



UNITED STATES  
NUCLEAR REGULATORY COMMISSION

REGION II  
SAM NUNN ATLANTA FEDERAL CENTER  
61 FORSYTH STREET, SW, SUITE 23T85  
ATLANTA, GEORGIA 30303-8931

July 28, 2006

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  
05000413/2006003 AND 05000414/2006003

Dear Mr. Jamil:

On June 30, 2006, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Catawba Nuclear Station Units 1 and 2. The enclosed inspection report documents the inspection results, which were discussed on July 12, 2006, with you and other members of your staff.

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

This report documents an NRC-identified finding of very low safety significance (Green) which was determined to involve a violation of NRC requirements. Additionally, a licensee-identified violation, which was determined to be of very low safety significance, is listed in this report. However, because of the very low safety significance and because they have been entered into your corrective action program, the NRC is treating these violations as non-cited violations (NCV) in accordance with Section VI.A.1 of the NRC's Enforcement Policy. If you contest any NCV in this report, you should provide a written 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 and its enclosure 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 [www.nrc.gov/reading-rm/adams.html](http://www.nrc.gov/reading-rm/adams.html) (the Public Electronic Reading Room).

Sincerely,

**/RA/**

Michael E. Ernstes, 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 05000413/2006003  
and 05000414/2006003  
w/Attachment: Supplemental Information

cc w/encl: (See page 3)

Sincerely,

/RA/

Michael E. Ernstes, Chief  
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Letter to D.M. Jamil from Michael Ernstes dated July 28, 2006

SUBJECT: CATAWBA NUCLEAR STATION - NRC INTEGRATED INSPECTION REPORT  
05000413/2006003 AND 05000414/2006003

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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.: 05000413/2006003 and 05000414/2006003

Licensee: Duke Energy Corporation

Facility: Catawba Nuclear Station, Units 1 and 2

Location: York, SC 29745

Dates: April 1, 2006 through June 30, 2006

Inspectors: E. Guthrie, Senior Resident Inspector  
A. Sabisch, Resident Inspector  
G. Williams, Project Engineer  
R. Moore, Senior Reactor Inspector (Sections 1R02 and 1R17)  
M. Scott, Reactor Inspector (Sections 1R02 and 1R17)  
C. Smith, Senior Reactor Inspector (Sections 1R02 and 1R17)  
J. Rivera-Ortiz, Reactor Inspector (Section 1R08)  
J. Fuller, Reactor Inspector (Section 1R08)

Approved by: Michael E. Ernstes, Chief  
Reactor Projects Branch 1  
Division of Reactor Projects

Enclosure

## SUMMARY OF FINDINGS

IR 05000413/2006-003, 05000414/2006-003; 4/1/2006 - 6/30/2006; Catawba Nuclear Station, Units 1 and 2; Event Followup.

The report covered a three-month period of inspection by two resident inspectors, a project engineer, a senior reactor inspector, and four reactor inspectors. One Green finding which was a non-cited violation (NCV) was 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," (ROP) Revision 3, dated July 2000.

### A. NRC-Identified and Self-Revealing Findings

#### Cornerstone: Mitigating Systems

- Green. 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 4OA5.1)

### B. Licensee-Identified Violations

A violation of very low safety significance, which was identified by the licensee, has been reviewed by the inspectors. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program. The violation and corrective action document numbers are listed in Section 4OA7 of this report.

## REPORT DETAILS

### Summary of Plant Status

Unit 1 began the inspection period operating at 100 percent (%) Rated Thermal Power (RTP). On May 20, a fault in the switchyard resulted in a loss of offsite power and a reactor trip. The unit was forced to cool down to Mode 5 to clean biological debris from several cooling system components located inside of containment. The unit was returned to 100% RTP on June 12 and remained there through the end of the inspection period.

Unit 2 began the inspection period in a refueling outage. The unit reached 100% RTP on April 30. On May 20, a fault in the switchyard resulted in a loss of offsite power and a reactor trip. The unit was stabilized in Mode 3. The unit was returned to 100% RTP on May 29 and remained there through the end of the inspection period.

1. REACTOR SAFETY  
Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

#### 1R01 Adverse Weather Protection

##### .1 Seasonal Weather Preparation

###### a. Inspection Scope

The inspectors reviewed the licensee's preparations for adverse weather associated with high ambient temperatures. This included field walkdowns to assess the material condition and operation of ventilation and cooling equipment as well as other preparations made to protect plant equipment from high ambient temperature conditions. Risk significant systems reviewed included portions of the standby shutdown facility and the nuclear service water pump house structure. In addition, the inspectors conducted discussions with operations, engineering, and maintenance personnel responsible for implementing the hot weather preparation program to assess the licensee's ability to identify and resolve deficient conditions associated with hot weather protection equipment prior to actual hot weather being experienced at the site. Documents reviewed are listed in the Attachment.

###### b. Findings

No findings of significance were identified.

#### 1R02 Evaluations of Changes, Tests or Experiments

###### a. Inspection Scope

The inspectors reviewed selected samples of evaluations to confirm that the licensee had appropriately considered the conditions under which changes to the facility, Updated Final Safety Analysis Report (UFSAR), or procedures may be made, and tests conducted, without prior NRC approval. The inspectors reviewed eight evaluations for

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changes and additional information, such as calculations, supporting analyses, the UFSAR, and drawings to confirm that the licensee had appropriately concluded that the changes could be accomplished without obtaining a license amendment. The evaluations reviewed are listed in the Attachment.

The inspectors also reviewed samples of changes for which the licensee had determined that evaluations were not required, to confirm that the licensee's conclusions to "screen out" these changes were correct and consistent with 10 CFR 50.59. The 16 "screened out" changes reviewed are listed in the Attachment.

The inspectors also reviewed problem investigation reports (PIPs) and 10 CFR 50.59 committee meeting notes to verify that problems were identified at an appropriate threshold, were entered into the corrective action process, and appropriate corrective actions had been initiated.

b. Findings

No findings of significance were identified.

1R04 Equipment Alignment

.1 Partial Walkdowns

a. Inspection Scope

The inspectors walked down the following five system alignments to verify that critical portions of equipment alignments remained operable while the redundant trains for that system were inoperable. The inspectors reviewed plant documents to determine the correct system and power alignments, as well as the required positions of selected valves and breakers. The inspectors reviewed equipment alignment problems which could cause initiating events or impact mitigating system availability to verify that they had been properly identified and resolved. Documents reviewed are listed in the Attachment.

- 2B diesel generator and 2B 4160-volt switchgear while the 2A diesel generator was removed from service for planned maintenance
- 2A diesel generator, 2B diesel generator, 4160-volt switchgear and turbine building switchgear when Unit 2 entered reduced inventory/mid-loop conditions following core reload in preparation for vacuum refill of the reactor coolant system
- Emergency core cooling system equipment and diesel generators on both units while external inspections of the nuclear service water (RN) headers were being performed
- Protection of B train equipment following the identification of a through-wall leak on the 2A component cooling water heat exchanger RN discharge piping
- 1B diesel generator and 1B 4160-volt vital switchgear when then 1A diesel generator was inoperable due to room flooding

b. Findings

No findings of significance were identified.

.2 Complete Walkdowna. Inspection Scope

The inspectors conducted a detailed walkdown of the Unit 2 safety injection (NI) 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 PIPs was also performed to verify that the licensee had appropriately characterized and prioritized NI-related equipment problems for resolution in the corrective action program. Documents reviewed are listed in the Attachment.

b. Findings

No findings of significance were identified.

1R05 Fire Protection - Walkdownsa. Inspection Scope

The inspectors walked down accessible portions of the following eight plant areas 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, 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 are listed in the Attachment.

- Unit 2 annulus area (conducted during the Unit 2 refueling outage)
- Unit 2 exterior doghouse
- Unit 1, A and B residual heat removal (ND) pump rooms
- Unit 2, A and B containment spray (NS) pump rooms
- Unit 1, A and B charging (NV) pump rooms

- Unit 1, A diesel generator room and associated corridor
- Unit 2 mechanical penetration room, 560 foot elevation
- Unit 1, A and B auxiliary shutdown panel rooms

b. Findings

No findings of significance were identified.

1R07 Heat Sink Performance - Annual Resident Inspection

a. Inspection Scope

The inspectors observed the performance of (Periodic Test) PT/2/A/4400/006B, Containment Spray Heat Exchanger 2B Heat Capacity Test, and evaluated the test data for acceptable performance. The inspectors also conducted discussions with test 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 via the data logger and computer processing equipment. Documents reviewed are listed in the Attachment.

b. Findings

No findings of significance were identified.

1R08 Inservice Inspection (ISI) Activities (3 Samples)

a. Inspection Scope

Piping Systems and Containment ISI. The inspectors reviewed the implementation of the licensee's ISI program for monitoring degradation of the reactor coolant system (RCS) boundary and the risk significant piping system boundaries. The inspectors selected a sample of American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI-required examinations for review. The inspectors reviewed nondestructive examination (NDE) activities to evaluate compliance with Technical Specifications (TSs) and the applicable editions of ASME Section V and XI (1989 Edition/No Addenda for examinations credited to the second 10-year ISI interval, and 1998 Edition/2000 Addenda for examinations credited to the third 10-year ISI interval), and to verify that indications and defects (if present) were appropriately evaluated and dispositioned in accordance with the requirements of ASME Section XI, IWB-3000 or IWC-3000 acceptance standards. Specifically, the inspectors directly observed the NDE activities described below and reviewed their corresponding NDE procedures, NDE reports, equipment and consumables certification records, and personnel qualifications records. Documents reviewed are listed in the Attachment.

- Ultrasonic (UT) examination of welds 2NI89-6, 2NI89-7, 2NI89-10, and 2NI89-11 (6-inch pipe in Safety Injection System, ASME Class 2)
- Liquid Penetrant (PT) examination of welds 2NC-89-4, 2NC-89-12, 2NC-89-13,

2NC-89-20, and 2NC-89-21 (2-inch line in Reactor Coolant System, ASME Class 1)

The inspectors reviewed final NDE reports for the welds referenced below to verify that the evaluation and disposition of indications was in accordance with the applicable version of ASME Section XI, IWB-3000.

- UT examination of Reactor Pressure Vessel welds 2RPV-101-124B, 2RPV-101-142A, 2RPV-101-142C, and 2RPV-101-171 (ASME Class 1)
- Radiographic (RT) examination of RCS welds 2NC-9-03 and 2SGA-Outlet-SE (RCS Cold Leg to Steam Generator (SG) weld, safe end to pipe weld, ASME Class 1)

The inspectors reviewed welding procedures, procedure qualification records, welder qualification records, and NDE reports (RT film, as applicable) listed in the Attachment for the following three welds.

- Weld 2BB61-23-1, 2-inch diameter socket weld, SG Blowdown System, ASME Class 2
- Weld 2492-NS.00-46-18-1, 8-inch diameter butt weld, Containment Spray System, ASME Class 2
- Weld 2CA62-12, 4-inch diameter butt weld, Auxiliary Feedwater System, ASME Class 2

In addition, the inspectors reviewed the implementation of the licensee's Containment ISI Program for monitoring the integrity of the containment structures. The inspectors reviewed a sample of wall thickness data for UT examinations performed in the containment liner surface area grids as part of the inspections scheduled for the second containment ISI interval. The inspectors compared the data to the acceptable standards of ASME Section XI, 1998 Edition/1999 and 2000 Addenda. The inspectors also conducted a containment walkdown of multiple elevations and peripheral locations to assess, in general, the material condition of structures, systems, and components.

Boric Acid Corrosion Control (BACC) Program. The inspectors reviewed the licensee's BACC activities to ensure implementation with commitments made in response to NRC Generic Letter 88-05, Boric Acid Corrosion of Carbon Steel Reactor Pressure Boundary, and applicable industry guidance documents. The inspectors reviewed procedures and the results of the licensee's Mode 3 containment walkdown inspection from this outage. The inspectors also conducted an independent walkdown of the reactor building to evaluate compliance with the licensee BACC program and to verify that degraded or non-conforming conditions, such as boric acid leaks identified during the Mode 3 containment walkdown, were properly identified and corrected in accordance with the licensee's corrective action program. The inspectors reviewed the following engineering evaluations completed for evidence of boric acid found on systems containing borated water to verify that the minimum design code-required section thickness had been maintained for the affected components.

- PIP C-05-06604, active boric acid leak in valve 2NV-232 (Chemical and Volume Control System)
- PIP C-05-05624, boric acid leak at a threaded piping joint at the mechanical seal

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housing of ND Pump 2A (Residual Heat Removal System)

Steam Generator (SG) Tube Inservice Inspection. The inspectors reviewed the Unit 2 SG tube eddy current testing (ECT) examination activities to ensure compliance with TSs, applicable industry operating experience and technical guidance documents, and ASME Code Section XI requirements. The inspectors reviewed licensee SG inspection activities to ensure that ECT inspections conducted this outage conformed to the Duke Power Steam Generator Management Program Manual. The inspectors reviewed the SG examination scope, ECT acquisition procedures, Examination Technique Specification Sheets (ETSS), ECT analysis guidelines, the current SG specific assessment of potential degradation mechanisms, SG Operational Assessment and Condition Monitoring documents from the previous Unit 2 outage, and the SG tube plugging and stabilization procedures. The inspectors reviewed documentation to ensure that the ECT probes and equipment configurations used were qualified to detect the expected types of SG tube degradation in accordance with Appendix H, "Performance Demonstration for Eddy Current Examination," of EPRI "Pressurized Water Reactor Steam Generator Examination Guidelines: Revision 6." In addition, the inspectors reviewed the qualification and certification records for the ECT standards, SG tube plugs, SG tube stabilizers, and ECT data analysis and resolution analysis personnel.

The secondary side water chemistry and loose parts monitoring programs were reviewed to ensure that they were consistent with applicable industry guidance documents. The inspectors independently reviewed the licensee's secondary side visual examination results and associated evaluations for loose parts that are not retrievable and will remain in the steam generators during the next operating cycle. The inspectors observed ECT acquisition, resolution analysis, tube stabilization, and tube plugging activities.

Identification and Resolution of Problems. The inspectors performed a review of ISI-related problems, including welding, BACC and SG ISI, that were identified by the licensee and entered into the corrective action program as PIP documents. The inspectors reviewed the PIPs to confirm that the licensee had appropriately described the scope of the problem and had initiated corrective actions. The inspectors performed this review to ensure compliance with 10 CFR 50, Appendix B, Criterion XVI, Corrective Action, requirements. Documents reviewed are listed in the Attachment.

b. Findings

No findings of significance were identified.

## 1R11 Licensed Operator Requalification

### Resident Quarterly Observation

#### a. Inspection Scope

The inspectors observed the Catawba Nuclear Station Annual Graded Exercise conducted on May 16 to assess the performance of licensed operators and to verify that evaluators were identifying and documenting crew performance weaknesses. The exercise included a leak in the reactor coolant system piping that increases in size during the exercise, fuel cladding failure caused by debris moving through the core, and a breach of the containment into the annulus, resulting in an off-site release. 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. The inspectors observed the critique following the exercise to verify that appropriate feedback was provided to the licensed operators regarding identified weaknesses. Documents reviewed are listed in the Attachment.

#### b. Findings

No findings of significance were identified.

## 1R12 Maintenance Effectiveness

#### a. Inspection Scope

The inspectors reviewed the licensee's effectiveness in performing the following routine maintenance activity. 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. Documents reviewed are listed in the Attachment.

- Repair of a packing leak on valve 2NS-18A; NS pump 2A suction from the containment sump

#### 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 (NSD) 415, Operational Risk Management (Modes 1-3), and NSD 403, Shutdown Risk Management (Modes 4,5,6, and No Mode), for appropriate guidance to comply with 10 CFR 50.65 (a)(4). Documents reviewed are listed in the Attachment.

- Rescheduling of the Unit 1 solid state protection system / reactor trip breaker testing due to delays in performance of the Unit 2 B Train essential safety feature testing.
- Identification of a leak on the Unit 2 reactor vessel head core exit thermocouple #76 and return to Mode 5.
- Review of scheduled surveillances during period of severe thunderstorm activity and rescheduling of quarterly Channel 4 Delta Temperature channel operational test.
- Turbine control system issues identified during the Unit 2 restart and delayed approach to criticality.
- Rescheduling of planned maintenance activities due to required surveillances associated with delay in the restart and power ascension of Unit 2 following the refueling outage.
- Review and rescheduling of planned work following the identification of a through-wall leak and additional piping degradation on the A and B main RN headers.
- Review and rescheduling of planned work following the identification of a through-wall leak on a weld on the 2A component cooling water heat exchanger RN discharge piping.

#### b. Findings

No findings of significance were identified.

### 1R14 Operator Performance During Non-Routine Plant Evolutions and Events

#### a. Inspection Scope

For the five events described below, the inspectors observed operator actions and reviewed operator logs and computer data to verify that proper operator actions were taken. The inspectors also observed licensed operators' use of procedures, control room pre-evolution briefings, and plant equipment manipulations during the reactor approach to criticality and performance of portions of zero power and startup physics testing. Documents reviewed are listed in the Attachment.

- Start-up of Unit 2 following the refueling outage
- Restart of Unit 2 following the repairs made to the core exit thermocouple nozzle assembly (CETNA) on the reactor vessel head.
- Notice of Unusual Event following the loss of offsite power and subsequent dual-unit reactor trip.
- Start-up of Unit 2 following the loss of off-site power event
- Start-up of Unit 1 following the loss of off-site power event

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations

a. Inspection Scope

The inspectors reviewed six 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. Documents reviewed are listed in the Attachment.

- PIP C-06-2855; Fire Penetration J-AX-655-W-007 found to be degraded
- PIP C-06-2961; ND system support discovered pulled loose from the wall and subsequent testing identified additional repairs on supports required due to a water hammer event in the ND system
- PIP C-06-2320; Unexpected entry into Tech Specs due to a ground on the SSF diesel generator 74 relay and PIP C-06-3533; 600-volt ground detected on the SSF diesel circuitry
- PIP C-06-0197; NV pump 2B oil leak operability evaluation
- PIP C-06-1890; Main Steam Isolation Valve 2SM-005 did not indicate fully closed when the close pushbutton was depressed at the start of the 2EOC14 refueling outage
- PIP C-06-0809; Design parameters for FWST to ND pump suction isolation valves 1/2FW-27A and 1/2FW-55B do not consider realignment of the ND suction from Residual Heat Removal mode to injection mode in the event of a Mode 4 loss of coolant accident

b. Findings

No findings of significance were identified.

R17 Permanent Plant Modifications

.1 Resident Modification Review

a. Inspection Scope

The inspectors reviewed the following two permanent plant modifications to verify the adequacy of the modification packages, and to evaluate the modifications for adverse effects on system availability, reliability, and functional capability. Documents reviewed are listed in the Attachment.

- Nuclear Station Modification CN-CE-200902, Replacement of an ITT Barton 752S volume control tank level transmitter with a Rosemount 3051S level transmitter (Mitigating Systems)
  - Environmental qualification of the replacement transmitter
  - Control signals provided by the transmitter
  - Maintenance procedures for calibration of the transmitter
  - Equivalency review of new transmitter
- Nuclear Station Modification CN-21441/00, Installation of main steam isolation valve air close assist upgrades and associated air manifold (Mitigating Systems)
  - Environmental qualification of the piping and manifolds
  - Control signals used to actuate the air-assist system
  - Maintenance procedures for components of the air assist system
  - Reliability of the air source supplying the air manifold

b. Findings

No findings of significance were identified.

.2 Biennial Modifications Inspection

a. Inspection Scope

The inspectors evaluated five modifications, four commercial grade dedications, and three equivalency evaluations in the Mitigating Systems and Initiating Events cornerstone areas, to evaluate the modifications and materials/components replacements for adverse effects on system availability, reliability, and functional capability. The five modifications and the associated attributes reviewed are as follows:

- CN 21425, Replace EPK System Battery chargers with SCI Chargers (Mitigating Systems)
  - Seismic Qualification
  - Materials/ Replacement Components (conformance with design parameters)
  - Post-Modification Testing and Calibration
  - Environmental Evaluation
  - Plant Document Updating
  - Field Configuration Observation

- CN 21432, Replace Unit 2 B NSHX (Mitigating Systems)
  - Material Certification and Evaluation
  - Plant Document Updating
  - Vendor Documents
  - Field Observation
  - Post-Modification Testing
- CD 50012, Increase RN Flow Setpoint and Decrease KC Temperature Mode Setpoint (Mitigating Systems)
  - System Flow Requirements
  - Post-Modification Testing Records
- CN 21441, Main Steam Isolation Valve (MSIV) Air Manifold Upgrades (Initiating Events)
  - Design Analysis
  - Plant Document Updating
  - Installation Records
  - Post-Modification Testing
  - Field Observation
- CN 21447, Unit 2 EDG Battery Replacement (Mitigating Systems)
  - Design Analysis
  - Post-Modification Testing
  - Installation Records
  - Plant Document Updating
  - Environmental Evaluation

The following commercial grade dedications (CGDs) and equivalency evaluations (CEs) were reviewed for material compatibility, functional properties, classification and environmental and seismic qualification:

- CGD 2012.01-04-0002, Evaluation of Chevron SRI-2 Grease
- CGD 2013.03-00-0001, Evaluation of Number 2 Diesel Fuel
- CGD 2018.04-00-0022, Power Element for AMOT Thermostatic Valve Model 8DAS
- CGD 3007.02-00-0003, Evaluation of GE CR151B4 Terminal Blocks.
- CE 500722, Allow Replacement of 1NMSV 2670 and Solenoid Valves
- CE 200211, Replace Controller 2CAML with Siemens 353 Controller
- CE 500594, Replace TDK Power Supply (fire detection system)

For the selected modification packages, the inspectors observed the as-built configuration. Documents reviewed included procedures, engineering calculations, modification design and implementation packages, work orders, site drawings, corrective action documents, applicable sections of the living UFSAR, supporting analyses, TSs, and design basis information.

The inspectors also reviewed selected PIPs and an assessment associated with modifications to confirm that problems were being identified at an appropriate threshold,

entered into the corrective action process, and appropriate corrective actions had been initiated.

b. Findings

No findings of significance were identified.

1R19 Post-Maintenance Testing

a. Inspection Scope

The inspectors witnessed and/or reviewed four post-maintenance testing procedures and/or test activities, as appropriate, for selected risk significant systems to verify if: (1) testing was adequate for the maintenance performed; (2) acceptance criteria were clear and adequately demonstrated operational readiness consistent with design and licensing basis documents; (3) test instrumentation had current calibrations, range, and accuracy consistent with the application; (4) tests were performed as written with applicable prerequisites satisfied; and (5) equipment was returned to the status required to perform its safety function. Documents reviewed are listed in the Attachment.

- Post-maintenance operability test for the 2B diesel generator (PT/2/A/4350/0002B, Revision 84)
- Repair of leak found on Unit 2 reactor vessel head CETNA #76 identified during Mode 4 containment walkdown
- Repair of Unit 1 normal letdown valve (1NV-10) following the loss of off-site power event
- Post-maintenance test of the "A" control room area chiller following its failure to start automatically on the loss of offsite power event

b. Findings

No findings of significance were identified.

1R20 Refueling and Outage Activities

.1 Unit 2 Refueling Outage

a. Inspection Scope

The inspectors evaluated following specific areas during Unit 2 refueling outage activities to ensure that the licensee considered risk in developing and implementing outage schedules; adhered to administrative risk reduction methodologies developed to control plant configuration; developed mitigation strategies for losses of key safety functions; and adhered to operating license and TSs requirements that ensure defense-in-depth. Documents reviewed are listed in the Attachment.

- management of configuration control and the risk associated with outage activities
- maintained defense-in-depth commensurate with the outage risk control plan for key

safety functions and applicable TS when risk-significant equipment was removed from service and that configuration changes due to emergent work and unexpected conditions were controlled in accordance with the outage risk control plan, and if control room operators were cognizant of plant configuration

- clearance tags were properly hung and that associated equipment was appropriately configured to support the function of the clearance and that the tags were properly removed when the equipment was returned to service
- reactor coolant system level and temperature instruments were installed and configured to provide accurate indication, and that instrumentation error was properly addressed including review and observation of lowering reactor water level activities.
- status and configurations of electrical systems for compliance with TS requirements and the licensee's outage risk control plan and that switchyard activities were controlled commensurate with safety and the licensee's outage risk control plan
- appropriate methods of decay heat removal were maintained throughout the outage as plant conditions and heat loads changed which included reviewing the updated Defense in Depth Assessment sheets, conducting walkdowns of in-plant equipment and the main control room panels, and discussing current and upcoming plant conditions with Operations and Outage Control Center personnel
- outage work was not impacting the ability of operators to operate the spent fuel pool cooling system during and after core offload
- reviewed flow paths, configurations, and alternative means for inventory addition to verify that they were consistent and maintained in accordance with the outage risk plan, and that reactor vessel inventory controls were adequate to prevent inventory loss.
- verify that proper reactivity control was maintained in accordance with the TS and Site Directive 3.1.30, Unit Shutdown Configuration Control (Modes 4,5,6 or No Mode), Revision 32, and NSD 403, Shutdown Risk Management (Modes 4, 5, 6 or No Mode), Revision 14.
- controlled containment penetrations in accordance with the refueling operations TS, and that containment closure could be achieved when needed
- reviewed the licensee's commitments from Generic Letter 88-17, Loss of Decay Heat Removal, to confirm that they were adequately implemented
- reviewed fuel handling operations to verify that they were performed in accordance with approved fuel handling procedures
- reviewed TS, license conditions, commitments, and administrative procedure prerequisites for mode changes to verify that they were met for changing plant configurations

b. Findings

No findings of significance were identified.

.2 Unit 1 Forced Outage

a. Inspection Scope

The inspectors evaluated Unit 1 forced outage activities following a loss of offsite power event to ensure that the licensee considered risk in developing and implementing

outage schedules; adhered to administrative risk reduction methodologies developed to control plant configuration; developed mitigation strategies for losses of key safety functions; and adhered to operating license and Technical Specification requirements that ensure defense-in-depth. The following specific areas were reviewed:

- assessed the licensee's management of configuration control and the risk associated with outage activities
- reviewed reactivity control to verify that proper control was maintained in accordance with the TS and Site Directive 3.1.30, Unit Shutdown Configuration Control (Modes 4,5,6 or No Mode), Revision 32, and NSD 403, Shutdown Risk Management (Modes 4, 5, 6 or No Mode), Revision 14
- licensee controlled containment penetrations in accordance with the refueling operations TS, and that containment closure could be achieved when needed
- reviewed the licensee's commitments from Generic Letter 88-17, Loss of Decay Heat Removal, and confirmed that they were adequately implemented
- reviewed TS, license conditions, commitments, and administrative procedure prerequisites for mode changes to verify they were met for changing plant configurations

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing

a. Inspection Scope

The inspectors observed and/or reviewed the five surveillance tests listed below to verify that TS surveillance requirements and/or Select 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 pre-conditioning 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. Documents reviewed are listed in the Attachment.

Surveillance Tests

- PT/2/A/4200/013 H; NI and NV Check Valve Test, Revision 20
- IP/2/A/3200/001 B; Solid State Protection System Train B Periodic Testing, Revision 0
- PT/0/A/4400/022A; Nuclear Service Water Pump Train A Performance Test, Revision 74

In-Service Tests

- PT/1/A/4200/004C; Containment Spray Pump 1B Performance Test, Revision 60

Ice Condenser Systems Testing

- MP/0/A/7150/006; Ice Condenser Lower Inlet Door Inspection and Testing (As-left portion), Revision 25

b. Findings

No findings of significance were identified.

1R23 Temporary Plant Modificationsa. Inspection Scope

The inspectors reviewed the following temporary plant modification to determine whether the modification was properly installed; the modification did not affect system operability; alarm responses, calculations and procedures were appropriately updated and the appropriate changes made to the alarm responses, calculations and procedures once the temporary modification was removed. Documents reviewed are listed in the Attachment.

- Revising the allowable #1 seal leakoff limit for the 1C reactor coolant pump to 5 gpm due to increased leakage through the seal and then returning the limit to its normal value following the seal replacement.

b. Findings

No findings of significance were identified.

**4. OTHER ACTIVITIES**4OA2 Identification and Resolution of Problems.1 Daily Review

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 screening of items entered into the licensee's corrective action program. This was accomplished by reviewing copies of PIPs, attending some daily screening meetings, and accessing the licensee's computerized database.

.2 Annual Sample Reviewa. Inspection Scope

The inspectors selected PIP C-06-0442 for detailed review. This PIP involved a loss of configuration control on 2RN-48B, nuclear service water crossover isolation valve, during a system modification. The piping downstream of the isolation valve was left open ended and the system was placed into operation without the 2RN-48B valve being

danger tagged in the closed position to prevent inadvertent operation. The inspectors evaluated the PIP against the requirements of the licensee's corrective action program document and 10 CFR 50, Appendix B.

b. Findings

No findings of significance were identified.

.3 Semi-Annual Review to Identify Trends

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 inspectors' review was focused on repetitive equipment issues, but also considered the results of daily inspector CAP item screenings discussed in section 4OA2.1 above, licensee trending efforts, and licensee human performance results. The inspectors' review primarily considered the six-month period of January 2006 through June 2006, 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, focus area reports, system health reports, self-assessment reports, maintenance rule reports, and Safety Review Group Monthly Reports. 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 licensee's trend report were reviewed for adequacy.

b. Findings and Observations

No findings of significance were identified. The inspectors followed the actions being implemented by the licensee in response to the inspector-identified trend associated with insufficient management oversight and control of vendors and contractors (non-station personnel). This trend statement was discussed in NRC Inspection Report 05000413, 414/2005005. Based on the inspectors' identification of this trend, the licensee concluded that a lack of guidance existed in NSD-105, Vendor Oversight and Control procedure. The licensee stated in corrective action documentation that this was evident in large projects undertaken during the recent service water project and at Oconee during the steam generator replacement project. Senior Management decided to incorporate specific decision points into the planning and approval process for major projects to ensure that oversight controls are considered and developed as part of an overall project development plan.

4OA3 Event FollowupUnit 1 and Unit 2 Loss of Offsite Power and Unit 1 A Diesel Generator Room Floodinga. Inspection Scope

The inspectors observed the operators stabilize the two units following a loss of offsite power (LOOP) that occurred on May 20. The inspectors also responded to the 1A diesel generator room flooding that occurred on May 22. The inspectors discussed the events with the operators, engineering, and licensee management personnel to gain an understanding of the events and assess followup actions. The inspectors reviewed the licensee's initial investigation reports and cause determinations. The licensee's initial cause determination for the LOOP identified a power circuit breaker current transformer failure due to a fault. An NRC augmented inspection was initiated on May 23 in response to these two events. The results of the augmented inspection were documented in NRC Inspection Report 05000413/2006009 and 05000414/2006009. Documents reviewed are listed in the Attachment.

b. Findings

No findings of significance were identified.

4OA5 Other Activities.1 (Closed) Unresolved Item (URI): 05000413,414/2006009-04; Review the Extent of Condition and Corrective Actions to Address Degraded Seals on Below-Grade Electrical Conduits Entering the Auxiliary Building

Introduction: A Green NCV of Technical Specification 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, was identified. Specifically, no procedure, program, or process existed to periodically inspect below-grade electrical conduit seals to identify and repair any degradation of seals which provide protection of safety-related equipment from external flooding.

Description: Much of the plant's electrical cables were buried underground and routed in conduits between manhole structures and plant structures such as the auxiliary building and diesel generator building. The electrical conduits that entered the plant structures were sealed using a silicone-based sealant in the manhole structure located closest to the specific plant structure. The silicone sealant had a finite lifetime specified by the sealant manufacturer.

On May 22, the 1A diesel generator room flooded due to cooling tower overflow water entering the underground electrical conduits through unsealed electrical conduit penetrations. As a result of this event, other electrical conduits entering the auxiliary and diesel generator buildings were inspected to verify that the required seals had been installed and their ability to prevent flooding of the plant structures from external sources had not been degraded.

The inspectors conducted an inspection of these conduit seals accompanied by engineers from the licensee's staff. Upon entering Conduit Manholes CMH-18A and CMH-18B, a number of seals were found to be degraded or not sealed in accordance with the licensee's design drawings or procedures. Work orders were initiated to have the conduits repaired and properly sealed. NRC inspections of other conduits entering areas of the plant containing safety-related equipment identified additional seals that required repairs to re-establish their integrity and waterproof function.

Following discussions with the engineers and maintenance personnel responsible for the electrical conduits at the station, it was determined that there were no programs, processes or procedures in place to periodically inspect the seals of below-grade electrical conduits for degradation or damage which could adversely affect their ability to prevent external flooding from reaching areas of the plant containing safety-related equipment.

Analysis: The finding was more than minor because the condition could have become more of a safety concern if uncorrected, i.e., additional degradation of the conduit seals would have occurred over time thereby increasing the potential for external flooding affecting safety-related equipment. The inspectors determined the finding to be of very low safety significance because the as-found condition of the conduit seals would not have resulted in the loss or degradation of safety-related equipment in the event of a Probable Maximum Precipitation event.

Enforcement: Technical Specification 5.4.1.b requires that written procedures as described in Regulatory Guide 1.33, Revision 2, Appendix A, be established, implemented, and maintained. Regulatory Guide 1.33, Appendix A, Section 9, Procedures for Performing Maintenance, Sub-Section b, requires that preventive maintenance procedures and schedules be developed to include inspections of equipment and replacement of items that have a specific lifetime. Contrary to the above, on May 26, 2006, the NRC determined that the licensee failed to establish and implement a preventive maintenance procedure and schedule to inspect the installation and integrity of silicone seals with a finite lifetime in below-grade electrical conduits designed to protect safety-related areas of the plant from external flooding. Because this violation was determined to be of very low safety significance and was placed in the corrective action program as PIP C-06-3902, this violation is being treated as a non-cited violation in accordance with Section VI.A.1 of the Enforcement Policy, and is identified as NCV 05000413,414/2006003-01, Failure to Establish Periodic Inspection Procedures for Seals on Below-Grade Electrical Conduits Entering Plant Areas Containing Safety-Related Equipment.

.2 (Closed) URI 05000413,414/2006009-01, Timeliness of Notification to the NRC of Loss of Offsite Power Event on May 20, 2006

The inspectors reviewed this issue involving late notification of a loss of offsite power. The loss of offsite power was classified by the licensee as an Unusual Event at 2:14 p.m. However, the NRC Operations Center was not notified of the classification until 4:15 p.m. The inspectors concluded that the licensee was required to notify the NRC within one hour following the classification of this event. The inspectors reviewed the

licensee's Emergency Response Organization post-event self-evaluation report. The licensee had identified, during the event response, that they had missed the notification. The licensee immediately made the required notification when they determined that they had missed the time requirement and informed the Technical Support Center Emergency Coordinator that the 1-hour event notification had been made over one hour late. The inspectors reviewed the Technical Support Center log and conducted interviews with the Emergency Response Organization staff who were on duty the day of the event. The inspectors concluded that this was a violation of NRC requirements and that it was a licensee-identified violation. The enforcement aspects of this violation are dispositioned in Section 4OA7.

.3 (Closed) NRC Temporary Instruction (TI) 2515/165: Operational Readiness of Offsite Power and Impact on Plant Risk

The inspectors reviewed licensee procedures and controls and interviewed operations and maintenance personnel to verify these documents contained specific attributes delineated in the TI to ensure the operational readiness of offsite power systems in accordance with plant Technical Specifications; the design requirements provided in 10 CFR 50, Appendix A, General Design Criterion 17, "Electric Power Systems," and the impact of maintenance on plant risk in accordance with 10 CFR 50.65(a)(4), "Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants." Appropriate documentation of the results of this inspection was provided to NRC headquarters staff for further analysis, as required by the TI. This completes the Region II inspection TI requirements for the Catawba Nuclear Station.

4OA6 Meetings, Including Exit

On July 12, the resident inspectors presented the inspection results to Mr. D. Jamil and other members of licensee management, who acknowledged the findings. The inspectors confirmed that proprietary information was not provided or examined during the inspection period.

4OA7 Licensee-Identified Violation

The following finding of very low safety significance (Green) was identified by the licensee and is a violation of NRC requirements which meets the criteria of Section VI of the NRC Enforcement Policy, NUREG-1600, for being dispositioned as a non-cited violation.

10 CFR 50.72(a)(3) requires the licensee to notify the NRC Operations Center of the declaration of any of the Emergency Classes specified in the licensee's approved Emergency Plan immediately after notification of the appropriate State and local agencies and not later than one hour after the time entry into the Emergency Class was declared. Contrary to this, on May 20, 2006, the licensee declared a Notice of Unusual Event at 2:14 p.m. following the loss of offsite electrical power to both Catawba units with onsite power available; however, the NRC Operations Center was not notified until 4:15 p.m. which was 61 minutes late. This issue is documented in the licensee's corrective action program as Problem Investigation Process Report (PIP) C-06-3916.

This finding was of very low safety significance because the Resident Inspectors were contacted within 15 minutes of the actual loss of offsite power, promptly responded to the site, and informed Regional and Headquarters personnel of the details of the event upon their arrival and provided updates as plant conditions changed.

ATTACHMENT: SUPPLEMENTAL INFORMATION

## SUPPLEMENTAL INFORMATION

### KEY POINTS OF CONTACT

#### Licensee Personnel

K. Adams, Human Performance Manager  
E. Beadle, Emergency Planning Manager  
S. Beagles, Chemistry Manager  
W. Byers, Security Manager  
J. Ferguson, Safety Assurance Manager  
J. Foster, Radiation Protection Manager  
W. Green, Reactor and Electrical Systems Manager  
G. Hamrick, Mechanical, Civil Engineering Manager  
D. Jamil, Catawba Site Vice President  
R. Hart, Regulatory Compliance Manager  
A. Lindsay, Training Manager  
J. Pitesa, Station Manager  
L. Reed, Modifications Engineering Manager  
R. Repko, Engineering Manager

### LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

#### Opened and Closed

05000413,414/2006003-01	NCV	Failure to Establish Periodic Inspection Procedures for Seals on Below-Grade Electrical Conduits Entering Plant Areas Containing Safety-Related Equipment (Section 4OA5.1)
<u>Closed</u>		
05000413,414/2006009-04	URI	Review the Extent of Condition and Corrective Actions to Address Degraded Seals on Below-Grade Electrical Conduits Entering the Auxiliary Building (Section 4OA5.1)
05000413,414/2006009-01	URI	Timeliness of Notification to the NRC of Loss of Offsite Power Event on May 20, 2006 (Section 4OA5.2)
05000413,414/2515/165	TI	Operational Readiness of Offsite Power and Impact on Plant Risk (Section 4OA5.3)

## LIST OF DOCUMENTS REVIEWED

### **Section 1R01: Adverse Weather Preparations**

PT/0/B/4700/039; Hot Weather Preparation, Revision 09  
PT/0/B/4700/038; Cold Weather Protection; Revision 25  
PIP C-05-3736; Hot weather preparation issues raised by NRC residents  
PIP C-05-3124; Revision to Hot Weather Preparation procedure required  
Hot Weather Program Action Register Update; 6/27/06

### **Section 1R02: Evaluation of Changes, Tests, or Experiments**

#### Full Evaluations

CNTM 0159, 1RN-4B removed from RN system, 8/20/04  
Procedure change OP/1/A/6400/006 RN inlet to NS Hx flush - Encl. 4.23, 4/1/04  
CN-21432/01 NS HX 2B replacement, 7/19/04  
Evaluate Spring only PORV Stroke time requirement - PT/1/2(2)/A/4200/023A, 10/5/04  
PIP C04-0114 Operable but degraded eval - NS Hx 2A degraded baffle condition, 2/19/04  
Change exercising frequency for RF 389B from quarterly to cold shutdown, 11/9/04  
CNCE -62336, Install surge protection on FWST level instr. Loops, 5/20/04  
CNCE-61427, Modify EDG 2A lube oil supply tubing to turbo charger, 10/11/04

#### Screened Out Items

CNCE 11024, Remove honeycomb straightening vanes from monitor 1ABUX-AFMD-1  
CNCE 71104, Replace Unit 1 36V Lamda power supply , 6/10/02  
CNCE 72586, Replace 2B gear drive oil pressure relief valve, 3/31/04  
CNCE 72645, Replace fuses for RA-8 and RA-9, 12/10/03  
CNCE 72884, Revise NI and NV TAC sheets. Flow balance procedures will be affected, 5/27/04  
CNCE 73039, Revise 2LPPS5040 and 2LPPS5050 setpoints, 4/6/04  
CNCE 73044, Replace 1NWL5020 with Rosemount model, 3/4/04  
CNCE 73069, Revise TAC sheets for KC Hx to reflect CNC-1223.24-00-0018, 4/21/04  
CNCE 73074, Allow use of square D custom built multitap transformer for U2 battery fan, 3/9/04  
CN 21441/00, MSIV air manifold upgrades , 01/25/06  
CNCE 62368, Aux contact for valve EMOs fed from 2EXMA, 8/8/05  
CD 200108, SWP install 30" U2 crossover line in aux bldg., 11/16/05  
CD 200323, Relocate valves 2CA-57 and 2CA-61, 10/24/05  
CD 100262, Relocate valves 1CA-57 and 1CA-61, 6/13/05  
CD 200494, Replace lube oil piping on 2B EDG, 12/14/05  
CN 21447, Unit 2 EDG Battery Replacement, 10/18/05

#### Self-Assessment Documents

NSRB 10 CFR 50.59 Evaluation Subcommittee Meeting Minutes, 9/15/05  
10 CFR 50.59 Screens and Evaluations Assessment RGC-01-05, 1/10/2005 - 2/10/2005  
10 CFR 50.59 Screens and Evaluations Assessment RGC-07-05, 9/10/2005 - 10/10/2005  
10 CFR 50.59 Screens and Evaluations Assessment RGC-01-06, 9/10/2005 - 12/20/2005

**Section 1R04: Equipment Alignment**

OP/2/A/6200/006, Revision 055; Safety Injection System, Enclosure 4.3 Valve Checklist  
CN-2562-1.0, 1.1, 1.2 and 1.3; Flow Diagrams of Safety Injection System  
CNS-1562.NI-00-0001, Revision 32; Design Basis Specification for the Safety Injection System  
Technical Specifications Emergency Core Cooling System: 3.5.2, 3.5.3, and 3.5.4  
Safety Injection Health Report, 2005T3  
PIP C-06-02793; Documented two problems with 2NI-9A  
W/O 98373981

**Section 1R05: Fire Protection**

Pre-Fire Plan for Fire Strategy Area RB-1; Unit 2 Reactor Building, Annulus Area Only  
Pre-Fire Plan for Fire Strategy Area 50; Unit 2 Exterior Doghouse  
Pre-Fire Plan for Fire Strategy Area 1; Unit 1 A and B ND pump rooms  
Pre-Fire Plan for Fire Strategy Area 41, Diesel Generator Building 1A Corridor  
Pre-Fire Plan for Fire Strategy Area 25, Diesel Generator Building Room 1A  
Pre-Fire Plan for Fire Strategy Area 41, Diesel Generator Building 1A Corrido  
Pre-Fire Plan for Fire Strategy Area 4; Auxiliary Building 543 foot elevation, Rooms 200 to 248  
Pre-Fire Plan for Fire Strategy Area 32; Auxiliary Building 543 foot elevation, Room 252; Unit  
1A Auxiliary Shutdown Panel  
Pre-Fire Plan for Fire Strategy Area 34; Auxiliary Building 543 foot elevation, Room 253; Unit  
1B Auxiliary Shutdown Panel

**Section 1R07: Heat Sink**

PIP C-06-4604; ; 2B NS heat exchanger unadjusted fouling factor was less than the  
administrative limit of 0.000

**Section 1R08: Inservice Inspection Activities**

Procedures

NDE-600, Ultrasonic Examination of Similar Metal Welds in Ferritic and Austenitic Piping,  
Revision 16  
NDE-35, Liquid Penetrant Examination, Revision 21  
PT/2/A/4150/001 H, Inside Containment Boric Acid Check, Revision 13  
PT/2/A/4150/002, Visual Inspection of Radioactive Systems Outside Containment, Revision 21  
MP/0/A/7650/040, Inspection, Evaluation and Cleanup of Boric Acid on Plant Materials,  
Revision 9  
SGMEP 105, Model D5 Specific Assessment of Potential Degradation Mechanisms for  
Catawba Unit 2 EOC 14, Revision 5  
Condition Monitoring and Operational Assessment for Catawba Unit 2 EOC 13  
D5 Steam Generator Site Technique Validation for Catawba Nuclear Station Unit 2, Revision 4  
OP/2/B/6150/010, Loose Parts Monitoring Program, Revision 15  
CMP 3.4.17.2, Secondary Chemistry, Revision 35  
SCM-8 Appendix A, System Chemistry Manual "Catawba Secondary Chemistry Optimization  
Plan," Revision 9

PIPs: C-06-02444, C-06-02346, C-06-02134, C-06-02321, C-06-02236, C-05-04865, C-06-  
01876, C-06-02442, C-06-02499, C-04-05114, C-06-00838

Reports

Wesdyne Report for 10-year Inservice Inspection of Reactor Vessel Welds (welds 2RPV-101-124B, -142A, and -142C, and -171)  
RT Examination Report/Technique for welds 2NC 9-03 and 2SGA-Outlet-SE  
UT Examination Reports UT-06-121 through -128 (welds 2NI89-6, -7, -10, and -11)  
UT Calibration Reports CAL-06-128 through -130 (welds 2NI89-6, -7, -10, and -11)  
PT Examination Reports PT-06-115 through -119 (welds 2NC-89-4, -20, -21, -12, and -13)  
Weld Process Control Record for Work Order: 98631591 (weld 2BB61-23-1)  
Weld Process Control Record for Work Order: 98717523 (weld 2492-NS.00-46-18-1)  
Weld Process Control Record for Work Order: 98731479 (weld 2CA62-12)  
SGM 2005-001, Oconee Steam Generator Management Program Group Self Assessment  
2005Q3Q4, Catawba Secondary Chemistry Systems Health Report

**Section 1R11: Licensed Operator Regualification**

NRC Graded Exercise Guide, May 16, 2006

**Section 1R12: Maintenance Effectiveness**

PIP C-06-2560; Rework associated with 2NS-18A

**Section 1R13: Maintenance Risk Assessments and Emergent Work Evaluation**

PIP C-06-2888; Need to reschedule the Unit solid state protection system / Reactor Trip Breaker test due to delays in performing the Unit 2 B Train ESG test during 2EOC14  
PIP C-06-3019; CETNA #76 was found to be leaking during the Mode 4 walkdown of the reactor head area  
PIP C-06-3076; Continuing leakage noted on CETNA #76  
PIP C-06-3110; Thurstorms in the area delayed surveillances  
PIP C-06-3175; Main turbine stop valve SV-2 failed open during turbine chest and shell warming  
PIP C-06-3812; Through wall leak discovered on the A RN train near the 2A component cooling water heat exchanger resulting in an unanticipated TSAIL entry for A train of RN on both units.  
OMP 2-18; Equipment Protection and Quarantine Procedure; Revision 66

**Section 1R14: Operator Performance During Non-Routine Plant Evolutions and Events**

PT/0/A/4150/019; 1/M Approach to Criticality; Revisions 29, 30, and 31  
PT/0/A/4150/001J, Zero Power Physics Testing; Revision 01  
PT/0/A/4150/001, Controlling Procedure for Startup Physics Testing; Revision 40  
OP/1/A/6100/001, Controlling Procedure for Unit Startup; Revision 211  
OP/2/A/6100/001, Controlling Procedure for Unit Startup; Revision 141  
OP/2/A/6100/003, Controlling Procedure for Unit Operations; Revision 97  
OP/2/B/6300/001, Turbine Generator Startup; Revision 69  
OP-CN-JITT-ZPPT/Turbine; Just In Time Training Package; Initial Startup / Zero Power Physics Testing / Turbine On-Line; Revision 03  
EP/1/A/5000/ES-0.2; Natural Circulation Cooldown; Revision 19  
AP/1/A/5500/007; Loss of Normal Power; Revision 49  
EP/1/A/5000/ECA-0.1; Loss of all AC Power Recovery Without SI Required; Revision 21  
EP/1/A/5000/E-0; Reactor Trip or Safety Injection; Revision 27

EP/1/A/5000/ES-0.1; Reactor Trip Response; Revision 22  
AP/1/A/5500/012; Loss of Charging or Letdown; Revision 23  
EP/2/A/5000/ES-0.1; Reactor Trip Response; Revision 22  
EP/2/A/5000/E-0; Reactor Trip or Safety Injection; Revision 26  
EP/2/A/5000/FR-I-1; Response to High Pressurizer Level; Revision 11  
AP/2/A/5500/012; Loss of Charging or Letdown; Revision 19  
AP/2/A/5500/007; Loss of Normal Power; Revision 49  
Plant Unified Operational Logs for Unit 1 and Unit 2; Covering 5/20/06 through 5/25/06

**Section 1R15: Operability Evaluations**

PIP C-01-3425; Support found damaged by an apparent water hammer load condition  
TSAIL entry C2-06-00802; 2B ND inoperable due to water hammer

**Section 1R17: Permanent Plant Modifications**

Minor Mod / Equivalent, Graded & Minor Design Change Package for CE200902; Replacement volume control tank level transmitter - Major Design Change CN-21441; Main Steam Isolation Valve air manifold single failure and air assist upgrades

**Section 1R19: Post-Maintenance Testing**

PIP C-06-3019; CETNA #76 was found to be leaking during the Mode 4 walkdown of the reactor head  
WO 98735228; Repair of leak on Unit 2 CETNA #76  
WR 98375994; Failure of valve 1NV-10 to open following loss of off-site power transient  
PIP C-06-4037; Failure of the A control room area chiller to start automatically following the loss of offsite power  
WO 98791173; Inspect / Repair the A control room area chiller

**Section 1R20: Refueling and Outage Activities**

Site Directive 3.1.30, Unit Shutdown Configuration Control (Modes 4, 5, 6 or No Mode), Revision 32,  
Operations Procedure OP/2/A/6150/006, Draining The Reactor Coolant System, Revision 68  
CN-06-006, 2EOC-14-IRT (Ipendent Review Team) Outage Risk Assessment  
PT/2/A/4350/003, Electrical Power Source Alignment Verification, Revision 44  
OP/2/A/6200/005, Spent Fuel Cooling System, Revision 61  
NSD 403, Shutdown Risk Management (Modes 4, 5, 6 or No Mode), Revision 14  
PT/2/A/4200/002C, Containment Closure Verification (Part I); Revision 62  
PT/2/A/4200/002I, Containment Closure Verification (Part II); Revision 34  
PT/2/A/4200/002J, Containment Closure Verification Penetration Status Change; Revision 12  
OP/0/A/6100/014, Penetration Control for Modes 5 and 6; Revision 30  
OP/2/A/6150/001, Filling and Venting the Reactor Coolant System, Enclosure 4.16, Reactor Coolant System Vacuum Refill Without Solid Operation; Revision 72  
OP/2/A/6150/006, Draining the Reactor Coolant (NC) System; Revision 68  
Enclosure 4.2, Decreasing the NC System Level;  
Enclosure 4.3, Increasing the NC System Level  
Enclosure 4.10, Requirements for Operation with the NC System Level Below 16%  
Enclosure 4.12; Reduced Inventory Posting Requirements

PT/0/A/4150/037, Fuel/Component Movement Accounting; Revision 6  
 OP/2/A/6550/006, Transferring Fuel with the Spent Fuel Manipulator Crane; Revision 49  
 OP/2/A/6550/007, Reactor Building Manipulator Crane Operation; Revision 24  
 OP/2/A/6550/008, Fuel Transfer System Operation; Revision 9  
 (Maintenance Procedure) MP/0/B/7150/012, Refueling Canal Cleanliness; Revision 07  
 PT/2/A/4550/001C, Refueling Communications Test; Revision 15  
 PT/2/A/4550/001D; Reactor Building Manipulator Crane Load test; Revision 12  
 PT/2/A/4550/001E; Spent Fuel Building Manipulator Crane Load test; Revision 7  
 PT/0/A/4550/003C, Core Verification; Revision 09  
 PT/0/A/4150/022, Total Core Reloading; Revision 37  
 Unit 2 2EOC14 Core Reload Verification videotape  
 PT/0/A/4200/002, Containment Cleanliness Inspection; Revision 25  
 SM/0/A/8510/008, Ice Condenser FME Inspection; Revision 3  
 PT/0/A/4150/019; 1/M Approach to Criticality; Revision 29  
 PT/0/A/4150/001J, Zero Power Physics Testing; Revision 01  
 PT/0/A/4150/001, Controlling Procedure for Startup Physics Testing; Revision 40  
 OP/2/A/6100/001, Controlling Procedure for Unit Startup; Revision 141  
 OP/2/A/6100/003, Controlling Procedure for Unit Operations; Revision 97  
 OP/2/B/6300/001, Turbine Generator Startup; Revision 69  
 OP-CN-JITT-ZPPT/Turbine; Just In Time Training Package; Initial Startup / Zero Power Physics Testing / Turbine On-Line; Revision 03  
 PT/1/A/4200/002C, Containment Closure Verification (Part I); Revision 73  
 PT/1/A/4200/002I, Containment Closure Verification (Part II); Revision 32  
 PT/1/A/4200/002J, Containment Closure Verification Penetration Status Change; Revision 10  
 OP/0/A/6100/014, Penetration Control for Modes 5 and 6; Revision 31  
 OP/1/A/6150/001, Filling and Venting the Reactor Coolant System, Enclosure 4.16, Reactor Coolant System Vacuum Refill Without Solid Operation; Revision 95  
 OP/1/A/6150/006, Draining the Reactor Coolant System; Revision 68  
 Enclosure 4.2, Decreasing the NC System Level;  
 Enclosure 4.3, Increasing the NC System Level  
 Enclosure 4.10, Requirements for Operation with the NC System Level Below 16%  
 Enclosure 4.12; Reduced Inventory Posting Requirements  
 PT/0/A/4200/002, Containment Cleanliness Inspection; Revision 26  
 PT/0/A/4150/019; 1/M Approach to Criticality; Revision 31  
 OP/1/A/6100/001, Controlling Procedure for Unit Startup; Revision 211  
 OP/1/A/6100/003, Controlling Procedure for Unit Operations; Revision 97  
 OP/1/B/6300/001, Turbine Generator Startup; Revision 69  
 SM/0/A/8510/002; Ice Basket Inspection, Revision 009  
 PIP C-06-2987; Documentation of the Unit 2 containment cleanliness PT conducted by Operations  
 PIP C-06-3056; During Unit 2 main turbine shell warming, a turbine control system malfunction caused a rapid steam generator pressure reduction and reactor coolant system cooldown which resulted in pressurizer pressure decreasing to approximately 2000 psig and level to 18%

**Section 1R22: Surveillance Testing**

PIP C-06-02743; Performance of NI/NV Check Valve Test PT/2/a/4200/013 H  
 PIP C-06-02744; Procedures PT/2/A/4200/007A, PT/2/A4200/005B, PT/2/A/4200/005A need to

be revised to incorporate new baseline data that was obtained during performance of NI/NV check valve testing

PIP C-06-02745; The desired flow for obtaining comprehensive IWP data for the 2A and 2B NV pumps and 2B NI pump could not be established during NI/NV check valve testing

PIP C-06-02793; Documented two problems with 2NI-9A

PIP C-06-03112; Outage Critique items concerning PT/2/A/4200/013 H Check Valve Test, and associated activities

**Section 1R23: Temporary Plant Modifications**

CD 100932; Engineering Change to revise the SSF upper limits for the Unit 1 NC Pump #1 seal leakoff

CD 100991; Engineering Change to restore NC pump #1 seal leakoff flow limits to normal

**Section 4OA2: Problem Identification and Resolution**

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PIP C-05-3748; Human Performance Cause Analysis

**Section 4OA3: Event Follow-up**

PIP C-06-4087; Drawings show unused conduits being stubbed and capped; however, the NRC Resident identified that in many cases, the actual conduits do not reflect that configuration in the field

PIP C-06-4112; Degraded conduit seals identified by the NRC Resident in conduit manholes CMH-18A and CMH-18B

PIP C-06-4663; NRC Resident identified discrepancies between field conditions and drawings associated with conduit manhole CMH-7B

PIP C-06-4884; Incorrect level switches and a buried sump pump drain line associated with three Conduit Manholes

PIP C-06-4887; As-Built / drawing discrepancies in conduit manholes CMH-3, CMH-4A and CMH-5B identified by the NRC Resident during inspections