

# Catawba 1

## 4Q/2006 Plant Inspection Findings

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### Initiating Events

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### Mitigating Systems

**Significance:**  Dec 31, 2006

Identified By: NRC

Item Type: NCV NonCited Violation

#### **Failure to Perform Adequate Examinations of 1A ND Heat Exchanger Inlet and Outlet Welds**

The inspectors identified a finding involving an NCV of 10 CFR Part 50.55a(g)(4)ii for failure to perform a volumetric examination of the 1A Residual Heat Removal (ND) heat exchanger as required by Section XI of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (B&PV) Code. The examinations were performed from the nozzle side of the weld only and the required examination coverage was not obtained as required by Section XI of the ASME Code. The limited ultrasonic (UT) examinations found no indications that the structural integrity of the supports was unacceptable for service. The licensee entered this issue into the Corrective Action Program as PIP C-06-5142 and has completed a 100 percent UT examination of the 1A ND heat exchanger inlet and outlet nozzles during 1EOC16 with no detected indications.

This finding was of more than minor significance because a failure to examine the 1A ND heat exchangers as required by the ASME Code is related to the "Equipment Performance" attribute of the "Mitigating Systems" cornerstone and affects the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. This finding was evaluated using Phase 1 of the NRC IMC 0609, "Significance Determination Process," and was determined to be of very low safety significance. This finding directly involved the cross-cutting area of Human Performance under the "Proper Work Planning" aspect of the "Work Control" component, in that the licensee did not properly plan and coordinate a work activity consistent with nuclear safety. Inadequate planning for 1A RHR HX inlet and outlet nozzle UT examinations resulted in the availability of only one (of two) required calibration blocks.

Inspection Report# : [2006005](#) (*pdf*)

**Significance:**  Dec 31, 2006

Identified By: NRC

Item Type: NCV NonCited Violation

#### **Failure to Prevent Recurring Scaffolding Installation Deficiencies**

The inspectors identified a Green NCV of 10 CFR 50, Appendix B, Criterion XVI, Corrective Action, for the licensee's failure to identify and implement effective corrective actions to prevent recurring deficiencies associated with the erection of scaffolding around safety related equipment. For the examples identified by the inspectors, the licensee removed or adjusted the scaffolding to correct the condition.

The inspectors determined that the licensee's repeated failure to erect scaffolding in accordance with the Duke Scaffold Manual and implement effective corrective actions to prevent recurrence was a performance deficiency. The inspectors determined that the performance deficiency was more than minor in that multiple occurrences were identified of scaffolding being located in a manner where safety-related equipment could be adversely impacted without the appropriate engineering evaluation or approval. In accordance with Appendix B, "Issue Screening," of IMC 0612, the inspectors determined that the finding was of more than minor significance since the finding was associated with the equipment performance and human performance attributes of the Mitigating Systems cornerstone and affected the cornerstone objective of ensuring the availability, reliability, and capability of equipment that respond to initiating events to prevent undesirable consequences. This finding directly involved the cross-cutting area of Problem Identification and Resolution

under the "Appropriate and Timely Corrective Actions" aspect of the "Corrective Action Program" component, in that ineffective corrective actions were established resulting in additional scaffolding deficiencies being identified over an 18 month period. The licensee has entered this issue into the corrective action program as PIP C-06-8183 and has identified scaffold construction and usage as an adverse trend requiring additional focus in 2007.

Inspection Report# : [2006005](#) (*pdf*)

**Significance:**  Dec 01, 2006

Identified By: NRC

Item Type: NCV NonCited Violation

**Failure to establish a procedure for mitigating the consequences of an external flooding event.**

A non-cited violation of TS 5.4.1b was identified for failing to establish procedures required by Regulatory Guide 1.33, Appendix A, Section 6, Procedures for Combating Emergencies and Other Significant Events. Specifically, no procedure existed to combat or mitigate the consequences from an external flooding event.

The finding is greater than minor because the failure to establish appropriate procedures to cope with an external flood affects the Mitigating Systems cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Using Manual Chapter 0609, Appendix A, Attachment 1, "Significance Determination Process," Phase 1 Worksheet, the finding is determined to have very low safety significance because it only affected the mitigating systems cornerstone and did not result in the total loss of any safety function that contributes to external event initiated core damage accident sequences. This violation was placed in the corrective action program as PIP C-06-08287,

Inspection Report# : [2006010](#) (*pdf*)

**Significance:**  Dec 01, 2006

Identified By: NRC

Item Type: FIN Finding

**Failure to conduct an adequate extent of condition review following multiple water intrusion events to ensure risk significant SSC's were proted from loss due to flooding.**

An NRC identified finding was identified for the licensee's failure to conduct adequate extent of condition reviews following multiple water intrusion events at the site by limiting the focus of the reviews to only safety-related structures, systems, and components (SSCs) and excluding those identified as being risk significant.

The finding is greater than minor as it was associated with the Protection Against External Factors and Equipment Performance attributes of the Mitigating Systems cornerstone in that by narrowly focusing extent of condition reviews to only encompass safety-related SSCs and excluding risk-significant SSCs, systems required to respond to and mitigate initiating events could be adversely affected. It was determined to be of very low safety significance because, while limiting extent of condition reviews to safety-related SSCs has the potential to adversely affect the ability of the station to respond to initiating events, failing to include risk significant equipment in the reviews conducted for the water intrusion events in 2006 after the 1A DG conduit seals were repaired did not result in an overall increase in plant risk in excess of the green/white threshold. The vulnerabilities of other risk-significant SSCs to flooding have been addressed by the station. This finding has captured in PIPs C-06-8246 and C-06-8311.

Inspection Report# : [2006010](#) (*pdf*)

**Significance:**  Sep 30, 2006

Identified By: NRC

Item Type: NCV NonCited Violation

**Inadequate Senior Reactor Operator Operating Examinations**

An NRC-identified NCV of 10 CFR 55.59 was identified for failure to adequately examine Senior Reactor Operators (SROs). Job Performance Measures (JPMs) that contained immediate operator actions was excluded from the sample of JPMs used to examine SROs.

The finding is more than minor because if left uncorrected it would lead to a more significant safety concern and affected the Mitigating Systems cornerstone. This finding affected an individual operating examination, was related to examination quality, and affected more than 20% of the SRO operating tests. Using MC 0609 Appendix I, License Operator

Requalification Significance Determination Process (SDP), the inspectors determined the finding was of very low safety significance.

Inspection Report# : [2006004](#) (*pdf*)

**Significance:**  Sep 30, 2006

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

**Failure to maintain design control over installation of seals in below-grade electrical conduits.**

A self-revealing NCV of 10 CFR 50, Appendix B, Criterion V, Instructions, Procedures and Drawings, was identified when the licensee failed to maintain appropriate design control in ensuring below-grade electrical conduits were properly sealed to prevent water intrusion into areas of the plant containing safety-related equipment. [This violation is in the licensee's corrective action program as PIP C-06-3902.]

The finding is more than minor in that it affected the flood hazard objective of the Protection Against External Factors attribute under the Mitigating Systems cornerstone. Based on the results of the Significance Determination Process Phase 1 screening and the Phase 2 evaluation using the Catawba Plant Notebook, it was determined that a Phase 3 evaluation was required. A regional Senior Risk Analyst performed a Phase 3 SDP evaluation and determined the performance deficiency was of very low safety significance. The dominant factor in the analysis was that a tornado-induced Loss of Offsite Power (LOOP) would have to coincide with a Predicted Maximum Precipitation flooding event. Such an initiating event frequency was sufficiently low enough to determine that, when also considering the possible recovery actions such as cross tying power from Unit 2 or the recovery of the 1A DG, that the performance deficiency was Green. Although the failure to seal the electrical conduits occurred during initial construction, this finding was not considered to be an old design issue because it was identified through a self-revealing event.

Inspection Report# : [2006004](#) (*pdf*)

**Significance:**  Jun 30, 2006

Identified By: NRC

Item Type: NCV NonCited Violation

**Failure to Establish Periodic Inspection Procedures for Seals on Below-Grade Electrical Conduits Entering Plant Areas Containing Safety-Related Equipment.**

The inspectors identified an NCV of Technical Specifications 5.4.1.b, for failure to adequately establish and implement procedures required by Regulatory Guide 1.33, Appendix A, Section 9, Procedures for Performing Maintenance. Specifically, no procedure or program existed to periodically inspect underground electrical conduit seals to identify and repair any degradation of seals which provided protection from external flooding.

The finding was more than minor in that it is associated with the protection against External Factors attribute and affected the Mitigating Events cornerstone objective of ensuring the availability, reliability and capability of systems that respond to initiating events to prevent undesirable consequences. The performance deficiency associated with this finding was that the licensee failed to establish a program, process or procedure to periodically inspect and assess the condition of seals in below-grade electrical conduits to identify degradation and ensure that the seals were properly maintained or repaired as needed. (Section 40A5.1)

Inspection Report# : [2006003](#) (*pdf*)

**Significance:**  Mar 31, 2006

Identified By: NRC

Item Type: NCV NonCited Violation

**Inadequate Risk Assessment and Management Associated With Planned Nuclear Service Water System Maintenance**

An NRC-identified non-cited violation was identified for the failure to adequately assess and manage the risk pertaining to a portion of the maintenance activities associated with the removal of the A train of nuclear service water (RN) from service for a planned 14-day outage as required by 10 CFR 50.65(a)(4).

The 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 that the availability, reliability and capability of systems that respond to initiating events to prevent undesirable consequences is maintained. The inspectors determined that the finding was of very low risk significance (Green), based on the resulting magnitude of the calculated Incremental Core Damage Probability ( $5.8E-7/\text{day}$ ), the length of time that the two A train diesels were unavailable (<18 hours) and that no actual loss of safety function of the 2B DG occurred. This finding involved the cross-cutting aspect of human performance. Inspection Report# : [2006002](#) (*pdf*)

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## Barrier Integrity

**Significance:**  Dec 31, 2006

Identified By: NRC

Item Type: NCV NonCited Violation

### **Inadequate Recognition, Assessment and Management of the Increased Shutdown Risk Associated With the Failure of the 1B KF Pump with the Core in the Spent Fuel Pool and the 1A DG Inoperable**

The inspectors identified a green NCV of 10 CFR 50.65(a)(4) for the licensee failing to adequately recognize, assess, and manage the increased risk resulting from the failure of the single operable spent fuel pool cooling pump with the opposite train's emergency diesel generator inoperable and the recently unloaded Unit 1 reactor core in the spent fuel pool.

The finding was more than minor because the deficiency is consistent with IMC 0612, Appendix B, Section 3, Minor Screening Question (5)(i). Specifically, the licensee failed to expeditiously develop and implement risk management actions to address the elevated risk the unit was in based on the 1B KF pump failure and other equipment out of service or in an outage alignment; i.e., core in the spent fuel pool and the 1A DG disassembled. The finding was associated with the Systems, Structures and Components (SSC) Performance attribute of the Barrier Integrity cornerstone and affected the cornerstone objective of maintaining the functionality of the spent fuel pool cooling system. The inspectors completed a Phase 1 screening of the finding using Appendix K of Inspection Manual Chapter 0609, "Maintenance Risk Assessment and Risk Management Significance Determination Process," and determined that the performance deficiency represented a finding of very low risk significance (Green), based on the resulting magnitude of the calculated Incremental Core Damage Probability being below  $1E-6$ . This was derived from discussions with the Region II Senior Reactor Analysts based on the time to boil in the Spent Fuel Pool being >24 hours which allows for operator actions to mitigate the effect of a postulated loss of cooling scenario. This finding has been entered into the licensee's Corrective Action Program as Problem Investigation Process reports (PIP) C-06-7829 and C-06-7840. The pump was returned to operable status approximately 48 hours after the failure occurred. This finding directly involved the cross-cutting aspect of Human Performance under the "Safety Significant / Risk Significant Decisions" aspect of the "Decision Making" component, in that the licensee failed to adequately recognize, assess and manage the increased risk resulting from the failure of the 1B Spent Fuel Pool Cooling (KF) pump during outage conditions on Unit 1.

Inspection Report# : [2006005](#) (*pdf*)

**Significance:**  Dec 31, 2006

Identified By: NRC

Item Type: NCV NonCited Violation

### **Failure to implement adequate design control for ice condenser lower inlet doors**

The inspectors identified a Green NCV of 10 CFR 50, Appendix B, Criterion III, Design Control, and Criterion XI, Test Control, for the licensee's failure to have design documentation to support the ice condenser lower inlet door surveillance procedure test acceptance limits. The licensee subsequently received the supporting information from the vendor and incorporated it into the Updated Final Safety Analysis Report (UFSAR), Technical Specifications (TS) and surveillance procedures.

The inspectors determined that the licensee's failure to have design documentation that supported the acceptance criteria contained in the TS surveillance procedures used to test the ice condenser's lower inlet doors at the 40-degree open position was a performance deficiency. The requirement to maintain design bases documentation for tests performed on safety-related SSC's is contained in 10 CFR 50, Appendix B, Criterion III. The requirement to implement a test program that incorporates the design basis for these components is contained in 10 CFR 50, Appendix B, Criterion XI. It was determined

to be more than minor using the guidance contained in IMC 0612, Appendix B, Issue Screening, in that an excessively high closing torque could adversely impact the ability of the lower inlet door to modulate properly in the event of a small-break Loss of Coolant Accident (LOCA); however, with no lower limit defined in the surveillance test's acceptance criteria, this condition might not have been identified and corrected prior to returning the unit to power operation. The finding is associated with the Barrier Integrity cornerstone and affected the integrity of the reactor containment structure; i.e., the ice condenser's ability to control internal pressure following a LOCA event, and protect the public from radio-nuclide releases. The licensee contracted the vendor to reconstruct the design basis of the 40-degree torque test and has incorporated this analysis into the applicable surveillance procedure, Technical Specification and Design Basis Documents. This finding directly involved the cross-cutting area of Human Performance under the "Complete Documentation and Component Labeling" aspect of the "Resources" component, in that the licensee failed to maintain complete, accurate and up-to-date design documentation and procedures.

Inspection Report# : [2006005](#) (*pdf*)

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## Emergency Preparedness

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## Occupational Radiation Safety

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## Public Radiation Safety

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## Physical Protection

[Physical Protection](#) information not publicly available.

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## Miscellaneous

**Significance:** N/A Aug 25, 2006

Identified By: NRC

Item Type: FIN Finding

### **Biennial Identification and Resolution of Problems Inspection**

No findings of significance were identified. The licensee was generally effective in identifying problems at a low threshold and entering them into the corrective action program. The licensee properly prioritized issues and routinely performed adequate evaluations that were technically accurate and of sufficient depth. However, there were examples where the licensee failed to initiate corrective action documents for conditions adverse to quality. In addition, there were examples where problems were not accurately and thoroughly described in corrective action documents, adversely impacting the licensee's ability to properly code the problems for trending. This was especially true with respect to human performance deficiencies.

It was also noted that actions taken to correct equipment problems have sometimes been slow; but, licensee management applied increased attention to equipment problems and increasing equipment reliability through the Equipment Reliability Initiative started in early 2004. The licensee's self-assessments and audits were effective in identifying deficiencies in the corrective action program. The inspectors did not identify any reluctance by plant personnel to report safety concerns.

Inspection Report# : [2006007](#) (*pdf*)

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