



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION II  
SAM NUNN ATLANTA FEDERAL CENTER  
61 FORSYTH STREET SW SUITE 23T85  
ATLANTA, GEORGIA 30303-8931**

January 16, 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  
05000413/2003005 AND 05000414/2003005**

Dear Mr. Jamil:

On December 20, 2003, 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 January 5, 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 three 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 (NCVs) consistent with Section VI.A of the NRC Enforcement Policy. If you contest any NCV 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 2.790 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

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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/**

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 05000413/2003005 and 05000414/2003005  
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: 05000413/2003005, 05000414/2003005

Licensee: Duke Energy Corporation

Facility: Catawba Nuclear Station, Units 1 and 2

Location: 4800 Concord Road  
York, SC 29745

Dates: September 28, 2003 - December 20, 2003

Inspectors: E. Guthrie, Senior Resident Inspector  
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W. Crowley, Senior Reactor Inspector Consultant (Section 1R08)  
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R. Taylor, Reactor Inspector (Section 1R17)  
K. VanDoorn, Senior Reactor Inspector (Section 1R17)

Approved by: R. Haag, Chief  
Reactor Projects Branch 1  
Division of Reactor Projects

Enclosure

## SUMMARY OF FINDINGS

IR 05000413/2003-005, IR 05000414/2003-005; 9/28/2003-12/20/2003; Catawba Nuclear Station, Units 1 and 2; Maintenance Effectiveness, Post-Maintenance and Surveillance Testing, and Other Activities.

The inspection covered a three month period of inspection by resident inspectors and announced regional inspections by one engineering consultant, one senior reactor inspector, one reactor inspector, and one operations engineer. Two Green non-cited violations (with one having two examples) 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 the first of two examples of a non-cited violation for failure to comply with 10 CFR 50 Appendix B, Criterion XVI, due to a failure to promptly identify and take effective corrective actions. Specifically, in this first example, the licensee failed to take effective corrective actions to prevent the 2B diesel generator battery bank from becoming inoperable sometime between October 18 - 25, 2003. Corrective actions resulting from the increased battery surveillance frequency were not adequate to identify an adverse trend in cell voltages prior to multiple cells being below the TS voltage.

This finding is greater than minor because it affected the reactor safety mitigating system cornerstone attribute to ensure availability, reliability, and capability of the system. The finding is of very low safety significance because there was no loss of safety function on the battery bank. The safety function was verified by the licensee performing capacity testing on two battery cells, which showed sufficient capacity existed and therefore cell reversal conditions were not present. (Section 1RST)

- Green. The inspectors identified a non-cited violation for failure to adequately implement a surveillance procedure in accordance with TS 5.4.1.a. Specifically, the licensee failed to identify approximately six gallons of material in the Unit 1 containment sump during a containment closeout inspection in accordance with the licensee's surveillance procedure.

The finding is greater than minor because the finding was associated with the reactor safety mitigating system cornerstone objective to ensure the availability, reliability, and capability of a system that responds to initiating events to prevent core damage. The finding is of very low safety significance because the debris in the containment sump did not result in the actual loss of function or loss of a single train of safety injection equipment. (Section 4OA5)

## Cornerstone: Barrier Integrity

- Green. The inspectors identified the second of two examples of a non-cited violation for failure to comply with 10 CFR 50 Appendix B, Criterion XVI, due to a failure to promptly identify and take corrective actions. Specifically, in this second example, the licensee failed to promptly identify and correct deficiencies and nonconformances in the 1B containment spray heat exchanger for known structural degradation of the tube support baffle plates from approximately 1992 until October 6, 2003.

The finding is greater than minor because the finding effected the Barriers cornerstone objective of providing reasonable assurance that physical barriers protect the public from radio nuclide releases caused by accidents or events, specifically the cornerstone attribute of maintaining the functionality of the containment by maintaining design structural integrity. Additionally, the finding is greater than minor because the heat exchanger actually was declared inoperable in excess of the allowed TS LCO time, which directly affected the cornerstone objective of functionality of the containment. The finding is under the Barrier Integrity cornerstone and is of very low safety significance because, the finding did not represent an actual reduction of the atmospheric pressure control function of the reactor containment since the other train was available and was designed for one hundred percent capability to meet design requirements. Extensive licensee engineering analysis, with vendor support, determined that heat exchanger past operability was maintained because service water flow during design accident system configurations was below newly developed limits due to system flow balancing.(Section 1R12)

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). The unit began reducing power on November 6, 2003, and was taken off-line on November 8, 2003, to begin the Unit 1 end of cycle 14 (1EOC-14) Refueling Outage. The reactor achieved criticality on December 18, 2003, and remained at approximately 7 percent RTP until the end of the inspection period awaiting completion of main generator repairs.

Unit 2 operated at 100 percent RTP for the entire inspection period except for a brief power reduction to approximately 20 percent RTP on November 22, 2003, to add oil to the 2A reactor coolant pump motor.

### 1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

#### 1R01 Adverse Weather Protection

##### .1 Cold Weather Preparation

###### a. Inspection Scope

The inspectors reviewed the licensee's preparations for adverse weather associated with extremely cold temperatures. This included field walkdowns to assess the material condition and operation of freeze protection equipment (e.g., heat tracing, instrument box heaters, area space heaters, etc.).

In addition, the inspectors conducted discussions with operations, engineering, and maintenance personnel responsible for implementing Catawba's cold weather protection program to assess the licensee's ability to identify, and resolve deficient conditions associated with cold weather protection equipment prior to cold weather events.

Documents reviewed during this inspection are listed in the Attachment to this report.

###### b. Findings

No findings of significance were identified.

##### .2 Cold Weather Condition

###### a. Inspection Scope

The inspectors reviewed the effectiveness of the licensee's cold weather protection program pertaining to the cold weather conditions throughout the period of December 1 through December 18, 2003. This included field walkdowns to assess the freeze protection equipment in the standby shutdown facility (SSF), refueling water storage tank (FWST) pit area, turbine and service buildings, and outside areas. The inspectors discussed specific measures with licensed operators to be taken in the event low

ambient temperatures were experienced. Documents reviewed during this inspection are listed in the Attachment to this report.

b. Findings

No findings of significance were identified.

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 partial system alignments and reviewed the associated listed documents:

- 1A Diesel Generator (DG) with the 1B DG out of service (OP/1/A/6350/002, Diesel Generator Operation, and Unit 1B Diesel Generator Unavailability Critical Evolution Plan)
- A Train Nuclear Service Water (RN) system with the B Train RN system out of service (OP/0/A/6400/006C, Enclosure 4.12B, Alignment for Single Pump Flow Balance Due to One Train B RN Pump and/or its Associated DG Inoperable and 1B RN Pump Removal Critical Evolution Plan)
- 2B Reactor Trip Breakers during testing of the 2A Reactor Trip Breakers (IP/2/A/3200/002A, Solid State Protection System (SSPS) Train A Periodic Testing and IP/2/A/3200/008A, Train A Reactor Trip Breaker Trip Actuating Device Functional and Operational Test)
- 2A Diesel Generator with 2B Diesel Generator unavailable for turbocharger replacement (OP/1/A/6350/002, Diesel Generator Operation and Emergent Complex Maintenance Plan 2B Diesel Generator)

b. Findings

No findings of significance were identified.

.2 Complete System Walkdown.

a. Inspection Scope

The inspectors conducted a detailed walkdown/review of the alignment and condition of the Unit 2 component cooling water (KC) system and the Unit 1 B DG. The inspectors utilized licensee procedures, as well as licensing and design documents, when verifying



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 (WOs). A review of open PIP documents was also performed to verify that the licensee had appropriately characterized and prioritized both KC and DG 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

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. The inspectors toured the following areas important to reactor safety:

- Unit 2, A Safety Injection (NI) pump room
- Unit 2, B NI pump room
- Unit 2, A Chemical Volume & Control (NV) pump room
- Unit 2, B NV pump room
- Unit 2, Component Cooling water (KC) pump areas
- Nuclear Service Water (RN) Intake Structure
- Unit 2, A Diesel Generator Room
- Unit 2, A Diesel Generator Sequencer area
- Unit 1, B NV pump room
- Unit 1, A NI pump room

b. Findings

No findings of significance were identified.

## 1R07 Heat Sink Performance

### a. Inspection Scope

The inspectors assessed the as-left condition of the 1B containment spray heat exchanger (NSHX) to determine if potential heat exchanger deficiencies, which could mask degraded performance, were identified. The inspectors reviewed PT/1/A/4400/009, Cooling Water Flow Monitoring For Asiatic Clams and Mussel Test, and PT/1/A/4400/006B, NS Heat Exchanger 1B Heat Capacity Test to evaluate test data for acceptable performance. The inspectors verified that the as-left condition of the heat exchanger met the acceptance criteria and that the acceptance criteria was valid based on the heat exchanger design specifications. The inspectors also conducted discussions with engineering personnel concerning system configuration and heat load requirements, the methodology in calculating heat exchanger performance, and the method for tracking the status of tube plugging activities.

### b. Findings

No findings of significance were identified.

## 1R08 Inservice Inspection (ISI)

### a. Inspection Scope

The inspectors observed in-process ISI work activities on Unit 1 and reviewed selected ISI records. The observations and records were compared to the Technical Specifications (TS) and the applicable Code (ASME Boiler and Pressure Vessel Code, Sections XI, 1989 Edition, with no Addenda) to verify compliance. The following specific activities were observed/reviewed:

- In-process Ultrasonic (UT) and Liquid Penetrant (LPT) examinations of Safety Injection System Piping Welds 1NI149-6, 1NI149-7 and 1NI149-8 were observed.
- In-process Magnetic Particle (MT) examination of Feedwater System Welded Attachment CF 1-R-CF-1563 was observed.
- In-process Visual (VT) examinations of Pipe Hangers 1-R-VN-0006, 1R-LD-0073, and 1-R-VN-0052 were observed.

(For all of the above listed UT, LPT, MT, and VT examinations, the inspectors reviewed qualification and certification records for examiners, equipment and consumables.)

- Radiographic (RT) film for Containment Spray System Pipe Welds 1NS26-27, 1NS25-28 and 1NS25-19, made in conjunction with replacement of the 1B Heat Exchanger, was reviewed by the inspectors.

- The inspectors reviewed ASME Section XI Repair and Replacement (R&R) WOs 98580345-04 (replacement of Component Cooling System Relief Valve 1KC-281) and 98624220-01, -10, and -21 (replacement of Containment Spray System Heat Exchanger 1B), including ASME Repair/Replacement Checklists and preservice inspection (PSI) requirements. In addition, a sample of pipe weld records (Weld Process Control Sheets) for piping welds associated with replacement of the Containment Cooling Heat Exchanger were reviewed.

The inspectors also reviewed the Unit 1 EOC-14 Steam Generator (SG) Work Scope, observed a sample of in-process Eddy Current (ET) data acquisition and analysis, and reviewed examination procedures and guidelines to verify compliance with applicable TS, Code, and Industry Guidelines. The observations/reviews were performed to verify compliance in the areas of: ET examination scope and expansion criteria; appropriate corrective actions if new degradation found, adherence to TS plugging criteria; qualification of ET probes and equipment for the expected types of tube degradation; and appropriate corrective actions for loose parts identified during the current outage.

A sample of licensee identified ISI/SG problems documented in Problem Identification Process reports (PIPs) was reviewed to verify that problems were being identified at the appropriate level and entered into the corrective action system. The specific PIPs and documents reviewed are listed in the Attachment to this report.

In addition to inspection of ISI activities, the inspectors reviewed the licensee's boric acid corrosion control program, reviewed a sample of licensee boric acid leakage inspection results for the current outage, and walked down portions of the Unit 1 lower containment to inspect for evidence of boric acid leakage.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification

.1 Simulator Training

a. Inspection Scope

The inspectors observed a simulator training scenario conducted on October 15, 2003, to assess the performance of licensed operators. The scenario, OP-LN-PTRQ-5-27, PTRQ Task Requirement Guide, involved a leak in the residual heat removal system and a loss of residual heat removal in a mid-loop plant condition. 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 training session, the inspectors assessed whether appropriate feedback was provided to the licensed operators regarding identified weaknesses.

b. Findings

No findings of significance were identified.

.2 Annual Operating Test Results

a. Inspection Scope

On October 3, 2003, the licensee completed the annual operating tests required to be given to all licensed operators by 10 CFR 55.59(a)(2). The inspectors reviewed the overall pass/fail results of the individual operating tests, and the crew simulator operating tests. These results were compared to the thresholds established in Manual Chapter 609 Appendix I, Operator Requalification Human Performance Significance Determination Process.

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 (SSC) 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 two items listed below. Documents reviewed are listed in the Attachment to this report.

- Unit 1 SSF Pressurizer Heater Subgroup D Repairs
- 1B Containment Spray Heat Exchanger Tube Support Baffle Plate Degradation

b. Findings

Introduction: A Green non-cited violation (NCV) was identified by the inspectors for failure to promptly identify and correct conditions adverse to quality, such as deficiencies and nonconformances, in accordance with 10 CFR 50 Appendix B, Criterion XVI. This issue is associated with degradation of the 1B NSHX tube support plates.

Description: On October 6, 2003, the 1B NSHX was removed from service to install inspection openings on the shell of the heat exchanger. (Note: RN flows through the shell side of the NSHXs.) This effort was being accomplished as a corrective action from a heat exchanger fouling issue that occurred on the 1A NSHX. The licensee was inspecting the shell side of the 1B NSHX for potential fouling of the tube bundle. The

licensee found that the tube support and baffle plates were severely corroded. A licensee engineering review determined that the heat exchanger could not be returned to service since the tube support function of the support plates was degraded such that seismic qualification of heat exchanger could not be met without extensive analysis. Subsequent evaluations by licensee engineering, with the support of a vendor, determined that the heat exchanger could be considered operable if shell side/RN flow restrictions were implemented.

The inspectors reviewed the past history associated with the NSHXs. The inspectors reviewed eddy current test (ECT) results on both Unit 1 and Unit 2 NSHXs and found that the tube support degradation had been identified in the testing summary analysis in 1992 for the 1B NSHX. The inspectors found that ECT performed in 1993 for Unit 2 NSHXs identified tube support degradation as a concern on the 2B NSHX. ECT on the 1B NSHX in 1997, 1998, and 2002 all identified tube support degradation as a concern. A review of system health reports found that the licensee did not identify the tube support degradation as an issue in those reports until the second quarter of 2003. The inspectors found that the system component health reports included the tube support degradation issue, but no action was taken to determine the cause, arrest the degradation, or repair the degradation. A search of the corrective action program back to 1992 did not find a corrective action document associated with the tube support degradation. The inspectors acknowledged that ECT was not recognized as an inspection method designed for deterministic conclusions involving the degradation of tube support plates. However, the inspectors concluded that ECT was recognized as a valid indicator of component structural changes that should have been pursued for corrective actions for deficiencies and nonconformances that may have been adverse to quality a safety-related component.

Analysis: The deficiency associated with this finding was that inadequate corrective actions were taken on known degradation of the 1B NSHX. The inspectors concluded that inspection information indicated structural degradation of the heat exchanger had taken place since 1992 and no actions were taken to identify the extent of degradation and initiate corrective actions to arrest, prevent, or repair the damage. Several of the licensee's ECT results and ultrasonic testing results showed degradation of the tube support plates and the shell of the heat exchanger was taking place. The finding was greater than minor because the finding effected the Barriers cornerstone objective of providing reasonable assurance that physical barriers protect the public from radio nuclide releases caused by accidents or events, specifically the cornerstone attribute of maintaining the functionality of the containment by maintaining design structural integrity. Additionally, the heat exchanger actually was declared inoperable in excess of the allowed TS Limiting Condition for Operation (LCO) time (see section 4OA5 of this report for Notice of Enforcement Discretion discussion), which directly affected the cornerstone objective of functionality of the containment. The finding which is under the Barriers cornerstone was of very low safety significance because, the finding did not represent an actual reduction of the atmospheric pressure control function of the reactor containment since the other train was available and was designed for one hundred percent capability to meet design requirements. Extensive licensee engineering analysis, with vendor support, determined that heat exchanger past operability was maintained because RN flow during design accident system configurations was below newly developed limits due to system flow balancing.

Enforcement: 10 CFR 50 Appendix B, Criterion XVI, states in part that measures shall be established to assure that conditions adverse to quality, such as deficiencies, and nonconformances are promptly identified and corrected. Contrary to the above for a period from approximately 1992 until October 6, 2003, a condition adverse to quality was not promptly identified and corrected in the 1B NSHX for known structural degradation of the tube support plates. Because this failure to promptly identify and correct a condition adverse to quality is of very low safety significance and has been entered into the licensee's corrective action program under PIP C-03-05464, this violation is being treated as an NCV, consistent with Section VI.A of the NRC Enforcement Policy: NCV 05000413,414/2003005-01, Failure to Identify and Correct Known Conditions Adverse to Quality - 1B Containment Spray Heat Exchanger. This is the first of two examples of 10 CFR 50 Appendix B, Criterion XVI violations in this report. The second example is discussed in Section 1RST of this report.

### 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) per 10 CFR 50.65 (a)(4).

- A Train RN Work Pinhole Repair (A train of RN out of service).
- 1B Diesel Generator Outage
- Unit 1, loop A delta temperature and overtemperature instrument card replacement
- 2B Diesel Generator turbo charger replacement
- 2B KC HX Tube Cleaning
- 1B NSHX Inspection
- 1B RN System Out for Maintenance

#### b. Findings

No findings of significance were identified.

### 1R14 Personnel Performance During Nonroutine Plant Evolutions

#### a. Inspection Scope

On October 30, 2003, the inspectors observed operator performance during portions of the Tavg RCS temperature coast down plant evolution. The inspectors observed licensed operators use of procedures, complex evolution plan, control room briefings, and plant equipment manipulations during the evolution.

On November 7 and 8, 2003, the inspectors observed operator performance during the shutdown of Unit 1 for the 1EOC-14 Refueling Outage. The inspectors observed licensed operators use of procedures, control room pre-evolution briefings, and plant equipment manipulations during the power reduction, manual reactor trip and portions of the subsequent plant cooldown.

On December 18, 2003, the inspectors observed operator and reactor engineer performance during a reactor startup, approach to criticality, and portions of the Zero Power Physics testing on Unit 1. The inspectors observed the conduct of control room activities, procedure use and adherence, and plant equipment manipulations, as well as attended control room briefings.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations

a. Inspection Scope

The inspectors reviewed operability determinations (or justifications for continued operation) 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 to this report. Operability evaluations were reviewed for the issues listed below:

- Component Cooling (KC) Surge Tank operability with missing stiffener plates discovered during In-Service Inspection
- KC Surge Tank operability during repair activities
- 1A Diesel Generator broken exhaust bolt
- 1B NSHX tube support baffle plate degradation
- 1B Diesel Generator reverse power trip indication failure on breaker 1ETB-4
- 2A Diesel Generator cam door bolts Missing
- Unit 1 containment divider barrier leak
- 2B Diesel Generator cell 30 voltage found less than TS allowable
- Crane located over Standby Shutdown Facility diesel fuel oil storage tank

b. Findings

No findings of significance were identified.

## 1R16 Operator Workarounds

### .1 Operator Workarounds

#### a. Inspection Scope

The inspectors performed an in-depth review of two operator workarounds. The first workaround reviewed was associated with steam generator inventory makeup transfer from the auxiliary feedwater nozzles to the main feedwater nozzles. An intermittent equipment condition existed where one of the three valves required to operate in sequence would not move. The second workaround that was reviewed involved operator compensatory actions that were specified as a result of reduced operating level bands on the Unit 2 KC surge tanks, during repairs on the surge tank support structures. This review assessed the: (1) impact on the reliability, availability, and potential for mis-operation of the identified system(s); (2) potential for increased 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. Documents reviewed are listed in the Attachment to this report.

#### b. Findings

No findings of significance were identified.

### .2 Cumulative Workarounds

#### a. Inspection Scope

The inspectors reviewed the cumulative CNS Operator Workaround List for potential affects on the functionality of mitigating systems. The inspectors performed an in-depth review of an operator workaround associated with dose equivalent iodine compensatory actions, as well as reviewed Nuclear System Directive 506, Operator Workarounds, and the cumulative effects of all identified operator workarounds. 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. Aggregate impacts of the identified workarounds on each individual operator watch station were also reviewed.

#### b. Findings

No findings of significance were identified.



1R17 Permanent Plant Modificationsa. Inspection Scope

The inspectors evaluated design change documentation and conducted field observations for one major modification associated with replacement of the 1B NSHX, to evaluate the modification for adverse affects on system availability, reliability, and functional capability. The following modification and the associated attributes were reviewed:

- NSM CN-11446/01, Replace Containment Spray Heat Exchanger 1B (Mitigating Systems, Barrier Integrity)
  - Conformance to design basis including selected calculation reviews
  - Field installation requirements
  - Functional testing and results
  - Plant procedure, critical drawing, Final Safety Analysis Report updating
  - Operations training
  - 10CFR50.59 Screen

b. Findings

No findings of significance were identified.

1R20 Refueling and Outage Activitiesa. Inspection Scope

The inspectors evaluated Unit 1 outage activities to ensure that the licensee considered risk in developing 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 TS requirements that ensure defense-in-depth. The following specific areas were reviewed:

- Review of Outage Plan - Prior to the outage, the inspectors reviewed the licensee's outage risk control plan, attended risk briefings, and verified that the licensee appropriately considered risk, industry experience, and previous site specific problems. The inspectors reviewed the licensee's contingency actions for losses of key safety functions, and verified that the licensee maintained key safety function status and controls throughout the outage. The inspectors reviewed the Unit 1 outage risk assessment CN-03-01, 1EOC-14-IRT Pre-Outage Review, Shutdown Risk Assessment.
- Monitoring of Shutdown Activities - The inspectors reviewed NSD 304, Reactivity Management, and OP/1/A/6100/002, Controlling Procedure For Unit Shutdown, during unit shutdown. In addition, PT/1/A/4600/017, Surveillance Requirements For Unit 1 Shutdown, was reviewed to ensure cooldown rates while cooling down the reactor coolant system were in accordance with TS 3.4.3, RCS Pressure and Temperature (P/T) Limits.

- Outage Configuration Management - The inspectors assessed the licensee's management of configuration control and the risk associated with outage activities by reviewing the licensee's implementation of Site Directive 3.1.30, Unit Shutdown Configuration Control (Modes 4, 5, 6 or No Mode) and NSD 403, Shutdown Risk Management (Modes 4, 5, 6 or No Mode) per 10CFR50.65(a)(4). This assessment included verification that the licensee 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. The inspectors also assessed whether 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 Activities - The inspectors verified that tags were properly hung and that associated equipment was appropriately configured to support the function of the clearance. Specifically, the inspectors reviewed tagouts for B RN work (Tagout IDs 03-02626,03-02609,03-02753) and for an oil leak repair on the 1ND-1B valve actuator (Tagout ID 03-03616).
- Reactor Coolant System Instrumentation - The inspectors verified that reactor coolant system level and temperature instruments were installed and configured to provide accurate indication, and that instrumentation error was properly addressed. This verification included a review of OP/1/A/6150/006, Draining The Reactor Coolant System, and the observation of lowering reactor water level activities. Additional documents reviewed are listed in the Attachment to this report.
- Electrical Power - The inspectors reviewed the status and configurations of electrical systems for compliance with TS requirements and the licensee's outage risk control plan. The inspectors verified that switchyard activities were controlled commensurate with safety and were consistent with the licensee's outage risk control plan. The inspectors reviewed Site Directive 3.1.30, Unit Shutdown and CN-03-01, 1EOC-14-IRT Pre-Outage Review, Shutdown Risk Assessment.
- Spent Fuel Pool Cooling System Operation - The inspectors verified that outage work was not impacting the ability of operators to operate the spent fuel pool cooling system during and after core offload. This verification included the review of OP/1/A/6200/05, Spent Fuel Cooling System, the review of control room indications specific to the spent fuel cooling system and the spent fuel pool, and the conduct of discussions with control room licensed operators.
- Inventory Control - The inspectors reviewed flow paths, configurations, and alternative means for inventory addition to verify they were consistent and maintained in accordance with the outage risk plan, 1EOC-14-IRT Pre-Outage Review, Shutdown Risk Assessment. The inspectors reviewed reactor vessel inventory controls to verify they were adequate to prevent inventory loss.
- Reactivity Control - The inspectors 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) and NSD 403, Shutdown Risk Management (Modes 4, 5, 6 or No Mode) per 10CFR50.65(a)(4). Potential reactivity changes were identified in the outage risk plan, 1EOC-14-IRT Pre-Outage Review, Shutdown Risk Assessment, and were reviewed to verify proper controls.

- Containment Closure - The inspectors verified that the licensee controlled containment penetrations in accordance with the refueling operations TS, and that containment closure could be achieved when needed. The inspectors reviewed the following documents and their implementation:
  - Site Directive 3.1.30, Unit Shutdown Configuration Control (Modes 4,5,6 or No Mode)
  - NSD 403, Shutdown Risk Management (Modes 4, 5, 6 or No Mode) per 10CFR50.65(a)(4)
  - PT/1/A/4200/002C, Containment Closure Verification (Part I)
  - PT/1/A/4200/002I, Containment Closure Verification (Part II)
  - PT/1/A/4200/002J, Containment Closure Verification Penetration Status Change
  - OP/0/A/6100/014, Penetration Control for Modes 5 and 6
  
- Reduced Inventory and Mid-Loop Conditions - The inspectors reviewed the licensee's commitments from Generic Letter 88-17, Loss of Decay Heat Removal, and confirmed they were adequately implemented. The inspectors verified that the configuration of plant systems during reduced inventory and mid-loop conditions were in accordance with Generic Letter 88-17 commitments. The inspectors observed control room activities during mid-loop conditions and verified that licensed operators could maintain required reactor vessel level. The inspectors reviewed OP/1/A/6150/001, Enclosure 4.16, Reactor Coolant System Vacuum Refill Without Solid Operation, and Site Directive 3.1.30, Unit Shutdown Configuration Control (Modes 4,5,6 or No Mode).
  
- Refueling Activities - The inspectors reviewed fuel handling operations to verify they were performed in accordance with fuel handling procedures. Specifically, the inspectors verified the positions of randomly selected fuel assemblies, and verified that these assemblies were tracked and placed in the correct position and orientation. The inspectors also observed the coordination and movement of several fuel assemblies from the reactor vessel to the spent fuel pool and from the spent fuel pool back into the reactor vessel. The video tape of the core reload verification was reviewed. The inspectors reviewed the following documents and their implementation:
  - PT/0/A/4150/017, Total Core Offloading
  - PT/0/A/4150/037, Fuel / Component Movement Accounting
  - OP/1/A/6550/007, Reactor Building Manipulator Crane Operation
  - PT/1/A/4550/001C, Refueling Communications Test
  - PT/0/A/4150/022, Total Core Reloading
  - PT/0/A/4550/003C, Core Verification

- Monitoring of Heatup and Startup Activities - The inspectors reviewed TS, license conditions, commitments, and administrative procedure prerequisites for mode changes to verify they were met for changing plant configurations. The inspectors performed a walkdown of primary containment prior to reactor startup to verify that debris had not been left which could affect performance of the containment sumps. The inspectors observed the reactor startup and the approach to criticality. The inspectors reviewed the following documents and their implementation:
  - OP/1/A/6100/001, Controlling Procedure for Unit Startup
  - PT/0/A/4150/019, 1/M Approach to Criticality
  - PT/0/A/4200/002, Containment Cleanliness Inspection
  - SM/0/A/8510/008, Ice Condenser FME Inspection
  - PIP C-03-06798 Foreign material suspected in valves 1NI164 and 1NI168
  - PIP C-03-04815, Material Condition & Housekeeping Discrepancies Notes During NRC Walkdown of Lower Containment

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 surveillance tests and post-maintenance tests listed below to verify that TS surveillance requirements and/or Selected Licensee Commitment (SLC) 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. Documents reviewed during this inspection are listed in the Attachment to this report. The following activities were reviewed:

Surveillance Tests - Containment Isolation Valves:

- PT/1/A/4200/001 C; As Left Containment Isolation Valve Leak rate Test, Enclosure 13.35, Penetration No. M236 As Left Type C Leak Rate Test
- PT/1/A/4200/001C, As Left Containment Isolation Valve Leak Rate Test, Enclosure 13.17, Penetration No. M322 as Left Type C Leak Rate Test

Surveillance Tests - Ice Condenser:

- SM/0/A/8510/007; Ice Basket Corrective Maintenance and Tracking
- MP/0/A/7150/005; Ice Basket Weight Determination (Bay 18, Row 9 activities)

In-Service Test:

- PT/2/A/4400/003A, Component Cooling (KC) Train 2A Performance Test

Post Maintenance Tests (associated with):

- 2B Diesel Generator Turbocharger Replacement  
- PT/2/A/4350/002B, Diesel Generator 2B Operability Test
- 1B NSHX Inspection and Repairs  
- PT/1/A/4400/009, Cooling Water Flow Monitoring For Asiatic Clams and Mussels Test  
- PT/1A/4400/006B, NS Heat Exchanger 1B Heat Capacity Test
- Unit 1, Safety Injection (NI) System Foreign Material Throttle Valve Repairs  
- PT/1/A/4400/001, ECCS Flow Balance
- Unit 1, NI Pump Foreign Material  
- PT/1/A/4200/005 A, Safety Injection Pump 1A Performance Test  
- PT/1/A/4200/005 B, Safety Injection Pump 1B Performance Test

b. Findings

Introduction: A Green non-cited violation (NCV) was identified by the inspectors for failure to promptly identify and correct conditions adverse to quality, such as deficiencies and nonconformances, in accordance with 10 CFR 50 Appendix B, Criterion XVI. Specifically, the inspectors identified that ineffective corrective actions were taken on the 2B diesel generator battery bank to ensure the availability and reliability of a safety-related component.

Description: On December 5, 2003, the inspectors conducted a review of PIP C-03-05743, which identified an unplanned entry into TS for the 2B diesel generator battery cells 79 and 90 cell voltage being below the TS allowable limit of 1.36 volts. This condition was found by the licensee during a periodic inspection and maintenance activity (IP/0/A/3710/012, Periodic Inspection and Maintenance for SAFT Model SBM277-2 and SBM277T-2 Storage Battery) on the 2B diesel generator battery bank. The frequency requirement of this procedure had been quarterly. However, the procedure was being performed on a weekly basis due to previously identified equipment reliability issues associated with the battery cell voltage going below the TS allowable limits. The licensee had concluded that the cell voltage behavior was erratic and voltages could not be predicted for longer periods of time. The inspectors reviewed IP/0/A/3710/012, which was performed on October 18, 2003, and noted that battery cell 79 voltage for the 2B diesel generator was recorded as 1.381 volts. The licensee's administrative limit for cell voltage was 1.38 volts. The inspectors noted that IP/0/A/3710/012 performed on October 25, 2003, identified cell 79 and cell 90 below the TS allowable limit of 1.36 volts.

The inspectors reviewed the licensee's engineering calculation from the battery vendor, Duke Energy - Catawba Station Battery Resizing Project, and found that the analysis stated, "Sizing calculations for the Catawba Emergency Diesel Generator batteries show

that there is sufficient installed capacity under all load conditions to support one cell in full reversal.” The analysis stated that cell voltages of less than 1.36 volts may have a possibility of undergoing a polarity reversal. A battery cell in a reversal condition becomes a load on the battery bank. The analysis stated that the battery was capable of handling one cell in reversal and maintain load capacity, but could not handle more than one cell in full reversal. The inspectors concluded that between October 18 and October 25 the 2B diesel generator battery bank potentially lost its design safety function capability. The inspectors concluded that the exact time could not be determined since the battery voltages could not be trended. The inspectors concluded that ineffective corrective actions were taken to prevent the 2B diesel generator battery bank from becoming inoperable sometime between October 18 and October 25, 2003. Corrective actions resulting from the increased battery surveillance frequency were not adequate to identify an adverse trend in cell voltage prior to multiple cells being below the TS voltage. The intended reason for performing the surveillance weekly was to identify cells that may be trending low. However, no action was taken on cell 79 when the voltage of that cell was found to be at a decreased voltage on October 18.

Analysis: The deficiency associated with this finding was that ineffective corrective actions were taken on the 2B diesel generator batteries, on October 18, to ensure the availability and reliability of the safety-related component. The licensee had taken corrective actions in an effort to prevent the loss of battery capability from cell failures; however, no specific actions were taken when decreasing voltage on cell 79 was identified. During the next weekly voltage check two cells were found to be below the TS allowable cell voltage. This finding was greater than minor because it affected the reactor safety mitigating system cornerstone attribute to ensure availability, reliability, and capability of the system. The finding was evaluated using the phase one SDP. The finding was determined to be of very low safety significance because there was no loss of safety function on the battery bank. The determination of no loss of safety function was made by the inspectors following a review of a capacity test that was performed on December 8, 2003, by the licensee on the two cells after they had been removed. The test showed that the two cells had sufficient capacity and, therefore, a cell reversal condition did not exist even though they were below the TS allowable cell voltage limit.

Enforcement: 10 CFR 50 Appendix B, Criterion XVI states, in part, that measures shall be established to assure that conditions adverse to quality, such as deficiencies and nonconformances, are promptly identified and corrected. Contrary to the above, on October 18, 2003, a condition adverse to quality was not identified and corrected when battery surveillance IP/0/A/3710/012 identified a decreased voltage on a battery cell, but corrective actions were not initiated to prevent the 2B diesel generator battery bank from becoming inoperable. Because this failure to promptly identify and correct a condition adverse to quality is of very low safety significance and has been entered into the licensee's corrective action program under PIP C-03-05743, this violation is being treated as an NCV, consistent with Section VI.A of the NRC Enforcement Policy: NCV 05000413,414/2003005-01, Failure to Identify and Correct Known Conditions Adverse to Quality - 2B Diesel Generator Battery. This is the second example of a 10 CFR 50, Appendix B, Criterion XVI violation. The first example is discussed in Section 1R12 of this report.

#### 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 October 2002 through September 2003. 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, Revision 2, were used to verify the basis in reporting for each data element.

- High Pressure Injection System Safety System Unavailability, Unit 1
- High Pressure Injection System Safety System Unavailability, Unit 2
- Residual Heat Removal System Safety System Unavailability, Unit 1
- Residual Heat Removal System Safety System Unavailability, Unit 2

The inspectors reviewed a selection of Licensee Event Reports (LERs), portions of Unit 1 and Unit 2 operator log entries, Technical Specification Action Item Log (TSAIL) 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

During a review of the data the licensee used to generate the Residual Heat Removal (RHR) System Safety System Unavailability (SSU) performance indicator, the inspectors found that the licensee was including accumulated defueled (No-Mode) hours as part of the system required availability time used to compute the performance indicator value. The equation used to determine the PI is the ratio of the sum of planned unavailable hours, unplanned unavailable hours and fault exposure hours divided by the hours the system trains were required to be available during the previous 12 quarters. The inspectors noted that excluding the No-Mode hours from the denominator of the equation can cause the PI value to increase. The specific amount of the increase, if the No-Mode hours were excluded from the calculation, had not been determined during this inspection period. The inspectors reviewed the NEI guidance and clarifying notes for this performance indicator, as well as the applicable frequently asked questions (FAQs). The inspectors found that the response to FAQ #183 stated, "During periods and conditions where Technical Specifications allow both shutdown cooling trains to be removed from service, the shutdown cooling system is, in effect, not required and required hours and unavailable hours would not be counted." Captured under PIP C-03-07216, the licensee indicated that they did not interpret this FAQ to be directly applicable to the issue of excluding No-Mode hours from the RHR SSU PI calculation. The resolution of this item is pending a response from Headquarters. Upon resolution of this issue, and in the event that the resolution excludes the No-Mode hours, the potential exists that the PI could cross a threshold based on the licensee's stated recognition of an increasing trend associated with the RHR System SSU PI. This issue

is therefore being tracked as unresolved item (URI) 05000413,414/2003005-02, Inclusion of No-Mode Hours in the "Hours Train Required" Portion of the RHR System Performance Indicator Calculation.

#### 4OA2 Problem Identification and Resolution (PI&R)

##### .1 Annual Sample Review

###### a. Inspection Scope

The inspectors selected two PIP documents for detailed review. PIP C-03-04566 was associated with two failed RWST level instruments due to lightning strikes. The second PIP (C-03-04814) involved a seal failure on the 1D ND pump when it was placed in service during a forced outage. Both root cause documents were reviewed to ensure that 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 documents against the requirements of the licensee's corrective action program, Nuclear System Directive (NSD) 208, Problem Investigation Process, and 10 CFR 50 Appendix B.

###### b. Findings

No findings of significance were identified.

##### .2 Cross-References to PI&R Findings Documented Elsewhere

Section 1R12 describes the licensee's failure to identify and correct known conditions adverse to quality in the 1B NSHX regarding tube support baffle plate degradation.

Section 1RST describes the licensee's failure to take effective corrective actions to prevent the 2B diesel generator battery bank from becoming inoperable.

##### .3 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 hard copies of each condition report, attending daily screening meetings, accessing the licensee's computerized database.

#### 4OA3 Event Followup

##### .1 Notice of Enforcement Discretion (NOED) to Inspect and Repair 1B NSHX

On October 8, 2003, the NRC granted a Unit 1 NOED related to enforcing compliance with the requirements of TS 3.6.6, Containment Spray System. The details of the failure and the request is documented in a Letter dated October 9, 2003, from the licensee to the NRC. The 1B NSHX was declared inoperable following an internal inspection of the heat exchanger subsequent to the installation of inspection ports and identification of



tube support plate degradation. Additional LCO time was needed to inspect, remove debris, repair, and perform subsequent testing necessary to restore the heat exchanger to service. The inspectors reviewed the applicable TS requirements, assessed the impact of the inoperable NSHX, and monitored for compliance with the compensatory measures established as conditions for granting of the NOED. A NCV concerning the licensee's failure to take previous corrective actions was identified, and is addressed in Section 1R12 of this report.

.2 (Closed) LER 05000413/2003005-00, Reactor Trip Due To Pressurizer Pressure Channel Failure

On August 29, 2003, a Unit 1 automatic reactor trip occurred due to the pressurizer pressure channel 2 instrument failing low. This resulted in the reduction of the loop 1B overtemperature delta temperature (OTDT) instrument setpoint to approximately 50 percent, which was below the current operating power level. The 1A OTDT trip bistable was previously tripped due to a reactor coolant system hot leg temperature detector failure. The reactor trip was initiated when 2 out of 4 OTDT trip bistables were actuated. The LER was reviewed by the inspectors and no findings of significance were identified. The licensee documented the failed equipment in PIP C-03-04791.

.3 (Closed) LER 05000414/2003001-00, Two Channels of FWST Level Instrumentation Were Rendered Inoperable Following Lightning Strike, Resulting in Technical Specification Violation

On August 16, 2003, Channels 1 and 3 of FWST level instrumentation failed high due to an apparent lightning strike. Both instrument channels were placed in bypass and Unit 2 entered TS LCO 3.0.3. A unit shutdown was initiated in accordance with TS requirements. The licensee requested a NOED that was granted by the NRC, however one of the instruments was repaired prior to having to have the plant in a mode 3 status, the TS was exited, so the NOED was not used by the licensee. The inspectors concluded that no violation NRC requirements occurred. The LER was reviewed by the inspectors and no findings of significance were identified. The licensee documented the failed equipment in PIP C-03-04566.

.4 (Closed) LER 05000413/2003006-00, 1B Containment Spray System Inoperable for Longer Than Technical Specifications Allow Due To Heat Exchanger Baffle Plate Degradation

On October 6, 2003, the 1B containment spray system was declared inoperable to install inspection openings in the shell of the 1B heat exchanger. Inspection of the heat exchanger internals found degradation of the tube support baffle plates. Licensee engineering review of the condition determined that the heat exchanger could not be returned to service within the time limits required by TS. A NOED was requested and granted by the NRC on October 8, 2003. Subsequent evaluations by licensee engineering with support from a vendor determined that the heat exchanger could be placed back in service with some limitations on shell side flows. The heat exchanger was declared to be operable by the licensee on October 21, 2003. This LER was reviewed by the inspectors. The degraded tube support baffle plate condition is discussed and dispositioned in section 1R12, Maintenance Effectiveness, of this report. The licensee documented the equipment condition in PIP C-03-05464.

- .5 (Closed) LER 05000413/2002006-001, TS Non-compliance- Inoperable DG Caused By Inadequate Wire Lug Crimping At Closing Spring Motor Disconnect Switch (revised to correct NCP seal replacement)

This LER was revised to correct the description of the NCP seal project. The LER revision was reviewed by the inspectors and found that the revision did not change the original report conclusions. This LER was originally dispositioned in NRC Integrated Report 05000413,414/2002003, section 4OA3.2. No new information was provided concerning the issue, no findings of significance were identified in this review.

#### 4OA5 Other Activities

- .1 (Closed) URI 05000413/2003004-01, Containment Walkdown Identified Debris In Containment Sump

Introduction: A Green NCV was identified by the inspectors for failure to adequately implement a surveillance procedure in accordance with TS 5.4.1.a, which resulted in the failure to identify approximately six gallons of material in the Unit 1 containment sump during a containment closeout inspection.

Description: During a Unit 1 forced outage activity inspection (NRC Inspection Report 05000413/2003004, dated October 20, 2003) the inspectors identified debris in the Unit 1 containment sump while conducting a containment closeout walkdown. The inspectors' walkdown was performed shortly after the licensee had completed a containment cleanliness inspection in accordance with PT/0/A/4200/002, Containment Cleanliness Inspection. Disposition of this issue was not completed at the end of the inspection report period since the licensee had not completed a past operability and reportability evaluation for the debris in the containment sump.

The licensee's operability evaluation determined the debris was cork material that had been removed from between the cold leg accumulator floor and the primary containment liner interface during several previous Unit 1 refueling outages. The inspectors reviewed the licensee's past operability evaluation. Based on extensive industry documentation regarding containment debris analysis, the operability evaluation concluded that the cork would not interfere with the containment sump, primarily because the material would float when the containment was flooded. Therefore, it would have floated out of the vortex suppression area of the sump before the sump would have been required to be placed in service. The volume of the cork was estimated to be approximately six gallons of material. The surface area of this material, taking into consideration industry analysis regarding containment debris and sump screen interaction, would have been less than the plant licensed surface area limits for external sump screen plugging. The inspectors agreed with the licensee's evaluation and conclusion regarding the past operability of the containment sump. The inspectors determined that the licensee should have identified the debris in the containment sump during their containment cleanliness inspection. The stated purpose of the containment closeout procedure was to ensure that no debris was present in the containment sump.

Analysis: The deficiency associated with this finding was a failure to adequately implement the containment closeout procedure. The licensee had a minimum of two missed opportunities to implement the containment closeout procedure adequately.

One opportunity was at the end of the last Unit 1 refueling outage (Spring 2003) and the second opportunity was at the end of the Unit 1 forced outage in September 2003. This finding was greater than minor because the finding was associated with the reactor safety mitigating system cornerstone objective to ensure the availability, reliability, and capability of a system that responds to initiating events to prevent core damage. The finding, which is under the Mitigation Systems cornerstone, was of very low safety significance because, the debris in the containment sump did not result in the actual loss of function or loss of a single train of safety injection equipment.

Enforcement: TS 5.4.1.a requires written procedures be established, implemented, and maintained covering activities specified in Regulatory Guide 1.33, Appendix A.

Regulatory Guide 1.33, Appendix A, Item 8b, requires procedures be implemented for the surveillance tests listed in TS. TS 3.5.3, Emergency Core Cooling Systems, Surveillance Requirement (SR) 3.5.2.8 stated, in part, that visual inspections of each containment sump must be performed. PT/0/A/4200/002, Containment Cleanliness Inspection, implemented the TS requirements specified in SR 3.5.2.8. Contrary to the above, PT/0/A/4200/002, Containment Cleanliness Inspection, was not adequately implemented, in that its performance on August 31, 2003, did not identify approximately six gallons of debris located inside the containment sump. Because this failure to adequately implement the surveillance is of very low safety significance and has been entered into the licensee's corrective action program under PIP C-03-04815, this violation is being treated as an NCV, consistent with Section VI.A of the NRC Enforcement Policy: NCV 05000413/2003005-03, Failure to Adequately Implement Containment Closeout Inspection Surveillance To Identify Debris In Containment Sump.

.2 Inspection of Reactor Pressure Vessel Lower Head Penetration Nozzles, Temporary Instruction (TI) 2515/152 - (Unit 1)

The inspectors verified that qualified and knowledgeable licensee individuals performed the inspection of the Unit 1 lower vessel head penetration nozzles. These individuals were qualified VT-1,2,&3 Level II examiners. The inspectors verified that the inspection was performed in accordance with the licensee's approved procedure. This procedure was written to be able to identify, disposition, and resolve deficiencies and any pressure boundary leakage. The inspection did not identify any deficiencies or pressure boundary leakage. There were no boric acid deposits at the interface of the vessel and nozzle penetrations. There was surface streaming boric acid residue from previous reactor cavity seal leakage. Four surface samples were taken and analyzed by the licensee to confirm the origination of the streaming boric acid residue. The licensee analysis followed the Electric Power Research Institute (EPRI) boric acid aging recommendations and compared the ratio of cobalt 58 and cobalt 60. The inspection of the vessel penetrations was performed by 360 degree visual inspection with the appropriate lighting and mirrors. The bottom head area was washed at the end of the refueling outage and the as-left condition documented by the licensee. Inspector independent review of the lower vessel head penetrations and licensee documentation of surface samples found no evidence of material deficiencies.

.3 Inspection of Reactor Containment Sump Blockage, TI 2515/153 - (Unit 1)

The licensee's response to Bulletin 2003-01 described interim compensatory measures. The inspectors verified that the interim compensatory measures identified have been

implemented, planned, and scheduled. This review included interviews with operators, a review of training records, procedures, documentation of containment inspections and foreign material control activities. During the Unit 1 refueling outage, the inspectors verified that the licensee performed containment walkdowns to quantify potential debris sources. The walkdown included a structural inspection of the containment sump for gaps in the sump screening. The inspectors performed a containment sump structural inspection and found no significant deficiencies. Unit 2 was scheduled to conduct a refueling outage in September 2004, at which time walkdown activities are scheduled. Pending further NRC review of the licensee's response to Bulletin 2003-01, this TI will remain open. Documents reviewed during this inspection are listed in the Attachment to this report.

#### 4OA6 Meetings

##### Exit Meeting Summary

On January 5, 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

E. Beadle, Emergency Planning Manager  
J. Bumgarner, IWS Work Control Coordinator  
W. Byers, Security Manager  
T. Daniels, Emergency Planning/Fire Protection  
B. Dolan, Engineering Manager  
J. Foster, Radiation Protection Manager  
M. Glover, Station Manager  
P. Grobusky, Human Resources Manager  
T. Hawkins, ISI Coordinator  
A. Hogge, ISI Plan Manager  
D. Jamil, Catawba Site Vice President  
J. Kammer, Mechanical, Civil Engineering Manager  
L. Keller, Regulatory Compliance Manager  
P. Kowalewski, Nuclear General Office Maintenance Rule Engineer  
A. Lindsay, Work Control Superintendent  
J. McArdle, Principle NDE Level III  
P. McIntyre, Safety Review Group Manager  
B. Pitesa, Operations Superintendent  
F. Smith, Chemistry Manager  
G. Strickland, Regulatory Compliance Specialist  
R. Sweigart, Safety Assurance Manager  
C. Trezise, Maintenance Superintendent

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

#### Opened

05000413,414/2003005-02	URI	Inclusion of No-Mode Hours in the "Hours Train Required" Portion Residual Heat Removal System Performance Indicator Calculation (Section 4OA1)
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#### Opened and Closed

05000413,414/2003005-01	NCV	Failure to Identify and Correct Known Conditions Adverse to Quality - two examples: (1) 1B Containment Spray Heat Exchanger (Section 1R12) and (2) 2B Diesel Generator Battery (Section 1RST)
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05000413/2003005-03	NCV	Failure to Adequately Implement Containment Closeout Inspection Surveillance To Identify Debris In Containment Sump (Section 4OA5.1)
<u>Closed</u>		
05000413/2003005-00	LER	Reactor Trip Due To Pressurizer Pressure Channel Failure (Section 4OA3.2)
05000414/2003001-00	LER	Two Channels of FWST Level Instrumentation Were Rendered Inoperable Following Lightning Strike, Resulting in Technical Specification Violation (Section 4OA3.3)
05000413/2003006-00	LER	1B Containment Spray System Inoperable for Longer Than Technical Specifications Allow Due To Heat Exchanger Baffle Plate Degradation (Section 4OA3.4)
05000413/2002006-001	LER	TS Non-compliance- Inoperable DG Caused By Inadequate Wire Lug Crimping At Closing Spring Motor Disconnect Switch (revised to correct NCP seal replacement) (Section 4OA3.5)
05000413/2003004-001	URI	Containment Walkdown Identified Debris In Containment Sump (Section 4OA5.1)
2515/152	TI	Inspection of Reactor Pressure Vessel Lower Head Penetration Nozzles - Unit 1 (Section 4OA5.2)
<u>Discussed</u>		
2515/153	TI	Inspection of Reactor Containment Sump Blockage - Unit 1 (Section 4OA5.3)

## DOCUMENTS REVIEWED

### (Section 1R01.1)

#### Cold Weather Preparation

Nuclear System Directive 317, Freeze Protection Program  
 Catawba Nuclear Station Freeze Protection Program Engineering Support Document, Rev. 001  
 PT/0/B/4700/038, Cold Weather Protection

PT/0/B/4350/008, Heat Trace Alignment Verification  
 OP/1/A/6200/014 and OP/2/A/6200/014, Refueling Water System, Enclosure 4.9,  
 FWST Cold Weather Protection  
 IP/O/B/3560/008, Preventative Maintenance and Operational Check of  
 Freeze Protection Heat Trace and Instrument Box Heaters (EHT/EIB) Systems  
 PIP C-03-03818, Three site assessment on the freeze protection program

PIPs generated during inspection

PIP C-03-07234, Various EHT boxes were found with open holes in the bottom of their  
 enclosures and some boxes did not have desiccant bags installed  
 PIP C-03-07250, Several thermostats for Turbine Building heaters were found set  
 incorrectly and the covers were not locked  
 PIP C-03-07277, Summary of problems encountered performing PT/0/B/4700/038,  
 Cold Weather Protection

**(Section 1R01.2)**

Cold Weather Condition

IP/O/B/3560/008, Preventative Maintenance and Operational Check of Freeze Protection Heat  
 Trace and Instrument Box Heaters (EHT/EIB) Systems  
 Alarm Response Procedures for Operator Aid Computer (OAC) points C1P0118 (Unit 1 Dry  
 Bulb Ambient Temperature), C1P1821 (Unit 1 Wet Bulb Ambient Temperature), C2P0118  
 (Unit 2 Dry Bulb Ambient Temperature) and C2P1821 (Unit 1 Wet Bulb Ambient  
 Temperature).  
 OP/1/B/6400/001A and OP/2/B/6400/001A, Condenser Circulating Water, Enclosure 4.12, Cold  
 Weather Increased Surveillance  
 RP/0/B/5000/030, Severe Weather Preparations

**(Section 1R04.2)**

Unit 2 Component Cooling (KC) Alignment Verification

Component Cooling Health Reports (2002Q4, 2003T1, and 2003T2)  
 OP/2/A/6400/005; Component Cooling System  
 TS 3.7.7 Component Cooling Water System (TS, Bases and associated Surveillance  
 Requirements  
 PT/2/A/4400/003 C, Component Cooling System Valve Verification (31 Day Flow Path Valve  
 Alignment Verification)  
 Drawings CN-2573-(1.0, 1.1, 1.2, 1.3, 2.0, 2.1, 2.2, 2.3 ), Flow Diagrams of Component Cooling  
 System (KC)  
 PT/2/A/4350/003; Electrical Power Source Alignment Verification  
 UFSAR Section 9.2.2, Component Cooling System  
 Design Basis Specification CNS-1573.KC-00-0001, Component Cooling System

Unit 1 B Emergency Diesel Generator Alignment Verification

Emergency Diesel Generator Health Report (2003T1 and 2003T2)  
 125VDC Diesel Auxiliary Power System Health Report (2003T1 and 2003T2)

OP/1/A/6350/002, Diesel Generator Operation

TS 3.3.5; Loss of Power Diesel Generator Start Instrumentation (TS, Bases and associated Surveillance Requirements)

TS 3.8.1/ 3.8.2; AC Sources - Operating / Shutdown (TS, Bases and associated Surveillance Requirements)

UFSAR Section 8.3.1.1.3, Standby Power Supplies

PIP C-02-03551, Unexpected TSAIL entry for 1B DG due to voltage on 1B DG battery cell 69 being below TS limits

PIP C-02-03685, During performance of PT/1/A/4350/015B, the DG breaker would not close on the 1ETB bus

### **(Section 1R08)**

Steam Generator Management Program (SGMEP), Revision 6

SGMEP 105, CFR80 Specific Assessment of Potential Degradation Mechanisms, Revision 4, for Catawba Unit 1 EOC 14

Eddy Current Analysis Guidelines for Duke Power Company's CFR80 Steam Generators, Revision 4

Steam Generator Work Scope for Catawba Unit 1 EOC 14

Framatome Procedure 54-ISI-400-12, Multi-Frequency Eddy Current Examination of Tubing

DPC Eddy Current Acquisition Guidelines for Duke Power Company's CFR80 Steam Generators, Revision 9

DPC Eddy Current Analysis Guidelines for Duke Power Company's CFR80 Steam Generators, Revision 4

PIP C-03-06372, UT Exam on 1A NC Pump Shaft

PIPs C-03-01549 and C-03-00141, Liquid Penetrant (PT) Chemical Shelf Life

PIP C-03-03582, Incorrect Calibration Block Used for Excess Let Down Heat Exchanger

PIP C-03-06367, ASME Section XI PSI not Performed on NS Heat Exchanger Prior to Delivery

PIP C-02-02238, Refueling Cavity Drain Valve 1FW-25 Seat Leakage

PIP C-03-00069, NRC Regulatory Issue Summary 2003-01

PIP C-03-03466, ASME Section XI, Table IWB-2412-1 Requirements not Met for Steam Generator Piping Welds

PIP G-03-00294, Inspection of Steam Generator Dissimilar Metal Welds not in Accordance with Requirements

PIP C-03-06219, Foreign Objects Found on the Secondary Side of SGs 1B and 1C During Post Sludge Lance Inspection

Procedure MP/0/A/7650/040, Inspection, Evaluation, and Cleanup of Boric Acid spills on Alloy, Carbon, and Stainless Steel Components

Completed (11/08/03) Procedure PT/1/A/4150/001 H, Inside Containment Boric Acid Check

Work Order (WO) 98579931-0, Clean and Inspect Unit 1 Cavity Drain Valves

Work Request (WR) 98296449, Boric Acid Residue on KC Valves 1KC-91 and 1KC-330

Procedure MP/0/A/7650/148, ASME Section XI Repairs or Replacements, Revision 010

Performance Demonstration Initiative Program (PDI) ID# 177-38-0948 for Procedure NDE-600, Revision 7

DPC Letter to the NRC Dated August 8, 2003, Request for Relief 03-004 - Minimum Percentage Requirements for Second Inspection Period

Liquid Penetrant Examination Report for Welds 1NI149-6, 7, and 8

UT Pipe Weld Examination and Calibration Reports for Welds 1NI149-6, 7, and 8

Certificate of Qualification Records for 1 Level II VT Examiner, 2 Level II PT Examiners, 2 Level II UT Examiners, and 1 Level II MT Examiner



## Sample of NDE Inspection Materials and Equipment Certification Records

**(Section 1R12)**Unit 1B Containment Spray Heat Exchanger Tube Support Baffle Plate Degradation

Response to NRC Generic Letter 89-13, Service Water System Problems Affecting Safety Related Equipment  
 Record of Eddy Current Inspection of Balance of Plant Heat Exchangers on Unit #2, March 12, 1993  
 Record of Eddy Current Inspection of Balance of Plant Heat Exchangers on Unit #1, August 16, 1992  
 Containment Spray Heat Exchangers (NSHX) - 1A & 1B Final Report - 1EOC13 (05/02)  
 Catawba 1EOC10 (12/97) - Containment Spray Coolers NS-1A/1B Final Report  
 Record of Eddy Current Inspection of Containment Spray Heat Exchanger NS2A, Sept. 1998  
 Record of Eddy Current Inspection of Containment Spray Heat Exchanger 2A & 2B, March 1989  
 Major Component Health Report, NS Containment Spray HXs, 2<sup>nd</sup> Qtr 1999  
 Major Component Health Report, NS Containment Spray HXs, 3<sup>rd</sup> Qtr 1999  
 Major Component Health Report, NS Containment Spray HXs, 4<sup>th</sup> Qtr 1999  
 Major Component Health Report, HXs: NS Containment Spray, 1<sup>st</sup> Qtr 2000  
 Major Component Health Report, HXs: NS Containment Spray, 2<sup>nd</sup> Qtr 2000  
 Major Component Health Report, HXs: NS Containment Spray, 3<sup>rd</sup> Qtr 2000  
 Major Component Health Report, HXs: NS Containment Spray, 2<sup>nd</sup> Qtr 2000  
 Major Component Health Report, HXs: NS Containment Spray, 4<sup>th</sup> Qtr 2000  
 RN - Nuclear Service Water Health Report, 2003T2  
 HXS - NS (Containment Spray) Health Report, 2002Q1  
 Licensee Event Report 2003-06-01, 1B Containment Spray System Inoperable for Longer than Technical Specifications Allow Due to Heat Exchanger Baffle Plate Degradation  
 Yuba Heat Transfer Corporation, Exchanger Specification Sheet, 6-29-73  
 PIP C-03-05443, Discrepancy in required minimum values of UA for the NS Heat Exchangers  
 SOER 02-04 Recommendation 3 Assessment Issue Identification and Disposition  
 Catawba Nuclear Station, Station Manager's Weekly Team Notes, October 13, 2003  
 Heat Sink - Presentation Notes, Service Water (SW) and Related Systems Plus Hot to cold shutdown  
 Catawba Nuclear Station, Station Manager's Weekly Team Notes, October 20, 2003  
 Service Water System Problems Affecting Safety-Related Equipment (Generic Letter 89-13)  
 Service Water System Program Manual, Rev. 5, Section 12.7.8.9  
 Duke Energy Corporation Topical Report, Quality Assurance Program, Amendment 32  
 Service Water System Problems Affecting Safety-Related Equipment (Generic Letter 89-13, Supplement 1)  
 UFSAR Chapter 3 Criterion 45 - Inspecting of Cooling Water System  
 1B NS Heat Exchanger EIT Management Debrief 10/16/03  
 Operability Evaluation for PIP C-03-05464  
 Porc Feedback on 1B NS HX

Unit 1 SSF Pressurizer Heater Subgroup D Repairs

TSAIL Entry #C1-03-2620  
 Work Request 98291990

Work Request 98617202

Work Request 98623569

PIP C-03-05434, Unexpected entry into TSAIL for SSF due to Unit 1 pressurizer heater subgroup D

**(Section 1R15)**

KC Surge Tank operability with missing stiffener plates discovered during In-Service Inspection

Calculation CNC-1148.00-04-0002, Component Cooling Surge Tank, Revisions 10 and 11  
10CFR50.59 Screening Form, Compensatory Action for KC Surge Tank Operable but Degraded Condition, Revision 1 and 2

Compensatory Action Sheet for the 1A, 1B, 2A and 2B KC Surge Tanks

PIP C-03-6593, During ISI of the 1A KC surge tank saddle supports, it was discovered that several of the support stiffener plates were missing

Catawba Drawing CNM-1148.00-0086, Revision 11

Operations Information Notice; Unit 2 KC Surge Tank Levels dated November 28, 2003

KC Surge Tank operability during repair activities

10CFR50.59 Screening Form, Compensatory Action for KC Surge Tank Operable but Degraded Condition, Revision 1 and 2

PIP C-03-6683, PIP to address the operability concerns associated with the welding and maintenance activities on the Unit 2 KC surge tanks

Calculation CNC-1148.00-04-0002, Component Cooling Surge Tank, Rev. 10

PIP C-03-5730, The 1A diesel generator, cylinder 8L bolt connecting exhaust gas to turbocharger is broken

1B NSHX tube support baffle plate degradation

CNC-1223.13-00-0022, Degraded Baffle Conditions

PIP C-03-05464, 1B Containment Spray Heat Exchanger Shell Side Structural Integrity Degradation

1B Diesel Generator reverse power trip indication failure on breaker 1ETB-4

PIP C-03-05855, Unplanned entry into TSAIL due diesel generator 1B 1ETB-4 reverse power trip indication failure

PT/1/A4350/006 B, 4160V Essential Power System Train B

2A Diesel Generator Cam Door Bolts Missing

PIP C-03-02100, 8 of 26 bolts missing from cam door on 2A diesel generator

Unit 1 containment divider barrier leak

PIP C-03-06271, found leak on containment barrier seal on splice at position 247 degrees

2B diesel generator cell 30 found less than TS allowable

PIP C-03-06702, found voltage on cell 30 at 1.307 volts below TS allowable limit

Crane Located Over Safe Shutdown Facility Diesel Storage Tank

PIP C-03-06664, Crane located over safe shutdown facility diesel storage tank

**(Section 1R16)**

Operations Information Notice; Unit 2 KC Surge Tank Levels dated November 28, 2003  
OP/1/A/6100/001, Controlling Procedure for Unit Startup, Enclosure 4.1, Steps 2.185 through 2.190

PIP C-03-05016, 1C Steam Generator Feedwater Containment Isolation Bypass Valve CF088 would not close during the Unit 1 startup when the CF nozzle swap was attempted

**(Section 1R20)**

Unit 1 Crew Cover Sheet for WO#/TSK 1NCLP6810: INST/CAL/RMV Ultrasonic Lvl Detector, Perform Pre-Outage Cal, 11/12/03

Unit 1 Crew Cover Sheet for WO#/TSK 1NCLP6820: INST/CAL/RMV Ultrasonic Lvl Detector, Perform Pre-Outage Cal, 11/12/03

Unit 1 Crew Cover Sheet for WO#/TSK 1NCLP6820: INST/CAL/RMV Ultrasonic Lvl Detector, Install Ultrasonic Level 11/12/03

Unit 1 Crew Cover Sheet for WO#/TSK 1NCLP6810: INST/CAL/RMV Ultrasonic Lvl Detector, Install Ultrasonic Level, 11/12/03

Unit 1 Crew Cover Sheet for WO# 1NCLP5200: 1NC: Procure, Install and Remove Transmitters: 1NC: Vent Reference Legs for NC Level, 11/12/03

Unit 1 Crew Cover Sheet for WO# 1NCLP5200: 1NC: Procure, Install and Remove Transmitters: 1NC; Install Cover Over Instruments, 11/12/03

Unit 1 Crew Cover Sheet for WO# 1NCLP5200: 1NC: Procure, Install and Remove Transmitters: 1NC; Install Transmitters, 11/12/03

Unit 1 Crew Cover Sheet for WO# 1NCLP5200: 1NC: Procure, Install and Remove Transmitters: 1NC; Procure and Calibrate Transmitters, 11/12/03

**(Section 1RST)**

PIP C-03-07016, Discrepancies found while reviewing test results of former EPQ battery cells 79 and 80.

Work Request 98297793, Test old cells 79/80 and 89/90 in battery 2DGBB

SAFT, Duke Energy, - Catawba Station Battery Resizing Project

PIP C-03-01273, 2DGBA was not in service. Battery cells 75 and 76 on 2DGBA reading 1.3532V and 1.3567V respectively. T/S limit is 1.36V

Catawba Nickel-Cadmium Battery Assessment, May 12-22, 2003

Catawba Nickel-Cadmium Battery Assessment, May 12-22, 2003, Recommended actions not covered in the assessment

Catawba Nickel-Cadmium Battery Assessment, May 12-22, 2003, Responses to areas for improvement

IP/0/A/3710/017, Rev. 38, Periodic Inspection and Maintenance for Saft Model SBM277-2 and SBM277T-2 Storage Battery

PIP C-03-05743, Unplanned entry into TSAIL. 2B Diesel Generator battery cells 79 and 90 were found below the tech spec limit for voltage during performance of the quarterly PT Plant Unified Operational Log, 10/24 and 10/25, 2003

**(Section 40A5.2)**

NRC Inspection Manual, TI 2515/153, Reactor Containment Sump Blockage (NRC Bulletin 2003-01), 10/03/03  
 Potential Impact of Debris Blockage on Emergency Sump Recirculation at Pressurized-water Reactors Emerging Issue Guide, Catawba Operations Training  
 Containment Sump Availability Guidance, DRAFT, Trial Use for 1EOC14  
 PT/1/A/4400/018, Rev. 0, Unit 1 Containment Building Civil Structures Inspection  
 SM/0/A/8510/004, Rev. 6, Inspection of Ice Condenser Floor Drains  
 PT/1/A/4600/003B, Rev. 21, Quarterly Surveillance Items  
 Site Directive 3.1.2 Revision (DRAFT)  
 PT/1/A/4600/016, Rev. 39, Surveillance Requirements for Unit 1 Startup  
 PT/0/A/4200/002, Rev. 23, Containment Cleanliness Inspection  
 Operator/TSC Read Package for NRC Bulletin 2003-1 and OMP 1-8  
 PIP C-03-03457, NRC Bulletin 2003-01 PWR Recirculating Sump Screen Debris Blockage Course Verification Report for Potential Impact of Debris Blockage on Emergency Sump Recirculation at Pressurized Water Reactors Emerging Issue Guide (Just in Time Training)  
 PT/2/A/4600/003B, Rev. 18, Quarterly Surveillance Items  
 All Users Report for Package: (CNS) NRC Bulletin 2003-01, End Date, 12/3/2003  
 Duke Energy Response to NRC Bulletin 2003-01, August 7, 2003

**LIST OF ACRONYMS USED**

CFR	-	Code of Federal Regulations
CNS	-	Catawba Nuclear Station
DG	-	Diesel Generator
ECCS	-	Emergency Core Cooling System
ECT	-	Eddy Current Testing
ET	-	Eddy Current
EHT	-	Electric Heat Trace
EOC	-	End of Cycle
FME	-	Foreign Material Exclusion
FWST	-	Refueling Water Storage Tank
IMC	-	Inspection Manual Chapter
<b>IP</b>	-	Inspection Procedure
ISI	-	Inservice Inspection
IRT	-	Independent Review Team
KC	-	Component Cooling Water
LCO	-	Limiting Condition for Operations
LER	-	Licensee Event Report
LPT	-	Liquid Penetrant
MT	-	Magnetic Particle
NCP	-	Reactor Coolant Pump
NCV	-	Non-Cited Violation
ND	-	Residual Heat Removal

NI	-	Safety Injection
NOED	-	Notice of Enforcement Discretion
NRC	-	Nuclear Regulatory Commission
NRR	-	Nuclear Reactor Regulation
NSD	-	Nuclear System Directive
NSHX	-	Containment Spray Heat Exchanger
NV	-	Charging/Volume Control
OP	-	Operating Procedure
OTDT	-	Overtemperature Delta Temperature
PI	-	Performance Indicator
PIP	-	Problem Investigation Process (report)
PI&R	-	Problem Identification and Resolution
PRA	-	Probabilistic Risk Assessment
PTRQ	-	Periodic Training Requalification
PT	-	Periodic Test
RCS	-	Reactor Coolant System
RN	-	Nuclear Service Water
RP	-	Response Procedure
RT	-	Radiographic
RTP	-	Rated Thermal Power
RWST	-	Refueling Water Storage Tank
SDP	-	Significance Determination Process
SG	-	Steam Generator
SSC	-	Systems, Structures, and Components
SSF	-	Standby Shutdown Facility
SSPS	-	Solid State Protection System
TI	-	Temporary Instruction
TS	-	Technical Specification
TSAIL	-	Technical Specification Action Item Log
UFSAR	-	Updated Final Safety Evaluation Report
URI	-	Unresolved Item
UT	-	Ultrasonic
VT	-	Visual
WO	-	Work Order