



**UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
SAM NUNN ATLANTA FEDERAL CENTER
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ATLANTA, GEORGIA 30303-8931**

April 23, 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
05000413/2004003 AND 05000414/2004003**

Dear Mr. Jamil:

On March 27, 2004, the US Nuclear Regulatory Commission (NRC) completed an inspection at your Catawba Nuclear Station. The enclosed integrated inspection report documents the inspection findings, which were discussed on April 13, 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 one NRC-identified finding of very low safety significance (Green) which was determined to be a violation of NRC requirements. However, because of its very low safety significance and because the issue was entered into your corrective action program, the NRC is treating the finding as a non-cited violation (NCV) consistent with Section VI.A of the NRC Enforcement Policy. If you contest the 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 2.390 of the NRC's "Rules of Practice," a copy of this letter and its enclosure, and your response (if any) will be available electronically for public inspection in the

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NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

/RA/

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 05000413/2004003 and 05000414/2004003
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: 05000413/2004003, 05000414/2004003

Licensee: Duke Energy Corporation

Facility: Catawba Nuclear Station, Units 1 and 2

Location: 4800 Concord Road
York, SC 29745

Dates: December 21, 2003 - March 27, 2004

Inspectors: E. Guthrie, Senior Resident Inspector
A. Sabisch, Resident Inspector
M. Bates, Operations Engineer (Sections 1EP1, 1EP4, and 4OA1.2)
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G. Laska, Operations Engineer (Section 1EP1)
L. Mellen, Senior Emergency Preparedness Inspector (Sections 1EP1, 1EP4, and 4OA1.2)
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Approved by: R. Haag, Chief
Reactor Projects Branch 1
Division of Reactor Projects

Enclosure

SUMMARY OF FINDINGS

IR 05000413/2004003, IR 05000414/2004003; 12/21/2003-3/27/2004; Catawba Nuclear Station, Units 1 and 2; Fire Protection.

The report covered a three month period of inspection by resident inspectors and announced regional inspections by a visiting senior resident inspector, one senior project engineer, two operations engineers and one senior emergency preparedness inspector. One Green non-cited violation 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," Revision 3, dated July 2000.

A. NRC-Identified and Self-Revealing Findings

Cornerstone: Mitigating Systems

- Green. The inspectors identified a non-cited violation of Unit 2 operating license condition 2.C.5 for the licensee's failure to have a penetration seal installed in a cable conduit located in a 3-hour fire barrier separating the Unit 2 A and B Electrical Penetration Rooms.

This finding was determined to be greater than minor because it is associated with the protection against external factors (fire) attribute and degraded the reactor safety mitigating system cornerstone objective in that the committed fire boundary separating two Safe Shutdown trains was not intact. The finding is of very low safety significance because a credible or likely fire scenario resulting in damage to the opposite train of equipment could not be identified following analysis and review of industry test data. (Section 1R05.1)

B. Licensee-identified Violations

None

REPORT DETAILS

Summary of Plant Status:

Unit 1 began the inspection period operating at seven percent Rated Thermal Power (RTP) awaiting completion of main generator repairs following the end-of-cycle refueling outage (1EOC14). The unit reached 100 percent RTP on January 4, 2004. On February 22, 2004, operators manually tripped the reactor after the failure of an actuator on a main feedwater isolation valve. The unit was restarted on February 27, 2004, and returned to full power on February 28, 2004. Unit 1 remained at 100 percent RTP for the remainder of the inspection period.

Unit 2 operated at 100 percent RTP for the entire inspection period.

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 experienced during the period of January 25 through January 27, 2004. This included field walkdowns to assess the freeze protection equipment in the standby shutdown facility (SSF), refueling water storage tank (FWST) pit area, selected areas in the turbine buildings, service buildings, and outside locations. The inspectors discussed with licensed operators the specific measures to be taken during the period when low ambient temperatures were experienced and conducted a walkdown of control room equipment related to cold

weather protection. The inspectors attended the Site Storm Response Team meeting to review actions being taken to prepare the station for the ice storm conditions experienced during the period. The inspectors met with system engineering personnel to discuss walkdowns being conducted to ensure the cold weather protection systems were functioning properly. Documents reviewed during this inspection are listed in the Attachment to this report.

b. Findings

No findings of significance were identified.

1R04 Equipment Alignment

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:

- 2A nuclear service water (RN) pump and the B RN Train with the 1A RN pump out of service (OP/0/A/6400/006C; Nuclear Service Water System, Enclosures 4.10 and 4.11, 1A RN Strainer Retube Critical Evolution Plan, work order (WO) 98617537-01, Tagout 03-03292)
- "A" control room area chilled water (YC) Chiller with the B YC Chiller out of service (OP/0/A/6450/011; Control Room Area Ventilation / Chilled Water System, Enclosure 4.2, Tagout 03-03768)
- 2B component cooling water (KC) heat exchanger with the 2A Heat Exchanger removed from service for cleaning (Tagout 04-00246, Protected Equipment Log, items 13-17, date February 12, 2004)
- 2A RN Pump and 2A diesel generator (DG) with the 2B RN Pump out of service for cleaning (2B RN Pump Motor Cooler Cleaning Complex Evolution Plan, MP/0/A/7150/098; Nuclear Service Water Pump, Motor Upper Bearing Oil and Motor Coolers Chemical Cleaning, WO 98649851)

b. Findings

No findings of significance were identified.

1R05 Fire Protection

.1 Fire Protection Walkdowns

a. Inspection Scope

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

- Unit 2, Auxiliary Feedwater (CA) Pump Rooms
- Unit 1, KC Pump Area
- A YC/VC Chiller Room
- Unit 2, EBB Battery Room
- Unit 1, Essential Switchgear Room, 577'
- Unit 2, Electrical Penetration Room, 560'
- Unit 2, A Train Auxiliary Shutdown Panel, 543'
- Unit 1, B Diesel Generator Room

b. Findings

Introduction: A Green non-cited violation (NCV) of the operating license condition for fire protection was identified by the NRC for failure to have a penetration seal installed in a cable conduit located in a 3-hour fire barrier separating the Unit 2, A and B Electrical Penetration Rooms.

Description: On January 20, 2004, the inspectors identified missing silicone RTV foam from the end of a four-inch cable conduit penetrating committed fire boundary J-AX-533-F-005 located in the ceiling of the Unit 2 electrical penetration room, 560' elevation, column BB-63. The conduit contained electrical cables associated with B Train equipment and communicated with the electrical penetration Room on 577' elevation containing A train safe shutdown equipment. Based on a review of dates associated with installation of the conduit and a fire penetration design bases reconstitution project conducted in 1999, the inspectors determined that the conduit was without an adequate seal since initial plant construction. Fire Protection Report, Drawing CFP-3, Fire Protection Layout and Boundaries-Auxiliary Building Elevation 560', identified that the auxiliary building elevation 560' ceiling is a 3 hour-rated committed fire boundary. The failure to have an intact 3-hour fire barrier as approved in Safety Evaluation Report (SER) Supplement 5 affects a fire protection defense in depth feature intended to protect structures, systems, and components important to safety to minimize the effect of the fire. The licensee declared the seal inoperable on January 21, 2004. A

work order was initiated and a seal was installed in the conduit on January 22, 2004; thereby, restoring the seal to a fully operable and compliant condition.

Analysis: Committed fire boundary J-AX-533-F-005 is contained in the licensee's Fire Barrier Program and was identified as being deficient during a licensee inspection performed in 1999; however, actions were not taken at that time to correct the condition. The inspectors determined this finding to be greater than minor because it is associated with the protection against external factors (fire) attribute and degraded the reactor safety mitigating system cornerstone objective. The inspectors performed an analysis using MC 0609, Appendix F and determined the finding to be of very low safety significance because review and analysis could not identify credible or likely fire scenarios in the 560' electrical penetration room that would lead to loss or degradation of equipment in the other safe shutdown train located in the 577' electrical penetration room. This is based on the inspectors review of industry test data (documented in the "Conduit Fire Protection Research Program, Final Report" performed by Professional Loss Control, Inc. dated June 1, 1987, and the Omega Point Labs test report performed for Tennessee Valley Authority dated June 4, 1989) for configurations similar to that of the affected fire penetration. Due to the length of the conduit extending into the 577' elevation (i.e., approximately 25 feet), the test data indicated the conduit and cable fill would not have allowed flame passage or hot gasses to propagate to the 577' elevation and cause sufficient damage to equipment. The inspectors performed a compartment hot gas layer temperature calculation based on the 560' electrical penetration room characteristics (i.e., size, material, ventilation, restriction of transient combustibles, and an electrical cabinet general fire release rate of 200kw). It confirmed the test furnace temperatures employed during the conduit testing were bounding; indicating ample time for the area fire detection system to detect the fire and for the fire brigade to respond and terminate it.

Enforcement: Unit 2 Facility Operating License NPF-52, Condition 2.C.5, requires that Duke Energy Corporation shall implement and maintain in effect all provisions of the approved fire protection program as described in Section 9.5.1 of the Updated Final Safety Analysis Report (UFSAR) as amended and approved in the SER through Supplement 5. SER 9.5.1.5, sections titled "Building Design" and "Electrical Cable Construction, Cable Trays and Cable Penetrations", state in part, that floor/ceiling assemblies shall have a 3-hour fire rating and cables and cable tray penetrations of fire barriers will be sealed at the barrier to provide protection equivalent to the rating of the original barrier whenever the safety-related equipment on either side of the assembly is required to be operable. Fire Protection Report, Drawing CFP-3, Fire Protection Layout and Boundaries, auxiliary building elevation 560', specified a 3-hour fire barrier between the A and B train electrical penetration rooms. Contrary to the above, from initial plant construction until January 22, 2004, the licensee failed to fully implement and maintain the provisions of the approved fire protection program, as required by Facility Operating License condition 2.C.5. Specifically, the 3-hour fire barrier between the A and B train electrical penetration rooms was not intact as a result of a cable conduit located at committed fire boundary J-AX-533-F-005 not having the required fire barrier seal installed. Because the finding is of very low safety significance and because it has been entered into the corrective action program as Problem Investigation Process report (PIP) C-04-0331, this violation is being treated as a NCV, consistent with Section VI.A of the NRC Enforcement Policy: NCV 05000414/2004003-01, Seal Not Installed in a Cable Conduit Penetrating a Fire Barrier.

.2 Fire Drill Observations

a. Inspection Scope

On January 14, 2004, the inspectors observed an announced shift fire drill simulating a fire in lighting transformer 1LA15 located in the Unit 1 cable room on the 574 foot elevation of the auxiliary building. The purpose of this annual inspection was to: monitor the fire brigade's use of protective gear and fire fighting equipment; to verify that fire fighting pre-plan procedures and appropriate fire fighting techniques were used; and to verify that the directions of the fire brigade leader were thorough, clear, and effective. The inspectors also attended the subsequent drill critique to assess whether it was appropriately critical, including discussions of drill observations and identifying any areas requiring corrective action. Documents reviewed in conjunction with this inspection are listed in the Attachment to this report.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification

.1 Simulator Exam

a. Inspection Scope

The inspectors observed a simulator exam conducted on January 7, 2004, to assess the performance of licensed operators. The scenario, Active Simulator Exam OP-CN-ASE-28, involved a failure of a pressurizer pressure channel and a pressurizer spray valve with a small break loss of coolant accident. The inspection focused on high-risk operator actions performed during implementation of the emergency operating procedures, emergency plan implementation and classification, and the incorporation of lessons learned from previous plant events. Through observations of the critique conducted by training instructors following the exam session, the inspectors assessed whether appropriate feedback was provided to the licensed operators regarding identified weaknesses.

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness

a. Inspection Scope

The inspectors reviewed the licensee's effectiveness in performing routine maintenance activities. This review included an assessment of the licensee's practices pertaining to the identification, scope, and handling of degraded equipment conditions, as well as common cause failure evaluations and the resolution of historical equipment problems. For those systems, structures, and components (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 three items listed below. Documents reviewed are listed in the Attachment to this report.

- Unit 1 cold leg accumulator level transmitter repairs
- Unit 1 feedwater isolation valve CF-42 maintenance
- 1A Diesel Generator controls transfer relay replacement

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 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).

- 1A residual heat removal (ND) train inoperable due to isolation of the 1ND28A valve following discovery of gas in the Unit 1 chemical/volume control (NV) piping
- 1A RN pump strainer tube work
- Scheduled work review and deferment during ice storm conditions experienced during the period of January 25 through 27, 2004
- 1A RN pump motor cooler cleaning
- Unit 1 digital feedwater control system manual operation
- Unit 2 A containment spray (NS) heat exchanger inspection port addition
- 2A RN piping replacement at 2RN33
- Unit 1 NV pump suction piping gas intrusion troubleshooting activities
- 1B RN pump motor cleaning
- 2B RN pump motor cleaning

b. Findings

No findings of significance were identified.

1R14 Personnel Performance During Nonroutine Plant Evolutions

a. Inspection Scope

On December 31, 2003, the inspectors observed operator performance while synchronizing the Unit 1 main generator to the off-site electrical grid as the unit was

returned to service following the refueling outage. The inspectors observed the conduct of control room activities, procedure use and adherence, and plant equipment manipulations.

On February 27, 2004, the inspectors observed operator performance during portions of the Unit 1 reactor startup and escalation to full power following the reactor trip to verify that the operators completed these evolutions in accordance with applicable procedures.

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:

- 1A DG controls transfer relay failure
- Unit 1 emergency core cooling system (ECCS) gas intrusion
- Unit 2 ND pump discharge pressure increased to HI-HI setpoint
- Unit 1 gas void discovered in NV emergency boration flow path
- 2A NS heat exchanger degradation
- Unit 2 RN piping pinhole leak

b. Findings

No findings of significance were identified.

1R23 Temporary Plant Modifications

a. Inspection Scope

The inspectors reviewed temporary station modification CNTM-0147, NC Pump 2D Vibration Alarm Time-Delay Temporary Modification, to determine whether: the modification was properly installed; the modification did not affect system operability, drawings and procedures were appropriately updated; and post-modification testing was satisfactorily performed. Documents reviewed are listed in the Attachment to this report.

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 Technical Specification (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. Additional documents reviewed during this inspection are listed in the Attachment to this report. The following activities were reviewed:

Surveillance Tests

- IP/1/A/3200/002A, Unit 1 Train A Reactor Trip Breaker Trip Actuating Device Functional & Operational Test
- IP/1/A/3200/008A, Unit 1 Solid State Protection System (SSPS) Train A Periodic Testing
- PT/1/A/4150/001D, Unit 1 NC System Leakage Calculation

In-Service Test

- PT/0/A/4400/022A, Nuclear Service Water Pump Train A Performance Test

Post Maintenance Tests (associated with)

- Unit 2B Essential Battery Maintenance
OP/2/A/6350/008, 125VDC/120VAC Vital Instrument and Control Power System, Enclosures 4.18, 4.24 and 4.28
- Unit 1 Feedwater Isolation Valve Repair
PT/1/A/4200/018 B, Main Feedwater Valve Inservice Test, Enclosures 13.3 & 13.4
- Auxiliary Feedwater Motor Driven Pump 2B Performance Test Following Maintenance
PT/2/A/4250/003B, Auxiliary Feedwater Motor Driven Pump 2B Performance Test
- 1A Diesel Generator Controls Transfer Relay Repair
PT/1/A/4350/002A, Diesel Generator 1A Operability Test

b. Findings

No findings of significance were identified.

Cornerstone: Emergency Preparedness

1EP1 Exercise Evaluationa. Inspection Scope

The inspectors reviewed the emergency exercise and scenario for the biennial, full participation 2004 emergency response exercise for Catawba Nuclear Station. The review covered whether the licensee created a scenario suitable to test the major elements of their emergency plan in accordance with 10 CFR 50, Appendix E.

Licensee activities inspected during the exercise included independent observations in the Control Room Simulator, Emergency Operations Facility, Technical Support Center, and Operations Support Center. The exercise was conducted on March 16, 2004. The inspectors reviewed a sample of corrective actions identified in the past to determine if any trends in performance represented a failure to correct weaknesses, or failures to meet planning standards or other regulatory requirements. The inspectors developed a list of performance areas to be observed in this exercise. The inspectors' evaluation focused on the risk-significant activities of event classification, notification of governmental authorities, onsite protective actions, offsite protective action recommendations, and accident mitigation. The inspectors also evaluated command and control, the transfer of emergency responsibilities between facilities, communications, adherence to procedures, and the overall implementation of the emergency plan. The inspectors attended the post-exercise critique to evaluate the licensee's self-assessment process, as well as the presentation of critique results to plant management.

At the conclusion of these evaluations and independent observations, the inspectors determined whether the exercise was a satisfactory test of the Emergency Plan.

b. Findings

No findings of significance were identified.

1EP4 Emergency Action Level (EAL) and Emergency Plan Changesa. Inspection Scope

The inspectors reviewed all non-administrative EAL changes against the requirements of 10 CFR 50.54(q) to determine whether they had decreased the effectiveness of the Radiological Emergency Plan (REP). The licensee had implemented REP Revisions 03-01, 04-01, including modifications to the EAL basis descriptions. The inspectors conducted a detailed review of all EAL basis changes. The inspectors reviewed documentation of the licensee's 10 CFR 50.54(q) screening evaluations for the referenced revisions.

b. Findings

No findings of significance were identified.

1EP6 Drill Evaluation

a. Inspection Scope

The inspectors observed and evaluated the licensee's performance during two drills conducted on February 3 and March 3, 2004. The inspectors observed licensee activities occurring in the Control Room Simulator on March 3, and in the Technical Support Center on both dates. The NRC's assessment focused on the timeliness and location of classification, the notification and protective action recommendations (PAR) developmental activities, and the licensee's expectations of response. The performance of the emergency response organization was evaluated against applicable licensee procedures and regulatory requirements. The inspectors attended the post-exercise critique to evaluate the licensee's self-assessment process for identifying deficiencies relating to failures in classification and notification, as well as PAR development activities. The inspectors assessed the drill for weaknesses and deficiencies in performance of classification and notification requirements.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification

.1 Initiating Events Cornerstone

a. Inspection Scope

The inspectors sampled licensee submittals for the performance indicators (PIs) listed below for the period from October 2002 to December 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.

- Unplanned Scrams per 7,000 Critical Hours, Units 1 and 2
- Scrams with Loss of Normal Heat Removal, Units 1 and 2
- Unplanned Power Changes per 7,000 Critical Hours, Units 1 and 2

The inspectors reviewed a selection of licensee event reports (LERs), portions of Unit 1 and Unit 2 operator log entries, selected PIPs, and PI data sheets to determine whether the licensee adequately identified the number of scrams and unplanned power changes greater than 20 percent that occurred during the previous four quarters. These numbers were compared to the numbers reported for the PI during the previous four quarters. The inspectors also assessed the accuracy of the number of critical hours reported and the licensee's basis for crediting normal heat removal capability for each of the reported reactor scrams. In addition, the inspectors also discussed the PI process with licensee personnel associated with the PI data collection, evaluation, and distribution.

b. Findings

No findings of significance were identified.

.2 Emergency Preparedness Cornerstone

a. Inspection Scope

The inspectors sampled licensee submittals relative to the PIs listed below for the period January through December 2003. To verify the accuracy of the PI data reported during that period, PI definitions and guidance contained in NEI 99-02, Revision 2, were used to confirm the reporting basis for each data element.

- Emergency Response Organization (ERO) Drill/Exercise Performance
- ERO Drill Participation
- Alert and Notification System Reliability

For the specified review period, the inspectors examined data reported to the NRC, procedural guidance for reporting PI information, and records used by the licensee to identify potential PI occurrences. The inspectors verified the accuracy of the PI for ERO drill and exercise performance through review of a sample of drill and event records. The inspectors reviewed selected training records to verify the accuracy of the PI for ERO drill participation for personnel assigned to key positions in the ERO. The inspectors verified the accuracy of the PI for alert and notification system reliability through review of a sample of the licensee's records of periodic system tests. The inspectors also interviewed the licensee personnel who were responsible for collecting and evaluating the PI data.

b. Findings

No findings of significance were identified.

40A2 Problem Identification and Resolution

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

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

.2 Annual Sample Review

a. Inspection Scope

During this report period, the inspectors selected for review PIPs C-04-00088, M-04-00239, C-04-00344, and C-04-00312, concerning the identification and resolution of gas found in the Unit 1 ECCS injection flowpaths. The PIPs were reviewed to

determine if the full extent of the issues was identified, whether an appropriate evaluation was performed, and if appropriate corrective actions were specified and prioritized. The PIPs were evaluated against the requirements of the licensee's corrective action program as delineated in the NSD 208, Corrective Action. The review also evaluated the licensee's use of the Failure Investigation Process (FIP) utilized by the licensee during the troubleshooting and the root cause analysis process.

b. Findings and Observations

There were no findings of significance identified during the review of this sample.

Description: On January 1, 2004, an abnormal quantity of unknown gas was identified in the ECCS injection flow path at 1NV-858, high point vent in common suction header for high head centrifugal charging pumps, during scheduled monthly venting per PT/1/A/4200/006B, ECCS Valve Line-up Verification. Gas was vented for approximately 1 minute with valve 1NV-858 about 20 degrees open. The licensee identified the issue in PIP C-04-00088 to address the concern.

On January 14, 2004, followup venting at 1NV-858 was performed which identified a larger quantity of gas (vented for 5 minutes). Based on the gas vented at 1NV-858, additional venting was performed at vent valves 1NV-859, 1NV-860, 1FW-68 and 1NI-426. Gas was vented for two minutes and ten seconds at 1NV-860 (i.e., high point vent in the A train ND piggyback lines to high head centrifugal charging pumps). No gas was obtained at the remaining vents.

On January 15, 2004, additional gas was vented at 1NV-858 and 1NV-860. The amount of gas vented at 1NV-860 was greater than expected to have accumulated over the period since the last venting. Unit 1 A train ECCS was declared inoperable at 1857 on January 15, 2004, entering the unit into a 72-hour action. Subsequently, gas was vented at least once per shift to ensure gas voids in the NV suction piping remained below the established limit of less than 2 % void fraction.

Greater than 24 hours elapsed without significant voids forming in the pipe. Consequently, the system was declared operable on January 18, 2004. The operability was also based on analysis of the gas vented from the identified locations indicating it was primarily air. Based on correlating the identified air sample to a potential source through maintenance on a volume control tank (VCT) makeup pump, the licensee concluded the gas was collected from a recent maintenance activity. As an additional precaution, on January 18, 2004, the frequency of the monitoring was established as twice per shift, as well as the development of informal guidance to be aware of concerning tests and plant operations which could set up conditions for gas formation, such as pressure fluctuations on the VCT.

Despite this information, on January 18, 2004, the licensee performed a scheduled controlled leakage test, which set up conditions for pressure perturbations on the VCT. Following the test, the licensee performed an ultrasonic testing (UT) at 1NV-860 on January 19, 2004, and found additional voiding. The licensee again placed the unit in a 72-hour LCO per Technical Specification 3.5.2. Additional problems were identified concerning the coordination of troubleshooting evolutions and the communications of expectations for venting and UT of suspect locations for accumulated gas. On at least

one occasion, mis-communications resulted in no UT data being collected prior to the location being vented. Problems were also identified regarding informal methods for acquiring gas samples utilizing large bags in lieu of more accurate gas capture/analysis techniques. This may have contributed to the use of unreliable data used in decisions to exit TS LCOs.

Based on these issues, the licensee refocused their FIP team, increased UT data collection, and improved the coordination of their troubleshooting plan implementation. By the end of the inspectors review, the FIP team had developed and researched a large number of potential gas sources and provided documented basis for elimination of many of them. This allowed resources to improve focus on the primary root causes.

On January 21, 2004, the licensee's FIP team identified that 1NV-224 (the hydrogen supply to the VCT), may not be controlling as designed and was making a sound different then the sound on the similar Unit 2 component. This was a root cause item which was originally eliminated as not being a source of the gas. The licensee replaced the controller and later worked the valve internals, which appeared to reduce gas accumulation rates. On January 22, 2004, the licensee exited the LCO based on their current understanding of the potential root cause for the gas. In addition, the licensee based their decision on the establishment of continuing compensatory actions, including: perform expanded UT; perform increased periodic venting; review operation and surveillance procedures to identify those activities which could impact VCT pressure; establish an ideal band for VCT pressure and level; and provide guidance to operators regarding the event. At the end of the assessment period, the licensee was continuing to evaluate the root cause of the gas accumulation. Currently, the gas accumulation is continuing during certain piping lineups, however, the compensatory measures in place (UT monitoring and venting as needed) are sufficient to ensure operability of the system. The licensee now suspects that the source of the gas is primarily leakage from relief valves (1NV-235 and 1NV-232) on the pressurizer sample line and relief header.

Conclusions: Based on the inspectors review, the licensee appropriately identified the initial concern in a timely manner. During the licensee's FIP investigation, several issues were identified that related to the overall efficiency and effectiveness of the troubleshooting and root cause investigation process. Several of these problems may have contributed to prolonging time in the TS LCO or setting up conditions in which the LCO had to be re-entered based on poor communications of expectations for limiting evolutions which could establish gas conditions in the subject ECCS areas. At the end of the assessment period, the licensee was continuing with an increased UT and venting regime and assessing additional potential root causes. Based on the established compensatory measures of enhanced UT and venting, the inspectors did not have any current operability concerns. The inspectors will continue to monitor the licensee's final root cause determination and continuation of their compensatory actions to maintain operability of the subject system.

4OA3 Event Followup.1 Unit 1 Reactor Trip on February 22, 2004a. Inspection Scope

Following the manual reactor trip on February 22, 2004, the inspectors reviewed computer-generated graphs of trends in important plant parameters, alarm printouts, and licensee-developed reports, to verify that:

- Mitigating systems functioned properly,
- Operators responded in accordance with applicable procedures,
- The licensee properly classified the event in accordance with emergency action level procedures, and
- The licensee made timely notifications to NRC and state/county governments, as required.

b. Findings

No findings of significance were identified.

.2 (Closed) LER 05000413/2003002-00, Loss of Safety function due to Inoperability of the 2B Diesel Generator upon Loss of Vital Inverter 2EID with the 2A Diesel Generator Inoperable

On February 12, 2003, the loss of a Unit 2 vital inverter resulted in the loss of power to the channel IV 120VAC panel board which provides power to the 2B diesel generator (DG) support equipment and caused the 2B DG to be declared inoperable. The 2A DG had been removed from service earlier for routine maintenance. Both DGs on Unit 2 were inoperable, which rendered both Unit 2 service water pumps inoperable. Service water is a shared system between the two units and the TS do not provide any action for the condition of two service water pumps being inoperable. As a result, both units entered T.S. 3.0.3. Power was restored to the affected panel board approximately 45 minutes following the initial loss of power and T.S. 3.0.3 was exited. The cause of the loss of power was determined to be due to a random failure resulting from an isolated fabrication deficiency of a electrical coil installed in the vital inverter; therefore, it was not reasonable to conclude that the licensee could have foreseen and prevented the failure. The event was captured in the licensee's corrective action program as PIP C-03-714. No findings of significance or violations of NRC requirements were identified during the inspectors review of the LER and associated root cause failure analysis report.

.3 (Closed) LER 05000413/2003004-00, 1A Containment Spray System Inoperable for Longer then Technical Specifications Allowed Due to Heat Exchanger Fouling

On May 8, 2003, the 1A Containment Spray (NS) train was declared inoperable when the 1A heat exchanger failed to meet the established acceptance criteria for flow resistance through the shell side of the heat exchanger. The cause of the reduced flow rate in the heat exchanger was determined to be fouling from freshwater clams and corrosion products. The Unit entered a 72-hour TS LCO for one NS train being inoperable while in Mode 1. The licensee requested and was granted a Notice of

Enforcement Discretion (NOED) by the NRC that provided an additional 7 days to allow for inspection and cleaning of the heat exchanger. Following chemical cleaning and additional flow testing, the 1A NS train was declared operable and the NOED exited on May 17, 2003. An NCV concerning the licensee's performance testing and trending was identified, and was addressed in Section 1R12 of NRC Integrated Inspection Report 05000413/2003003. The event was captured in the licensee's corrective action program as PIP C-03-02910. No additional findings of significance were identified during the inspectors review of this LER and associated root cause failure analysis report.

4OA5 Other Activities

Spent Fuel Material Control and Accounting at Nuclear Power Plants, Temporary Instruction (TI) 2515/154 - Unit 1 and Unit 2

The inspectors completed the Phase I and Phase II objectives of the temporary instruction which was to gather site specific material control and accounting program information concerning the licensee's program.

4OA6 Meetings

Exit Meeting Summary

On April 13, 2004, the resident inspectors presented the inspection results to Mr. D. Jamil, Site Vice President, and other members of licensee management, who acknowledged the finding. 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
W. Byers, Security Manager
T. Daniels, Emergency Planning/Fire Protection
B. Dolan, Engineering Manager
J. Foster, Radiation Protection Manager
R. Glover, Station Manager
W. Green, Reactor and Electrical Systems Manager
G. Hamrick, Mechanical, Civil Engineering Manager
P. Ivey, Human Resources Manager
D. Jamil, Catawba Site Vice President
L. Keller, Regulatory Compliance Manager
P. McIntyre, Safety Review Group Manager
M. Patrick, Work Control Superintendent
J. Pitesa, Operations Superintendent
F. Smith, Chemistry Manager
G. Strickland, Regulatory Compliance Specialist
R. Sweigart, Safety Assurance Manager
J. Thrasher, Modifications Manager
C. Trezise, Maintenance Superintendent

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

05000414/2004003-01	NCV	Seal Not Installed in a Cable Conduit Penetrating a Fire Barrier (Section 1R05.1).
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Closed

05000413/2003002-00	LER	Loss of Safety function due to Inoperability of the 2B Diesel Generator upon Loss of Vital Inverter 2EID with the 2A Diesel Generator Inoperable (Section 4OA3.2)
05000413/2003004-00	LER	1A Containment Spray System Inoperable for Longer than Allowed by the Technical Specifications Due to Heat Exchanger Fouling (Section 4OA3.3)

Items Discussed

2515/154	TI	Spent Fuel Material Control and Accounting at Nuclear Power Plants - Units 1 and 2 (Section 40A5)
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LIST OF DOCUMENTS REVIEWED**(Section 1R01.1: Adverse Weather Protection)**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

PIPs generated as a result of this inspection

C-04-0096, Not enough YH water flowing to Unit 2 TB heaters TB-11 and TB-32
 C-04-0097, Water intrusion into heat trace controller boxes located on Unit 1 and Unit 2 FWST
 C-04-0098, Unable to work on heat trace controller boxes 1RY25 and 1RY26
 C-04-0414, Drain holes apparently drilled in plastic plugs used to seal heat trace controller boxes
 C-04-0244, EHT drawings/documents need to be improved

(Section 1R01.2: Adverse Weather Protection)Cold Weather Condition

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
 PT/0/B/4350/008, Heat Tracing Alignment Verification
 RP/0/B/5000/030, Severe Weather Preparations

(Section 1R04: Equipment Alignment)PIP generated as a result of this inspection

C-04-0158; Protected Equipment signs were not placed in areas required by the Critical Evolution Plan for the 1A RN pump strainer tube work

(Section 1R05.1: Fire Protection)PIPs generated as a result of this inspection

C-04-0060; Committed Fire Protection seal F-AX-394-W-045 is not shown on Fire Boundary drawings or included in the Fire Boundary program

C-04-0062; Numerous exposed / open embedded conduit ends are not sealed along column line AA/62-65 in the CA Pump Rooms and CA Pump Pits.

C-04-0331, Penetration Seal J-AX-533-F-005 (4" conduit in a 6" core drill hole) was found open and declared inoperable.

(Section 1R05.2: Fire Protection)

Fire Drill Scenario No. 03-5, dated 1/14/04

Nuclear System Directive NSD-112, Appendix B, Fire Drill Critique, dated 1/14/04

Response Procedure RP/0/B/5000/029, Fire Brigade Response

Response Procedure RP/0/A/5000/001, Classification of an Emergency

Pre-Fire Plan, Section 1.17 (Fire Area 17, Auxiliary Building 574 Level, Rooms 491 and 491A)

(Section 1R12: Maintenance Effectiveness)

PIP C-04-0047, Cold leg accumulator level fluctuating and causing CR alarms

TSAIL Entry #C1-04-00084

Work Order 98639475

PIP C-04-0132, Unexpected entry into TSAIL due to 1A CLA level indication drifting high

PIP C-04-0779, Unplanned TSAIL entry due to 1D CLA reading erratically

PIP C-04-0822, Insufficient procedural guidance on minimum CLA level

PIP C-04-0869, Trend of problems with the reference legs of the Unit 1 CLA level transmitters since the end of the refueling outage

PIP C-04-01287, 1A Diesel Generator failed to start locally during performance of PT/1/A/4350/002.

PIP C-04-01308, 1A Diesel Generator failed to achieve required speed and frequency following relay repairs

PIP C-04-00891, Unit 1 reactor manually tripped due to 1CF-42 failing closed

WO 98650249, 1CF-42 - Inspect and Repair

(Section 1R15: Operability Evaluations)

PIP C-04-01287, 1A Diesel Generator failed to start locally during performance of PT/1/A/4350/002.

PIP C-04-01308, 1A Diesel Generator failed to achieve required speed and frequency following relay repairs

PIP C-04-01070, Pinhole leak upstream of vent valve 2RN33

PIP C-04-01258, Gas intrusion in the Unit 1 NV system

PIP C-04-00614, Gas void discovered in the NV Emergency Boration flow path downstream of 1NV236B

PIP C-04-01258, Unplanned entry into Tech Specs for ECCS Train 1A being inoperable due to 1ND28A closed with power removed in response to gas intrusion

PIP C-04-00114, Evaluate results of shell side inspections of the U2 NSHXs upon installation of shell ports

PIP C-04-00601, ND pump discharge pressure increased to HI HI setpoint on OAC during circulation of normally idle KC components

(Section 1R23: Temporary Plant Modifications)

Temporary Station Modification CNTM-0147, NC Pump 2D Vibration Alarm Time-Delay
Temporary Modification

IP/2/B/3310/001; Procedure for Unit 2 Reactor Coolant Pumps Vibration Monitor
Instrumentation

WO 98657401; TM0147; Revise time delay vibration alarm

10CFR50.59 Screen for CNTM-0147

Operations Information Notice on 2D Reactor Coolant Pump Vibration

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

PT/0/A/4400/022A; Nuclear Service Water Pump Train A Performance Test

Work Order 98635864-01

Work Order 98635856-01

PIP C-04-00470, Review of IWP data collected during performance of PT/2/A/4250/003B

(Section 1EP4: EAL and Radiological Emergency Plan Changes)

Radiological Emergency Plan, Rev 03-01

Radiological Emergency Plan, Rev 04-01

(Section 4OA3.1: Event Followup)

Event Notification Report #40538

Transient Investigation for Unit 1 Reactor Trip on 2/22/04

Reactor Trip Evaluation dated 2/22/04, 17:29

LIST OF ACRONYMS USED

ASE	-	Active Simulator Evaluation
CA	-	Auxiliary Feedwater
CFR	-	Code of Federal Regulations
CNS	-	Catawba Nuclear Station
DG	-	Diesel Generator
EAL		Emergency Action Level
EBB	-	Essential Battery "B"
ECCS	-	Emergency Core Cooling System
EHT	-	Electric Heat Trace
EIB	-	Electric Instrument Box
ERO		Emergency Response Organization
EOC		End of Cycle
FWST	-	Refueling Water Storage Tank
IMC	-	Inspection Manual Chapter
IP	-	Inspection Procedure

ISI	-	Inservice Inspection
IWP	-	Pump Inservice Test
KC	-	Component Cooling Water
LCO	-	Limiting Condition for Operations
LER	-	Licensee Event Report
NC	-	Reactor Coolant System
NCV	-	Non-Cited Violation
ND	-	Residual Heat Removal
NEI	-	Nuclear Energy Institute
NOED	-	Notice of Enforcement Discretion
NRC	-	Nuclear Regulatory Commission
NRR	-	Nuclear Reactor Regulation
NS	-	Containment Spray
NSD	-	Nuclear System Directive
NV	-	Charging/Volume Control
OAC	-	Operator Aid Computer
OP	-	Operating Procedure
PAR	-	Protective Action Recommendation
PI	-	Performance Indicator
PIP	-	Problem Investigation Process (report)
PRA	-	Probabilistic Risk Assessment
PT	-	Periodic Test
RN	-	Nuclear Service Water
RP	-	Response Procedure
RTP	-	Rated Thermal Power
SDP	-	Significance Determination Process
SER	-	Safety Evaluation Report
SLC	-	Selected Licensee Commitments
SSC	-	Systems, Structures, and Components
SSF	-	Standby Shutdown Facility
SSPS	-	Solid State Protection System
TS	-	Technical Specification
TSAIL	-	Technical Specification Action Item Log
UFSAR	-	Updated Final Safety Evaluation Report
URI	-	Unresolved Item
VC	-	Control Room Area Ventilation System
VCT	-	Volume Control Tank
WO	-	Work Order
YC	-	Control Area Chilled Water
YH	-	Heated Water