UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
SAM NUNN ATLANTA FEDERAL CENTER
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July 15, 2004

Duke Energy Corporation
ATTN: Mr. D. M. Jamil
Site Vice President
Catawba Nuclear Station
4800 Concord Road
York, SC 29745

SUBJECT: CATAWBA NUCLEAR STATION - NRC INTEGRATED INSPECTION REPORT 05000413/2004004 AND 05000414/2004004

Dear Mr. Jamil:

On June 19, 2004, the US Nuclear Regulatory Commission (NRC) completed an inspection at your Catawba Nuclear Station. The enclosed integrated inspection report documents the inspection findings, which were discussed on June 29, 2004, with you and members of your staff.

The inspection examined activities conducted under your licenses as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your licenses. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

This report documents two NRC-identified findings of very low safety significance (Green) which were determined to be violations of NRC requirements. However, because of their very low safety significance and because the issues were entered into your corrective action program, the NRC is treating the findings as non-cited violations (NCV) consistent with Section VI.A of the NRC Enforcement Policy. If you contest the NCVs in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC, 20555-0001; with copies to the Regional Administrator Region II; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC, 20555-0001; and the NRC Resident Inspector at the Catawba Nuclear Station.

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

NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

/RA by Robert E. Carroll Jr. Acting For/

Robert Haag, Chief
Reactor Projects Branch 1
Division of Reactor Projects

Docket Nos.: 50-413, 50-414
License Nos.: NPF-35, NPF-52

Enclosure: Integrated Inspection Report 05000413/2004004 and 05000414/2004004
w/Attachment: Supplemental Information

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U. S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket Nos:	50-413, 50-414
License Nos:	NPF-35, NPF-52
Report No:	05000413/2004004, 05000414/2004004
Licensee:	Duke Energy Corporation
Facility:	Catawba Nuclear Station, Units 1 and 2
Location:	4800 Concord Road York, SC 29745
Dates:	March 28, 2004 - June 19, 2004
Inspectors:	E. Guthrie, Senior Resident Inspector A. Sabisch, Resident Inspector
Approved by:	R. Haag, Chief Reactor Projects Branch 1 Division of Reactor Projects

Enclosure

SUMMARY OF FINDINGS

IR 05000413/2004004, IR 05000414/2004004; 3/28/2004-6/19/2004; Catawba Nuclear Station, Units 1 and 2; Problem Identification and Resolution, Other Activities.

The report covered a three month period of inspection by resident inspectors. Two Green non-cited violations were identified. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using IMC 0609, "Significance Determination Process" (SDP). Findings for which the SDP does not apply may be Green or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 3, dated July 2000.

A. NRC-Identified and Self-Revealing Findings

Cornerstone: Mitigating Systems

- Green. The inspectors identified a non-cited violation of 10 CFR 50, Appendix B, Criterion XVI, Corrective Action, for the failure to perform prompt corrective actions to prevent recurrence of a significant condition adverse to quality on the control room area ventilation chilled water (YC) system 'A' chiller inlet flow divider plate support clamp. This resulted in a test failure of the YC system 'A' chiller.

  The finding is greater than minor because it affected the reactor safety mitigating system cornerstone objective of ensuring reliable, available, and capable systems that respond to initiating events. The finding is of very low safety significance because, both trains of YC were not inoperable at the same time and each train is fully capable of performing the mitigating system safety function; therefore, there was not a complete loss of system function. (Section 4OA2.3)

- Green. The inspectors identified a non-cited violation for the failure to comply with 10 CFR 50, Appendix B, Criterion III, Design Control, to assure that the minimum tornado missile protection shield thickness of 5.0 feet was maintained or controlled when the ground barrier over the Unit 2, nuclear service water (RN), train 'B' electrical conduits was removed with the remaining ground coverage less than 5 feet.

  The finding is more than minor because it affected the reactor safety mitigating system cornerstone objective of ensuring equipment reliability. The finding was determined to be of very low safety significance because of the low frequency of tornados, the relative small amount of electrical conduit that did not have the required ground coverage, the short exposure time, and the low impact on mitigating systems since just one pump in one train of RN was involved. (Section 4OA5.1)

B. Licensee-identified Violations

None

REPORT DETAILS

Summary of Plant Status:

Unit 1 began the inspection period operating at 100 percent Rated Thermal Power (RTP). On May 6, 2004, power was reduced to 45 percent to repair a main condenser tube leak in the 1C1 waterbox. The Unit was returned to 100 percent RTP on May 9, 2004, and remained there for the rest of the inspection period.

Unit 2 began the inspection period operating at 100 percent RTP. On June 18, 2004, power was reduced to approximately 97 percent to return a failed main feedwater header pressure transmitter to service. The Unit was returned to 100 percent RTP on June 18, 2004, and remained there for the rest of the inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

1R04 Equipment Alignment

.1 Partial System Walkdowns

a. Inspection Scope

The inspectors verified the critical portions of equipment alignments for selected trains that remained operable while the redundant trains were inoperable. The inspectors reviewed plant documents to determine the correct system and power alignments, and the required positions of select valves and breakers. The inspectors verified that the licensee had properly identified and resolved equipment alignment problems that could cause initiating events or impact mitigating system availability. The inspectors verified the following three partial system alignments and reviewed the associated listed documents:

- 1B component cooling water (KC) system with the 1A KC heat exchanger out of service for cleaning (1A KC Heat Exchanger Tube Cleaning Critical Evolution Plan and work order (WO) 98643550)

- 1A, 2A and 1B nuclear service water (RN) trains with the 2B RN train out of service for various maintenance activities (Technical Specification Action Item Log (TSAIL) Entry C0-04-1354)

- Unit 2 motor driven auxiliary feedwater pumps with turbine driven auxiliary feedwater pump out of service (WO 98655612, WO 986118209)

b. Findings

No findings of significance were identified.

.2 Complete System Walkdown

a Inspection Scope

The inspectors conducted one detailed walkdown/review involving the alignment and condition of the Unit 1 chemical and volume control (NV) system. The inspectors utilized licensee procedures, as well as licensing and design documents to verify that the system (i.e., pump, valve, and electrical) alignment was correct. During the walkdowns, the inspectors also verified that: valves and pumps did not exhibit leakage that would impact their function; major portions of the system and components were correctly labeled; hangers and supports were correctly installed and functional; and essential support systems were operational. In addition, pending design and equipment issues were reviewed to determine if the identified deficiencies significantly impacted the system's functions. Items included in this review were: the operator workaround list, the temporary modification list, system Health Reports, and outstanding maintenance work requests/work orders. A review of open Problem Identification Process reports (PIP) was also performed to verify that the licensee had appropriately characterized and prioritized NV related equipment problems for resolution in the corrective action program. Documents reviewed during this inspection are listed in the Attachment to this report.

b. Findings

No findings of significance were identified.

1R05 Fire Protection

Fire Protection Walkdowns

a. Inspection Scope

The inspectors walked down accessible portions of the plant to assess the licensee's control of transient combustible material and ignition sources, fire detection and suppression capabilities, fire barriers, and any related compensatory measures. The inspectors observed the fire protection suppression and detection equipment to determine whether any conditions or deficiencies existed which could impair the operability of that equipment. The inspectors selected the areas based on a review of the licensee's safe shutdown analysis, probabilistic risk assessment (PRA) based on sensitivity studies for fire related core damage accident sequences, and summary statements related to the licensee's 1992 Initial Plant Examination for External Events Submittal to the NRC. Documents reviewed during this inspection are listed in the Attachment to this report. The inspectors toured the following eight areas important to reactor safety:

- Unit 1, spent fuel pool area
- Unit 1, 'A' NV pump room
- Unit 1, 577 foot elevation electrical penetration room
- Unit 1, 'A' containment spray (NS) pump room
- Unit 1, volume control tank room

- Unit 1, mechanical penetration room 318/318A, auxiliary building 560 foot elevation
- Unit 2, 'A' safety injection pump room
- Unit 2, cable tray access room, auxiliary building 568 foot elevation

b. Findings

No findings of significance were identified.

1R06 Flood Protection Measures

a. Inspection Scope

Internal Areas (Two Samples)

The inspectors reviewed the Final Safety Analysis Report and flood analysis documentation associated with internal plant areas to determine the effect of flooding. The inspectors reviewed the licensee's internal flood protection features for two areas located in the auxiliary building. The inspectors chose the 577 foot elevation and the 522 foot elevation for the two annual samples. The internal areas were selected and walked down based on the flood analysis calculation and recently completed polyethylene piping system modifications to the Unit 1 nuclear service water system on the auxiliary building 577 foot elevation. Through observation and design review the inspectors reviewed sealing of doors, holes in elevation penetrations, sump pump operations, and potential flooding sources.

External Areas (One Sample)

The inspectors reviewed the licensee's external flood protection features. The inspectors performed a walkdown of external site areas, which included manhole bunkers CMH-7B and CMH-8B to assess flood protection measures. Through observation and design review the inspectors reviewed sealing of doors, cables and splices subject to submergence, sump pump and level circuit operations, and potential flooding sources.

The inspectors reviewed the corrective action program documents to verify that the licensee was identifying issues and resolving them. Documents reviewed during this inspection are listed in the Attachment to this report.

b. Findings

No findings of significance were identified.

1R07 Heat Sink Performance

a. Inspection Scope

The inspectors reviewed PT/1/A/4400/006B, Containment Spray (NS) Heat Exchanger (HX) 1B Heat Capacity Test, and evaluated test data for acceptable performance. The inspectors also conducted discussions with engineering personnel concerning system

configuration and heat load requirements, the methodology used in calculating heat exchanger performance, and the method for tracking the status of tube plugging activities. Documents reviewed during this inspection are listed in the Attachment to this report.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification

a. Inspection Scope

The inspectors observed a simulator exam conducted on May 26, 2004, to assess the performance of licensed operators. The scenario, Active Simulator Exam OP-CN-ASE-32, involved a steam generator tube rupture, an automatic and manual reactor trip failure, and a residual heat removal pump miniflow valve failure. The inspection focused on high-risk operator actions performed during implementation of the emergency operating procedures, emergency plan implementation and classification, and the incorporation of lessons learned from previous plant events. Through observations of the critique conducted by training instructors following the exam session, the inspectors assessed whether appropriate feedback was provided to the licensed operators regarding identified weaknesses.

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness

a. Inspection Scope

The inspectors reviewed the licensee's effectiveness in performing routine maintenance activities. This review included an assessment of the licensee's practices pertaining to the identification, scope, and handling of degraded equipment conditions, as well as common cause failure evaluations and the resolution of historical equipment problems. For those systems, structures, and components scoped in the maintenance rule per 10 CFR 50.65, the inspectors verified that reliability and unavailability were properly monitored, and that 10 CFR 50.65 (a)(1) and (a)(2) classifications were justified in light of the reviewed degraded equipment condition. The inspectors conducted this inspection for the degraded equipment conditions associated with the three items listed below. Documents reviewed are listed in the Attachment to this report.

- Unit 2, NV-39A; NV supply isolation valve to reactor coolant system loop, E-30 switch replacement
- Unit 2, RN-351B; KC temperature control valve repair
- Unit 2, main feedwater header pressure transmitter, 2CFPT5142, repair

b. Findings

No findings of significance were identified.

1R13 Maintenance Risk Assessments and Emergent Work Evaluation

a. Inspection Scope

The inspectors reviewed the licensee's assessments concerning the risk impact of removing from service those components associated with the seven emergent and planned work items listed below. This review primarily focused on activities determined to be risk significant within the maintenance rule. The inspectors also assessed the adequacy of the licensee's identification and resolution of problems associated with maintenance risk assessments and emergent work activities. The inspectors reviewed Nuclear System Directive 415, Operational Risk Management (Modes 1-3) for appropriate guidance to comply with 10 CFR 50.65 (a)(4).

- 1A KC heat exchanger tube cleaning
- Unit 1 digital feedwater control system troubleshooting activities
- Unit 1 down power with Unit 2 KC system inoperable due to a failure of the 2RN-351 valve
- Planned relay work in the station switchyard when Blues Creek station was off-line resulting in an 'Orange' grid status
- 1A NS system emergent work
- Unit 1 refueling water storage tank level transmitter modification activities during period of predicted severe weather
- Unit 2 main feedwater header pressure transmitter repair activities

b. Findings

No findings of significance were identified.

1R14 Personnel Performance During Nonroutine Plant Evolutions

a. Inspection Scope

On May 6-7, 2004, the inspectors observed operator performance while Unit 1 reactor power was reduced from 100 percent to 45 percent RTP in preparation for repairing a main condenser tube leak in the 1C1 water box. The inspectors attended the pre-job brief for the evolution and observed the conduct of control room activities, procedure use and adherence, and plant equipment manipulations. Documents reviewed are listed in the Attachment to this report.

On June 18, the inspectors observed operator performance while reducing Unit 2 reactor power from 100 percent to 97 percent RTP in preparation for returning a main feedwater header pressure transmitter to service following repair and the restoration of the transmitter's input to the digital feedwater control system. The inspectors attended the Just-in-Time training provided to the operators, the pre-job brief for the evolution and observed the conduct of control room activities, procedure use and adherence, and plant equipment manipulations.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations

a. Inspection Scope

The inspectors reviewed operability evaluations to verify that the operability of systems important to safety were properly established, that the affected components or systems remained capable of performing their intended safety function, and that no unrecognized increase in plant or public risk occurred. Operability evaluations were reviewed for the five issues listed below:

- NS system heat exchanger outlet design temperatures could be exceeded during a design basis event (PIP C-04-02464)
- Engineered Safety Feature Actuation System (ESFAS) Test alarm was not received during safeguards equipment testing (PIP C-04-01998)
- 2B Emergency Diesel Generator (EDG) jacket water cooling heat exchanger heat capacity test failures (PIP C-04-01937)
- Containment high range radiation monitor (EMF 53 A/B) thermal effect on coaxial cabling (PIP C-04-01445)
- 2B nuclear service water pump motor cable jacket splitting (PIP C-04-01369)

b. Findings

No findings of significance were identified.

1R16 Operator Workarounds

Cumulative Workarounds

a. Inspection Scope

The inspectors reviewed the current list of active operator workarounds for potential affects on the functionality of mitigating systems. The workarounds were reviewed to determine: (1) if the functional capability of the system or human reliability in responding to an initiating event was affected; (2) the affect on the operator's ability to implement abnormal or emergency procedures; and (3) if operator workaround problems were captured in the licensee's corrective action program. The inspectors performed an in-depth review of the cumulative effects of all identified operator workarounds and their: (1) impact on the reliability, availability, and potential for mis-operation of the identified system(s); (2) potential for increasing an initiating event frequency; and (3) impact on the ability of operators to respond in a correct and timely manner to a plant transient and accident. Aggregate impacts of the identified workarounds on each individual operator watch station were also reviewed. Documents reviewed for this inspection are listed in the Attachment to this report.

b. Findings

No findings of significance were identified.

1R17 Permanent Plant Modifications

a. Inspection Scope

The inspectors evaluated design change documentation and conducted field observations for one major modification associated with installation of flush connection piping in the nuclear service water system, to evaluate the modification for adverse affects on system availability, reliability, and functional capability. The following modification and the associated attributes were reviewed:

- Minor Modification, CNCE-62338, Install 12 inch flush connection piping between 1A and 1B nuclear service water system supply piping to the containment spray heat exchanger (Mitigating Systems)

  - Conformance to design basis including selected calculation reviews
  - Field installation requirements
  - Functional testing and results
  - Plant procedure, critical drawing
  - 10CFR50.59 screen

b. Findings

No findings of significance were identified.

1RST Post-Maintenance and Surveillance Testing (Pilot)

a. Inspection Scope

The inspectors observed and/or reviewed the nine surveillance tests and post-maintenance tests listed below to verify that Technical Specification (TS) surveillance requirements and/or Selected Licensee Commitment requirements were properly complied with, and that test acceptance criteria were properly specified. The inspectors verified that proper test conditions were established as specified in the procedures, that no equipment preconditioning activities occurred, and that acceptance criteria had been met. Additionally, the inspectors also verified that equipment was properly returned to service and that proper testing was specified and conducted to ensure that the equipment could perform its intended safety function following maintenance or as part of surveillance testing. Additional documents reviewed during this inspection are listed in the Attachment to this report. The following activities were reviewed:

Surveillance Tests

- PT/1/A/4200/004C; Containment Spray Pump 1B Performance Test
- PT/1/A/4400/009; Cooling Water Flow Monitoring for Asiatic Clams and Mussels Test (Enclosure 13.2, NS HX 1B Flow Verification)

- PT/2/A/4200/009A; Unit 2 Auxiliary Safeguards Periodic Test (Enclosures 13.5, 13.7 and 13.31)
- CP/0/B/8200/002; Determination of Gross Radioactivity and XE-133 Equivalent Activity in Reactor Coolant

In-Service Test

- PT/0/A/4200/007B, Centrifugal Charging Pump 1B Test

Post Maintenance Tests (associated with)

- 2B Safety Injection Pump maintenance
  PT/2/A/4200/005 B, Safety Injection Pump 2B Performance Test
  Work Order 98655178, Perform Electrical Testing on Unit 2 Safety Injection Pump

- Unit 2 Turbine Driven Auxiliary Feedwater Pump maintenance
  PT/2/A/4250/003 C, Turbine Driven Auxiliary Feedwater Pump #2 Performance Test
  Work Order 98655612, Perform Preventative Maintenance on Unit 2 Turbine Driven Auxiliary Feedwater Pump

- Unit 1 Solid State Protection System Train 'A' Engineered Safety Feature relay Replacement
  PT/1/A/4200/009 A, Auxiliary Safeguards Test Cabinet Periodic Test
  Work Order 98661354, Inspect and Repair K644 Relay In 1A Solid State Protection System

- Repair of a fuel oil leak on the 1A Diesel Generator 6-Right cylinder high pressure fuel injector tubing
  PT/1/A/4350/002A, Diesel Generator 1A Operability Test
  WO 98671903, Replacement of high pressure fuel oil injector tubing on the 1A Diesel Generator

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification

.1 Mitigating Systems Cornerstone

a. Inspection Scope

The inspectors sampled licensee submittals for the performance indicators (PIs) listed below for the period from April 2003 through March 2004. To verify the accuracy of the PI data reported during that period, PI definitions and guidance contained in Nuclear

Energy Institute (NEI) 99-02, "Regulatory Assessment Performance Indicator Guideline," Rev. 2, were used to verify the basis in reporting for each data element.

- Safety System Unavailability - Emergency AC Power (Unit 1 and Unit 2)
- Safety System Functional Failures (Unit 1 and Unit 2)

The inspectors reviewed a selection of Licensee Event Reports, portions of Unit 1 and Unit 2 operator log entries, PIP descriptions, monthly operating reports, and PI data sheets to verify that the licensee had adequately identified the number of unavailability hours and safety system functional failures. These numbers were compared to the numbers reported for the PIs.

b. Findings

No findings of significance were identified.

.2 Barrier Integrity Cornerstone

a. Inspection Scope

The inspectors sampled licensee submittals for the PI listed below for the period from April 2003 through March 2004. To verify the accuracy of the PI data reported during that period, PI definitions and guidance contained in NEI 99-02, "Regulatory Assessment Performance Indicator Guideline," Rev. 2, were used to verify the basis in reporting for each data element.

- Reactor Coolant System Specific Activity (Unit 1 and Unit 2)

The inspectors reviewed the licensee's chemistry sample records to verify that the correct numbers were reported for the PI. Additionally, the inspectors observed a chemistry technician obtain, and a radiation protection technician analyze a reactor coolant sample.

b. Findings

No findings of significance were identified.

4OA2 Problem Identification and Resolution

.1 Daily Screening of Items Entered Into the Corrective Action Program

As required by Inspection Procedure 71152, "Identification and Resolution of Problems," and in order to help identify repetitive equipment failures or specific human performance issues for follow-up, the inspectors performed a daily screening of items entered into the licensee's corrective action program. This review was accomplished by reviewing copies of PIPs, attending some daily screening meetings, and accessing the licensee's computerized database.

.2 Semi-Annual Trend Review

a. Inspection Scope

As required by Inspection Procedure 71152, "Identification and Resolution of Problems," the inspectors performed a review of the licensee's corrective action program (CAP) and associated documents to identify trends that could indicate the existence of a more significant safety issue. The inspector's review was focused on repetitive equipment issues, but also considered the results of daily inspector CAP item screening discussed in section 4OA2.1 above, licensee trending efforts, and licensee human performance results. The inspector's review nominally considered the six month period of January 2004 through June 2004, although some examples expanded beyond those dates when the scope of the trend warranted. The review also included issues documented outside the normal CAP in major equipment problem lists, plant health team vulnerability lists, Catawba focus area reports, system health reports, self-assessment reports, and maintenance rule reports. The specific items reviewed are listed in this report. The inspectors compared and contrasted their results with the results contained in the licensee's latest quarterly trend reports. Corrective actions associated with a sample of the issues identified in the licensees trend report were reviewed for adequacy.

b. Assessment and Observations

No findings of significance were identified. In general, the licensee has identified trends and has appropriately addressed the trends with their CAP. However, the inspectors identified a trend associated with inadequate procedure use and adherence that the licensee had not previously fully recognized. This trend was identified based on actual inspector observations of several surveillance activities performed by licensee personnel. The observations included individuals not using the instrument specified in the procedure to record surveillance data, not establishing the system condition as specified in the procedure to obtain the required data, individuals not performing the procedure steps in sequence as required, individuals not performing procedure steps that were signed as complete, and the use of reference material called out in the procedure that was uncontrolled. The inspectors made the observations throughout the past year and have made these observations as recently as the current quarterly inspection period. Some of the observations resulted in the licensee performing the surveillance over, prior to the surveillance being signed as complete. The observations were discussed with the licensee and several observations were dispositioned as minor violations. For some of the examples noted above, the licensee generated PIPs as a result of the observations and those are listed in the Attachment to this report.

The inspectors performed a review of the PIP documents generated as a result of each of the inspectors observations, including the description, classification, corrective actions, and issue coding. The inspectors noted that neither the descriptions of the issues nor the classification coding identified procedure use and adherence as the underlying cause of each event. The inspectors determined that this was most likely the reason the licensee had not identified the procedure use and adherence trend involving the observed surveillance activities, while analyzing the PIP database.

The inspectors reviewed the licensee's recent human performance initiative that was implemented to improve procedure use and adherence, and self-assessments that

identified procedure use and adherence issues. The inspectors observed that the human performance initiative and actions resulting from the assessments would not address the issues that were identified by the inspectors. The licensee's human performance initiative concentrated on administrative issues and not technical issues as related to the inspectors' observations. The inspectors have continued to observe examples of inadequate procedure use and adherence, indicating that the trend had not been resolved.

The inspectors discussed the basis for their observation that a trend existed with the licensee. Following these discussions and the licensee's subsequent review of the PIPs associated with the inspector's observations, the licensee initiated several actions. The PIPs that were generated as a result of the inspector observations were cause coded to reflect procedure use and adherence, some of the problem statements were enhanced to more accurately reflect the inadequate procedure use and adherence aspects, group training sessions were scheduled with the appropriate personnel to ensure that accurate problem statements would be generated in the future, and the issues associated with this trend were considered for incorporation into the site human performance initiative.

.3 Annual Sample Review

a. Inspection Scope

The inspectors selected one PIP for a detailed review. The PIP, C-03-05870, involved the failure of control room area ventilation chilled water (YC) system 'B' chiller to pass a performance test on November 3, 2003. The report was chosen for review based on a subsequent performance test failure of the YC system 'A' chiller on April 7, 2004. The PIP was reviewed to determine whether the full extent of the issues were identified, an appropriate evaluation was performed, and appropriate corrective actions were specified and prioritized. The inspectors evaluated the PIP against the requirements of the licensee's corrective action program document and 10 CFR 50, Appendix B.

b. Findings

Introduction: A Green Non-cited Violation (NCV) was identified for the failure to perform prompt corrective actions for a significant condition adverse to quality associated with the failure of the YC system chiller baffle plates. This resulted in a subsequent test failure of the YC system 'A' chiller.

Description: The inspectors found that the root cause investigation for PIP C-03-05870 determined the failure of the YC system 'B' chiller to meet the performance test was caused by an inlet flow divider plate becoming displaced. The displacement was primarily due to degradation of the divider plate support clamps. The divider plate displacement, of two and one-half inches, allowed approximately a 600 gallon per minute bypass flow to occur. The bypass flow, which involves nuclear service water not passing through the chiller tubes, caused the chiller to not meet the performance test acceptance criteria. An urgent modification was performed on the YC system 'B' chiller divider plate support clamps prior to restoring the YC system 'B' chiller to service on November 6, 2003. The inspectors found that the root cause investigation report specified a corrective action to perform the same modification to the YC system 'A' chiller divider plate support clamps by May 31, 2004. The YC system 'A' chiller failed a

performance test on April 7, 2004, due to the divider plate becoming displaced. A divider plate support clamp modification was performed prior to restoring the YC system 'A' chiller back in service.

The inspectors found that the licensee was aware that the YC system 'A' chiller divider plate was susceptible to the same failure mechanism that had occurred on the YC system 'B' chiller, since they found that the YC system 'A' chiller divider plate was displaced by one-half an inch during cleaning of the chiller on October 28, 2003. The inspectors also noted that the licensee opened and cleaned the YC system 'A' chiller on January 20, 2004, but the divider plate clamp support modification was not performed. The inspectors concluded that delaying the planned modification of the YC system 'A' chiller divider plate clamps until May 31, 2004, constituted a failure to take prompt corrective action. This conclusion was based on the following information: (1) the licensee knew that the YC system 'A' chiller divider plate was susceptible to movement and possible failure based on actually finding the plate displaced; (2) the licensee stated in their root cause that the performance testing of the chillers could not predict displacement of the divider plate in the chiller, therefore they could not predict when the divider plate would move enough to cause an inoperable condition; and (3) the licensee missed an opportunity to implement the modification on the YC system 'A' chiller divider plate clamp on January 20, 2004, when the chiller was opened for cleaning.

Analysis: The performance deficiency associated with this finding was a failure to perform prompt corrective actions, which resulted in a test failure of the YC system 'A' chiller. This condition adversely impacted the reliability and availability of the YC system 'A' train. The finding was greater than minor because it is associated with the equipment performance attribute and affects of the reactor safety mitigating system cornerstone objective of ensuring reliable, available, and capable systems that respond to initiating events. The finding was only of very low safety significance because both trains of the YC system were not inoperable at the same time and one train is fully capable of performing the safety function; therefore, there was not a complete loss of system function.

Enforcement: 10 CFR 50, Appendix B, Criterion XVI, Corrective Action, states, in part, that measures shall be established to ensure conditions adverse to quality such as failures, defective material, and equipment are promptly identified and corrected. In the case of significant conditions adverse to quality, the measures shall assure that the cause of the condition is determined and corrective action taken to preclude repetition. Contrary to the above, the licensee did not promptly correct a known significant condition adverse to quality, when on April 7, 2004, the YC system 'A' chiller failed its performance test due to the inlet flow divider plate support clamp failure. The licensee was aware that the YC system 'A' chiller divider plate clamps were susceptible to this failure mechanism based on their discovery on October 28, 2003, that the YC system 'A' chiller plate was displaced and a similar failure of the YC system 'B' chiller divider plate clamps on November 3, 2003. Because the failure to promptly correct the deficient condition of the divider plate clamps on the YC system 'A' chiller divider plate was of very low safety significance and has been entered into the licensees corrective action program under PIPs C-04-1757 and C-04-1759, this violation is being treated as a NCV, consistent with Section VI.A of the NRC Enforcement Policy: NCV 05000413, 414/ 2004004-01, Failure to Promptly Correct YC System Chiller Divider Plate Clamps.

4OA5 Other Activities

.1 Plant Status Tour

a. Inspection Scope

While conducting a site tour of the protected area yard on April 28, 2004, the inspectors observed construction activities associated with a permanent plant modification to the low pressure service water system. The permanent plant modification involved installing a polyethylene pipe under the ground in an effort to replace the existing system piping. The inspectors observed a trench as part of this modification that was dug over the top of the Unit 2 'B' train of the nuclear service water (RN) system electrical conduits.

b. Findings

Introduction: A Green NCV was identified for failure to comply with 10 CFR 50, Appendix B, Criterion III, Design Control, related to the minimum missile protection shield thickness of 5.0 feet of ground barrier over the Unit 2, RN system, train 'B' electrical conduits.

Description: The RN electrical conduits are buried under the ground and routed in plastic conduit. The conduit runs between structural concrete manholes. The inspectors observed a trench that had been dug perpendicular to the RN system electrical conduit, traversing directly over the 'B' train, RN electrical conduit. Several feet of dirt had been removed. The inspectors questioned the licensee regarding how many feet of dirt was remaining over the electrical conduit and was informed that approximately 2 feet of dirt remained. The inspectors found that no compensatory measures were in place to compensate for having the dirt removed. The inspectors found that site minor modification CNCE-62011, which was being used to control the digging evolution to install low pressure service water pipe, did not address that this portion of the trench would remove dirt from the top of the RN electrical conduit and that design limits would need to be maintained or compensatory measures implemented. The Final Safety Analysis Report, Section 3.5.2, Systems To Be Protected, stated that the "Electrical Conduit running between manholes is covered with a one foot thick concrete slab when it does not have five feet or more of ground cover." The purpose for the ground cover over the electrical conduit is to protect the RN cables from tornado generated missile hazards. In the location where the trench was dug, there was no concrete slab over the top of the electrical conduit; therefore, the 5 feet of ground cover was required.

Analysis. The performance deficiency associated with this finding was that the licensee did not have adequate design controls associated with the modification process, involving the digging evolution, to ensure that the required depth of ground cover was maintained or that compensatory actions were in place prior to removing the ground cover over the 'B' train, RN electrical conduit. Because the finding is associated with the protection against external factors attribute and affected the mitigating system cornerstone objective of ensuring equipment reliability, the finding is more than minor. The finding was required to be evaluated under Phase 3 of the Safety Significance Determination Process since it involved a barrier to external events on one train of a support system. A Phase 3 analysis was conducted by the Regional Senior Reactor Analyst. The finding was determined to be of very low safety significance because of the

low frequency of tornados, the relative small amount of conduit that did not have the required ground cover, the short exposure time, and the low impact on mitigating systems since just one pump in one train of RN was involved.

Enforcement: 10 CFR 50, Appendix B, Criterion III, Design Control, states in part that "Measures shall be established to assure ... the design basis ... for those structures, systems, and components to which this appendix applies are correctly translated into specifications, drawings, procedures, and instructions. These measures shall include provisions to assure that appropriate quality standards are specified and included in design documents and that deviations from such standards are controlled."

The Final Safety Analysis Report, Section 3.5.2, Systems To Be Protected, states that the "Electrical Conduit running between manholes is covered with a one foot thick concrete slab when it does not have five feet or more of ground cover." Certificate of Engineering Calculation, CNC 1150.00-00-001, Missile Protection Shield, calculated the minimum ground cover thickness for tornado generated missile protection to be 4.55 feet.

Contrary to the above, starting on April 28, 2004, for 21 hours, the licensee failed to assure that the minimum missile protection shield thickness of 5.0 feet was maintained or controlled for the ground barrier over the Unit 2 RN Train 'B' electrical conduits. This violation is being treated as a NCV, consistent with Section VI.A of the NRC Enforcement Policy: NCV 05000413,414/2004004-02, Failure to Maintain/Control the Thickness of the Ground Barrier Missile Protection Shield Over RN Train 'B' Electrical Conduits.

.2 (Open) Temporary Instruction (TI) 2515/156, Offsite Power System Operational Readiness - Unit 1 and Unit 2

a. Inspection Scope

The inspectors collected data from licensee maintenance records, event reports, corrective action documents and procedures and through interviews of station engineering, maintenance, and operations staff, as required by the Temporary Instruction (TI) 2515/156. The data was gathered to assess the operational readiness of the offsite power systems in accordance with NRC requirements such as Appendix A to 10 CFR Part 50, General Design Criterion (GDC) 17; Criterion XVI of Appendix B to10 CFR Part 50, Plant Technical Specifications (TS) for offsite power systems; 10 CFR 50.63; 10 CFR 50.65 (a)(4), and licensee procedures. Documents reviewed for this TI are listed in the Attachment to this report.

b. Findings

No findings of significance were identified. Based on the inspection, no immediate operability issues were identified. In accordance with TI 2515/156 reporting requirements, the inspectors provided the required data to the headquarters staff for further analysis. This TI will remain open pending completion of that analysis.

4OA6 Meetings

Exit Meeting Summary

On June 29, 2004, the resident inspectors presented the inspection results to Mr. D. Jamil, Site Vice President, and other members of licensee management, who acknowledged the findings. The inspectors confirmed that proprietary information was not provided or examined during the inspection.

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

K. Adams, Human Performance Manager
E. Beadle, Emergency Planning Manager
W. Byers, Security Manager
T. Daniels, Emergency Planning/Fire Protection
B. Dolan, Engineering Manager
J. Foster, Radiation Protection Manager
R. Glover, Station Manager
W. Green, Reactor and Electrical Systems Manager
G. Hamrick, Mechanical, Civil Engineering Manager
P. Ivey, Human Resources Manager
D. Jamil, Catawba Site Vice President
L. Keller, Regulatory Compliance Manager
P. McIntyre, Safety Review Group Manager
M. Patrick, Work Control Superintendent
J. Pitesa, Operations Superintendent
F. Smith, Chemistry Manager
G. Strickland, Regulatory Compliance Specialist
R. Sweigart, Safety Assurance Manager
J. Thrasher, Modifications Manager
C. Trezise, Maintenance Superintendent

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

05000413,414/2004004-01	NCV	Failure to Promptly Correct YC System Chiller Divider Plate Clamps (Section 4OA2.3)
05000413,414/2004004-02,	NCV	Failure to Maintain/Control the Thickness of the Ground Barrier Missile Protection Shield Over RN Train 'B' Electrical Conduits (Section 4OA5.1)

Items Discussed

2515/156	TI	Offsite Power System Operational Readiness - Unit 1 and Unit 2 (Section 4OA5.2)

LIST OF DOCUMENTS REVIEWED

(Section 1R04.2: Equipment Alignment)

OP/1/A/6200/001, Chemical Volume and Control System
OP/1/A/6200/001M, Fill and Vent of the NV System
OP/1/A/6200/012, Reactor Makeup Water
PT/1/A/4200/001B, Emergency Core Cooling System Valve Lineup Verification
PT/1/A/4200/006D, Emergency Core Cooling System Throttle Valve Mechanical Stop Position Verification
Chemical Volume and Control System Health Reports for Trimesters 2 and 3 in 2003 and Trimester 1 in 2004
PIP C-03-6618, Valve 1NV-11A failed stroke time test
PIP C-03-7200, 1NV-10A would not close
PIP C-04-0431, Troubleshooting perceived control problems with 1NV224
PIP C-04-0614, A gas void was discovered in the NV emergency boration flow path
PIP C-04-0673, Residual Heat Removal, NV, Safety Injection, and spent fuel cooling pumps have small amounts of boron crystals on them
PIP C-04-1823, Inaccurate vibration data was recorded and evaluated for the 1B NV pump
PIP C-04-1853, Pasty material noted in outboard seal troughs of 1B NV pump
PIP C-04-1906, Valve 1NV-294 has dried boron on flange surface
System Drawings CN-1554-1.0 through CN-1554-1.8

PIPs / Work Requests generated as a result of this inspection:
WR 98313317, Valve position indication for 1NB-16 (1A NB Evaporator Feed Demin Resin Sluice Isolation Valve) shows dual indication when in the closed position
PIP C-04-1893, Several NV valve reach rod position indicators were found not to be indicating properly
PIP C-04-2530, Some NV system vent and drain valves are not in agreement with piping & instrumentation drawings with respect to having caps installed

(Section 1R05: Fire Protection)

Pre-Fire Plan for Fire Area 1
Pre-Fire Plan for Fire Area 4
Pre-Fire Plan for Fire Area 11
Pre-Fire Plan for Fire Area 13
Pre-Fire Plan for Fire Area 24

PIPs generated as a result of this inspection:
PIP C-04-3063, Some rooms in the Auxiliary building are not shown on the Pre-Fire Plan or are shown on the incorrect plan.

(Section 1R06: Flood Protection Measures)

CNS-1565.WL-00-0001, Section 3.2.1.4.3. Residual Heat Removal and Containment Spray Pump Room Sump

CNS-1465.00-00-0011,Flooding From External Sources
10CFR50.59 Evaluation, Enclosure 4.23 to OP/0/A/6400/006F, RN Inlet to NS HX 1A Flush, and Enclosure 4.24 to OP/0/A/6400/006F, RN Inlet to NS HX 1B Flush
IP/0/B/3112/008, Calibration of RN System Conduit Manhole Sump Level Switches
Minor modification CNCE-62338, Installation of 12 inch flush connection piping to RN
Work Order 98645713, PM on Overly Doors
Work Order 98644901, Verify Level Switch/ Pump Operation
Updated Final Safety Evaluation Report, Section 3.4, Water Level (Flood) Design
PIP C-04-01369, 2B RN Pump Motor Cable in CMH-11B has nick in outer jacket
PIP C-04-02386, Design misapplication of level switches
PIP C-04-02351, Five foot soil cover of RN piping headers is degraded

(Section 1R07: Heat Sink)

PIPs generated as a result of this inspection:
C-04-01688, Uncontrolled copies of resistance temperature detector (RTD) calibration data sheets were used to record RTD calibration constants in the Heat Capacity test procedure and Heat Capacity Data Acquisition setup program

(Section 1R12: Maintenance Effectiveness)

PT/2/A/4200/013C, RN Valve Inservice Test, Enclosure 13.22, 2RN-351 Valve Inservice Test
Work Instruction 2004-06-16; 2CFPT5142 CF Header Pressure Internal Circuit Card Replacement
Work Instruction 2004-06-18; 2CFPT5142 CF Header Pressure Calibration/Replacement
Complex Evolution Plan; Unit 2 Digital Feedwater Control 2CFPT5142 electronic card replacement
Critical Evolution Plan; Unit 2 Digital Feedwater Control 2CFPT5142 calibration/replacement
Work Order 98672357; Inspect/repair cause of high pressure alarm on U2 feedwater header
PIP C-04-2861; Digital Feedwater Control System failure due to the failure of feedwater header pressure transmitter 2CFPT5142

(Section 1R14: Personnel Performance During Nonroutine Plant Evolutions)

OP/1/A/6100/003, Controlling Procedure for Unit Operation; Enclosures 4.2, Power Decrease, and 4.3, Unit Operation Between 85% and 100% Power
OP/1/B/6300/001, Turbine Generator, Enclosure 4.2, Load Changing
OP/1/A/6150/009, Boron Concentration Control, Enclosure 4.5; Adding Boric Acid
IP/1/A/3240/011, Nuclear Instrumentation System Power Range Calibration at Power
Reactor Engineering Power Maneuver Plan for 1C1 Water Box Leak Repair
Written Pre-job Briefing sheet for Power Decrease per OP/1/A/6100/003
Unit 1 1C1 Main Condenser Water Box Leak Repair task schedule
Nuclear Site Directive 3.0.21, Pre-job Briefing
Critical Evolution Plan; Unit 2 Digital Feedwater Control 2CFPT5142 calibration/replacement
Work Instruction 2004-06-18; 2CFPT5142 CF Header Pressure Calibration/Replacement

(Section 1R16: Operator Workarounds)

Nuclear System Directive 506, Operator Workarounds
Catawba Nuclear Station Operator Workaround List
PIP C-03-3350, Unit 2 automatic turbine runback to 50% power due to 2A generator breaker opening
PIP C-99-3172, The glycol supply outside containment isolation valves 1(2)-NF-228A will not close against the calculated maximum expected differential pressure of 117 psi
PIP C-03-2132, Unexpected shaft vibration increase in reactor coolant pump 2D during End-of-Cycle 12 cooldown

(Section 1RST: Post-Maintenance and Surveillance Testing (Pilot))

CP/0/B/8200/002, Determination of Gross Radioactivity and XE-133 Equivalent Activity in Reactor Coolant, Enclosure 6.1 (Calculating GSA and Xe-133 Equivalent Activity, Rheodyne Valve Method) and Enclosure 6.2 (Rheodyne Valve Method)
OP/1/A/6200/034, Unit 1 NM Automation Sampling System; Enclosure 4.1, Reactor Coolant Rheodyne Sampling
HP/0/B/1001/029, Genie/CAS Gamma Spectroscopy System Operation and Calibration; Sections 4.5 (Sample Counting) and 4.6 (Editing and Signing Results)
PIP C-04-2780, Fuel oil leak occurred on the high pressure fuel injection tubing on cylinder 6R on the 1A Diesel Generator during performance of surveillance test
PIP C-04-2778, Unexpected TSAIL entry upon discovery of a leaking fuel injection line during operability PT

PIPs generated as a result of this inspection:
C-04-01991, Process instrument cannot be read with enough precision to ensure test acceptance criteria is met

(Section 4OA1: Performance Indicator Verification)

PIPs generated as a result of this inspection:
C-04-02479, The Performance Indicator data for the 2B Emergency Safety System Availability needs to be amended for November 2003 to include nuclear service water pit B inspection hours

(Section 4OA2.2: Problem Identification and Resolution Semi Annual Trend Review)

Operations Human Performance Self Assessment reports; third quarter 2002 to first quarter 2004
Operations Department Procedure Use and Adherence Assessment report
Technical Procedure Use and Adherence Error Rate trend data, 2004 report
PIP C-04-0118; 4th Quarter Operations Procedure Use and Adherence self-assessment
2004 Catawba Focus Area, Human Performance
PIP C-04-01991, Process Instrument Cannot Be Read With Enough Precision
PIP C-04-01844, Common Cause Analysis on Equipment Reliability
PIP C-04-01829, Operations 2003 Third Quarter Human Performance Assessment
PIP C-04-00018, Fourth Quarter Operations Procedure Use & Adherence Self-Assessment
PIP C-03-05691, KC pump 2A1 IWP indicates an acceptable range that was not within the readability of the gauge

PIP C-04-00470, 2B Auxiliary Feedwater A Pump IWP: Data Recorded From Incorrect Instruments
PIP C-04-01688, Setup of data acquisition equipment for the 1B NS HX capacity test was done using uncontrolled calibration sheets
PIP C-04-02533,When performing PT/2/A/4200/007B, 2B NV IWP, steps were signed off as having been performed when in fact they had not been and should have been marked as N/A based on plant conditions
PIP C-04-0414, Drain holes were drilled in plastic plugs used to seal heat trace controller boxes contrary to Inspection Procedure O/B/3560/008, Preventative Maintenance and Operational Check of Freeze Protection Heat Trace and Instrument Box Heaters Systems
PIP C-04-2268, Emerging trend in procedure use and adherence associated with NSD-706, N/A requirements
Maintenance Training Procedure Use and Adherence lesson plan, dated June 23, 2004

(Section 4OA5.2: Offsite Power System Operational Readiness, Temporary Instruction (TI) 2515/156 - Unit 1 and Unit 2

OP/1(2)/A/6350/001; Normal Power Checklist, Enclosure 4.27; Degraded Grid Response
OP/1(2)/A/6350/002; Diesel Generator Operation, Enclosures 4.15 and 4.16, Removing (Returning) Diesel Generator from (to) service
OAC Alarm Response for points C1E1797 (230kV Red Bus) and C1E1795 (230 kV Yellow Bus)
OP/1(2)/B/6100/010L; Annunciator Response for Panel 1(2)AD-11 (Window K/6; 230kV Switchyard Voltage Low)
PT/1(2)/A/4350/003; Electrical Power Source Alignment Verification
Catawba Station Directive 3.0.18; On-Line Maintenance Risk Management
Catawba Station Directive 3.0.23; Outage Work Activity Risk Management Process
Nuclear Site Directive NSD-403; Shutdown Risk Management (Modes 4, 5, 6 and No Mode) per 10CFR50.65(a)(4)
Nuclear Site Directive NSD-415; Operational Risk Management (Modes 1-3) per 10CFR50.65(a)(4)
Licensee Event Report 414/1996-001; Loss of Off-Site Power due to Electrical Component Failures
Site Specific Operating Agreement Between Electric Transmission Department and Catawba Nuclear Station
Service Level Agreement Between Electric Transmission, Nuclear Generation, Power Generation Maintenance Support and Telecommunications

LIST OF ACRONYMS USED

ASE	-	Active Simulator Evaluation
CAP	-	Corrective Action Program
CFR	-	Code of Federal Regulations
CNS	-	Catawba Nuclear Station
EDG	-	Emergency Diesel Generator
ESFAS	-	Engineered Safety Feature Actuation System
GDC	-	General Design Criterion
HX	-	Heat Exchanger
IMC	-	Inspection Manual Chapter
IWP	-	Pump Inservice Test
KC	-	Component Cooling Water

LOCA	-	Loss of Coolant Accident
NCV	-	Non-Cited Violation
NEI	-	Nuclear Energy Institute
NGD	-	Nuclear Generation Department
NRC	-	Nuclear Regulatory Commission
NRR	-	Nuclear Reactor Regulation
NS	-	Containment Spray
NV	-	Chemical and Volume Control
OAC	-	Operator Aid Computer
OP	-	Operating Procedure
PD	-	Power Delivery
PI	-	Performance Indicator
PIP	-	Problem Investigation Process (report)
PRA	-	Probabilistic Risk Assessment
PT	-	Periodic Test
RN	-	Nuclear Service Water
RTCA	-	Real Time Computer Analysis
RTD	-	Resistance Temperature Detector
RTO/TSO	-	Regional Transmission Organization
RTP	-	Rated Thermal Power
SDP	-	Significance Determination Process
TI	-	Temporary Instruction
TS	-	Technical Specification
TSAIL	-	Technical Specification Action Item Log
WO	-	Work Order
YC	-	Control Room Area Ventilation Chilled Water