

Catawba 2

1Q/2008 Plant Inspection Findings

Initiating Events

Significance:  Jun 30, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Perform Required Weld Inspections on the Fuel Handling Cask Cranes

Inspectors identified a NCV of 10 CFR 50, Appendix B, Criterion III, Design Control, for the licensee's failure to effectively implement the requirement to fully inspect fuel handling cask crane welds in accordance with Updated Final Safety Analysis Report (UFSAR) Section 9.1.4.2.3 following reinforcements made in response to a Part 21 notification. Following implementation of the modification to restore the fuel handling cask crane's capacity to 125 tons, the licensee had performed visual weld inspections rather than magnetic particle or liquid penetrant testing as required by the UFSAR. The licensee performed the required inspections prior to actual use of the cranes to lift loaded spent fuel casks. This issue has been entered into the licensee's corrective action program as PIP C-07-2028.

This finding was more than minor because if left uncorrected it could become a more significant safety concern in that improperly performed inspections on fuel handling equipment could impact the safe movement of nuclear fuel and increase the probability of a fuel handling accident. This finding is associated with the Equipment Performance attribute of the Initiating Events cornerstone and affected the cornerstone objective of limiting the likelihood of an event that could challenge critical safety functions during spent fuel movement. The finding is not suitable for SDP evaluation, but has been reviewed by NRC management and was determined to be a finding of very low safety significance (Green) because the affected welds on the fuel handling cask cranes were properly inspected prior to lifting fully loaded fuel casks in the spent fuel pool building. This finding directly involved the cross-cutting area of Problem Identification and Resolution under the "Operating Experience Evaluation" aspect of the "Operating Experience" component, in that the licensee failed to properly evaluate the Part 21 notification received from Whiting Corporation to ensure all testing requirements were identified prior to implementing the required modification and declaring the cranes fully operable (P.2.a). (Section 1R17b.(3))

Inspection Report# : [2007003](#) (*pdf*)

Mitigating Systems

Significance:  Mar 31, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Identify an Inoperable CRACWS Chiller Prior to Removing the Remaining Chiller from Service Placed Both Units in TS 3.0.3 for Approximately 110 minutes (Section 40A2.2(2))

The inspectors identified a Green non-cited violation of Technical Specification 5.4.1.a, for the failure to adequately establish and implement procedures required by Regulatory Guide 1.33, Appendix A, Section 1.b, Administrative Procedures. Specifically, the licensed operators in the main control room and work control center failed to identify that the "A" Control Room Area Chilled Water System (CRACWS) was inoperable prior to removing the remaining chiller from service for testing. This placed both Catawba units in Technical Specification 3.0.3 for approximately 110 minutes without any of the required actions being taken.

The finding was more than minor because it was associated with the Configuration Control attribute of the Barrier Integrity cornerstone and affected the cornerstone objective of providing reasonable assurance that physical design barriers provide protection from radionuclide releases caused by accidents or events. While the Control Room Area Ventilation System (CRAVS) would have remained operable in terms of filtering air in the areas it services, without chilled water providing cooling, operators would have had to bypass the filtered air paths using Abnormal Operating Procedure (AP) guidance in order to maintain area temperatures at values needed to ensure equipment in the areas remained operable over time. The inspectors determined the finding to be of very low safety significance using the

Phase 1 Screening Worksheet of Inspection Manual 0609, "Maintenance Risk Assessment and Risk Significance Determination Process". The issue would only become evident if the 2A diesel generator failed to re-energize the 2A 4.16kV vital bus following a loss of offsite power (LOOP) event with the "A" chiller control power aligned to the 2A bus and the length of time available before the AP would have had to be entered and the filtered air flow paths bypassed.

The finding directly involved the cross-cutting area of Human Performance under the "Procedural Compliance" aspect of the "Work Practices" component, in that the licensee failed to effectively follow multiple station procedures to ensure redundant CRACWS chillers were not removed from service, resulting in a potential loss of chilled water cooling for areas supplied by the CRAVS [H.4.b]. This issue has been entered into the licensee's Corrective Action Program as Problem Investigation Process report (PIP) C-07-7073. (Section 40A2.2(2))

Inspection Report# : [2008002](#) (pdf)

Significance:  Dec 31, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Perform Required ASME Code Section XI Leakage Testing

The inspectors identified a Green non-cited violation (NCV) of 10 CFR 50.55a(g)(4) for the failure to perform periodic leakage testing of buried piping portions of the service water system as required by Section XI of the ASME Code for the second 10-year Inservice Inspection interval for Units 1 and 2. The licensee entered this issue into their corrective action program for resolution.

This finding is more than minor because it affects the Equipment Performance attribute of the Mitigating Systems cornerstone objective of ensuring availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. This finding is of very low safety significance because it did not represent an actual loss of a system's safety function. (Section 1R08.1)

Inspection Report# : [2007005](#) (pdf)

Significance:  Dec 31, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Develop a Lift Plan and Risk Management Actions for the Replacement of Piping Over a Safety-Related SSC

The inspectors identified a Green NCV of 10CR50.65(a)(4) for the failure to manage and minimize the risk associated with the replacement of portions of the nuclear service water (RN) system. More specifically, the licensee failed to develop a Complex Lift Plan as required by Corporate procedures and develop appropriate risk management actions as part of the Critical Activity Plan.

The finding was more than minor because it was associated with the "Protection Against External Factors" attribute of the Mitigating Systems cornerstone and affected the cornerstone objective of ensuring the availability, reliability and capability of systems designed to prevent undesirable consequences was maintained. An unexpected loss of the 2A train of spent fuel pool cooling (from an inadequately controlled RN piping lift above it) could have resulted in undesirable consequences with the recently off-loaded reactor core being in the spent fuel pool. The inspectors completed a Phase 1 screening of the finding using Appendix K of the Inspection Manual Chapter 0609, "Maintenance Risk Assessment and Risk Significance Determination Process," and determined that the performance deficiency represented a finding of very low safety significance on the basis that the actual RN piping replacement had not begun at the time the deficiencies were identified and the lifts were deferred until the appropriate actions were developed and implemented. The finding directly involved the cross-cutting area of Human Performance under the "Safety Significant/Risk Significant Decisions" aspect of the "Decision Making" component (H.1.a), in that the licensee failed to develop a lift plan and applicable risk management actions in accordance with station and corporate requirements to ensure the risk associated with moving RN piping over in-service spent fuel pool cooling piping was controlled and minimized. This finding was entered into the licensee's corrective action program. (Section 1R13)

Inspection Report# : [2007005](#) (pdf)

Significance:  Dec 31, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

Inspections of the Unit 2 ECCS Containment Sump Installation Failed to Identify Deficiencies Prior to Declaring the Safety-Related Structure Operable

The inspectors identified a Green NCV of 10 CFR 50, Appendix B, Criterion X, Inspections, for the licensee's failure to adequately implement inspections of the new Unit 2 emergency core cooling system (ECCS) containment sump to ensure it was installed in accordance with design specifications so as to support operability when required by Technical Specifications (TSs).

The finding was more than minor because it was associated with the Design Control 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 to prevent undesirable consequences was maintained. Following final inspections of the ECCS containment sump modification, inspectors identified deficiencies that required resolution prior to declaring the sump operable as required by TSs to support unit restart. The inspectors determined that the finding was of very low safety significance using the Phase 1 Screening Worksheet of Inspection Manual 0609, Maintenance Risk Assessment and Risk Significance Determination Process, based on the fact that Unit 2 had not yet entered an operational mode in which the ECCS containment sump was required to be operable at the time the construction deficiencies were identified. The finding directly involved the cross-cutting area of Human Performance under the "Human Performance and Error Prevention" aspect of the "Work Practices" component, in that the licensee failed to implement the required inspections of the ECCS sump to ensure the permanent modification was installed in accordance with design specifications and would remain operable under all postulated accident conditions (H.4.a).

This finding was entered into the licensee's corrective action program. (Section 1R17)

Inspection Report# : [2007005](#) (pdf)

Significance:  Aug 03, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

ELU Replacement Batteries Not Tested After Installation

Inspectors identified a non-cited violation (NCV) of Units 1 and 2 Operating License Condition 2.C.(5) for failure to follow the emergency battery lighting maintenance and testing procedure IP/0/B/3540/002, Emergency Battery Lighting Periodic Maintenance and Testing, Revision 33, during replacement of failed batteries. The licensee stated that the batteries were routinely tested prior to installation while in the maintenance shop; however, this bench test was neither required by the periodic maintenance and testing procedure nor documented in any test record. This NCV was entered into the licensee's corrective action program as Problem Investigation Process report C-07-2025.

This finding was more than minor because it was associated with the external factors attribute (i.e., fire) of the Mitigating Systems cornerstone and it affected the cornerstone objective. The finding involved systems or components (i.e., emergency lights) required for post-fire safe shutdown of the reactor. The inspectors completed a Phase 1 screening of the finding in accordance with Inspection Manual Chapter 0609, Appendix F, Fire Protection Significance Determination Process Phase 1 Qualitative Screening Approach, Step 1.3, and concluded that the finding, given its low degradation rating, had very low safety significance (Green) and no further analysis was required. The finding directly involved the cross-cutting area of Human Performance under the "procedural compliance" aspect of the "Work Practices" component, in that the licensee failed to effectively communicate expectations regarding procedure compliance for testing of replacement emergency lighting batteries (H.4.b). (Section 1R05.09.b)

Inspection Report# : [2007007](#) (pdf)

Significance:  Jun 30, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

Inadequate Implementation of Risk Management Actions Associated With Planned Maintenance on the Unit 2 B Train KC Heat Exchanger

Inspectors identified a non-cited violation (NCV) of 10 CFR 50.65(a)(4) for the licensee's failure to effectively implement the risk mitigation actions contained in the approved Critical Evolution Plan associated with work on the Unit 2 B Train Component Cooling Water (KC) heat exchanger to manage and minimize the resulting increased plant

risk. Specifically, during the cleaning of the Unit 2 B Train KC heat exchanger tubes, the offsite power supply was not protected and in fact, work was conducted within the switchyard's protective fence. This issue has been entered into the licensee's corrective action program as Problem Investigation Process report (PIP) C-07-2025.

This finding was more than minor because it was 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 to prevent undesirable consequences is maintained. The inspectors completed a Phase 1 screening of the finding using Appendix K of the Inspection Manual Chapter 0609, "Maintenance Risk Assessment and Risk Significance Determination Process," and determined that the performance deficiency represented a finding of very low safety significance based on the resulting magnitude of the calculated Incremental Core Damage Probability associated with the work being performed in the switchyard in conjunction with the 2B KC heat exchanger tube cleaning being less than 1E-6. The finding directly involved the cross-cutting area of Human Performance under the "Work Activity Coordination" aspect of the "Work Control" component, in that the licensee failed to appropriately coordinate work activities to ensure the operational impact of the planned work was controlled and the increased risk minimized in accordance with the approved Critical Evolution Plan associated with the cleaning of the Unit 2 B train KC heat exchanger (H.3.b). (Section 1R13b.(1))

Inspection Report# : [2007003](#) (pdf)

Significance:  Jun 30, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

Inadequate Implementation of Risk Management Actions Associated With the Excavation of the RN Supply Headers

Inspectors identified a NCV of 10 CFR 50.65(a)(4) for the licensee's failure to develop and implement an effective Complex Evolution Plan associated with excavation and inspection of the nuclear service water (RN) supply headers in order to manage and minimize the risk associated with the activity. Specifically, during the excavation phase of the activity, the potential of damaging the RN headers was not adequately controlled to minimize the increased risk resulting from the excavation. This issue has been entered into the licensee's corrective action program as PIP C-07-2079.

This finding was more than minor because it was 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 to prevent undesirable consequences is maintained. The inspectors completed a Phase 1 screening of the finding using Appendix K of the Inspection Manual Chapter 0609, "Maintenance Risk Assessment and Risk Significance Determination Process," and determined that the performance deficiency represented a finding of very low safety significance on the basis that in the event an RN supply header was damaged during the excavation, the licensee could complete repairs to the header within the TS allowable out-of-service time of 72 hours. The finding directly involved the cross-cutting area of Human Performance under the "Supervisory and Management Oversight" aspect of the "Work Practices" component, in that the licensee failed to ensure that the appropriate level of supervisory oversight was provided during the excavation phase to ensure the expectations pertaining to the use of mechanized equipment when digging in close proximity to the RN supply headers were properly implemented (H.4.c). (Section 1R13b.(2))

Inspection Report# : [2007003](#) (pdf)

Significance:  Apr 20, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

Inadequate Corrective Action for CA System Air Entrainment Issue Identified in PIP C-97-01579

The team identified a finding of very low safety significance (Green) involving a non-cited violation of 10 CFR 50, Appendix B, Criterion XVI, Corrective Action, for failure to perform adequate corrective action associated with an air entrainment issue in the auxiliary feed water system (CA) pump suction line identified in PIP C-97-01579. The corrective actions in PIP 97-01579 were inadequate in that they did not address the potential impact of the air entrainment on the swap over instrumentation for the assured water supply located in the suction line upstream of the pumps. The licensee entered this deficiency into their corrective action program.

This finding is more than minor because the engineering calculation error which failed to include the potential impact of the air entrainment on the RN/CA swap over pressure switches resulted in a condition in which there was reasonable doubt on the operability of the CA pumps. The finding is of very low safety significance because the licensee's engineering evaluations performed during the inspection determined that there was no adverse impact on the

pressure switches and therefore no loss of the CA pumps capability for short term heat removal. (Section 1R21.2.5)
Inspection Report# : [2007006 \(pdf\)](#)

Significance:  Apr 20, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Perform Adequate and Timely Corrective Action to Identify and Resolve an Equipment Design Deficiency of the Alternate Power Supply for the 125 VDC Vital I&C Distribution Center 1EDF

The team identified a finding of very low safety significance (Green) involving a non-cited violation of 10 CFR 50, Appendix B, Criterion XVI, Corrective Action, for failure to perform adequate and timely corrective actions to resolve a potential equipment design deficiency of the 1DGBB battery and distribution which provided the alternate power supply to the 125 VDC Vital I&C distribution panel 1EDF. The licensee entered this deficiency into their corrective action program. This finding is more than minor because it affects the mitigating systems cornerstone objective to ensure the reliability, availability, and capability of systems that respond to initiating events in that 125 VDC distribution center 1EDF provides control power to critical equipment such as the 4.16kV vital bus which aligns power to ECCS pumps and valves. The finding is associated with the cornerstone attribute of design control. This finding is of very low safety significance because the team identified no occurrence, since this issue was identified on July 20, 2006, in which the station was aligned in the vulnerable condition relying on the alternate power supply to 1EDF. Additionally, the normal power supply, the vital battery, is a highly reliable power source and the alignment to the alternate power source requires manual action. Therefore there was no loss of the 1EDF safety function to provide adequate vital I&C control power for safe shutdown of the plant. This finding involved the crosscutting area of Problem Identification and Resolution because the evaluation, specifically the operability assessment, was inadequate and contributed the inadequacy of subsequent corrective actions. (P.1.c) (Section 1R21.2.12)

Inspection Report# : [2007006 \(pdf\)](#)

Significance:  Apr 20, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Follow Procedure for Analyzing the Impact of Updated Vendor Technical Information on Reactor Trip Breaker Maintenance and Inspection Procedures

The team identified a finding of very low safety significance (Green) involving a non-cited violation of 10 CFR 50, Appendix B, Criterion V, Instructions, Procedures, and Drawings, for failure to follow procedure NSD 319, Vendor Technical Information Program, Rev. 2, which requires performance of technical impact reviews of maintenance and surveillance procedures due to vendor manual changes and technical updates. The licensee entered this deficiency into their corrective action program. This finding is more than minor because procedure inconsistencies were identified between the reactor trip breaker vendor manual and procedure SI/0/A/5100/002, Reactor Trip Breaker Surveillance Procedure, Rev. 18, which indicated that the licensee routinely failed to perform engineering evaluations on similar issues. The finding was determined to be of very low safety significance because there was no loss of the reactor trip breaker safety function to open on a scram signal. (Section 1R21.2.15)

Inspection Report# : [2007006 \(pdf\)](#)

Barrier Integrity

Significance:  Dec 31, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Promptly Identify and Correct a Significant Condition Adverse to Quality Affecting the Ability of Both CRAVS Chillers to Operate as Designed Following a SBO due to Inadequate Troubleshootin

The inspectors identified a Green NCV of 10 CFR 50, Appendix B, Criterion XVI, Corrective Action, for the licensee's failure to promptly identify and correct a significant condition adverse to quality affecting the ability of both control room area ventilation system (CRAVS) chillers to operate as designed following a station blackout (SBO).

The finding was more than minor because it was associated with the Configuration Control attribute of the Barrier Integrity cornerstone and affected the cornerstone objective of providing reasonable assurance that physical design barriers provide protection from radio-nuclide releases caused by accidents or events. While the CRAVS would have remained operable in terms of filtering air in the areas it services, without chilled water providing cooling, operators would have had to bypass the filtered air paths using abnormal operating procedure (AP) guidance in order to maintain area temperatures at values needed to ensure equipment in the areas remained operable. The inspectors determined the finding to be of very low safety significance using the Phase 1 Screening Worksheet of Inspection Manual 0609, Maintenance Risk Assessment and Risk Significance Determination Process, based on the fact that the issue would only become evident if one CRAVS chiller was out-of-service at the time of a SBO event and the time available to restore at least one chiller before the AP would have had to be entered and the filtered air flow paths bypassed. Based on a review of station Probabilistic Risk Assessment data, the likelihood of a SBO event in conjunction with one chiller being inoperable was determined to be extremely low. The finding directly involved the cross-cutting area of Problem Identification and Resolution under the "Thorough Evaluation of Identified Problems" aspect of the "Corrective Action Program" component, in that the licensee failed to take the necessary actions to identify and correct the cause (i.e., high resistance fuse installed in temperature reset circuit) of the "A" CRAVS chiller failing to restart during engineered safety features (ESF) testing to ensure both chillers would function as designed under all postulated transients (P.1.c). This finding was entered into the licensee's corrective action program. (Section 1R19)

Inspection Report# : [2007005](#) (pdf)

Significance:  Jun 30, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

Inadequate Design and Implementation of Modifications to the Hydrogen Igniter System on Catawba Units 1 and 2

Inspectors identified a NCV of 10 CFR 50, Appendix B, Criterion III, Design Control, for the licensee's failure to effectively design and implement a modification that replaced the containment hydrogen ignition system's glow plugs with upgraded glow coils to ensure the system's operability was maintained. Specifically, following the installation of the hydrogen igniter glow coils in both units, certain breakers and fuses in the individual igniter circuits were found to be undersized, resulting in breakers tripping and fuses failing when called upon to provide power to the igniters for extended periods. The licensee implemented corrective actions to restore the HIS on both units to full operability. This issue has been entered into the licensee's corrective action program as PIPs C-06-8562 and C-06-8742.

This finding was more than minor because it was associated with the Design Control attribute of the Barrier Integrity cornerstone and affected the cornerstone objective of providing reasonable assurance that a physical design barrier (i.e., containment) would protect the public from radio nuclide releases caused by accidents or events. The inspectors determined the finding to be of very low safety significance using the Manual Chapter 0609, Appendix H, Containment Integrity Significance Determination Process, Phase 2, based on the under-rated breakers or fuses not resulting in the loss of coverage in two adjacent areas inside of containment. The finding directly involved the cross-cutting area of Human Performance under the "Procedural Compliance" aspect of the "Work Practices" component, in that the licensee failed to follow the guidance contained in their Nuclear System and Department-level procedures governing the modification process to ensure that a safety-related system remained operable under all postulated design requirements. (Section 1R17b.(1))

Inspection Report# : [2007003](#) (pdf)

Significance:  Jun 30, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

Inadequate Test Procedure Used to Verify the Operability of the Hydrogen Igniter System Glow Coils on Catawba Units 1 and 2

Inspectors identified a NCV of 10 CFR 50, Appendix B, Criterion XI, Test Control, for the licensee's failure to ensure that surveillance procedures were adequate to verify the operability of the newly-installed hydrogen igniter glow coils on Catawba Units 1 and 2. Specifically, following the installation of the hydrogen igniter glow coils, the voltage for several igniters was set below the required value to ensure the temperature specified in the TS was obtained due to an inadequate surveillance procedure. The licensee implemented corrective actions to restore the hydrogen ignition system on both units to full operability. This issue has been entered into the licensee's corrective action program as PIP C-06-8562.

The finding was more than minor because it was associated with the Procedure Quality attribute of the Barrier

Integrity cornerstone and affected the cornerstone objective of providing reasonable assurance that a physical design barrier (i.e., containment) would protect the public from radio nuclide releases caused by accidents or events. The inspectors determined the finding to be of very low safety significance using the Phase 1 Screening Worksheet of the Inspection Manual Chapter 0609, "Maintenance Risk Assessment and Risk Significance Determination Process" based on the actual temperatures of the affected hydrogen igniters being above the value that was subsequently shown to result in hydrogen ignition. The finding directly involved the cross-cutting area of Human Performance under the "Complete and Accurate Procedures" aspect of the "Resources" component, in that the licensee failed to develop an adequate surveillance procedure to ensure voltages on hydrogen igniter glow coil circuits would produce temperatures that met the acceptance criteria specified in the TS (H.2.c). (Section 1R17b.(2))

Inspection Report# : [2007003](#) (*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

Last modified : June 05, 2008