



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

April 28, 2003

EA -02 -218

Duke Energy Corporation
ATTN: Mr. G. R. Peterson
Site Vice President
Catawba Nuclear Station
4800 Concord Road
York, SC 29745

**SUBJECT: CATAWBA NUCLEAR STATION - NRC INTEGRATED INSPECTION REPORT
50-413/03-02 AND 50-414/03-02 AND OFFICE OF INVESTIGATIONS
REPORT 2-2002-021**

Dear Mr. Peterson:

On March 29, 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 April 3, 2003, 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.

Based on the results of this inspection one Severity Level IV violation of NRC requirements was identified based upon NRC staff review of an NRC Office of Investigation (OI) Report. A synopsis of the OI Report is attached. Due to the low severity level and because the violation was entered into your corrective action program, this violation meets the criteria of Section VI of the NRC Enforcement Policy, NUREG-1600, for being dispositioned as a non-cited violation (NCV). Additionally, two licensee identified violations are listed in Section 4OA7 of this report. 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 document system

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(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 50-413/03-02, 50-414/03-02
w/Attachments: (1) Supplemental Information; and
(2) OI Report 2-2002-021 Synopsis

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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: 50-413/03-02, 50-414/03-02

Licensee: Duke Energy Corporation

Facility: Catawba Nuclear Station, Units 1 and 2

Location: 4800 Concord Road
York, SC 29745

Dates: December 29, 2002 - March 29, 2003

Inspectors: E. Guthrie, Senior Resident Inspector
E. Dipaolo, Acting Senior Resident Inspector
M. Giles, Resident Inspector
B. Bearden, Reactor Inspector (Section 1R08)
R. Carroll, Senior Project Engineer (Section 1R06)
D. Jones, Senior Health Physics Inspector (Sections 2PS1, 2PS3
and 4OA1.3 and .4)
J. Lenahan, Reactor Inspector (Section 1R08)
B. Sartor, Senior Emergency Preparedness Inspector (Sections
1EP2, 1EP3, 1EP4, 1EP5 and 4OA.2)
F. Wright, Senior Health Physics Inspector (Section 4OA5.2)
R. Hamilton, Health Physics Inspector (Section 2OS1, 2OS3 and
4OA3.3)

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

Enclosure

SUMMARY OF FINDINGS

IR 05000413/03-02, IR 05000414/03-02; Duke Energy Corporation; 12/29/2002-3/29/2003; Catawba Nuclear Station, Units 1 and 2; other activities.

The inspection covered a three month period of inspection by resident inspectors and announced inspections by one senior project engineer, one senior emergency preparedness inspector, three health physicist inspectors, and two reactor inspectors. One Severity Level IV non-cited violation (NCV), was identified. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using IMC 0609, "Significance Determination Process" (SDP). Findings for which the SDP does not apply may be Green or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 3, dated July 2000.

A. Inspector Identified and Self-Revealing Findings

Cornerstone: Occupational Radiation Safety

- A Severity Level IV violation that was characterized as an NCV of Technical Specification 5.4 and 10 CFR 50.9 was identified for a period of at least January 1 through June 4, 2002. This involved a health physics technician failing to perform required, routine radiation surveys on numerous occasions and deliberately fabricating data on the radiological survey records, which are required to be maintained by 10 CFR 20.2103.

Because this issue involved willfulness on the part of a licensee employee and inaccurate information which impacts the regulatory process, it was not subject to the provisions of the Reactor Oversight Process, and was dispositioned in accordance with traditional enforcement. The finding was determined to be greater than minor because it was willful and involved required radiation surveys, some involving high radiation areas, that were not made over an extended period of time. (Section 4OA5.2)

B. Licensee Identified Violations

Violations of very low safety significance, which were identified by the licensee have been reviewed by the inspectors. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program. These violations and corrective action tracking numbers are listed in Section 4OA7.

Report Details

Summary of Plant Status:

Unit 1 operated at 100 percent power, until February 4 when a reactor trip occurred during maintenance activities on a main feedwater header pressure transmitter. Unit 1 returned to 100 percent power operations on February 6 and remained at or near 100 percent power for the remainder of the inspection period.

Unit 2 operated at 100 percent power until it was shutdown on February 28, for the end-of-cycle refueling outage (2EOC-12). The reactor was restarted on March 26, and reached approximately 63 percent power at the end of the 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, area space heaters, etc.) for susceptible locations, and a review of the following documents:

- Nuclear System Directive 317 Freeze Protection Program
- RP/0/B/5000/030, Severe Weather Preparations
- IP/O/B/3560/008, Preventative Maintenance and Operational Check of Freeze Protection Heat Trace and Instrument Box Heaters (EHT/EIB) Systems
- Catawba Nuclear Station - Freeze Protection List 2002
- OP/1/B/6450/016, Turbine Building Ventilation System, Enclosure 4.10, Cold Weather Operations of Turbine Building Ventilation
- OP/1/B/6400/001A, Condenser Circulating Water, Enclosure 4.12, Cold Weather Increased Surveillance

In addition, the inspectors conducted discussions with engineering personnel responsible for managing and 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.

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 an extreme cold weather event that occurred on January 22. The inspectors discussed extremely cold forecasted temperatures with licensed operators to discover specific preparatory measures they would take. The inspectors reviewed IP/O/B/3560/008, Preventative Maintenance and Operational Check of Freeze Protection Heat Trace and Instrument Box Heaters (EHT/EIB) Systems, and operator-aid-computer alarm responses for extremely cold ambient temperatures. The inspectors assessed the actions which would be required by Enclosure 11.4, Extreme Cold Weather Surveillance, when temperatures were expected to remain less than 32 degrees Fahrenheit for more than 24 hours.

The inspectors also reviewed the failure of the Unit 1 Refueling Water Storage Tank level channel 1, which was declared inoperable on January 24, after a sensing line providing input to that channel's level transmitter froze. The inspectors reviewed maintenance Work Request 98268178 and PIP C-03-00324 to verify that the circuit was functioning properly upon completion of the maintenance activity.

b. Findings

No findings of significance were identified.

1R04 Equipment Alignment

a. Inspection Scope

Partial System Walkdowns

The inspectors verified the critical portions of equipment alignments for selected trains that remained operable while the redundant train was 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:

- 2B Emergency Diesel Generator (EDG) while 2A EDG was inoperable for maintenance activities (OP/1/A/6350/002, Diesel Generator Operation)
- B train Nuclear Service Water (RN) System during A train pipe replacement activity (OP/O/A/6400/006C, Nuclear Service Water system)
- 2A EDG while 2B EDG was inoperable for maintenance activities (OP/2/A/6350/002, Diesel Generator Operation)

b. Findings

No findings of significance were identified.

1R05 Fire Protectiona. 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 1 Auxiliary Building, Component Cooling Water (KC) Area
- Unit 2 Auxiliary Building, KC Area - February
- Unit 2 Auxiliary Building, KC Area - March
- Unit 2 Reactor Building Annulus Area
- Unit 2 Auxiliary Feedwater (CA) Pump Room
- Unit 2 Auxiliary Building Filtered Exhaust Fan Area
- Unit 1 CA Pump Room
- Unit 2 Lower Primary Containment

b. Findings

No findings of significance were identified.

1R06 Flood Protection Measuresa. Inspection Scope

Through walkdowns and document reviews, the inspectors assessed the licensee's flooding mitigation plans and equipment to determine if they were consistent with design requirements and risk analysis, with respect to: (1) the potential flooding affects from probable maximum precipitation on the power house yard (e.g., auxiliary service building, emergency diesel generator buildings, exterior doghouses, auxiliary building, etc.); (2) the potential affects of a feedwater line break on safety-related equipment in the doghouses; and (3) the potential internal flooding affects on the residual heat removal (ND) and containment spray (NS) pump rooms in the 522 foot level of the auxiliary building. Included in this assessment determination were the presence/condition of credited exterior flood barriers/doors, yard catch basins, and surrounding berms; operability of related sump pumps, level alarms, and system isolation switches (i.e., ND/NS common sump system, auxiliary building C and D floor drain sump systems, and doghouse level isolation systems); and appropriateness of

credited human recovery/compensatory actions. Licensee problem identification and resolution was also assessed by determining if flood-related problems identified during the inspection, as well those identified at other times by the licensee, were appropriately entered into their corrective action program and properly addressed for resolution. Documents reviewed during the course of this inspection are listed in Attachment 1 at the end of this report.

b. Findings

No findings of significance were identified.

1R07 Heat Sink Performance

a. Inspection Scope

The inspectors assessed the as-found condition of the 2B Containment Spray heat exchanger to determine if potential heat exchanger deficiencies, which could mask degraded performance, were identified. The inspectors reviewed PT/2/A/4400/006B, NS Heat Exchanger Capacity Test, and evaluated test data for acceptable performance. The inspectors also conducted discussions with engineering personnel concerning system configuration and heat load requirements, the methodology 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 Activities

The specific documents reviewed during Inservice Inspection Activities are listed in Attachment 1 at the end of this report.

.1 Inservice Inspection (ISI)

a. Inspection Scope

The inspectors observed in-process ISI work activities on Unit 2 and reviewed selected ISI records. The observations and records were compared to the Technical Specifications (TS) and ASME Boiler and Pressure Vessel Code, Section XI, 1995 Edition with Addenda through 1996, to verify compliance. In addition, nondestructive examination (NDE) procedures for selected ISI examination activities were reviewed. Portions of the following Unit 2 ISI examinations were observed:

Liquid Penetrant (PT)

- Weld Nos. 2NI88-2, -3, -10, -13, -14, -15, and -16 on the 8-inch diameter safety injection piping.

Magnetic Particles (MT)

- Weld No. 2-R-CF-1560, a welded attachment on feedwater system piping.

Ultrasonic Examination (UT)

- Weld Nos. 2NI88-13, -14, -15, and -16 on the 8-inch diameter safety injection piping.

The inspectors also observed activities and reviewed selected inspection records for the eddy current examination (ET) of the steam generators (SG). The records were compared to the TS, License Amendments, and applicable industry established performance criteria to verify compliance. Qualification and certification records for examiners, equipment and procedures for the above ET activities were reviewed. Approximately twelve examples of bobbin and rotating coil inspection ET data were reviewed to evaluate the adequacy of completed data analysis. Additionally, the inspectors reviewed two Problem Investigation Process reports (PIPs) associated with SG examinations.

b. Findings

No findings of significance were identified.

.2 Containment Vessel Inspection

a. Inspection Scope

The inspectors examined interior portions of the steel containment vessel (SCV) and reviewed selected records associated with the SCV. The observations and records were compared to the Technical Specifications, ASME Boiler and Pressure Vessel Code, Article IWE of Section XI, 1992 Edition and 1992 Addenda, and 10 CFR 50.55a. The inspectors examined the accessible interior surfaces of the SCV in the pipe chase area (elevation 565.25) and in the containment air return system (VX) fan pit between azimuth 247 and 303 degrees at elevation 594.5. The inspectors also reviewed records documenting visual inspections performed on the SCV in March 2000, September 2001, and during the March 2003 outage to satisfy applicable requirements of the TS and ASME Section XI.

b. Findings

No findings of significance were identified.

.3 Boric Acid Inspection Program

a. Inspection Scope

The inspectors reviewed licensee procedures which are performed before and after outages to identify boric acid leakage onto various components, evaluate the cause of the leakage, and evaluate the effects of leakage on components. Procedures reviewed were as follows:

- PT/1/A/4150/001H, Inside Containment Boric Acid Check
- PT/1/A/4150/001A, Reactor Coolant System Leak Test
- MP/0/A/7650/040, Inspection, Evaluation and Cleanup of Boric Acid Spills on Alloy, Carbon Steel, and Stainless Steel Components

The inspectors also reviewed three PIPs which document boric acid leaks identified by the ISI group during the March 2003 refueling outage.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification

a. Inspection Scope

The inspectors observed a simulator training scenario conducted on March 27, to assess the performance of licensed operators. The scenario involved the starting of a RN pump, an inadvertent reactor trip initiated by a turbine trip, and the failure of source range instrumentation to re-energize following the reactor trip. The inspection focused on high-risk operator actions performed during implementation of the emergency operating procedures, emergency plan implementation and classification, and the incorporation of lessons learned from previous plant events. The training session highlighted the importance of effective communications between licensed operators in accordance with ADM-04, Application of Self Check, Peer Check and Communication Techniques. 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.

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 following degraded equipment conditions:

- Loss of Unit 2 Vital Inverter 2EID
Documents reviewed:
 - Maintenance Rule: SSC Summary Sheets EPG 120 VAC Vital Instrumentation & Control Power
 - CN-21415/00, Install Unit 2 Swing Inverters for Vital I&C System 91-01 Presentation
 - PIP C-02-02562, Maint. Rule Perf. Criteria Notes for EPG System is inconsistent with EDM-201, Table 201-C MRFF evaluation criteria
 - Work Orders for past three years generated for Unit 1 and Unit 2, EPG, 120 VAC Vital Instrumentation & Control Power
 - Transformer Failure Analysis 310851-03-04-03, Failure Analysis for 310851 Saturation Filter Choke.
- Unit 2, Train B Shutdown Margin Alarm
Documents reviewed:
 - PIP C-03-01211, Train B Shutdown Margin Alarm, B Train Boron Dilution Mitigation System (BDMS) placed in defeat
 - Maintenance Rule functional failure
 - Catawba Nuclear Station Maintenance Rule a(1) SSCs November 2002- PIP C-02-5185, Train B BDMS power removed at shutdown.

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 six 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).

- Unit 2 "D" Steam Generator Manway leak repair (Additionally: Critical Maintenance Plan- 2D, Steam Generator Manway Leak, was reviewed.)
- 2B2 KC Component Cooling Water System maintenance - pump replacement, heat exchanger cleaning
- A Train Nuclear Service Water System pipe replacement activity
- Unit 1 Hydrogen Ignitor preventative maintenance
- Unit 1 Hydrogen Skimmer Fan/Return Fan performance test
- Unit 2 Main Turbine Weekly trip test

b. Findings

No findings of significance were identified.

1R14 Personnel Performance During Non-routine Plant Evolutions

a. Inspection Scope

On February 4, the inspectors observed operator performance in response to a Unit 2 turbine trip; the tripping of both main feedwater pumps; and subsequent reactor trip. The inspectors observed portions of plant stabilization and recovery. The inspectors observed licensed operators use of procedures, control room briefings, and plant equipment manipulations following the reactor trip. Plant process computer traces, operator statements, and the licensee's trip investigation report were reviewed.

On February 5, the inspectors observed operator performance during a reactor startup and approach to criticality. The inspectors observed the conduct of control room activities, procedure use and adherence, and plant equipment manipulations.

The inspectors assessed the performance of licensed operators following the loss of the Unit 2 "D" vital 125 volt alternating current (AC) bus on February 12. The inspectors observed the licensee's implementation of AP/2/A/5500/029, Loss of Vital or Aux Control Power, and AP/2/A/5500/16, Malfunction Of Nuclear Instrumentation System; attended control room briefings; and reviewed control room logs associated with this event.

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. Operability evaluations were reviewed for the three issues listed below:

- 2A Charging Pump, Motor Stator temperature alarm (PIP C-03-01662)
- 2A Main Feed Pump Trip Circuitry /Auxiliary Feedwater pump auto-start logic (PIP C-02-5978)
- Low turbo lube oil pressure associated with the 2B Emergency Diesel Generator (PIP C-03-0453)

b. Findings

No findings of significance were identified.

1R19 Post Maintenance Testinga. Inspection Scope

The inspectors observed and/or reviewed post-maintenance tests associated with the following five work activities to verify 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. The documents reviewed are listed after each work activity.

- 1CA-58A, CA Pump A Discharge to Steam Generator 1B Isolation Valve Repair
 - PT/1/A/4200/013 E, CA Valve Inservice Test
 - PT/1/A/4700/061 A, 1A CA Pump EP/AP Local Valve Movement
- Leaking weld on Chemical Volume and Control letdown line vent valve, 2NV-950
 - PIP C-03-00692, Leak at 2NV-950 weld
 - NDE-60, Visual Examination of Welds and Brazed Joints
 - Work Order 98576495-01, Weld Process Control
- 2B Emergency Diesel Generator exhaust gasket leak repair
 - PT/2/A/4350/002 B, Diesel Generator 2B Operability Test
 - Work Order 98444755, Replace 3 Right Cylinder Exhaust Gasket
- A train RN pipe replacement activity
 - PIP C-01-00884
 - Work Order 98479788, RN Train A Pipe Replacement
 - MP/0/A/7650/088, Controlling Procedure for System Pressure Testing of ASME and ANSI Piping Systems
- 2A Emergency Diesel Generator pre-outage maintenance
 - PT/2/A/4350/002A, Diesel Generator 2A Operability Test
 - Work Order 98481209, Right Bank Turbo Boot Seal Replacement

b. Findings

No findings of significance were identified.

1R20 Refueling and Outage Activitiesa. Inspection Scope

The inspectors evaluated Unit 2 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 2 outage risk assessment CN-03-02, 2EOC-12-IRT Pre-Outage Review, Shutdown Risk Assessment.

- Monitoring of Shutdown Activities - The inspectors reviewed OP/2/A/6100/002, Controlling Procedure For Unit Shutdown, during unit shutdown, and also reviewed PT/2/A/4600/017, Surveillance Requirements For Unit 2 Shutdown, 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 (Mode 4, 5, 6 or No Mode). 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 Tagout ID: 03-00186, CAPT #2, and performed a field walkdown to verify the turbine driven auxiliary feedwater pump was properly isolated to facilitate maintenance activities.
- 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/2/A/6150/006, Draining The Reactor Coolant System, and the observation of lowering reactor water level activities.
- 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-03-02, 2EOC-12-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/2/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, 2EOC-12-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 (Mode 4,5,6 or No Mode). Potential reactivity changes were identified in the outage risk plan, 2EOC-12-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 Site Directive 3.1.30, Unit Shutdown Configuration Control (Mode 4,5,6 or No Mode).
- 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/2/A/6150/001, Enclosure 4.16, Reactor Coolant System Vacuum Refill Without Solid Operation, and Site Directive 3.1.30, Unit Shutdown Configuration Control (Mode 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. Included in this verification was a review of PT/0/A/4150, Total Core Unloading. The inspectors also observed the coordination and movement of several fuel assemblies from containment as well as the spent fuel pool area.
- 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 reactor startup, the approach to criticality, and portions of the power ascension. The inspectors reviewed PT/0/A/4150/19, 1/M Approach to Criticality.

b. Findings

No findings of significance were identified.

1R22 Surveillance Testinga. Inspection Scope

The inspectors observed and/or reviewed the surveillance 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 also 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.

Diesel Generator Operability Tests

- PT/1/A/4350/002B, Diesel Generator 1B Operability Test
- PT/2/A/4350/002A, Diesel Generator 2A Operability Test

In-Service Tests

- PT/1/A/4250/003B, Auxiliary Feedwater Motor Driven Pump 1B Performance Test
- PT/2/A/4400/003A, Component Cooling (KC) 2A Performance Test

Unit 2 Containment Isolation Valve Test for Refueling Outage 2 EOC-12

- MP/0A7150/072, Main Steam Safety Valve Setpoint Test; Valve 2SV-21

Ice Condenser System Test for Refueling Outage 2 EOC-12

- MP/0/A/7150/141, Ice Condenser Lower Inlet Doors Inspection and Corrective Maintenance
- PT/0/A/4200/018, Ice Bed Analysis Periodic Test

b. Findings

No findings of significance were identified.

1R23 Temporary Plant Modificationsa. Inspection Scope

The inspectors reviewed temporary modifications listed below 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:

- Temporary Station Modification CNTM-0102, Fire Protection to Diesel Generator Engine Cooling Water Heat Exchanger
- Temporary Station Modification CNTM-0104, Drinking Water to Diesel Generator Starting Air After Cooler

b. Findings

No findings of significance were identified.

Cornerstone: Emergency Preparedness

1EP2 Alert Notification System Testing

a. Inspection Scope

The inspector reviewed the alert (siren) and notification system (ANS) designed to meet the acceptance criteria of Section B of Appendix 3, NUREG-0654, and described in Appendix 3 of the Catawba Nuclear Station Emergency Plan. The semi-weekly silent tests and the quarterly full cycle tests were reviewed against the minimum commitments for testing listed in paragraph C.2. of Appendix 3 to the Emergency Plan. The inspector reviewed testing results, assessed the failure rate of individual sirens and the effectiveness of repairs, and reviewed any changes related to the siren system.

b. Findings

No findings of significance were identified.

1EP3 Emergency Response Organization Augmentation Testing

a. Inspection Scope

The inspectors reviewed Table B-1 in Section B of the Emergency Plan to determine the licensee's commitment for staffing/activation of the emergency response facilities and shift staffing augmentation. The results of the annual augmentation drill, most recently conducted on June 13, 2002, were evaluated against the above commitments. The effectiveness of corrective actions taken in response to staffing issues from this drill were evaluated.

b. Findings

No findings of significance were identified.

1EP4 Emergency Action Level and Emergency Plan Changes

a. Inspection Scope

The inspectors reviewed the changes made to Revisions 02-1 and 02-2 of the Emergency Plan against the requirements of 10 CFR 50.54(q) to determine whether any of the changes decreased the effectiveness of the Emergency Plan.

b. Findings

No findings of significance were identified.

1EP5 Correction of Emergency Preparedness Weaknesses and Deficiencies

a. Inspection Scope

The inspectors evaluated the efficacy of licensee programs that addressed weaknesses and deficiencies in emergency preparedness. Items reviewed included exercise and drill critique reports, emergency preparedness assessment reports done by the Nuclear Assessment Section, and the licensee's Problem Investigation Process. The review was conducted against the requirements listed in Section N.5 of the Emergency Plan. The specific documents reviewed are listed in the Attachment 1.

b. Findings

No findings of significance were identified.

2. RADIATION SAFETY

Cornerstones: Occupational Radiation Safety (OS) and Public Radiation Safety (PS)

2OS1 Access Controls To Radiologically Significant Areas

.1 Access Controls

a. Inspection Scope

Licensee program activities for monitoring workers and controlling their access to radiologically significant areas and tasks were evaluated. The inspectors assessed the adequacy of procedural guidance; directly observed implementation of administrative and established physical controls; and assessed resultant worker exposures to radiation and radioactive material. Radiation worker and Health Physics Technician (HPT) proficiency in implementing Radiation Protection (RP) program activities were appraised.

Routine work activities within the Radiological Controlled Area (RCA) were observed. Through procedure reviews, direct observation of established controls, and interviews with workers, the inspectors evaluated the adequacy of established physical and administrative controls including postings, barricades, procedural guidance, radiation work permits and key controls for High Radiation Areas (HRAs) and Very High Radiation Areas (VHRAs). The inspectors performed independent confirmatory radiation surveys of accessible areas of the Auxiliary Building 577 and 594 foot elevations. The results of these surveys were compared to current licensee survey documentation. Electronic alarming dosimeter (EAD) set points were reviewed for consistency with expected work area dose rates. Radiation worker performance with respect to procedural guidance and HPT proficiency were assessed based on interviews and work observation. The

workers knowledge of their expected response to an EAD dose or dose rate alarm was assessed through interviews.

Licensee controls and monitoring for radioactive material airborne concentrations and for internally deposited radionuclides were evaluated. The potential for airborne transuranic radionuclides was assessed based on interviews, screening of lists of corrective action documentation descriptions, and review of 10 CFR Part 61 analysis documentation from calendar year (CY) 1995 through CY 2002. The adequacy of whole body counter radionuclide libraries were assessed against 10 CFR 61 analysis data. The inspectors reviewed the number of High Efficiency Particulate Air (HEPA) ventilation units staged and available for use. HPT proficiency in evaluating personnel contamination events were evaluated through observation of their responses to personnel contamination monitor alarms.

The inspectors reviewed procedural guidance for control of access to highly radioactive irradiated materials stored in spent fuel pool and discussed those controls with the site Radiation Protection Manager and Senior Scientist.

Radiation protection program activities and their implementation were evaluated against: Title 10 Code of Federal Regulations (10 CFR) 19.12; 10 CFR 20, Subparts B, C, F, G, H, and J; Updated Final Safety Analysis Report (UFSAR) Revision (Rev.) 9, Section 11, Radioactive Waste Management, and Section 12, Radiation Protection; Technical Specification (TS) Sections 5.4 Procedures, 5.5 Programs and Manuals, 5.6 Reporting Requirements, and 5.7 High Radiation Area; and approved licensee procedures. Licensee guidance documents, records, and data reviewed within this inspection area are listed in Section 2OS1 of Attachment 1 to the report.

b. Findings

No findings of significance were identified.

.2 Problem Identification and Resolution

a. Inspection Scope

Issues identified through department self-assessments, Functional Area Evaluation audits, and Problem Investigation Process (PIP) documents associated with radiological controls, personnel monitoring, and exposure assessments were reviewed and discussed with responsible licensee representatives. The inspectors evaluated the corrective action programs against Duke Power Nuclear Policy Manual, Nuclear System Directive: 208 Problem Investigation Process (PIP), Rev. 24 and Catawba Nuclear Station Radiation Protection Management Procedure 7.2, PIP- Threshold and Initiation, Rev. 4. Specific assessments, audits, and PIP documents reviewed and evaluated in detail for this inspection area are identified in Section 2OS1 of Attachment 1 to the report.

b. Findings

No findings of significance were identified.

2OS3 Radiation Monitoring Instrumentation and Protective Equipment

.1 Area Radiation Monitoring and Post-Accident Sampling Systems

a. Inspection Scope

The availability, reliability, and operation of selected direct Area Radiation Monitors (ARMs) were reviewed and evaluated. The inspectors reviewed Maintenance Rule evaluation data and directly observed equipment material condition, and installed configurations (where accessible). Inspectors reviewed calibration records, maintenance rule records, material condition and operability for selected ARMs associated with the Unit 1 (U1) Charging Pump Area (1EMF3), the U1 Filter Hatch Area (1EMF9), U1 In-core Instrument Room (1EMF11), Hot Chemistry Laboratory (1EMF14), and the U1 Refueling Bridge Spent Fuel Building (1EMF15) areas.

The inspectors reviewed the post accident contingency sampling procedures that were developed to meet commitments incurred with the elimination of the Post Accident Sampling System.

Program guidance, performance activities, and equipment material condition for the direct radiation detection instrumentation and continuous air sampling equipment were reviewed against details documented in TS Section 5.4 Procedures; 10 CFR Parts 20 and 50, UFSAR Sections 11 and 12; and associated licensee procedures. Licensee guidance documents, records, and data reviewed within this inspection area are listed in Section 2OS3 of Attachment 1 to the report.

b. Findings

No findings of significance were identified.

.2 Personnel Survey Instrumentation

a. Inspection Scope

The inspectors observed performance checks, evaluated instrument sensitivity and checked calibration status for personnel contamination monitor (PCM) equipment including three Eberline PCM-1, one PCM-2, and one National Nuclear Corporation (NNC) Gamma 60 Portal Monitor. In addition, operability of one NE America Small Article Monitor (SAM)-9 detection system was evaluated.

The inspectors performed pre-operational checks and reviewed calibration documentation for available portable radiation monitoring instruments including three Eberline RO-20 ion chamber instruments, one Automess 6112B Eberline teletector, one Eberline E-530 GM survey meter, and one Dosimeter DCA 3090-3 portable area radiation monitor. The proficiency of HPTs in selection of portable instruments for use and in completing pre-operational checks were evaluated through direct observation. In addition, the calibration records were reviewed for five EADs. The inspectors directly examined the calibration status of approximately 50 EADs, available for use which were maintained near the RCA entrance.

Current program guidance, including calibration and operation procedures, and its implementation to maintain operability, accuracy, and availability of selected portable survey instruments were reviewed and evaluated at the Duke Power Company (DPC) Central Calibration Facility (CCF). During the week of January 6, 2003, the inspectors reviewed current quality control and calibration data for selected calibration and personnel survey instruments, and assessed operability of various portable survey instruments ready for shipment to licensee facilities. Responsible staff's knowledge and proficiency regarding portable survey instrumentation calibration activities was evaluated through interviews, record reviews, and direct observation of calibration activities associated with a Teletector Model 6112B Geiger Counter portable survey instrument (Serial Number 00966) using the Shepherd Model 89 Irradiator. Availability of portable instruments for licensee use was evaluated through discussion of the portable instrumentation management program and review of current reports generated for licensee innage and outage usage needs, assigned site instruments, site instruments requiring calibration in less than 45 days, CCF portable instrument status, and instruments ready for shipment. In addition, the inspectors assessed licensee program guidance for portable instruments received from the licensee's site and found to be out-of-calibration/tolerance.

Licensee activities associated with personnel radiation monitoring instrumentation were reviewed against TS 5.4, Procedures; 10 CFR 20.1204 and 20.1501; and applicable licensee procedures listed in Section 2OS3 of the report Attachment. The CCF activities and records associated with portable radiation monitoring instrumentation were reviewed against 10 CFR Part 20, and applicable procedures listed in Section 2OS3 of Attachment 1 to the report.

b. Findings

No findings of significance were identified.

.3 Respiratory Protection - Self-Contained Breathing Apparatus (SCBA)

a. Inspection Scope

Three sets SCBA equipment staged for use by the Fire Brigade were evaluated for operability. The evaluation included verification of current hydrostatic testing, regulator calibration, physical examination of face-piece, hose, harness, tank, regulator alarm bell and supplemental alarm. The licensee's ability to resupply the control room and other emergency facilities with bottled air was assessed.

The SCBA training and medical qualification status matrix for shift health physics and chemistry personnel were reviewed. Training guidance provided and hands-on training requirements for SCBA bottle change-outs were evaluated through discussion and interviews.

Licensee activities associated with maintenance and use of SCBA equipment were reviewed against TS Section 5.4, Procedures; 10 CFR Part 20.1703; UFSAR Section 12; RG 8.15, Acceptable Programs for Respiratory Protection, Rev. 1, October 1999; American National Standards Institute (ANSI)-Z88.2-1992, American National Standard

Practices for Respiratory Protection; and applicable licensee procedures listed in Section 2OS3 of Attachment 1 to the report.

b. Findings

No findings of significance were identified.

.4 Problem Identification and Resolution

a. Inspection Scope

The inspectors reviewed selected PIP issues associated with ARM equipment, portable radiation detection instrumentation, and respiratory protective program activities. The inspectors assessed the licensee's ability to characterize, prioritize, and resolve the identified issues in accordance with licensee procedure Nuclear System Directive 208, Problem Investigative Process, Rev. 24. Specific documents reviewed and evaluated are listed in Section 2OS3 of Attachment 1 to the report .

b. Findings

No findings of significance were identified.

2PS1 Radioactive Gaseous and Liquid Effluent Treatment and Monitoring Systems

.1 Radioactive Gaseous and Liquid Effluent Treatment and Monitoring Systems

a. Inspection Scope

The inspectors reviewed the licensee's most recent Annual Radioactive Effluent Release Report which delineated the quantities of radionuclides released in liquid and gaseous effluents during CY 2001 and the radiation doses to the public resulting from those releases. The inspectors evaluated the reported information and data required to demonstrate conformance with applicable regulations. The inspectors reviewed the licensee initiated changes for Revision 45 to the Offsite Dose Calculation Manual (ODCM) and evaluated whether those changes were technically justified and consistent with the regulatory guidance. The inspectors toured the Auxiliary and the Monitor Tank Buildings and assessed the configuration of the major radioactive effluent process components and monitoring equipment against descriptions documented in the UFSAR and the ODCM. Calibration procedures and current data for selected liquid and airborne effluent monitors were reviewed and evaluated.

Sampling and analysis for a liquid radioactive waste batch release from Waste Monitor Tank A on February 29, 2003, and a gaseous release from Unit 1 Upper Containment on February 28, 2003, were directly observed by the inspectors. Sample representativeness, radionuclide concentrations, pre-release dose calculations, local and control room data regarding flow rates and channel response checks, and effluent monitor alarm set points were reviewed and evaluated. Technician proficiency in conducting pre-release processing, sampling, and gamma spectroscopy analyses was observed and evaluated. Interviews were conducted with two chemistry technicians to evaluate staff proficiency and knowledge of effluent release requirements, equipment

capabilities, and procedural details. Count Room calibration procedures and records, laboratory quality control activities, and performance test results for gamma spectroscopy equipment used to analyze liquid and gaseous effluent samples were discussed and evaluated.

Program guidance, equipment configuration and material condition, observed task evolutions, and offsite dose results were reviewed against details documented in TS Sections 5.4 Procedures, 5.5 Programs and Manuals, and 5.6 Reporting Requirements; 10 CFR Part 20; 10 CFR Part 50, Appendix I; UFSAR Sections 11 Radioactive Waste Management, 12 Radiation Protection, and 16 Selected Licensee Commitment (SLC) Manual; Offsite Dose Calculation Manual (ODCM), Rev. 45; ANSI-N13.1-1969, Guide to Sampling Airborne Radioactive Materials in Nuclear Facilities; ANSI-N13.10-1974, ANS Specification and Performance of On-Site Instrumentation for Continuously Monitoring Radioactivity in Effluents, and approved procedures listed. Laboratory and sample processing activities were evaluated against RG 1.21, Measuring, Evaluating and Reporting Radioactivity in Solid Wastes and Releases of Radioactive Materials In Liquid and Gaseous Effluents from Light-Water Cooled Nuclear Power Plant, June 1974; and RG 4.15, Quality Assurance for Radiological Monitoring Programs (Normal Operation) - Effluent Streams and the Environment, December 1977. Procedures and data reviewed during the inspection are listed in Section 2PS1 of Attachment 1 to the report.

b. Findings

No findings of significance were identified.

.2 Problem Identification and Resolution

a. Inspection Scope

Licensee PIP issues documented for effluent processing and monitoring activities were reviewed. The inspectors assessed the licensee's ability to characterize, prioritize, and resolve the identified issues in accordance with licensee procedure Nuclear System Directive 208, Problem Investigation Process (PIP), Revision (Rev.) 24. Five PIPs documented in Section 2PS1 of Attachment 1 to the report were reviewed and evaluated in detail.

b. Findings

No findings of significance were identified.

2PS3 Radiological Environmental Monitoring Program (REMP) and Radioactive Material Control Program

a. Inspection Scope

During the week of January 6, 2003, analytical laboratory activities conducted at the DPC Environmental Radiation (EnRad) facilities used to conduct quantitative radionuclide analyses for licensee REMP samples were reviewed and evaluated. The inspectors evaluated procedural guidance and its implementation and assessed

knowledge and proficiency of responsible staff. In addition, laboratory analysis quality control (QC) activities for sample preparation and for gamma spectroscopy, liquid scintillation counting, and gross beta analysis instrumentation were reviewed and evaluated. The program policy and QC data reviewed and discussed included sample receipt and storage; sample preparation and chain of custody implementation; analytical instrument calibration and performance data; inter-laboratory sample comparison results; and quantitative radionuclide measurement accuracy, and Lower Limit of Detection capabilities.

Program guidance and data for the analytical laboratory activities were reviewed against 10 CFR Part 20, and applicable procedures as documented in the Attachment to this report. Laboratory QC activities were evaluated against RG 1.21, Measuring, Evaluating and Reporting Radioactivity in Solid Wastes and Releases of Radioactive Materials In Liquid and Gaseous Effluents from Light-Water Cooled Nuclear Power Plant, June 1974; and RG 4.15, Quality Assurance for Radiological Monitoring Programs (Normal Operation) - Effluent Streams and the Environment, December 1977. Documents reviewed during this inspection are listed in Section 2PS3 of Attachment 1 to the report.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification

.1 Reactor Safety Cornerstone

a. Inspection Scope

The inspectors sampled licensee submittals for the performance indicators (PIs) listed below for the period from October 2001 through January 2003. To verify the accuracy of the PI data reported during that period, PI definitions and guidance contained in NEI 99-02, "Regulatory Assessment Performance Indicator Guideline," Rev. 2, were used to verify the basis in reporting for each data element.

- Unplanned Scrams per 7,000 Critical Hours, Unit 1 and Unit 2
- Scrams with a Loss of Normal Heat Removal, Unit 1 and Unit 2
- Unplanned Transients per 7000 Critical Hours, Unit 1 and Unit 2

The inspectors reviewed a selection of Licensee Event Reports (LERs), portions of Unit 1 and Unit 2 operator log entries, PIP descriptions, monthly operating reports, and PI data sheets to verify that the licensee had adequately identified the number of scrams and unplanned power changes greater than 20 percent. This number was compared to the number reported for the PI. The inspectors also reviewed 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.

.2 Emergency Preparedness Cornerstone

a. Inspection Scope

Licensee records were reviewed to determine whether the submitted PIs listed below for the fourth quarter of 2002 were calculated in accordance with the guidance contained in Section 2.4 (Emergency Preparedness Cornerstone) of NEI 99-02, Revision 2.

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

The inspectors assessed the accuracy of the PI for ERO drill and exercise performance (DEP) over the past eight quarters through review of a sample of drill and event records. The inspector assessed the accuracy of the PI for ERO drill participation during the previous eight quarters for personnel assigned to key positions in the ERO. The inspectors assessed the accuracy of the PI for the alert and notification system reliability through review of a sample of the licensee's records of the semiweekly silent tests and quarterly full-cycle tests.

b. Findings

No findings of significance were identified.

.3 Occupational Radiation Safety Cornerstone

a. Inspection Scope

The licensee's records and data generated during Calendar Year (CY) 2002 for the Occupational Exposure Control Effectiveness Performance Indicator (PI) were reviewed. The information reviewed included data reported to the NRC, pertinent corrective action program issues and procedurally specified Health Physics program records collected monthly by the licensee. The inspectors assessed the licensee's CY 2002 monthly reviews for PI occurrences which were performed pursuant to Procedure SH/0/B/2006/001. The licensee's disposition of the reviewed issues was evaluated against NEI 99-02, Regulatory Assessment Performance Indicator Guideline, Rev. 2.

b. Findings

No findings of significance were identified.

.4 Public Radiation Safety Cornerstone

a. Inspection Scope

The inspectors reviewed and discussed the licensee's CY 2002 Radiological Control Effluent Release Occurrence PI results. The inspectors reviewed data reported to the NRC, and sampled and evaluated applicable corrective action program issues and procedurally specified Health Physics program records collected monthly by the licensee. The inspectors assessed the licensee's CY 2002 monthly reviews for PI

occurrences as performed pursuant to Procedure SH/0/B/2006/001. The licensee's disposition of the reviewed issues was evaluated against Nuclear Energy Institute (NEI) 99-02, Regulatory Assessment Performance Indicator Guideline, Rev. 2.

b. Findings

No findings of significance were identified.

4OA3 Event Followup

.1 Turbine Trip, Main Feedwater Isolation, and Reactor Trip

a. Inspection Scope

On February 4, the inspectors responded to the Unit 1 control room following a reactor trip that was initiated by a loss of both main feedwater pump turbines as a result of high 1B steam generator water level. This occurred while maintenance was being performed on a condensate and feedwater pressure transmitter, which resulted in a pressure perturbation on a common sensing line with two other condensate and feedwater pressure transmitters. All three transmitters had input to the digital feedwater control system (DFWCS). The pressure perturbation caused the DFWCS to switch to manual control, at which time the operators were unable to maintain the 1B steam generator water level below the setpoint. This caused a main feedwater isolation, turbine trip, and subsequent reactor trip. The inspectors assessed plant status and parameters, including mitigating system performance during and following the unit trip. Plant process computer traces, operator statements, and the licensee's trip investigation report were reviewed.

b. Findings

No findings of significance were identified.

.2 (Closed) LER 50-413/02-04-00: Pipe Spray Interaction Affecting Safety-Related Equipment

On March 4, 2002, the licensee identified that essential 600 volt motor control centers 1EMXG and 2EMXH, were not adequately protected from postulated pipe rupture events associated with fire protection (RF) and demineralized water (YM) systems. Further evaluation by the licensee, completed on June 13, 2002, identified a similar condition in which RF system piping could also impact essential 4160 volt switchgear 2ETA. The licensee determined that they had failed to identify appropriate spray shielding on RF piping located near equipment necessary for safe shutdown of the plant. Corrective actions included the installation of spray deflectors near the postulated pipe rupture locations. The inspectors reviewed the new spray shield installation and reviewed other locations on the piping systems identified above which could possibly need spray shields.

This issue is more than minor because it had a credible impact on safety, in that a rupture of the RF system piping could have resulted in the loss of the 4160 volt 2ETA switchgear. The finding affects the mitigating systems cornerstone. The Region II,

Senior Reactor Analyst determined this finding to have very low safety significance (Green) because the likelihood of an RF system piping rupture that could impact the switchgear was low due to the limited amount of piping in the area. The impact of the mitigating function of the equipment powered from the switchgear to an event other than the loss of 2ETA was evaluated by the Senior Reactor Analyst to be minimal, due to the very low chance of the spray happening shortly after another initiating event occurred. The enforcement aspects of the violation are discussed in Section 4OA7. This LER is closed.

- .3 (Closed) LER 50-413/ 2002-005-00: Americium-241 source was lost during procedure verification activities

10 CFR 20.1802 requires that licensee maintain constant surveillance of licensed material that is in a controlled or unrestricted area and that is not in storage. Contrary to 10 CFR 20.1801, on June 25, 2002, the licensee determined that a nonexempt 0.0244 microcurie Americium-241 check source was damaged and that approximately 95 percent of the original activity was missing. The licensee's investigation concluded that the material was lost when the mylar film containing the active source material adhered to double-stick tape used to secure the source during conduct of instrument performance testing. After completion of the testing, the tape was discarded. Based on the source physical characteristics and credible exposure assessment scenarios, the licensee concluded that potential doses to either an individual worker or to a member of the public were negligible. No new findings were identified in the inspectors' review. This finding constitutes a violation of minor significance that is not subject to enforcement action in accordance with Section IV of the NRC's Enforcement Policy. The licensee documented this issue in the corrective action program as PIP C-02-03620. This LER is closed.

4OA5 Other Activities

- .1 Reactor Pressure Vessel Head and Vessel Head Penetration Nozzles Inspection - Temporary Instruction 2515/150, section 04.05, Bare Metal Visual Examination

The inspectors independently reviewed and observed a sample of the visual examination of the Unit 2 reactor vessel head penetration nozzles. The inspectors verified that the individuals involved in the head inspection were qualified examiners based on classroom training, examination, and practical testing by reviewing licensee document Form QA-140E for both individuals. The inspectors assessed by direct observation that the examiners performed the inspection in accordance with procedure MP/0/A/7150/042 D, Reactor Vessel Head Penetration Visual Inspection. The procedure described the criteria for nozzle penetration leakage. Following the examiners identification of areas that needed engineering evaluation, the inspectors reviewed the licensee's evaluation and disposition of the areas. The inspectors observed that the head area had minor dirt and grit deposits and some evidence of boron on the head. The licensee determined through isotopic analysis that all identified boron deposits were old, and that they originated from locations above the head. The inspectors assessed the adequacy of the conditions under which this inspection was performed (i.e., lighting, removal of insulation, and absence of obstruction for viewing the nozzle penetrations. No nozzle penetrations were identified to be leaking nor were any deficiencies identified that needed repair).

.2 Office of Investigations (OI) Report No. 2-2002-021

a. Inspection Scope

The inspectors reviewed the results of OI Investigation No. 2-2002-021, completed on August 28, 2002, regarding the alleged falsification of radiation survey records by a health physics technician. The inspectors reviewed evidence gathered by OI, the licensee's investigation into the issue, and applicable documentation. The licensee's activities were reviewed against TS 5.4, 10 CFR 20.1501, 10 CFR 20.2103, and 10 CFR 50.9.

b. Findings

Introduction: A Severity Level IV, non-cited violation (NCV) was identified in that during the period of January 1 through June 4, 2002, a health physics technician failed to perform required, routine radiation surveys on numerous occasions and deliberately fabricated data as actual data on radiological survey records, records; required to be maintained by 10 CFR 20.2103.

Description: In its investigation and as documented in the OI Report synopsis (Attachment 2), OI concluded that a health physics technician (Radiation Protection Specialist) deliberately falsified radiological surveys. Specifically, during the period of at least January 1 through June 4, 2002, the licensee identified that a health physics technician had failed to perform required, routine radiological surveys and fabricated data as actual data on radiological survey forms. The inspectors reviewed the relevant evidence gathered by OI and the licensee, and noted the following: (1) licensee review of radiation surveys for the previous six months found greater than 30 surveys documented by the individual which appeared similar to previous survey data for the areas; and (2) licensee review of key card data for a survey taken by the individual on March 2, 2002, in Room 217, indicated substantially less survey time as compared to surveys of the room by two other technicians conducted in January and April 2002. Review of the affected surveys by the inspectors noted that the reproducibility of the health physics technician's survey results was not likely considering the multiple variables normally associated with the performance of radiation surveys and changing radiological conditions of various plant areas between the survey periods.

Analysis: Because this finding involved willfulness on the part of a licensee employee and inaccurate information which impacts the regulatory process, it is not subject to the provisions of the Reactor Oversight Process; but is being dispositioned in accordance with traditional enforcement. The finding was determined to be greater than minor because it was willful and involved required radiation surveys, some involving high radiation areas that, were not made over an extended period of time.

Enforcement: 10 CFR 20.1501(a) requires, in part, that licensee's make or cause to be made, surveys that (1) may be necessary for the licensee to comply with the regulations in this part; and (2) are reasonable under the circumstances to evaluate (i) the magnitude and extent of radiation levels; and (ii) concentrations or quantities of radioactive material; and (iii) the potential radiological hazards.

TS 5.4, Procedures, requires, in part, that written procedure be established, implemented, and maintained covering the applicable procedures recommended in Regulatory Guide 1.33, Revision 2, Appendix A, February 1978. Appendix A includes written radiation protection procedures for radiation surveys. Licensee Procedure HP/0/B/1000/045, Radiation Protection Routines, Revision 6, Section 4.3, Surveillance Routines, requires, in part, the performance of routine radiation surveys.

10 CFR 50.9 (a) requires, in part, that information required by statute or by the Commission's regulations, orders, or licensee conditions to be maintained by the licensee shall be complete and accurate in all material respects. 10 CFR 20.2103 (a) requires each licensee to maintain records showing the results of surveys and calibrations required by 10 CFR 20.1501, and that the licensee retain these records for three years after the record is made.

Contrary to these requirements, during the period of at least January 1 through June 4, 2002, a health physics technician failed to perform required routine radiation surveys on numerous occasions and fabricated data as actual data on radiological survey records. As a result, survey records required to be maintained were inaccurate. The survey information was material in that it is used to establish radiological controls and to verify compliance with NRC requirements. Although this violation is willful, it was brought to the NRC's attention by the licensee, it involved isolated acts of a low-level individual, and it was addressed by appropriate remedial action. Therefore, this Severity Level IV violation is being treated as a non-cited violation (NCV), consistent with Section VI.A.1 of the NRC Enforcement Policy. It will be identified as NCV 50-413, 414/03-02-01, Falsification of Radiological Survey Records. The licensee's corrective actions are documented in Employee Concern Program Record HR-02-01-CNS.

40A6 Meetings

.1 Exit Meeting Summary

On April 3, 2003, the resident inspectors presented the inspection results to Mr. Gary Peterson, 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.

.2 Annual Assessment Meeting Summary

On April 15, 2003, the NRC's Chief of Reactor Project's Branch 1 and the Senior Resident Inspector assigned to the Catawba Nuclear Station met with Duke Energy Corporation to discuss the NRC's Reactor Oversight Process (ROP) and the Catawba annual assessment of safety performance for the period of January 1, 2002 - December 31, 2002. The major topics addressed were: the NRC's assessment program, the results of the Catawba assessment, and NRC security activities. Attendees included Catawba site management, members of site staff, and State of South Carolina and York County government officials.

This meeting was open to the public. The presentation material used for the discussion is available from the NRC's document system (ADAMS) as accession number ML

031060532. ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

4OA7 Licensee Identified Violations

The following findings of very low safety significance (Green) were identified by the licensee and are violations of NRC requirements, which meet the criteria of Section VI of the NRC Enforcement Policy, NUREG-1600 for being dispositioned as NCVs.

- Catawba Unit 1 and Unit 2 license condition 2.C.6 states that the fire protection program shall implement and maintain in effect all provisions of the approved fire protection program as described in the Final Safety Analysis Report. Final Safety Analysis Report, Section 9.5.1.1, Fire Protection System Design Bases, states that "Inadvertent operation of or a crack in a fire suppression system would not preclude safe shutdown of the plant since redundant trains of equipment required for safe shutdown are located in separate rooms, have adequate spatial separation, or have appropriate water spray shielding." Contrary to this, the licensee failed to ensure that a rupture or inadvertent operation of the fire protection system located adjacent to 1EMXG, 2EMXH, and 2ETA switchgear would not significantly impair the safety-related switchgear. This issue is documented in the licensee's corrective action program, PIP C-02-01091, and described in Section 4OA3.2 of this inspection report. This finding was of very low safety significance because of the low probability of a pipe rupture event.
- 10 CFR 20.1501(a) requires each licensee to make or cause to be made, surveys that (1) may be necessary for the licensee to comply with the regulations in this part; and (2) are reasonable under the circumstances to evaluate concentrations or quantities of radioactive material. UFSAR Chapter 16, Selected Licensee Commitment Manual, Table 16.11-6-1 Radioactive Gaseous Waste Sampling and Analysis Program, specifies sampling and monitoring requirements for the main plant vent airborne effluents, including monitoring of radionuclide particulates. Contrary to the above the licensee collected particulate samples from the Unit 1 and Unit 2 main plant vents using a regulated air pump (RAP) -1 sampling apparatus which did not ensure representative samples of the main plant vent airborne effluents. Specifically, the RAP-1 sample line suction configuration and flow operation did not use isokinetic sampling equipment and air velocity characteristics. This condition is documented in the licensee's corrective action program as PIP C-02-00898 and Nuclear Station Modifications 11440 and 21440. Because the dose to the public from particulates in the licensee's airborne effluents is a small fraction of regulatory limits, this finding is of very low safety significance.

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

E. Beadle, Emergency Preparedness Manager
T. Beadle, Emergency Planning Supervisor
W. Beaver, Reactor Electrical Systems - Freeze Protection Coordinator
C. Blackwelder, Engineer
S. Brown, Operations Superintendent
W. Byers, Security Manager
D. Caldwell, Engineering Supervisor
J. Foster, Radiation Protection Manager
G. Gilbert, Regulatory Compliance Manager
W. Green, Work Control Superintendent
P. Grobusky, Human Resources Manager
M. Glover, Station Manager
G. Hamrick, Manager, Nuclear Services Division
T. Hawkins, ISI Coordinator, Work Control
P. Herran, Engineering Manager
D. Kaul, Engineer
L. Keller, Safety Review Group Manager
R. Parker, Maintenance Superintendent
G. Peterson, Catawba Site Vice President
R. Sheffield, NDE Supervisor
F. Smith, Chemistry Manager
G. Strickland, Regulatory Compliance Specialist
R. Sweigart, Safety Assurance Manager

LIST OF ITEMS OPENED AND CLOSED

<u>Opened/Closed</u>	<u>Item Type</u>	<u>Description</u>
50-413,414/03-02-01	NCV	Falsification of Radiological Survey Records (Section 40A5.2)
<u>Closed</u>		
50-413/02-04-00	LER	Pipe Spray Interaction Affecting Safety- Related Equipment (Section 40A3.2)
50-413/2002-005-00	LER	Loss of Americium-241 Source During Procedure Verification Activities

DOCUMENTS REVIEWED

(Section 1R06)

UFSAR, Section 2.4 Hydrologic Engineering & Section 11.2 Liquid Radwaste System, Updated October 22, 2001

PIP C-00-01440, ND & NS Sump Pump Rooms Reached HI-Hi Level Due to Pumps Not Turning On

PIP C-01-01252, U1 A and B ND/NS Sumps Do Not Get Auto Start Signals

PIP C-00-00601, ND/NS Sump Pump Interlock With SSPS Does Not Meet Outage (Work Controls) Schedule.

PIP C-02-03941, Discrepancy Between Valve and Station Diagrams.

Drawing Number CN-1565-1.1, Flow Diagram of Liquid Radwaste System (WL), Rev. 29

Design Basis Specifications For The Liquid Waste (WL) System, Section 20.4, 30.1 & 30.3, CNS-1565.WL-00-0001, Rev. 20

PM Model Technical Basis, PM Model #: 91003041, PFM Cal Level SW CNOWLLS5060

PM Model #: 91003042, PFM Cal Level SW CNOWLLS5070

PM Model #: 91003043, PFM Cal Level SW CNOWLLS5080

PM Model #: 91003044, PFM Cal Level SW CNOWLLS5090

Procedure IP/1/A/3181/001, WL Safety Related Sump Level Control Switches, Rev. 31

Crew Report, PFM Cal Level SW CNOWLLS5060, Dated October 23, 2002

Crew Report, PFM Cal Level SW CNOWLLS5080, Dated January 9, 2003

Procedure IP/2/A/3181/001, WL Safety Related Sump Level Control Switches, Rev. 31

Crew Report, PFM Cal Level SW CNOWLLS5070, Dated March 11, 2002

Crew Report, PFM Cal Level SW CNOWLLS5090, Dated June 20, 2003

OP/1/A/6100/010K, Annunciator Response For Panel 1AD-10, NS & ND Rooms Sump Level Emergency Hi

OP/1/A/6100/010K, Annunciator Response For Panel 1AD-10, NS & ND Rooms Sump Level HI-Hi

PIP C-02-03070, Doghouse Level Switch Total Loop Uncertainty Calculation CNC-1210.04-00-02- is Deficient.

PIP C-00-01374, CF Out -of-Tolerance Identified on Work Order 98202400-01

PIP C-00-04245, Drawing Discrepancy for Doghouse Level Switches 1CFLS6000, 6030, 6060 & 6090

OP/1(2)/A/6100/010I, Annunciator Response For Panel 1AD-8 (2AD-8), Rev. 66

Drawing Number CN-1565-2.2, Flow Diagram Of Liquid Radwaste System (WL), Rev. 32

Final Scope Documentation Notification, 05/08/02, Rev. 11

Crew Cover Sheet, 1CF- TADOT Inboard/Outboard DH Lvl Switches, Dated May 5, 2002

Crew Cover Sheet, 2CF- TADOT Inboard/Outboard DH Lvl Switches, Dated October 12, 2001

Procedure IP/1/A/3010/006 A, Main Feedwater (CF) System Doghouse Water Level Instrumentation, Rev. 23

Procedure IP/2/A/3010/006 A, Main Feedwater (CF) System Doghouse Water Level Instrumentation, Rev. 13

Technical Specifications, Section 3.3.2: Engineered Safety Feature Actuation System (ESFAS) Instrumentation, Amendment Nos. 173/165

Modification No: NSM CN-11424, Upgrade of Doghouse Level Instrumentation

PT/1/A/4350/002 E, Feedwater Isolation on HI-HI Doghouse Level

License Amendment Request for Catawba Nuclear Station Technical Specifications 3.3.2, Engineered Safety Feature Actuation system Instrumentation; and 3.3.5, Loss of Power Diesel Generator Start Instrumentation: Dated December 20, 2001

License Amendment Request Applicable to Catawba Nuclear Station Technical Specification 3.3.2 and Table 3.3.2-1, Engineered Safety Feature Actuation System Instrumentation; and Technical Specification 3.3.5, Loss of Power Diesel Generator Start Instrumentation: Dated November 20, 2002

Design Basis Specifications For The Doghouse Level Monitors, Section 32.6, CNS-011.01-EA-0001, Rev. 8

PM Formal Change Request, CR2003-00013-PM, Annual Inspection of Yard Drains, dated February 13, 2003, Rev. 0

Drawing Number: CN-1022-17, Powerhouse Yard Drainage Layout, Rev. 2

Drawing Number: CN-1024, Yard Drainage Sections, Details, & Schedule, Rev. 31

Flood Calculation, CNC-1206.03-00-0001, Flood Level for Structures Outside the Reactor Building

Flood Calculation, CNC-1206.03-00-0142, Flooding of Safety Related Structures Due to Excessive Rainfall, Rev. 3

2002 Catawba Nuclear Station, Units 1&2 Annual Yard Drainage Inspection, File No: CN-1114.00, -1412.14, -1168.00, Dated January 29, 2003

Drawing Number: Figure No. 2.4.2-3, Local Intense Probable Maximum Precipitation Exterior Door Entrances to Safety Related Structures, Rev. 0

MP/0/A/7650/079, Safety Related Doors Corrective Maintenance, Rev. 17

Design Basis Specifications for Water Level Determination, Section 30.2.4, CNS-1465-00-00-0011, Rev. 0

Work Order Task, PM On Overly Doors, dated March 6, 2001, Rev. HXC

Work Order Task, PM Low Usage Roll-up Doors, dated August 6, 1998, Rev. HXC

Work Order Task, PM High Usage Roll-up Doors, dated January 16, 2003, Rev. H03

Work Order Task, PM On Personnel Doors, dated November 11, 1994, Rev. 5

Procedure No. SP#202, Protected Area Patrol, Rev. 35

Procedure No. SP#211, CAS/SAS Operator, Rev. 38

PIP C-01-05184, 2A1 Condenser Outlet Expansion Joint Leak

PIP C-01-01420, Evaluate Building a "Flood Wall" Around the 4160 Transformers and Switchgear Located in the Turbine Building at Elevation 568

PIP C-01-00425, Discrepancy Between Vendor Information and CNS Practice Regarding RC Rubber Expansion Joints

PIP C-01-05748, Expansion Joint On Outlet of 2A1 Waterbox Discovered Leaking

PIPs Generated During Inspection

PIP C-03-00731, Discrepancy Discovered in the UFSAR Pertaining to Normal Discharge Flow Path of the ND/NS Sump Pumps

PIP C-03-00651, Non QA Guards on Level Switches 2CFLS6060 and 2CFLS6090 are Not Properly Secured and the DBD for the Protection System has a Discrepancy

PIP C-03-00790, Doors AR5 and AX656B Have Gaps at the Threshold Larger Than Specified in UFSAR Figure 2-33

(Section 1R08)

Procedure QAL-13, Inservice Inspection (ISI) Visual Examination, VT-1 and VT-1C, Rev. 18, dated 9/11/02

Procedure QAL-14, Inservice Inspection (ISI) Visual Examination, VT-3 and VT-3C, Rev. 24, dated 9/11/02

Procedure NDE-600, Ultrasonic Examination of Similar Metal Welds in Ferric and Austenitic Piping, Rev. 14, dated 10/1/01, including Field Changes FC Nos. 02-15 and 02-16.

Procedure NDE-25, Magnetic Particle Examination, Rev. 21, dated 2/19/03

Procedure NDE-35 Liquid Penetrant Examination, Rev 19, dated 1/31/02

Eddy Current Acquisition Guidelines for Duke Power Company's D5 Steam Generators, Rev 2

Eddy Current Analysis Guidelines for Duke Power Company's D5 Steam Generators, Rev 2

Drawing number CN-1042-ISI.2-003, Reactor Building - Unit 2, Steel Containment Vessel - Inside Surface Inservice Inspection Areas Developed Elevation, Rev. 2

Drawing number CN-1042-ISI.2-021, Reactor Building - Unit 2, Steel Containment Vessel - Outside Surface Augmented Examination Areas Details, Rev. 3

Drawing number CN-NI-88, Safety Injection System from RHR Heat Exchanger 2A to RC Cold Legs C & D, Rev. 11

Problem Investigation Process (PIP) C-01-04627, Small foreign object in Unit 2 SG B secondary side

PIP C-01-04704, Small foreign object in Unit 2 SG A secondary side

PIP C-03-01217, Boric acid residue on pressurizer manway bolts

PIP C-03-01220, Boric acid residue on mating surface of valve 2NC-33A

PIP C-03-01223, Boric acid residue on bolted connections on valves 2NV-33 and 2NV-34

PIP C-03-01549, Shelf life of liquid penetrant materials

PIP C-03-01562, Loose instrumentation line for valve 2-CF-42

PIP G-03-00069, Performance demonstration requirements for dissimilar metal welds

SGMEP 105, Model; D5 Specific Assessment of Potential Degradation Mechanisms, dated March 5, 2003

Liquid penetrant examination reports for weld numbers 2NI88-2, -3, -10, -7, -13, -14, -15, and -16, dated 3/11/03

Magnetic particle examination report for weld number 2-R-CF-1560, dated 3/12/03

Ultrasonic examination instrument calibration data sheet numbers 0302040 through 0302047, for 3/11/03

Ultrasonic examination reports for weld numbers 2NI88-2, -3, -7, -10, and -13 through -16, dated 3/12/03

(Section 1EP2 - 5)

Emergency Planning Assessment Plan, Assessment Number EMP 04-02P, dated 12/27/01
Emergency Planning Functional Area Assessment, Assessment Report SA-02-21
(NPA)(EP)(ALL), dated December 2, 2002
PIP Number C-02-05851

Procedures, Instructions, Lesson Plans, and Manuals

Standard Health Physics Procedure (SH) SH/0/B/2000/005, Posting of Radiation Control Zones, Revision (Rev.) 1
SH/0/B/2000/006, Removal of Items from RCA/RCZ and Use of Release/Radioactive Material Tags, Rev. 1
SH/0/B/2000/012, Access Controls for High, Extra High, and Very High Radiation Areas, Rev. 1
Nuclear System Directive 208, Problem Investigation Process (PIP), Revision (Rev.) 24

Records and Data

Summary of CNS 10CFR61 Filter History
Summary of CNS 10CFR61 DAW History
Summary of CNS 10CFR61 PST Resin History
Summary of CNS 10CFR61 RBT Resin History
Summary of CNS 10CFR61 Secondary Bead Resin History
Summary of CNS 10CFR61 Secondary Powdex Resin History

Audits, Self-Assessments, and Problem Identification Program (PIP) Documents

Duke Power Company Assessment Report, GO-02-15(NPA)(RP)(ALL) conducted 1/21 - 31/02
PIP C-02-00209, RP Technician Did Not Follow Proper Procedures When Investigating a PCM Alarm at the Single Access Point
PIP C-02-03468, RP Vendor Technician Did Not Properly Release Individual from the Radiation Control Area after Whole Body Monitor Alarm
PIP C-02-02124, Vendor Employees Exited Unit 1 Upper Containment by Crossing under the RCA Boundary Rope at the Equipment Hatch and Passing into the Unit 1 Tent
PIP C-02-05633, INPO Recommendation That RP Work Risk Analysis Be Modified to Focus More on Low Risk Activities in Order to Reduce Personal Contamination Events
Nuclear System Directive 208, Problem Investigation Process (PIP), Rev. 24

(Section 2OS3)

Procedures, Standing Orders, Guidance Documents

Operation and Calibration: Eberline Model BC-4, HP/0/B/1003/019, Rev. 9
Control of Radiation Protection Equipment, HP/0/B/1003/014, Rev. 13

Calibration of Portable Count Rate Meters, HP/0/B/1003/011, Rev. 20
 Area Monitor Channel Calibration, IP/0/B/3314/086 A, Rev. 24
 Procedure 801, Radiation Protection Portable Instrument Data Management, Rev. 0
 Procedure 810, Setup and Calibration of Teletector Model 6112B Geiger Counter, Rev. 0,
 Procedure 812, Calibration of Eberline E-120, Rev. 0
 Health Physics Procedure (HP) HP/0/b/1001/018, RP Compliance Sampling, Rev. 22

Records, Worksheets, and Data

Surveillance Sheet SCBA Air Quality, dated 10/29/2002
 Computer printout of all Whole Body Counter Libraries, dated 9/3/2002
 Calibration Data Sheets for Electronic Dosimeters 196187 (7/31/02), 195998 (7/31/02),
 189232 (7/30/02), 190937 (8/1/02), 193242 (8/5/02)
 Calibration Data Sheets for Area Radiation Monitors 1EMF-3 (9/18/02), 1EMF-9 (8/19/02)
 1EMF-11 (4/3/02), 1EMF-14 (8/20/02), 1EMF-15 (2/27/02)
 Verification Data of the SCRAM program used for Calibration of the J. L. Shepherd
 Model 89 Shield Calibration Irradiator at the Central Calibration Facility; Serial Number
 (S/N) 9128, 10/22/02; and S/N 8129, 12/12/2002.
 Catawba Nuclear Station, Instrument Usage Needs, Innage and Outage Activities, dated
 September 9, 2002
 Instruments Ready for Shipment, Report, as of January 8, 2003,
 Instrument Status Report - CCF Laboratory, as of January 8, 2003,
 CCF Instruments by Site Matrix Report
 Calibration Required \leq 45 Days Report, as of January 8, 2003

PIP Documents

PIP C-02-00745, Contamination Found in Two Wire Brushes Stored in Clean Tool Room
 PIP C-02-04442, Documentation of Benchmarking/Self-assessment Trip
 PIP C-02-06249, Concerns Pertaining to Instrument Calibrations Affecting Critical Path
 When Problems Are Encountered During Calibrations
 PIP C-02-04596, User Notice Issued by MSA Related to Audible Alarms on SCBA
 PIP C-02-04478, Actions Taken in Response to NRC Approval of Eliminating Post
 Accident Sampling System

(Section 2PS1)

Procedures, Guidance Documents, and Operating Manuals

Catawba Offsite Dose Calculation Manual, Rev. 45
 Instrument Procedure (IP) IP/0/B/3314/049 R, 0EMF49 (Low Range) Liquid Monitor
 Channel Calibration, Rev. 13
 IP/0/B/3314/057 R, 0EMF57 Transfer Calibration Procedure, Rev. 18
 IP/2/B/3314/035 R, 2EMF35 (Low Range) Particulate Monitor Channel Calibration, Rev. 9
 IP/2/B/3314/036 R, 2EMF36 Gas Monitor Channel Calibration, Rev. 9
 IP/2/B/3314/037 R, 2EMF37 Iodine Activity Monitor Channel Calibration, Rev. 12
 IP/0/B/3314/050 R, 0EMF50L (Low Range) Gas Monitor Channel Calibration
 Operations Procedure (OP) OP/0/B/6500/015, Discharging a Monitor Tank to the
 Environment, Rev. 88
 Health Physics Procedure (HP) HP/0/b/1001/018, RP Compliance Sampling, Rev. 22

HP/0/B/1001/029, Genie/CAS Gamma Spectroscopy System Operation and Calibration,
Rev. 5

Nuclear System Directive 208, Problem Investigation Process (PIP), Rev. 24

Effluent Monitoring Program Records and Effluent Release Permits Reviewed

Effluent Monitor 0EMF49, Waste Monitor Discharge Calibration Data, Completed 1/16/02
Effluent Monitor 0EMF57, Waste Monitor Tank Building Liquid Discharge Calibration Data,
Completed 2/11/02

Effluent Monitor 0EMF35, Plant Vent Particulate Monitor Calibration Data, Completed
8/20/02

Effluent Monitor 0EMF36, Unit Vent Gas Monitor Calibration Data, Completed 6/26/02

Effluent Monitor 0EMF37, Unit Vent Iodine Monitor Calibration Data, Completed 6/11/02

Effluent Monitor 0EMF50, Waste Gas Discharge Monitor Calibration Data, Completed
11/8/02

Gamma Spectroscopy Detector 3 Calibration Data, Completed 8/24/02

Gamma Spectroscopy Detector 4 Calibration Data, Completed 4/18/02

Count Room Quality Control and Performance Test Data for 1/28 & 29/02

Liquid Waste Release Permit Number 2003009

Analytical Results for Unit 1 Upper Containment Air Sample Collected on 2/28/03

Audits, Self Assessments, and PIP Documents

Duke Power Company Assessment Report, GO-02-15(NPA)(RP)(ALL)
Conducted 1/21 - 31/02

PIP G-02-00059, Independent Technical Evaluation and Review of ODCM

PIP C-02-00898, Unit Vent and Waste Monitor Tank Building Vent Are Not Sampled under
Isokinetic Conditions as Described in the UFSAR

PIP C-02-02089, Question Regarding Requirement to Complete Channel Operational Test
(COT) on Containment Gas Monitor (EMF-39) Prior to Starting Containment Purge
Ventilation System (VP)

PIP C-02-03513, Increasing Trend in Tritium Concentration since Mid-year 2000 at
Environmental Sampling Location #214 (Drinking Water Sample Collected at the Rock
Hill Water Supply Indicator Location)

PIP C-02-04824, Documentation of Results for Assessment No. CN-02-09

Annual Reports

Catawba 2001 Annual Radioactive Effluent Release Report

(Section 2PS3)Procedures, Guidance Documents

Duke Power Company (DPC) Radiation Protection Policy Manual, Radiological Environmental Monitoring Program Policy IV-07, Rev. 1.
 DPC Environmental Division, Radiological and Environmental Services (EnRad) Procedure 52, Preparation of Samples for Gamma Analysis, Rev. 2
 EnRad Procedure 53, Preparation of Samples for Gross Alpha and Gross Beta Analysis, Rev. 13
 EnRad Procedure 54, Preparation and Counting of Samples for Low Level Iodine - 131 Analysis, Rev. 7
 EnRad Procedure 62, Preparation of Tritium Samples, Rev. 0
 EnRad Procedure 106, Calculation and Determination of Lower Limits of Detection for Radiological Laboratory Instrumentation, Rev. 2
 EnRad Procedure 109, Initial and Final Review of Data Using the Lab Manager Laboratory Information Management System, Rev. 1
 EnRad Procedure 111, Routine Quality Control Using the Count Room Analysis System (CAS), .
 EnRad Procedure 112, Routine QC on the Tennelec Series 5 Low Background Counting Instruments Using Eclipse Software, Rev. 2,
 EnRad Procedure 113, Routine QC of the Packard 2550 Liquid Scintillation System, Rev. 0
 EnRad Procedure 205, Calibration of the Gamma Spectroscopy System Using the CAS, Rev. 2
 EnRad Procedure 206, Calibration of the Tennelec Series 5 Low Background Counting Instruments Using Eclipse Software, Rev. 2,
 EnRad Procedure 315, Operation of the PACKARD 2550 Liquid Scintillation System, Rev. 3

Records

Catawba Nuclear Station, Air Sampler Run-time Reports, January 1, 2002 through December 31, 2002
 Certificates of Calibration: 2 Inch Simulated Filter in Falcon Petri Dish, dated January 1, 2002, and 25 milliliter Ion-exchange Resin in Falcon Petri Filled to Top, dated January 1, 2003
 Inter-laboratory Cross-Check Program Data, for the 1st 2nd and 3rd Quarters 2002
 Quality Control (QC) data for the following DPC EnRad Laboratory Analytical Instrumentation:
 - Gamma Spectroscopy Analysis System Detectors 2, 4, 8, January 1, 2002 through December 31, 2002, including background data, Full-Width Half Maximum, Peak Centroid, and selected performance check results
 - Beta Counting System Number 4 QC data from 12/ 07/ 2002 through January 6, 2003 including alpha and beta efficiency and background checks
 - Liquid Scintillation Counting System S/N 428 and S/N 404281 QC May1, 2002, through June 11, 2002, monthly tritium efficiency data and daily background check data and graphs
 Beta Attenuation Report, and Supporting Documents, for Unit 4, 11/18/02
 Gross Alpha/Beta Calibration Verification Worksheet, Unit 4, 11/18/2002
 Memo to File: Regarding Problem Identification Process General Office (PIP-G) 03-00014, Need to Improve Guidance for Distillation in Preparation of Liquid Samples, 01/23/2003

Memo to File: Regarding PIP-G 03-00016, Geometry Calibration and Sample Analysis Discrepancies, 01/28/03

Memo to File: Regarding PIP-G 03-00017, Lower Limit of Detection (LLD) Verification for Oconee Broadleaf Vegetation, 01/15/3003,

(Sections 40A1.3 and .4)

Procedures

SH/0/B/2006/001, NRC Performance Indicator Data Collection, Validation, Review and Approval, Rev. 1

Records

SH/0/B/2006/001, Enclosure 5.3, Radiation Protection Monthly Review and Evaluation of Data for NRC Performance Indicators, for the months of January through December 2002

SH/0/B/2006/001, Enclosure 5.4, Radiation Protection Monthly Data Review for NRC Occupational and Public Radiation Safety Significance Determination Process, for the months of January through December 2002

LIST OF ACRONYMS USED

ANS	-	Alert(Siren) and Notification System
ANSI	-	American National Standards Institute
ARM	-	Area Radiation Monitor
BDMS	-	Boron Dilution Mitigation System
CA	-	Auxiliary Feedwater
CCF	-	Central Calibration Facility
CFR	-	Code of Federal Regulations
CNS	-	Catawba Nuclear Station
CY	-	Calendar Year
DFWCS	-	Digital Feedwater Control System
DPC	-	Duke Power Company
EAD	-	Electronic Alarming Dosimeter
EDG	-	Emergency Diesel Generator
EMF	-	Radiation Monitoring System
EnRad	-	Environmental Radiation
EOC	-	End-of-Cycle
ERO	-	Emergency Response Organization
ET	-	Eddy Current Testing
GM	-	Geiger Mueller
HEPA	-	High Efficiency Particulate air
HP	-	Health Physics Procedure
HPT	-	Health Physics Technician
HRA	-	High Radiation Area
IP	-	Instrument Procedure
ISI	-	Inservice Inspection
KC	-	Component Cooling Water
LER	-	Licensee Event Report
LLD	-	Lower Limit of Detection

MT	-	Magnetic Particles
NCV	-	Non-Cited Violation
ND	-	Residual Heat Removal
NDE	-	Nondestructive Examination
NNC	-	National Nuclear Corporation
NS	-	Containment Spray
NRC	-	Nuclear Regulatory Commission
NRR	-	Nuclear Reactor Regulation
OA	-	Other Activities
ODCM	-	Offsite Dose Calculation Manual
OP	-	Operations Procedure
OS	-	Occupational Radiation Safety
PCM	-	Personnel Contamination Monitor
PI	-	Performance Indicator
PIP	-	Problem Investigation Process (report)
PS	-	Public Radiation Safety
PT	-	Liquid Penetrant
QC	-	Quality Control
RAP	-	Regulated Air Pump
RCA	-	Radiologically Controlled Area
RCS	-	Reactor Coolant System
REMP	-	Radiological Environmental Monitoring Program
RG	-	Regulatory Guide
REV	-	Revision
RN	-	Nuclear Service Water
RP	-	Radiation Protection
SAM	-	Small Article Monitor
SCBA	-	Self-contained Breathing Apparatus
SCV	-	Steel Containment Vessel
SG	-	Steam Generators
SH	-	Standard Health Physics Procedure
SLC	-	Selected Licensee Commitment
SSC	-	Systems, Structures, and Components
TS	-	Technical Specification
UFSAR	-	Updated Final Safety Evaluation Report
UT	-	Ultrasonic Examination
VHRA	-	Very High Radiation Area
VX	-	Containment Air Return System

OI Report 2-2002-021 Synopsis

The U.S. Nuclear Regulatory Commission, Office of Investigations, Region II, initiated this investigation on June 28, 2002, to determine if a former radiation protection specialist at the Duke Energy Corporation, Catawba Nuclear Station, deliberately falsified radiological surveys.

Based upon evidence developed, testimony, and documentation obtained during this investigation, the allegation that a radiation protection specialist at the Catawba Nuclear Station deliberately falsified radiological surveys was substantiated.

Approved for release on November 7, 2002

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FIELD OFFICE DIRECTOR, OFFICE OF INVESTIGATIONS, REGION II