

Fort Calhoun

4Q/2009 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:  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:  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 8.2×10^{-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:  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:  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)

Significance:  Jun 30, 2009

Identified By: NRC

Item Type: VIO Violation

Failure to Properly Translate Raw Water System Design Basis Requirements

The inspectors identified a cited violation of 10 CFR Part 50, Appendix B, Criterion III, for the failure to correctly translate the Fort Calhoun Station raw water strainer component's design basis into specifications, procedures, and instructions. The raw water strainers were incorrectly translated as nonsafety related in design documents for their function of filtering small debris from the raw water system although the equipment is relied upon for design basis accident mitigation. This violation was identified by the NRC in 2007 and was a continuing violation that was not corrected in a reasonable time.

This finding was more than minor because it affected the Mitigating System Cornerstone objective of the design control attribute to ensure the reliability and availability of the raw water system to mitigate initiating events. Using the NRC Manual Chapter 0609, Phase 1 screening worksheet, the issue screened as having very low safety significance because it was a design or qualification deficiency confirmed not to result in a loss of operability per Part 9900, "Technical Guidance, Operability Determination Process for Operability and Functional Assessment." The finding had a problem identification and resolution crosscutting aspect (corrective action component) because the licensee failed to take appropriate corrective actions to address the safety issue in a timely manner [P.1(d)]

Inspection Report# : [2009003](#) (pdf)

Significance:  May 19, 2009

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Perform an Operability Determination after Identifying a Degraded Condition

The team identified a Green non-cited violation for the licensee's failure to meet 10 CFR Part 50, Appendix B, Criterion V in that the licensee failed to perform an operability determination for a degraded condition. The licensee determined that certain relays classified as Functional Importance Determination 1, should be replaced every 9 or 15 years depending the duty cycle and environmental conditions. Most of the relays in the emergency diesel generator had been in service since initial installation, over 35 years ago. Subsequent to the inspection, the licensee performed an operability determination that showed all the effected relays were operable. This condition has been entered into the licensee's corrective action program as Condition Reports 2009-2319 and 2342.

The finding was determined to be greater than minor because the performance deficiency is associated with the procedure quality attribute (maintenance procedures) of the mitigating system cornerstone, and the performance

deficiency adversely affected the associated cornerstone objective of ensuring the availability, reliability and capability of systems that respond to initiating events to prevent undesirable consequences. The inspectors evaluated this finding using Manual Chapter 0609, Attachment 4, Phase 1 Significance Determination, and determined that it was of very low safety significance (Green) because the failure to perform the operability determination did not result in loss of operability or functionality and because the finding did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. This finding has a crosscutting aspect in the area of human performance, decision-making, in that the licensee did not make safety-significant decisions using a systematic process, especially when faced with uncertain or unexpected plant conditions to ensure safety is maintained [H.1(a)].

Inspection Report# : [2009007](#) (pdf)

Significance:  Mar 31, 2009

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

Failure to implement adequate corrective action for floor cracks

A self-revealing noncited violation of 10 CFR Part 50, Appendix B, Criterion XVI, “Corrective Action,” was identified for the licensee’s failure to take prompt corrective measures after identifying that water could penetrate cracks in the turbine building concrete floor and adversely impact the operability of an emergency diesel generator and safety related switchgear. Cracks in the floor of turbine building mechanical equipment room were identified in February 2006, when water was observed leaking into the Diesel Generator 1 room (Room 63). The licensee took no immediate corrective actions to evaluate or repair the cracks. In February 2009, water was again observed leaking into Room 63, resulting in unexpected tripping of breakers associated with the Diesel Generator 1, secondary compressor motor starter. The licensee entered this issue into their corrective action program as Condition Report 2009-0687.

This finding was more than minor because the failure to perform adequate corrective actions on the turbine building floor, if left uncorrected, could become a more serious safety concern. Specifically, water could seep through the floor and render the emergency diesel generator and/or safety related switchgear inoperable. Using the Manual Chapter 0609, “Significance Determination Process,” Attachment 4 “Phase 1 Initial Screening and Characterization of Findings,” this finding was of very low safety significance because it: 1) was confirmed to result in a loss of functionality of the secondary compressor motor starter; 2) did not represent a loss of safety function; 3) did not result in a loss of a technical specification required train for more than its allowed outage time; 4) did not result in a loss of risk significant equipment for more than 24 hours; and 5) did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. This finding did not have a crosscutting aspect because the performance deficiency was aged and not indicative of current licensee performance.

Inspection Report# : [2009002](#) (pdf)

Barrier Integrity

Significance:  Jun 30, 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)

Significance:  Jun 29, 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)

Emergency Preparedness

Occupational Radiation Safety

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: N/A May 15, 2009

Identified By: NRC

Item Type: FIN Finding

Biennial Assessment of Identification of Resolution of Problems

The team reviewed approximately 500 condition reports, work orders, engineering evaluations, root and apparent cause evaluations, and other supporting documentation to determine if problems were being properly identified, characterized, and entered into the corrective action program for evaluation and resolution. The team reviewed a sample of system health reports, self assessments, trending reports and metrics, and various other documents related to the corrective action program. Because of these reviews, the team concluded that when site personnel identified problems, they entered them into the corrective action program. The team identified several issues with the quality of cause evaluations. The team concluded that corrective actions were generally effective and implemented in a timely manner

The licensee appropriately evaluated industry operating experience for relevance to the facility and entered applicable items in the corrective action program. The licensee used industry operating experience when performing root cause and apparent cause evaluations. The licensee performed effective quality assurance audits and self-assessments, as demonstrated by self-identification of corrective action program weaknesses.

Based on 66 interviews including six focus groups (consisting of approximately 48 people) conducted during this inspection, observations of plant activities, and reviews of the corrective action and employee concerns programs, the team determined that site personnel were willing to raise safety issues and document them in the corrective action program. The team observed that workers at the site felt free to report problems to their management, and were willing to use the Employee Concerns Program.

Inspection Report# : [2009007](#) (*pdf*)

Last modified : March 01, 2010