could lead to a barge strike that is different than described in the updated safety analysis report. Using Supplement I of the NRC Enforcement Policy, this finding will be treated as a Severity Level IV violation. This finding was not assigned a crosscutting aspect because the underlying cause was not indicative of current performance (Section 4OA5.1).

Inspection Report# : 2009006 *(pdf)*

Mitigating Systems

Significance:  Jun 30, 2010
Identified By: Self-Revealing
Item Type: NCV NonCited Violation
Failure to Correct Adverse Condition Trips Turbine Driven Auxiliary Feedwater Pump
A self-revealing noncited violation of 10 CFR 50 Appendix B, Criterion XVI, “Corrective Action,” occurred for the licensee’s failure to assure that a condition adverse to quality was corrected. Specifically, the licensee identified five instances of the turbine driven auxiliary feedwater pump FW-10 reset lever being bumped and unlatching, which would prevent FW-10 from starting if required, and failed to correct the adverse configuration condition allowing the reset lever to be bumped. The failure to correct this adverse condition was demonstrated when the turbine driven auxiliary feedwater pump FW-10 reset lever apparently partially unlatched due to bumping, tripped during a surveillance test start attempt February 17, 2010. The licensee entered this issue in their corrective action program as CR-2010-0813.

The finding is more than minor because it is associated with the equipment performance attribute of the mitigating systems cornerstone, and affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events. Using Manual Chapter 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," the issue screened as potentially risk significant since the finding represented a loss of system safety function of a single train for greater than the technical specification allowed outage time. The finding required a Phase 2 analysis. When evaluated per Manual Chapter 0609, Appendix A, "Determining the Significance of Reactor Inspection Findings for At-Power Situations," and the Fort Calhoun Phase 2 pre-solved table item “Turbine Driven Auxiliary Feedwater Pump Fails to Start,” the inspectors determined this finding to be potentially risk significant. The finding was forwarded to a senior reactor analyst for review. The senior reactor analyst performed the Phase 3 analysis, Attachment 4, and determined that the finding was of very low risk significance. This finding has a

crosscutting aspect in the corrective action program component of the Problem Identification and Resolution area because the licensee's periodic trends and assessments did not recognize the significance of precursor events related to bumping the reset lever and prompt action to prevent further problems with the turbine driven auxiliary feedwater pump FW-10 [P.1(b)].

Inspection Report# : 2010006 *(pdf)*

Significance: G Jun 30, 2010
Identified By: NRC
Item Type: NCV NonCited Violation
Failure to Verify Trip Fully Latched results in Turbine Driven Auxiliary Feedwater Pump Trip
The team identified a noncited violation of Technical Specification 5.8.1.a that requires written procedures be implemented as recommended in Regulatory Guide 1.33, Revision 2, Appendix A, that requires procedures for startup, shutdown and operation of the auxiliary feedwater system. Specifically, the licensee having no procedural guidance to verify full engagement of the turbine driven auxiliary feedwater pump FW-10 high exhaust back pressure trip when latched. This resulted in the partially latched high exhaust trip mechanism vibrating loose and a failure to start of FW-10, on February 17, 2010. The licensee entered this deficiency in their corrective action program as CR 2010-0813.

This finding is greater than minor because it was associated with the Mitigating Systems cornerstone attribute of procedural quality and it affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Using Manual Chapter 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," the issue screened as very low safety significance because it was not a design or qualification deficiency that resulted in a loss of operability or functionality, did not create a loss of system safety function of a single train for greater than the technical specification allowed outage time and did not affect seismic, flooding, or severe weather initiating events. The finding has a crosscutting aspect in the area of problem identification and resolution associated with operating experience because the licensee failed to implement and institutionalize operating experience through changes to station operating procedures when they failed to incorporate industry information to verify the turbine driven auxiliary feedwater pump is fully latched [P.2(b)].

Inspection Report# : 2010006 *(pdf)*

Significance: G Jun 30, 2010
Identified By: Self-Revealing
Item Type: NCV NonCited Violation
Inadequate Procedure Results in Failure of Turbine Driven Auxiliary Feedwater Pump to Start.
A self-revealing non-cited violation of Technical Specification 5.8.1.a was identified regarding the licensee's failure to implement and maintain the applicable procedures recommended in Regulatory Guide 1.33, Revision 2, Appendix A, February 1978. Paragraph 9.a of Appendix A requires that such maintenance that can affect the performance of safety-related equipment be properly pre-planned and performed in accordance with documented instructions. Specifically, the licensee failed to have an adequate procedure for ensuring air was vented from the auxiliary feedwater pump control oil system following maintenance. As a result, the turbine-driven auxiliary feedwater pump failed to start during an operability test. The licensee has entered this issue into their corrective action program as condition report CR-2009-0905

The finding is more than minor because it is associated with mitigating system cornerstone attribute of procedure quality and adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Using Manual Chapter 0609.04, "Phase 1 Initial Screening and Characterization of Findings," the finding was found to have very low safety significance (Green) because it was not a design deficiency; did not represent loss of a safety function, loss of a single train for greater than its allowed outage time, or loss of a non technical specification train of equipment; and did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. The finding has a crosscutting aspect in the area of problem identification and resolution associated with operating experience because the licensee failed to implement and institutionalize operating experience through changes to station work instructions when they failed to incorporate industry information on control and hydraulic oil system

failures due to air introduced during maintenance [P.2(b)].

Inspection Report# : 2010006 *(pdf)*

Significance: G Jun 30, 2010
Identified By: Self-Revealing
Item Type: NCV NonCited Violation
Turbine Driven Auxiliary Feedwater Pump Trip Due to Inadequate Design Margin
A self revealing non-cited violation of 10 CFR, Part 50, Appendix B, Criterion III, “Design Control,” occurred when the licensee failed to ensure that the design basis of certain structures, systems and components were translated into specifications, drawings, procedures, and instructions when implementing Engineering Change 45105. Specifically, this design change reduced the turbine driven auxiliary feedwater pump’s margin between the pump discharge pressure and the pump’s high discharge pressure trip set-point resulting in a April 6, 2009, high pump discharge pressure trip during a scheduled surveillance test start. The licensee entered this issue in their corrective action program as CR 2009-1611.

The inspectors determined the finding is more than minor because it is associated with the design control attribute of the mitigating systems cornerstone, and adversely affected the cornerstone objective to ensure the availability, reliability and capability of systems that respond to initiating events to prevent undesirable consequences. Using Manual Chapter 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," the issue screened as potentially risk significant since the finding represented a loss of system safety function of a single train for greater than the technical specification allowed outage time. The finding required a Phase 2 analysis. When evaluated per Manual Chapter 0609, Appendix A, "Determining the Significance of Reactor Inspection Findings for At-Power Situations," and the Fort Calhoun Phase 2 pre-solved table item “Turbine Driven Auxiliary Feedwater Pump Fails to Start,” the inspectors determined this finding to be potentially risk significant. The finding was forwarded to a senior reactor analyst for review. The senior reactor analyst performed the Phase 3 analysis, Attachment 4, and determined that the finding was of very low risk significance. The finding has a crosscutting aspect in the area of human performance because the licensee failed to use conservative assumptions in decision making when a non conservative design margin was approved and implemented on the turbine driven auxiliary feedwater pump [H.1(b)].

Inspection Report# : 2010006 *(pdf)*

Significance: G Dec 31, 2009
Identified By: NRC
Item Type: NCV NonCited Violation
Inadequate Assessment of Seismic Qualification of Raw Water Pumps
Green. The team identified a Green, noncited violation of 10 CFR Part 50, Appendix B, Criterion III, “Design Control.” Specifically, from February 1992 to September 8, 2009, the licensee failed to adequately evaluate the seismic qualification of the raw water pumps to ensure that the pumps’ anchor bolts imbedded in the floor would meet Seismic Class I standards. The team determined that the February 1992 seismic analysis was not conservative for the following reasons: (1)The weight distribution of the pump/motor assembly in the analysis did not correctly apply the center of gravity of the pump to the loading analysis. (2)The stress analysis of the anchors did not include the weight of the water in the piping. (3)The stress analysis did not include the nozzle loads applied to the pump due to the weight of the discharge piping. The licensee entered the issue into their corrective action program as CR 2009-3977, and performed a preliminary operability evaluation of the support components which determined that the pumps would remain operable following a safe shutdown earthquake. The team reviewed the evaluation, and concurred with the operability evaluation. The finding is more than minor because it adversely affected the design control attribute of the Mitigating Systems Cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The finding was of very low safety significance (Green) because it was a design deficiency that did not result in actual loss of safety function. This finding was not assigned a crosscutting aspect because the underlying cause was not indicative of current performance (Section 1R21.2.15).

Inspection Report# : 2009006 *(pdf)*

Significance: G Dec 31, 2009
Identified By: NRC
Item Type: NCV NonCited Violation
Inadequate Flood Protection for the Intake Structure
Green. The team identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings." Specifically, from August 9, 1973, to September 8, 2009, the licensee failed to prescribe instructions into procedures that would ensure that the plant could be safely shutdown at the probable maximum flood elevation of 1009.3 feet mean sea level. The licensee's updated safety analysis report, technical specifications, and station procedures state that protection of the raw water pumps against flooding up to the probable maximum flood height of 1009.3 feet mean sea level is accomplished by sandbag berms and flood gates. During an intake structure walkdown, the team observed two unsealed, 14 inch diameter fire protection piping penetrations in the outer wall, with the bottom of the penetration at elevation 1008.5 feet mean sea level. The penetrations had an air gap of about ½ inch between the wall and the pipe. After reviewing station procedures, the team determined that the unsealed penetrations would not be sealed during flooding conditions.

As a result of the team's concern, the licensee entered the issue into their corrective action program as CR 2009-4166 and CR 2009-6195, and verified that there are no other open penetrations in the building walls below the flood level of 1009.3 feet mean sea level. The licensee changed procedure GM-RR-AE-1002 to provide temporary sealing of the penetrations if predicted floods occurred before the permanent seals were installed. The licensee stated that the penetrations will be permanently sealed before the spring 2010 flood season.

This performance deficiency is more than minor because it adversely affected the Mitigating Systems Cornerstone attribute of external events and affected the cornerstone objective of ensuring the availability and reliability of systems that respond to initiating events to prevent undesirable consequences. The finding affected the Mitigating Systems Cornerstone because flood protection was degraded. The team determined that the finding resulted in the degradation of equipment and functions specifically designed to mitigate a flooding initiating event and that during a flooding event the loss would degrade two or more trains of a multi-train safety system. Therefore, the finding was potentially risk significant to flood initiators and a Phase 3 analysis was required. The final change in core damage frequency was calculated to be 8.2 x 10-7 indicating that the finding was of very low safety significance (Green). This finding was not assigned a crosscutting aspect because the underlying cause was not indicative of current performance (Section 1R21.2.15).

Inspection Report# : 2009006 *(pdf)*

Significance: G Dec 31, 2009
Identified By: NRC
Item Type: NCV NonCited Violation
Inadequate Corrective Actions to Ensure the Reliability of the Raw Water Pump Power Cables
Green. The team identified a Green, noncited violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action" for failure to take adequate corrective action following the discovery of water intrusion in manholes MH-5 and MH-31 in 1998, 2005, and 2009. Specifically, from 1998 to September 11, 2009, the licensee failed to take corrective action to establish an appropriate monitoring frequency that would mitigate potential common mode failure of raw water 5kV motor cables in underground ducts and manholes. The licensee entered the condition into the corrective action program as CR 2009-4216. The corrective action changed the manhole inspection schedule from an 18 month schedule to a quarterly schedule.

The finding is more than minor because it adversely affected the Mitigating Systems Cornerstone attribute of design control for ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The finding was of very low safety significance (Green) because it was a design deficiency that did not result in actual loss of safety function. This finding has a crosscutting aspect in the area of human performance, decision making, because the licensee failed to use conservative assumptions in decision making and adopts a requirement to demonstrate that the proposed action is safe in order to proceed rather than a requirement to

demonstrate that it is unsafe in order to disapprove the action. Specifically, since 2005, the licensee decided to postpone installation of proposed level corrective actions and failed appropriately monitor water intrusion in MH-5 and MH-31 multiple times [H.1(b)](Section 1R21.3.4).

Inspection Report# : 2009006 *(pdf)*

Significance: SL-IV Dec 31, 2009
Identified By: NRC
Item Type: NCV NonCited Violation
Failure to Maintain Quality Records of the Intake Structure Design
SL-IV. The team identified a Severity Level IV, noncited violation of 10 CFR Part 50, Appendix B, Criterion XVII, "Quality Assurance Records," for failure to maintain original records of the seismic and tornado analysis of the intake structure. Specifically, in 2005, the licensee could not retrieve the original design documentation of the seismic and tornado analysis of the intake structure. This condition was documented in CR 200504345. After the licensee determined the documentation was not retrievable, the licensee reconstituted the seismic and tornado analysis of the intake structure. These analyses were available during the team's inspection.

This finding is assessed through traditional enforcement because the finding has the potential for impacting the NRC's ability to perform its regulatory function. Using Inspection Manual Chapter 0612, Appendix E, the finding is more than minor because the records were not retrievable. Using Supplement I of the NRC Enforcement Policy, this finding will be treated as a Severity Level IV violation. This finding was not assigned a crosscutting aspect because the underlying cause was not indicative of current performance (Section 4OA5.1).

Inspection Report# : 2009006 *(pdf)*

Significance: SL-IV Aug 24, 2009
Identified By: NRC
Item Type: NCV NonCited Violation
Failure to Adopt appropriate Procedures to Evaluate Deviations and Failures to Comply with 10 CFR part 21 Evaluations
The NRC identified a Severity Level IV noncited violation of 10 CFR Part 21.21(a), "Notification of failure to comply or existence of a defect and its evaluation" for the licensee's failure to adopt appropriate procedures to evaluate deviations and failures to comply associated with substantial safety hazards. Specifically, the procedure fails to adequately assess the extent of deviations, which are discovered, and the potential impact on other components either installed in the plant or stored in the warehouse. Additionally, the procedure failed to adequately evaluate defects in components, which have never been installed or used in the nuclear plant.

The inspectors determined that the failure to adopt appropriate procedures to evaluate deviations and failures to comply associated with substantial safety hazards was a performance deficiency. This finding was more than minor because if the procedure were left uncorrected it could become a more serious safety concern. Specifically, failure to notify the vendor upon discovery of a deviation does not allow for adequate evaluation of other components that could be subject to the deviation. Additionally, components with deviations could be located in the licensee's warehouse and subsequently installed in the plant without the licensee's knowledge, potentially creating a substantial safety hazard. Because this issue affected a potential reporting requirement and NRC's ability to perform its regulatory function, it was evaluated with the traditional enforcement process. Consistent with the guidance in Section IV.A.3 and Supplement VII paragraph D.4 of the NRC Enforcement Policy, this violation was categorized at Severity Level IV noncited violation. There is no crosscutting aspect associated with this finding because it is not indicative of current performance in that the procedure is many years old.

Inspection Report# : 2009004 *(pdf)*

Significance: G Jul 17, 2009
Identified By: Self-Revealing
Item Type: NCV NonCited Violation

Inadequate Valve Motor Maintenance Work Instruction
A self-revealing, Green noncited violation of Technical Specification 5.8.1.a (Procedures) was identified for failure to provide an adequate maintenance work instruction. While performing maintenance on the motor, the HPSI Header - Charging Header Crosstie Valve, HCV-308, the maintenance work instruction failed to ensure that the HPSI Alternate Header Isolation Valve, HCV-2987, was closed, resulting in unexpected pressurization of the Number 2 HPSI Header.

The failure to provide an adequate maintenance work instruction was a performance deficiency. This finding was greater than minor because the finding was associated with the Mitigating Systems Cornerstone objective (procedure quality attribute) to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Using Manual Chapter 0609, Appendix A, "Determining the Significance of Reactor Inspection Findings for At-Power Situations," Phase 1 screening worksheet, the inspectors determined that the finding was of very low safety significance (Green) because it was not: (1) a design or qualification deficiency; (2) a loss of system safety function; (3) an actual loss of safety function for greater than its technical specification allowed outage time; (4) a loss of safety function of a nontechnical specification train; or (5) a seismic, flooding or severe weather related finding. There is no crosscutting aspect associated with this finding since the root cause of the performance deficiency was not indicative of current plant performance.

Inspection Report# : 2009004 *(pdf)*

Barrier Integrity

Significance: G Jul 17, 2009
Identified By: NRC
Item Type: FIN Finding
Failure to Perform Checks at the Beginning of Each Work Shift on the Main Hoist Limit Switches
The inspectors identified a finding of having very low safety significance (Green) for failure to perform checks at the beginning of each shift on the main hoist limit switches of the refueling area crane (HE – 2) in the spent fuel pool area as specified in ANSI B30.2 – 1976, "Overhead and Gantry Cranes", section 2-2.1.2 Frequent Inspections a.2, prior to using the crane to perform dry fuel storage activities on June 29, 2009.

The failure to perform checks on the main hoist limit switches at the beginning of each work shift is a performance deficiency because the dry cask personnel used the crane to perform dry cask storage operations to lift items over the spent fuel pool without performing the required checks per shift change. The inspectors determined that the performance deficiency was more than minor in accordance with Inspection Manual Chapter 0612, Appendix B, "Issue Screening", minor question 2 because if left uncorrected the performance deficiency could lead to a more significant safety issue. Specifically, the main hoist limit switches are installed to limit the main hoist travel and to prevent a two blocking event. Preventing two blocking events ensures safe load handling of heavy loads over the spent fuel pool. Using the NRC Manual Chapter 0609, Phase 1 screening worksheet under the Barrier Cornerstone for spent fuel pool issues, the finding screened as having very low safety significance because it did not result in loss of cooling to the spent fuel pool, did not cause damage to the fuel cladding or result in dropped fuel assembly or result in a loss of spent fuel pool volume of greater than 10 percent. The finding had a crosscutting aspect in problem identification and resolution because the licensee failed to take appropriate corrective actions to address safety issues [P.1 (d)].
Inspection Report# : 2009004 *(pdf)*

Significance: G Jul 17, 2009
Identified By: Self-Revealing
Item Type: NCV NonCited Violation
Failure to Follow Auxiliary Building Crane Operating Instructions
A self-revealing Green noncited violation (NCV) of 10 CFR 50, Appendix B, Criterion V, was identified for the failure of personnel to follow an auxiliary building crane operating procedure. This resulted in the crane contacting the fuel handling bridge and moving it approximately eight feet.

The failure to follow the prerequisites of the auxiliary building crane operating procedure is a performance deficiency. The finding is greater than minor because it would become a more significant safety concern if left uncorrected in that a collision with the fuel handling bridge could cause damage such that pieces of the mast could fall into the spent fuel pool and damage the spent fuel. Using the NRC Manual Chapter 0609, Phase 1 screening worksheet under the Barrier Integrity Cornerstone for spent fuel pool issues, the finding screened as having very low safety significance because it did not result in loss of cooling to the spent fuel pool, did not cause damage to the fuel cladding or result in dropped fuel assembly or result in a loss of spent fuel pool volume of greater than 10 percent. This finding has a crosscutting aspect in the area of human performance associated with work practices because personnel failed to use human error prevention techniques commensurate with the risk of the assigned task, such that work activities were performed safely.

Inspection Report# : 2009004 *(pdf)*

Emergency Preparedness

Occupational Radiation Safety

Significance: G Dec 31, 2009
Identified By: NRC
Item Type: NCV NonCited Violation
Failure to Provide Adequate Instruction to Pregnant Workers
The inspectors identified a noncited violation of 10 CFR 19.12 for failure to provide adequate instruction to declared pregnant workers. Specifically, the licensee did not provide adequate information concerning the potential health protection problems and risk associated with exposure of an embryo/fetus to radiation and/or radioactive materials. The licensee entered this issue into their corrective action program as Condition Report CR 2009-5854.

The inspectors determined that the failure to provide adequate instruction to declared pregnant workers is a performance deficiency. The finding is more than minor because it is associated with the occupational radiation safety cornerstone attribute and adversely affects the objective to ensure adequate protection of worker health and safety from exposure to radiation during routine civilian nuclear reactor operation. Using the Occupational Radiation Safety Significance Determination Process, the inspectors determined this finding to be of very low safety significance because the finding did not involve ALARA planning and work controls, did not result in an overexposure, did not present a substantial potential for overexposure, and did not compromise the licensee's ability to assess dose. Additionally, the finding had a crosscutting aspect in the area of human performance, resources component, because the licensee failed to ensure the procedures related to declared pregnant workers included adequate instructions concerning the increased health concerns related to radiation exposure to the embryo/fetus [H.2.(c)].

Inspection Report# : 2009005 *(pdf)*

Public Radiation Safety

Physical Protection

Although the NRC is actively overseeing the Security cornerstone, the Commission has decided that certain findings pertaining to security cornerstone will not be publicly available to ensure that potentially useful information is not

provided to a possible adversary. Therefore, the cover letters to security inspection reports may be viewed.

Miscellaneous

Significance: SL-IV Mar 31, 2010
Identified By: NRC
Item Type: NCV NonCited Violation
Inadequate Reportability Guidance
Severity Level IV. The inspectors identified a Severity Level IV noncited violation of Fort Calhoun Technical Specification 5.8.1 for inadequate corrective action documents. Specifically, the documents do not adequately address assigning reportability evaluations. As a result, the licensee failed to evaluate the reportability of a condition that was determined to be reportable until questioned by the inspectors.

The inspectors determined that the licensee's inadequate corrective action documents were a performance deficiency. The inspectors reviewed this issue in accordance with NRC Inspection Manual Chapter 0612 and the NRC Enforcement Policy. Through this review, the inspectors determined that traditional enforcement was applicable to this issue because the NRC's regulatory ability was potentially affected. Specifically, the NRC relies on the licensees to identify and report conditions or events meeting the criteria specified in regulations in order to perform its regulatory function, and when this is not done the regulatory function is impacted, and is therefore a finding. The inspectors determined that this finding was not suitable for evaluation using the significance determination process, and as such, was evaluated in accordance with the NRC Enforcement Policy. The finding was reviewed by NRC management and due in part to its repetitive nature the violation was determined to be of more than minor significance, however since it was not found to be willful, and was entered into the corrective action program, this violation is being treated as a Severity Level IV noncited violation consistent with the NRC Enforcement Policy.
Inspection Report# : 2010002 *(pdf)*

Last modified : September 02, 2010