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

October 27, 2005

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

SUBJECT: CATAWBA NUCLEAR STATION - NRC INTEGRATED INSPECTION REPORT 05000413/2005004 AND 05000414/2005004

Dear Mr. Jamil:

On September 30, 2005, 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 October 13, 2005, with members of your staff.

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

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

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

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

Sincerely,

/RA/

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

Docket Nos.: 50-413, 50-414, 72-45
License Nos.: NPF-35, NPF-52

Enclosure: Integrated Inspection Report 05000413/2005004, 05000414/2005004, w/Attachment: Supplemental Information

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U. S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket Nos:	50-413, 50-414, 72-45
License Nos:	NPF-35, NPF-52
Report No:	05000413/2005004, 05000414/2005004
Licensee:	Duke Energy Corporation
Facility:	Catawba Nuclear Station, Units 1 and 2
Location:	4800 Concord Road York, SC 29745
Dates:	July 1, 2005 - September 30, 2005
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Approved by:	Michael E. Ernstes, Chief Reactor Projects Branch 1 Division of Reactor Projects

Enclosure

SUMMARY OF FINDINGS

IR 05000413/2005-004, IR 05000414/2005-004; 7/1/2005 - 9/30/2005; Catawba Nuclear Station, Units 1 and 2; Maintenance Risk Assessments and Emergent Work Evaluation, Maintenance Effectiveness, Occupational Radiation Safety

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

A. NRC-Identified and Self-Revealing Findings

Cornerstone: Mitigating Systems

- Green. The inspectors identified a non-cited violation (NCV) for the failure to assure that purchased equipment conformed to the procurement documents as required by 10 CFR Part 50, Appendix B, Criterion VII.

  This finding was greater than minor because it affected an objective and attribute of the Reactor Safety, Mitigating Systems Cornerstone to ensure the availability and reliability of systems that respond to initiating events to prevent undesirable consequences. The performance deficiency associated with this finding was the licensee's commercial grade dedication program did not verify manufacturing defects existed on previously dedicated commercial grade relays. The licensee was responsible to acquire the necessary information to assure the procured equipment maintained original design specifications and quality control. The finding was assessed using the SDP for Reactor Inspection Findings for At-Power Situations. The finding was evaluated using the SDP Phase 2 plant notebook and it was determined a Phase 3 evaluation was required, based on the increase in the probability failure rate of the relays which represented an increase in the likelihood of the loss of safety function of the nuclear service water (RN) system and its associated initiating event frequency. The regional SRA performed a Phase 3 SDP for the finding. Electrical schematics were reviewed to determine mode of failures caused by the relays. A time line was constructed to verify the time periods the various relays were in service. Conservative screening values were established for relay failure rates, based on number of demands experienced by the inservice relays. Fault trees were developed to estimate the relay failure impact on the Loss of Service Water initiating event frequency. Using these conservative values, the NRC's plant risk model was run to determine an upper limit for the risk due to the finding. The risk associated with the finding was determined to be GREEN. (Section 1R12)

- Green. The inspectors identified a NCV for the failure to follow the Duke Power Company Lifting Program procedure as required by 10 CFR 50, Appendix B, Section II, Quality Assurance Plan, when the inspectors determined that a complex lift was going to occur over the top of a safety-related structure with no developed or documented lift plan as required by the licensee lifting procedure.

The finding is greater than minor because the finding could be viewed as a precursor to a significant event. Without a complex lift plan to ensure quality measures were taken and compensatory actions were considered, had the 23 ton steel structure fallen on the RN lake intake structure, a potential loss of RN may have occurred which would have required prompt action by the operators to transfer the assured water source to the standby nuclear service water pond. Damage to the RN pump structure could have adversely impacted reactor safety and affected the availability and reliability of a mitigating system performance attribute of the reactor safety cornerstone. The finding was determined to be of very low safety significance, using the significance determination phase 1 worksheet, because the lack of a documented complex lift plan did not result in the loss of safety function of the RN system as the lift was deferred until a plan was developed. This finding involved the cross-cutting aspect of human performance since individuals did not follow or implement the requirements of the Duke Power Company Lifting Program procedure. (Section 1R13)

Cornerstone: Occupational Radiation Safety

- Green. The inspector identified a NCV of 10 CFR 20.1501(a) for failure to conduct adequate airborne radionuclide concentration surveys prior to personnel making Unit 1 (U1) or Unit 2 (U2) lower containment 'at power' entries. Specifically, the licensee failed to assure grab samples collected using the U1 and U2 Containment Air Release and Addition System effluent monitor system (EMF) -38,-39, -40 skid supply line were representative of lower containment airborne conditions.

  This finding is greater than minor because the failure to conduct adequate surveys of lower containment airborne radionuclide concentrations decreased the effectiveness of radiological controls for workers entering potential airborne radiation areas. The finding was associated with radiation protection program and process attributes of the Occupational Radiation Safety Cornerstone. The finding is of very low safety significance because workers who may have entered lower containment airborne areas were provided with appropriate external radiation monitoring devices, were screened for internally deposited radionuclides upon exiting the radiologically controlled area, and the assigned doses resulting from external radiation sources and from internally deposited radioactive materials were within regulatory limits. This finding has a Problem Identification and Resolution cross-cutting aspect due to the February 2005 evaluation for the ventilation alignment issue not being thorough nor comprehensive. The licensee has entered this finding in its corrective action program as PIP C-05-05169 and was evaluating corrective actions to take (Section 2OS1).

B. Licensee Identified Findings

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

- 10 CFR 20.1703(a) requires the licensee to implement and maintain a respiratory protection program that includes written procedures regarding

maintenance, repair, testing, and quality assurance of respiratory protection equipment. Contrary to the above, from December 5, 2002, through April 21, 2005, the licensee failed to perform SCBA diaphragm functional tests required by Procedure RA/0/1600/001, Radiological Respirators, Rev 2. This item is documented in the licensee's CAP as PIP document C-05-02166. This violation is of very low safety significance because the missed surveillances did not result in failure of the respirators to function as designed.

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REPORT DETAILS

Summary of Plant Status:

Unit 1 operated at 100 percent Rated Thermal Power (RTP) for the duration of the inspection period.

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

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

1R04 Equipment Alignment

1. Partial System Walkdowns

a. Inspection Scope

The inspectors verified the critical portions of equipment alignments for selected trains that remained operable while the redundant trains were inoperable. The inspectors reviewed plant documents to determine the correct system and power alignments, as well as the required positions of selected 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. Documents reviewed are listed in the Attachment to this report. The inspectors verified the following three partial system alignments:

- Unit 2 B component cooling water (KC) system with the 2A KC heat exchanger removed from service for tube cleaning
- Unit 2 B residual heat removal (ND) system with the 2A ND system removed from service for planned maintenance
- 2A, 1A, and 1B diesel generators and associated 4160Volt busses with the 2B diesel generator inoperable due to voltage swings experienced during testing

b. Findings

No findings of significance were identified.

2. Complete System Walkdown

a. Inspection Scope

The inspectors conducted one detailed walkdown / review involving the alignment and condition of the Unit 1 containment valve injection (NW) system. The inspectors utilized licensee procedures, as well as licensing and design documents to verify that the system (i.e. pump, valve, and electrical) alignment was correct. During the walkdowns, the inspectors also verified that: valves did not exhibit leakage that would impact their function; major portions of the system and components were correctly labeled; hangers and supports were correctly installed and functional; and essential support systems

were operational. In addition, pending equipment issues were reviewed to determine if the identified deficiencies significantly impacted the system's functions. Items included in this review were: the operator workaround list, system Health Reports, and outstanding maintenance work requests/work orders. A review of open Problem Identification Process (PIP) reports was also performed to verify that the licensee had appropriately characterized and prioritized NW-related equipment problems for resolution in the corrective action program. Documents reviewed during this inspection are listed in the Attachment to this report.

b. Findings

No findings of significance were identified.

1R05 Fire Protection

Fire Protection Walkdowns

a. Inspection Scope

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

- Unit 1, 'A' Essential Switchgear Room, 577 foot elevation
- Unit 1, 'B' Essential Switchgear Room, 560 foot elevation
- Auxiliary Building Ventilation Equipment Area, 594 foot elevation
- Unit 1 refueling water storage tank (FWST)
- Unit 2 FWST
- Unit 2 'A' Diesel Generator Room
- Unit 1 KC Pump Area; Auxiliary Building, 560 foot elevation
- Unit 1 Auxiliary Feedwater (CA) Pump Room, Auxiliary Building 543 foot elevation (Room 250)

b. Findings

No findings of significance were identified.

1R06 Flood Protection Measures

a. Inspection Scope

Internal Areas (Two Samples)

The inspectors reviewed the Updated Final Safety Analysis Report and flood analysis documentation associated with internal plant areas to determine the effect of flooding. The inspectors reviewed the licensee's internal flood protection features for two areas located in the auxiliary building. The inspectors chose the auxiliary building 560 foot and 522 foot elevations and the CA pump pits and rooms for the annual samples. The internal areas were selected and walked down based on the flood analysis calculation. Through observation and design review the inspectors reviewed sealing of doors, holes in elevation penetrations, sump pump operations, and potential flooding sources.

External Areas (One Sample)

The inspectors reviewed the licensee's external flood protection features. The inspectors performed a walkdown of external site areas including Nuclear Service Water (RN) conduit manhole bunkers to assess flood protection measures. Through observation and design review the inspectors reviewed sealing of doors, cables and splices subject to submergence, sump pump and level circuit operations, and potential flooding sources.

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

b. Findings

No findings of significance were identified.

1R07 Heat Sink Performance

1. Annual Sample

a. Inspection Scope

The inspectors observed the performance of PT/2/A/4400/006A, Containment Spray (NS) Heat Exchanger (HX) 2A Heat Capacity Test, and evaluated the test data for acceptable performance. The inspectors also conducted discussions with test personnel concerning system configuration and heat load requirements, the methodology used in calculating heat exchanger performance, and the method for tracking the status of tube plugging activities via the data logger and computer processing equipment.

b. Findings

No findings of significance were identified.

2. Biennial Sample

a. Inspection Scope

The inspectors reviewed inspection records, test results, maintenance work orders, and other documentation to ensure that HX deficiencies that could mask or degrade performance were identified and corrected. The test procedures and records were also reviewed to verify that these were consistent with Generic Letter (GL) 89-13 licensee commitments, and industry guidelines. Risk significant heat exchangers (HX) reviewed included the KC HXs, NS HXs, and the Diesel Generator Cooling Water (KD) HXs.

The inspectors reviewed HX inspection and cleaning work instructions, work maintenance history, and completed inspection records for all the safety related HXs selected. In addition, the inspectors observed actual cleaning of the 1A and 1B KC HXs. The documents were reviewed to verify inspection methods were consistent with industry standards, to verify HX design margins were being maintained, and to verify performance of the HXs under the current maintenance frequency was adequate.

The inspectors also reviewed general health of the service water system via review of design basis documents, system health reports, chlorination/dispersant treatment trending and performance reports, and discussions with the HX and service water (RN) system engineers. In addition, component health was verified via review of RN pump data trending such as differential pressure and flow rate. The inspectors performed corrective action data searches for critical RN valve problems to find undisclosed problem trends and to corroborate the appropriateness of actions taken with known valve problems. These documents were reviewed to verify design basis were being maintained and to verify adequate RN system performance under current preventive maintenance, chemical treatments, cleanings, inspections, and test frequencies

The inspectors also verified RN system corrosion and degradation were being monitored and addressed via review of corrosion control program procedures, RN pipe replacement and material condition action plans. RN header flushes, system flow balance, and flow monitoring with chemical injection were also reviewed to verify design flow conditions to components were maintained and verified. The inspectors reviewed the licensee's RN Project activities that are in progress for piping replacement, weld repair, and piping coating over the next several years.

The inspectors reviewed PIPs for potential common cause problems and problems which could affect system performance to confirm that the licensee was entering problems into the corrective action program and initiating appropriate corrective actions. These PIPs included actions regarding RN weld problems, valve problems, and component flow degradation issues including corrosion products and silt found in heat exchangers.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification

a. Inspection Scope

The inspectors observed simulator exams conducted on July 20 and August 3, 2005, to assess the performance of licensed operators. The scenarios, Active Simulator Exams (ASE) 21 and 32 were observed. ASE 21 involved a rod control malfunction; a dropped control rod: a large break loss of coolant accident with the main turbine failing to trip: and a loss of offsite power following transition to cold leg recirculation. ASE 32 involved a steam generator tube rupture and an anticipated transient without a scram. The inspection focused on high-risk operator actions performed during implementation of the emergency operating procedures, emergency plan implementation and classification, and the incorporation of lessons learned from previous plant events. Through observations of the critique conducted by training instructors following the exam session, the inspectors assessed whether appropriate feedback was provided to the licensed operators regarding identified weaknesses.

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness

a. Inspection Scope

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

- 2VQ-3B (Containment Air Addition Release fan suction from containment isolation valve) failure to close
- Diesel Generator voltage regulator potentiometer voltage swings
- RN system relay failures on 2RN-38B (2B RN pump discharge isolation valve) and 1RN-38B (1B RN pump discharge isolation valve)

b. Findings

Commercial Grade Dedication Program

Introduction: A Green, NRC-identified, non-cited violation was identified for inadequate control of purchased equipment as required by 10 CFR 50, Appendix B, Criterion VII, in

that, the licensee's commercial grade dedication program did not verify manufacturing defects existed on previously dedicated commercial grade relays of which the manufacturer was aware of, but was not obligated to inform the licensee.

Description: A manufacturing defect existed on six installed 120 Volt alternating current (VAC) relays manufactured between January, 2003 to December, 2004 without the knowledge of the dedicating authority, the Catawba Nuclear Station. The six relays were installed in the RN system in safety-related applications. Two of the relays failed in motor operated valve control circuits during a valve movement demand signal. The relays were installed in the discharge isolation valve control circuits for the 1A, 2A, and 2B RN pumps; the motor cooler isolation valve circuit for the 2B RN pump; and the 'B' RN pump structure pit supply isolation valve for both the Lake Wylie and Standby Nuclear Service Water Pond sources, 1RN4B and 1RN6B respectively. The two failures occurred on the discharge valves for the 1B RN pump and 2B RN pump on different dates. After the second failure, the licensee contacted the vendor and found that the relay coil had not been annealed and therefore was causing the coil to draw an excessive amount of current that caused the relay to fail and in some cases the circuit fuses to open. Since three RN pump discharge valves were affected by the manufacturing defect, concerns were raised by the inspectors for common cause failure of the RN system. The inspectors found that the licensee's commercial grade dedication program periodically reviewed the technical evaluation associated with the procured equipment but the review asked the vendor whether any changes to design or material of manufacturing occurred. This question identified changes to original manufacturing specification, but did not ensure that operating experience issues that the vendor became aware of based on installed equipment service data were reviewed for applicability to dedicated equipment.

Analysis: The performance deficiency associated with this finding was that the licensee's commercial grade dedication program did not verify manufacturing defects existed on previously dedicated commercial grade relays of which the manufacturer was aware of but was not obligated to inform the licensee. The licensee was responsible to acquire the necessary information to assure the procured equipment maintained original design specifications and quality control. This finding was greater than minor because it affected an objective and attribute of the Reactor Safety, Mitigating Systems Cornerstone to ensure the availability and reliability of systems that respond to initiating events to prevent undesirable consequences. The finding was assessed using the SDP for Reactor Inspection Findings for At-Power Situations. The finding was evaluated using the SDP Phase 2 plant notebook and it was determined a Phase 3 evaluation was required, based on the increase in the probability failure rate of the relays which represented an increase in the likelihood of the loss of safety function of the RN system and its associated initiating event frequency. A time line was constructed to verify the time periods the various relays were in service. Conservative screening values were established for relay failure rates, based on number of demands experienced by the inservice relays. Fault trees were developed to estimate the relay failure impact on the Loss of Service Water initiating event frequency. Using these conservative values, the NRC's plant risk model was run to determine an upper limit for the risk due to the finding. The risk associated with the finding was determined to be GREEN.

Enforcement: 10 CFR Part 50, Appendix B, Criterion VII, requires, in part, that measures be established to assure that purchased equipment conforms to the procurement documents. Contrary to the above, on August 2, 2005, after the failure of a second 120 VAC relay installed in the RN system, the inspectors identified that the licensee's commercial grade dedication program failed to assure that the relays met procurement documents since the program did not verify manufacturing defects existed on previously dedicated commercial grade relays. The licensee, as the dedicating authority, was responsible for acquiring the necessary information to assure the procured equipment maintained original design specifications and quality control, however the commercial grade dedication program did not adequately review operating experience information. This finding is being treated as an NRC-identified NCV in accordance with NRC Enforcement Guidance. The licensee entered the issue into its corrective action program as PIP C-05-4651. Because this violation was of very low safety significance and because it was entered into the licensee's corrective action program, this violation is being treated as a NCV, consistent with Section VI.A of the NRC Enforcement Policy: NCV 05000413, 414/2005004-01, Inadequate Control Of Purchased Equipment.

1R13 Maintenance Risk Assessments and Emergent Work Evaluation

a. Inspection Scope

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

- Review of planned and emergent work following receipt of tornado watch in York county on 07/07/05
- Removal of the 2A train of KC for heat exchanger tube cleaning
- Removal of the 1B KC heat exchanger for tube cleaning during an "A" train work week
- Review of planned and emergent work declaration of the 2B diesel generator being inoperable due to voltage oscillations observed during testing
- Review of planned and emergent work with Orange grid status due to persistent relay issues at the Oconee Nuclear Station
- Review of planned and emergent work following receipt of tornado watch in York county on 08/30/05 and potential severe weather from Hurricane Katrina
- Review of activities associated with the cofferdam construction at the RN intake structure in Lake Wylie

b. Findings

Introduction: A Green NCV was identified for the failure to follow the Duke Power Company Lifting Program procedure as required by 10 CFR 50, Appendix B, Section II, Quality Assurance (QA) Plan, when the inspectors determined that a complex lift was planned to occur over a safety-related structure with no developed or documented lift plan.

Description: On September 1, 2005 the licensee planned to perform a heavy lift of a 23-ton steel structure over the top of the submerged RN lake intake structure. This evolution was to be performed as part of a cofferdam construction activity to be built around the RN intake structure. The licensee planned to install the cofferdam to de-water the RN system intake piping and allow the piping to be cleaned, inspected, and repaired. The lift was to take place with the use of a crane located on a barge. A steel structure was to be placed on top of the RN intake structure. The inspectors questioned the operators about the lift and found that they were not aware of the details concerning the lift. When questioned by the inspectors, the licensee initially stated that they did not need a documented lift plan, citing a lift plan that had been generated by a vendor. The inspectors informed the licensee that the procedure required that a documented, complex lift plan be used whenever an uncontrolled movement or loss of the load could adversely affect any safety-related systems or structures. The vendor lift plan document did not meet the licensee's requirements as it only proved that the crane lift from the barge met safety requirements.

The inspectors found that the operators were not aware of the significance of the load that was being lifted and the potential impact on system operability if the load impacted the structure. The inspectors concluded that the licensee was not following their procedure requirements. The inspectors discussed with the licensee that maintaining vendor/contractor control required that the vendor follow site procedures and guidance. Following discussions with the licensee a documented complex lift plan was developed, continuous communications were established between the lift location and the control room, and the operators were thoroughly briefed on the lift plan prior to the lift evolution taking place.

The submerged RN lake intake structure was a designated safety-related structure and was credited for single failure in conjunction with the standby nuclear service water pond (SNSWP). In the event the load impacted and damaged the intake structure a potential loss of RN could occur until the assured water source could be transferred manually or an automatic transfer occurred to the SNSWP. The licensee had not completed an engineering analysis to address load impact on the RN intake structure due to the complexity of such an analysis and as a result, the effect of a loss of the load was therefore unknown.

Analysis: The finding is greater than minor because the finding could be viewed as a precursor to a significant event. Without a complex lift plan to ensure quality measures were taken and compensatory actions were considered, had the 23-ton steel structure fallen on the RN lake intake structure, a potential loss of RN may have occurred which would require prompt action by the operators to transfer the assured water source to the

standby nuclear service water pond or require an automatic action to transfer to the SNSWP. Damage to the RN lake intake structure could have adversely impacted reactor safety and affected the availability and reliability of a mitigating system performance attribute of the reactor safety cornerstone, since one of the single failure credited water sources would not have been available. The finding was determined to be of very low safety significance, using the significance determination phase 1 worksheet, because the lack of a documented complex lift plan did not result in the loss of safety function of the RN system as the lift was deferred until a plan was developed. This finding involved the cross-cutting aspect of human performance since individuals did not follow or implement the required steps of the Duke Power Company Lifting Program procedure.

Enforcement: 10 CFR 50, Appendix B, Section II, Quality Assurance Plan, requires in part that the licensee's quality assurance program shall provide control over activities affecting the quality of identified structures and systems to the extent consistent with their importance. The program shall take into account the need for special controls. The Duke Energy Corporation Topical Report Quality Assurance Program, Duke-1-A, Section 17.3.2.14, Document Control, stated in part that for specific operational activities associated with QA Condition 1 structures and systems it was required that such activities be accomplished in accordance with procedures. The Duke Power Company Lifting Program procedure, Lifting Checklist, stated in part that a lift evolution was considered a complex lift, requiring a documented lift plan if during the lift an uncontrolled movement or loss of the load could adversely affect any safety-related system or structure. Contrary to the above, on September 1, 2005, the licensee failed to develop and document a complex lift plan, as required by the Duke Power Company Lifting Program procedure, in preparation to lift a 23-ton steel structure, from a crane located on a floating barge, and place it on top of the submerged, safety-related, RN lake intake structure. Because this issue was of very low safety significance and was placed in the corrective action program as PIP C-05-5372, this violation is being treated as a non-cited violation in accordance with Section VI.A.1 of the Enforcement Policy, and is identified as NCV 05000413,414/2005004-02, Failure to Develop a Complex Lift Plan.

1R14 Personnel Performance During Nonroutine Plant Evolutions

a. Inspection Scope

On June 24, 2005, a service barge was conducting preparation activities associated with the RN piping inspection and refurbishment project above the intake structure in Lake Wylie. The barge sank unexceptedly, coming to rest on top of the RN intake structure. The control room was immediately notified and swapped over the RN suction from the lake to the nuclear service water pond. The inspectors verified operator actions and use of procedures in stabilizing the unit as well as actions taken to remove the barge and realign RN suction to the lake.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations

a. Inspection Scope

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

- Unexpected Technical Specification Action Item Log (TSAIL) entries due to faulty relays identified in several motor operated valve (MOV) control circuits associated with RN valves (PIPs C-05-4652, 4655 and 4656)
- Failure of valve 2VQ-3B, VQ Fan Suction from Containment Isolation Valve, to close during the performance of a surveillance procedure (PIP C-05-4574)
- Through-wall leak identified on the 1B RN discharge header downstream of 1RN-36; 1B NS Heat Exchanger Outlet Isolation Valve (PIP C-05-4728)

b. Findings

No findings of significance were identified.

1R19 Post-Maintenance Testing

a. Inspection Scope

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

- Post-maintenance functional testing of 2RN-38B; 2B RN pump discharge isolation valve, following relay replacement
- Operability run of the 2B diesel generator following voltage oscillations experienced during normal monthly periodic test (PT)
- Functional test of the 2B diesel generator room emergency ventilation fans following the failure of both fans to start automatically on August 9, 2005
- Functional test of the 2B diesel generator room emergency ventilation fans following the failure of both fans to start automatically on September 6, 2005
- Post maintenance testing on the Unit 2 CA pump turbine #2

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing

a. Inspection Scope

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

Surveillance Tests:

- Unit 2 reactor coolant sample analysis
- Unit 2 reactor coolant system leakage calculation
- 1B diesel generator operability test
- 1A and 1B simultaneous diesel generator start
- Unit 2 Reactor Coolant (NC) System Leakage Calculation

In-Service Tests:

- Unit 2 ‘A’ Containment Spray Pump Performance Test (PT/2/A/4200/004B)
- In-Service Test of 1NW-20A; NW Surge Chamber 1A Outlet Valve, (PT/1/A/4200/027; Enclosure 13.5)

b. Findings

No findings of significance were identified.

1R23 Temporary Plant Modifications

a. Inspection Scope

The inspectors reviewed one temporary station modification associated with defeating the failed power relay for the 2ATE transformer, which resulted in a locked-in control room annunciator to determine whether: the modification was properly installed; the modification did not affect system operability, drawings and procedures were appropriately updated; and post-modification testing was satisfactorily performed. Documents reviewed are listed in the Attachment to this report.

b. Findings

No findings of significance were identified.

2. RADIATION SAFETY

Cornerstone: Occupational Radiation Safety (OS)

2OS1 Access Controls To Radiologically Significant Areas

a. Inspection Scope

Access Controls Licensee program activities for monitoring workers and controlling access to radiologically significant areas and tasks were inspected. The inspectors evaluated procedural guidance; directly observed implementation of administrative and established physical controls; assessed worker exposures to radiation and radioactive material; and appraised radiation worker and technician knowledge of, and proficiency in implementing radiation protection program activities.

During the inspection, radiological controls for selected operations and maintenance activities were observed and discussed. Briefings and/or radiation control field activities were observed for on-going valve maintenance, a reactor coolant system (NC) primary filter change-out and movement to onsite storage facility, and ‘at power' lower containment surveillances. Inspector evaluations included, as applicable, Radiation Work Permit (RWP) details, use and placement of dosimetry and air sampling equipment, electronic dosimeter (ED) set-points, and monitoring and assessment of worker dose from direct radiation and airborne radioactivity source terms. Effectiveness of established controls were assessed against area radiation and contamination survey results, and occupational doses received. Physical and administrative controls and their implementation for extra-high radiation area (EHRA) locations and for storage of highly activated material within the spent fuel pool (SFP) areas were evaluated through discussions with licensee representatives, direct field observations, and record reviews.

Occupational worker adherence to selected RWPs and Health Physics Technician (HPT) proficiency in providing job coverage were evaluated through direct observations of staff performance during job coverage and routine surveillance activities, review of selected exposure records and investigations, and interviews with licensee staff. Radiological postings and physical controls for access to designated high radiation areas (HRA) and EHRA locations within Auxiliary Building (AB) and SFP areas were evaluated during facility tours. In addition, the inspectors independently measured radiation dose rates and evaluated established posting and access controls for selected AB locations and equipment including waste storage facilities; volume control tank and containment spray equipment and locations; and AB equipment/piping hot spots. Occupational exposures associated with direct radiation, potential radioactive material intakes, and from discrete radioactive particle or dispersed skin contamination events for calendar year (CY) 2004 and year-to-date 2005 were reviewed and discussed.

Radiation protection program activities were evaluated against 10 CFR 19.12; 10 CFR 20, Subparts B, C, F, G, H, and J; Updated Final Safety Analysis Report (UFSAR) details in Section 12, Radiation Protection; Technical Specification (TS) Sections 5.4, Procedures; and 5.7, High Radiation Area; and approved licensee procedures. Licensee guidance documents, records, and data reviewed within this inspection area are listed in Sections 2OS1of the report Attachment.

Problem Identification and Resolution Licensee Corrective Action Program (CAP) documents associated with access controls to radiologically significant areas were reviewed and assessed. The inspectors evaluated the licensee's ability to identify, characterize, prioritize, and resolve the identified issues in accordance with Nuclear System Directive (NSD)-208, Problem Investigation Process (PIP), Revision (Rev.) 27. Licensee audits, self-assessments and PIP documents related to access controls that were reviewed and evaluated in detail for this program area are identified in Sections 2OS1 and 4OA5 of the report Attachment.

b. Findings

Introduction. A Green NRC-identified NCV of 10 CFR 20.1501(a) was identified for failure to conduct adequate surveys of the Unit 1 (U1) and Unit 2 (U2) airborne radionuclides for workers making lower containment ‘at power' entries.

Description. The inspectors' review and discussion of access controls for workers making U2 lower containment entries ‘at power' during the week of August 22, 2005 identified inadequacies in licensee programs for evaluating lower containment airborne radionuclide concentrations. Specifically, the inspectors identified that grab samples collected and analyzed to assess initial airborne hazards prior to entry were not representative of workers' breathing zones. Initial airborne radionuclide concentration data used to assess lower containment airborne conditions were determined from grab samples collected from the sample line supplying the U2 Containment Air Release and Addition System (VQ) effluent monitor (EMF)-38,-39,-40 skid. Review and discussion of applicable procedures and actual grab sampling, e.g., RA1/1100/003, U1 Upper or Lower Containment Building Power Entry, indicated that applicable guidance and/or licensee actions did not address alignment of the U1/U2 VQ EMF-38, -39, -40 skid sample line suction to assure representative air samples for personnel entering lower containment. The inspectors noted that the U2 skid's sample line was configured to take suction from a single sample point in upper containment and two sample points in lower containment, and thus, was not representative of the worker breathing zones within lower containment. For example, grab samples collected using the observed U2 VQ EMF monitor's skid sample line suction alignment provided noble gas concentrations which were approximately 66 percent of reported values for lower containment breathing zone air samples collected by HPT staff. Based on discussions with knowledgeable licensee representatives, the inspectors noted that prior to February 2005 airborne radionuclide concentration data used to evaluate U1/U2 lower containment ‘at power' entries were determined from samples collected using the U1/U2 VQ EMF-38, -39, -40 skid supply line configured to take suction entirely from upper containment. The inspectors noted that either of the U1/U2 VQ sample alignments discussed above for

approximately 80 lower containment ‘at power' entries made between August 2004 and July 2005 above would result in non-representative samples for noble gas, particulate, and/or iodine radionuclides, if present.

Licensee representatives stated that subsequent to identification of concerns regarding the adequacy of the U1/U2 VQ EMF-38, -39, -40 monitors in February 2005 to meet leak rate detection requirements, HPTs were directed to collect supplemental breathing zone grab samples for analysis of airborne radionuclides for workers conducting ‘at power' containment entries. However, the inspectors noted that the supplemental sampling techniques and associated analyses were inadequate, in that the directive was not proceduralized, nor had evaluations been conducted to assure that the sample size and/or time between sample collection and subsequent analysis were adequate to accurately measure selected radionuclides including short-lived isotopes which could be present.

Analysis. The inspectors determined that the failure to conduct adequate surveys for workers entering lower containment at power was greater than minor in that grab samples collected using the observed U1/U2 VQ EMF-38, -39, -40 skid sample line configuration were not representative of lower containment airborne radionuclide concentrations. The failure to assure adequate collection and analysis of supplemental breathing zone grab samples were performance deficiencies associated with the program and process attributes of the Occupational Radiation Safety Cornerstone and affected the cornerstone objective to accurately monitor occupational worker exposure to radiation and radioactive materials. The finding was evaluated using the Occupational Radiation Safety Significance Determination Process (SDP) and was determined to be of very low safety significance because all individuals were monitored for exposures from external radiation fields and from internally deposited radionuclides, as appropriate, and no individuals exceeded either internal or external exposure limits. The finding involved the cross-cutting aspect of Problem Identification and Resolution because the licensee failed to properly evaluate the effect of variable U1/U2 VQ EMF - 38, -39, -40 skid supply line suction alignments to assure representative sampling for airborne radionuclide hazards for personnel entering U1/U2 lower containment areas.

Enforcement. 10 CFR 20.1501(a) requires each licensee to make or cause to be made surveys that may be necessary to comply with regulations in this part, and are reasonable under the circumstances to evaluate the magnitude and extent of radiation levels, concentration/quantities of radioactive material, and the potential radiological hazards.

Contrary to the above, prior to August 22, 2005, the licensee failed to conduct adequate surveys of airborne radionuclide concentrations for workers making ‘at power' lower containment entries. Because the failure to conduct the surveys was of very low safety significance and has been entered into the corrective action program (PIP Number C-05-05169), this violation is being treated as an Non-cited Violation (NCV), consistent with Section VI.A of the NRC Enforcement Policy: NCV 50-413, 414/2005-004-03, Failure to conduct adequate initial surveys of lower containment airborne radionuclides for personnel making ‘at power' entries.

2OS3 Radiation Monitoring Instrumentation and Protective Equipment

a. Inspection Scope

Radiation Monitoring Instrumentation and Post-Accident Sampling Systems During tours of the auxiliary building, Radiologically Controlled Area (RCA) exit points, and administrative building areas, the inspectors observed installed radiation detection equipment including Area Radiation Monitor (ARM), Personnel Contamination Monitor (PCM), Portal Monitor (PM), Small Article Monitor (SAM), and Whole Body Counter (WBC) equipment. During the tours, the adequacy of the equipment's physical location and material condition were evaluated.

From review of selected records and discussions with the system engineer, the inspectors evaluated completion and adequacy of equipment calibrations, and assessed system operability and reliability. The two most recent calibration records for ARM 0EMF-43A, Control Room Air; ARM 1EMF-11, U1 Incore Instrument Room; ARM 1 EMF-4, U1 Charging Pump Area; ARM EMF-23, Waste Solidification Pad; and ARM 2EMF-11, U2 Main Steam Line Loop 'B', were evaluated against required calibration frequencies and technical requirements. Status of, and potential changes to ARM alarm setpoints for impact on licensee Emergency Action Levels also were reviewed. In addition, the inspectors reviewed and discussed changes to Post-Accident Sampling System (PASS) capabilities and selectively evaluated material condition of current liquid and gaseous sampling equipment.

During equipment walk-downs, the inspectors observed functional checks of various fixed and portable radiation monitoring/detection instruments. The observations included source checks of PCM, PM, SAM, and WBC equipment. The inspectors reviewed calibration records and discussed the functional testing and testing intervals for selected PCM and PM equipment located at the RCA and protected area exits. PCM equipment detection capabilities were demonstrated using a low-level mixed radionuclide source that was passed through the equipment. The operability and analysis capabilities of the WBC equipment were evaluated. WBC equipment operations and training of staff were reviewed and discussed with responsible personnel.

For selected portable survey instrumentation used in field tasks, the inspectors observed HPT selection of survey instruments, completion of required performance and/or functional checks, and use of instruments during selected task coverage. Availability of portable instruments for licensee use was evaluated through observation of instruments staged for issue and discussion with licensee personnel. For frisker and portable survey instruments in the field, the inspectors noted operability and verified calibration dates. Calibration data for four portable instruments staged or recently used for coverage of radiation workers were reviewed.

Operability and reliability of selected radiation detection instruments were reviewed against 10 CFR Part 20; TS Section 5.4, Procedures; Selected Licensee Commitments (SLC) Manual Section 16.7; UFSAR Chapters 11 and 12; and applicable licensee

procedures. Documents reviewed during the inspection are listed in Sections 2OS3 and 2PS3 of the report Attachment.

Self-Contained Breathing Apparatus (SCBA) and Protective Equipment Selected SCBA units staged for emergency use in the Control Room and other locations were inspected for material condition and adequate air pressure. The inspectors also reviewed the previous maintenance records for vital components of two SCBA units. In addition, certification records associated with supplied-air quality were reviewed and discussed.

Qualifications of staff responsible for testing and repairing SCBA equipment were evaluated through review of training records. Control Room operators were interviewed to determine knowledge of available SCBA equipment locations, including corrective lens inserts if needed. Respirator qualification records were reviewed for licensed operators working the August 23, 2005 'B' Shift.

Licensee activities associated with maintenance and use of respiratory protection equipment were reviewed against 10 CFR Part 20; Regulatory Guide (RG) 8.15, Acceptable Programs for Respiratory Protection; American National Standards Institute (ANSI)-Z88.2-1992, American National Standard for Respiratory Protection; and applicable licensee procedures. Documents reviewed during the inspection are listed in Section 2OS3 of the report Attachment.

Problem Identification and Resolution Eight PIPs and three group assessments associated with instrumentation and protective equipment were reviewed and assessed. Inspectors evaluated the licensee's ability to identify, characterize, prioritize, and resolve the identified issues in accordance with NSD- 208, PIP, Rev. 27. Documents reviewed are listed in Section 2OS3 of the report Attachment.

b. Findings

No findings of significance were identified.

Cornerstone: Public Radiation Safety

2PS1 Radioactive Gaseous and Liquid Effluent Treatment and Monitoring Systems

a. Inspection Scope

Effluent Monitoring and Radwaste Equipment During inspector walk-downs, accessible sections of the U1 and U2 liquid radioactive waste (radwaste) system including waste monitor tanks A and B, system piping and valves, and Waste Liquid Discharge (1EMF-49), Turbine Building Sump (1EMF-31), and Boron Recycle Evaporator Condensate (1EMF-47) monitors were assessed for material condition and conformance with current system design diagrams. Inspected components of the gaseous effluent process and release system included waste gas decay tanks, hydrogen recombiners, the U1/U2 unit vent air particulate/noble gas/iodine monitor (1/2-EMF-35,36,37) skids,

Waste Gas Discharge monitor (1EMF-50), Auxiliary Building Ventilation monitor (1EMF-41), Condenser Air Ejector Exhaust monitor (2EMF-33), MTB Unit Vent Noble Gas monitor (1EMF-58), Annulus Noble Gas monitor (1EMF-60), and associated effluent sample lines. The inspectors interviewed chemistry and radiation protection personnel regarding radwaste equipment configuration, effluent monitor operation, and system modifications.

The operability, availability, and reliability of selected effluent process sampling and detection equipment used for routine and accident monitoring activities were reviewed and evaluated. The inspectors reviewed results of calibrations and/or observed performance of surveillances for selected process monitors, flowmeters, and air filtration systems, including 1EMF-35, 1EMF-36, 1EMF-37, and 0EMF-41. The two most recent surveillances on the Containment Ventilation High Efficiency Particulate Air (HEPA)/charcoal air treatment systems, VQ1B and VQ2B, were also reviewed. The inspectors evaluated out-of-service (OOS) effluent monitors and compensatory action data for the period of April 2003 through July 2005.

Installed configuration, material condition, operability, and reliability of selected effluent sampling and monitoring equipment were reviewed against details documented in 10 CFR Part 20; Regulatory Guide (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 Plants, June 1974; ANSI-N13.1-1969, Guide to Sampling Airborne Radioactive Materials in Nuclear Facilities; TS Section 5; the Offsite Dose Calculation Manual (ODCM), Rev. 47; SLC Manual, Section 16.11; and the UFSAR, Chapter 11. Procedures and records reviewed during the inspection are listed in Section 2PS1 of the report Attachment.

Effluent Release Processing and Quality Control (QC) Activities Activities associated with gamma spectroscopy and alpha- and beta-emitter detection were discussed with count room technicians and radiation protection supervision. The inspectors observed performance of count room activities, assessing count room technician knowledge and proficiency. Spectroscopic analysis of effluent samples and subsequent assessment of isotopic content were discussed with cognizant licensee personnel. The inspectors reviewed the daily QC check data of August 24, 2005 for four germanium detectors, the two liquid scintillation (LS) counters, and two automatic planchet counting (APC) systems. For the same germanium detectors and LS counters, the inspectors reviewed December 2004 - August 2005 QC control chart trending graphs. Equivalent data were reviewed for the APC systems for the period of April - August 2005. The inspectors also reviewed the most recent calibration records for germanium detectors 2 and 4, APC detectors 1295 and 1299, and LS counter 1293. In addition, results of the radiochemistry cross-check program were reviewed from the first quarter of CY 2003 through the first quarter of CY 2005.

Procedures for effluent sampling, processing, and release were evaluated for consistency with licensee actions. Three liquid and two gaseous release permits were reviewed against ODCM specifications for pre-release sampling and effluent monitor setpoints. The ODCM was reviewed and discussed with responsible licensee

representatives to identify and evaluate any changes made since January 1, 2003. The inspectors also reviewed CY 2002, CY 2003, and CY 2004 Annual Effluent Reports for effluent release data trends and anomalous releases.

Observed task evolutions, count room activities, and offsite dose results were evaluated against details and guidance documented in 10 CFR Part 20 and Appendix I to 10 CFR Part 50; ODCM; RG 1.21; RG 1.109, Calculation of Annual Doses to Man from Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10 CFR Part 50 Appendix I, October 1977; and TS Section 5. Procedures and records reviewed during the inspection are listed in Section 2PS1 of the report Attachment.

Problem Identification and Resolution Selected PIP documents and audits associated with effluent release activities were reviewed and assessed. The inspectors evaluated the licensee's ability to identify, characterize, prioritize, and resolve selected issues in accordance with NSD-208, PIP, Rev 27. Reviewed documents are listed in Section 2PS1 of the report Attachment.

b. Findings

No findings of significance were identified.

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

a. Inspection Scope

REMP Implementation The inspectors reviewed the licensee's Annual Radiological Environmental Operating Reports for 2003 and 2004 which described implementation of the REMP and provided an assessment of the program results. Information regarding surveillance results, analysis of data, land use census, and the interlaboratory comparison program were evaluated. Equipment operational status and staff proficiency for implementing REMP activities were assessed through review of records, observations of equipment material condition and operating characteristics, and assessment of selected sample collection activities.

The inspectors observed collection of air particulate filters and charcoal cartridges at air sampling stations and assessed sample collection methodology and techniques. Calibration procedures and records for the air sampling stations were reviewed. The inspectors also observed thermoluminescent dosimeters (TLDs) placement at locations described in the ODCM. Using Global Positioning System equipment, the inspectors independently assessed selected TLD and air sampling locations and compared the current location data to ODCM specified locations.

Through the above reviews and observations, the licensee's practices and implementation of their radiological monitoring program were evaluated by the inspectors for consistency with the ODCM, the UFSAR, TS, and 10 CFR Part 20 requirements.

Meteorological Monitoring Program The inspectors reviewed the operability of the meteorological monitoring equipment and operator access to meteorological data in the control room. Licensee program activities to assure accuracy and availability of meteorological monitoring data were evaluated. Calibration records for recent calibrations of the meteorological monitoring instruments for air temperature, wind speed and direction were reviewed. Licensee personnel primarily responsible for equipment maintenance and surveillance were interviewed by the inspectors concerning equipment performance and reliability. Availability of Meteorological data during the assessment period was reviewed and discussed with licensee representatives.

Meteorological instrument operation, calibration, and maintenance were reviewed against details listed in the UFSAR, Chapter 2; NRC Safety Guide 23, Onsite Meteorological Programs-1972; ANSI -3.11-2000, Determining Meteorological Information; RG 1.21; and RG 4.15, Quality Assurance for Radiological Monitoring Programs (Normal Operation) - Effluent Streams and the Environment, December 1977 and applicable licensee procedures. Reviewed documents and data are listed in the report Attachment.

Unrestricted Release of Materials from the Radiologically Controlled Area (RCA) Radiation protection program activities associated with the unconditional release of potentially contaminated material or personnel from the RCA were evaluated. The evaluation included review of calibration records associated with PCM, PM, and SAM equipment located at the RCA portal and protected area exits. The inspectors also observed source checking of personnel contamination monitors, portal monitors, and material survey monitors. Source activity and radionuclides used for checks and equipment minimum detectable activities were discussed with licensee personnel.

Licensee guidance and implementation of RCA exit monitoring activities were evaluated against 10 CFR Part 20 requirements. The inspectors verified that radiation detection sensitivities were consistent with NRC guidance in Inspection and Enforcement (IE) Circular 81-07 Control of Radioactively Contaminated Material, May 14, 1981, and IE Information Notice 85-92, Surveys of Wastes Before Disposal from Nuclear Reactor Facilities. Documents reviewed are listed in the report Attachment.

Problem Identification and Resolution The inspectors reviewed audits and selected corrective actions associated with REMP operations, meteorological monitoring and the program for unrestricted release of materials from the RCA. The inspectors assessed the licensee's ability to identify, characterize, prioritize, and resolve the identified issues in accordance with licensee procedures. Specific corrective action documents reviewed and evaluated in detail for these program areas are identified in the report Attachment.

b. Findings

No findings of significance were identified. However, the following examples of a minor violation was screened using Supplement IV of the Enforcement Policy and are being documented as items of agency wide concern as specified in Inspection Manual Chapter 0612.

A minor violation of 10 CFR Part 20.1802 was identified for failure to maintain control of licensed material. Shortly after the Catawba Nuclear Station (CNS) Unit 2 End-of-Cycle 13 Refueling Outage (2EOC13) ended, the licensee was informed that small quantities of licensed radioactive material were discovered on clothing of workers during in-processing whole body count analyses conducted at both the Shearon Harris (October 13, 2004) and HB Robinson (October 18, 2004) nuclear plants. The contaminated individuals, most recently, worked for the licensee during the 2EOC13 outage. The approximate levels of clothing contamination ranged from 8 - 10 nanocuries (nCi) of Cobalt-58 and approximately 50 nCi of mixed isotopes. For both cases, the inspectors verified that the release of the material did not result from performance deficiences and that the quantities of radioactive material were below the detection limits of the licensee's personnel contamination monitoring equipment.

The inspectors reviewed the licensee's program for release of potentially contaminated personnel and equipment, and identified no concerns associated with the technical bases for the monitoring equipment used nor found any performance deficiencies regarding program implementation. These issues have been entered into the licensee's corrective action program as PIPs C-04-05506 and C-04-05627.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification

a. Inspection Scope

The inspectors sampled licensee data to verify the accuracy of reported performance indicator (PI) data for the periods listed below. To verify the accuracy of the reported PI elements, the reviewed data was assessed against PI definitions and guidance contained in NEI 99-02, Regulatory Assessment Indicator Guideline, Rev. 3.

Public Radiation Safety Cornerstone The inspectors reviewed the Radiological Effluent Technical Specifications (RETS)/ODCM Effluent Occurrence PI results for the period January 2003 through December 2004. The inspectors reviewed selected OOS effluent radiation monitor and compensatory sampling data, abnormal release results as reported in the 2003 and 2004 Annual Effluent Reports, and selected PIP documents related to RETS/ODCM issues. In addition, the inspectors reviewed cumulative and projected doses to the public for the period January 2003 through December 31, 2004. Documents reviewed are listed in Section 2PS1 of the report Attachment.

Occupational Radiation Safety Cornerstone The inspectors reviewed the Occupational Exposure Control Effectiveness PI results for the period October 2004 through June 2005. For the assessment period, the inspectors reviewed electronic dosimeter alarm records and PIP documents related to controls for exposure significant areas. The reviewed documents reviewed are listed in Sections 2OS1 and 2OS3 of the report Attachment.

b. Findings

No findings of significance were identified.

4OA2 Problem Identification and Resolution (PI & R)

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

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

b. Findings

No findings of significance were identified.

2. Annual Sample Review

a. Inspection Scope

The inspectors selected one PIP for detailed review. PIP C-05-3935 involved a barge that sank and came to rest on top of the RN lake intake. The PIP was reviewed to determine whether the full extent of the issues were identified, an appropriate evaluation was performed, and appropriate corrective actions were specified and prioritized. The inspectors evaluated the PIP against the requirements of the licensee’s corrective action program document and 10 CFR 50, Appendix B.

b. Findings

No findings of significance were identified.

4OA5 Other Activities

1. Operational Readiness of Offsite Power (Temporary Instruction (TI) 2515/163)

This TI was completed in inspection report 05000369,370/2005003. However, after NRC headquarters review of the information provided, additional information related to the TI was requested. The inspectors collected this information from licensee discussions, site procedures, and other licensee documentation. Appropriate documentation of the inspection results was provided to the headquarters staff for further analysis.

2. (Closed) Temporary Instruction (TI) 2515/161, Transport of Control Rod Drive (CRD) in Type A Packages

a. Inspection Scope

The inspectors reviewed shipping logs and discussed shipment of CRDs in Type A packages with shipping staff. The inspectors noted that no shipments of CRDs in Type A packages have been made since January 1, 2002. Further, the inspectors reviewed and discussed Department of Transportation requirements for proper Type A package use with responsible licensee shipping personnel.

b. Findings

No findings of significance were identified.

4OA6 Meetings

Exit Meeting Summary

On October 13, 2005, the resident inspectors presented the inspection results to Mr. D. Jamil, Site Vice President, and other members of licensee management, who acknowledged the findings. The inspectors confirmed that proprietary information that was reviewed, was returned to the licensee, during the inspection period.

4OA7 Licensee Identified Violations

The following violation of very low safety significance (Green) was identified by the licensee and is a violation of NRC requirements which met the criteria of Section VI of the NRC Enforcement Policy, NUREG-1600, for disposition as a NCV.

- 10 CFR 20.1703(a) requires the licensee to implement and maintain a respiratory protection program that includes written procedures regarding maintenance, repair, testing, and quality assurance of respiratory protection equipment. Contrary to the above, from December 5, 2002, through April 21, 2005, the licensee failed to perform SCBA diaphragm functional tests required by Procedure RA/0/1600/001, Radiological Respirators, Rev 2. This item is documented in the licensee's CAP as PIP document C-05-02166. This violation is of very low safety significance because the missed surveillances did not result in failure of the respirators to function as designed.

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

K. Adams, Human Performance Manager
E. Beadle, Emergency Planning Manager
W. Byers, Security Manager
S. Beagles, Chemistry Manager
T. Daniels, Emergency Planning/Fire Protection
J.Ferguson, Safety Assurance Manager
J. Foster, Radiation Protection Manager
R. Glover, Station Manager
W. Green, Reactor and Electrical Systems Manager
G. Hamrick, Mechanical, Civil Engineering Manager
D. Jamil, Catawba Site Vice President
L. Keller, Regulatory Compliance Manager
A. Lindsay, Training Manager
S. Magee, Public Relations
G. Mitchell, Emergency Planning
M. Patrick, Work Control Superintendent
J. Pitesa, Operations Superintendent / Station Manager
T. Ray, Safety Assurance Manager / Maintenance Superintendent
R. Repko, Engineering Manager
R. Smith, Emergency Planning
G. Strickland, Regulatory Compliance Specialist
C. Trezise, Maintenance Superintendent / Operations Superintendent

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

05000413,414/2005004-01	NCV	Inadequate Control Of Purchased Equipment (Section 1R12)
05000413,414/2005004-02	NCV	Failure to Develop a Complex Lift Plan (Section 1R13)
05000413,414/2005004-03	NCV	Failure to conduct adequate airborne radionuclide surveys for workers making ‘at power’ lower containment entries (Section 2OS1).

Closed

2515/161	TI	Transport of Control Rod Drive (CRD) in Type A Packages (Section 4OA5.2)

Discussed

2515/163	TI	Operational Readiness of Offsite Power (Section 4OA5.1)

LIST OF DOCUMENTS REVIEWED

Section 1R04: Equipment Alignment

OP/1/A/6200/019; Containment Valve Injection Water System
Drawing CN-1569-1.0; Flow Diagram of Containment Valve Injection Water System
Tech Spec 3.6.17; Containment Valve Injection Water System and associated bases
OMP 2-33; Valve and Breaker Position Verification, Valve Operation and Pipe Cap Removal and Installation
Tagout 05-0500; 2A KC Hx Cleaning
OP/2/A/6400/005; KC Train 2B Alignment For KC Hx 2A Cleaning
Summary Flow Diagram Component Cooling System (KC) Unit 2

PIPs generated as a result of this inspection

C-05-4802; The process and procedures by which Operations System Valve Checklists are developed, performed and retained can be revised to improve the overall quality of Plant System Configuration Control

Section 1R05: Fire Protection

Pre-Fire Plan for Fire Strategy Area 22; Auxiliary Building 594 level
Pre-Fire Plan for Fire Strategy Area 15; Auxiliary Building 577 level, Unit 1 'A' Essential Switchgear Room
Pre-Fire Plan for Fire Strategy Area 8; Auxiliary Building 560 level, Unit 1 'B' Essential Switchgear Room
Pre-Fire Plan for Fire Strategy Area 27; Diesel Generator Building Room 2A
Pre-Fire Plan for Fire Strategy Area 11; Auxiliary Building 560 level

PIPs generated as a result of this inspection
PIP C-05-4124; Two barrels of spent carbon from filter replacement were found stored with an expired Combustible/Flammable Material Storage Authorization Form (firm removal date of 11/30/04)

Section 1R06: Flood Protection Measures

PIP C-05-04922; WL isolation valves discussed in WL DBD to isolate Aux. Service Bldg from Aux. Bldg. In case of flooding due to tornado are not proceduralized
PIP C-05-05049; Water leaking through welding area of OMF shop floor
PIP -C-04265; WR written to inspect catch basin drain pipe for obstruction and none found
CNS 1565.WL-00-0001; WL Design Basis Specification, Liquid Waste System, Rev. 24
CNS 1465.00.00.0011; 3.5, Probably Maximum Precipitation Protection

Procedure IP/1/A/3181/001, WL Safety Related Sump Level Control Switches, Rev. 31
Procedure IP/2/A/3181/001, WL Safety Related Sump Level Control Switches, Rev. 31
OP/1/A/6100/010K, Annunciator Response for Panel 1AD-10, NS & ND Rooms Sump Level Emergency Hi and Hi-Hi
OP/1(2)/A/6100/0101, 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
CNC 1206.03-00-0001; Maximum flood levels for Catawba Nuclear Station
Fire Seal Penetration pictures, engineering D-AX-354A-W-W48 through 57
Reg. Guide 1.102, Flood protection for Nuclear Power Plants
Reg. Guide 1.59; Design Basis floods for Nuclear Power Plants
MP/0/A/7650/079, Safety Related Doors Corrective Maintenance, Rev. 17
CNS-1465-00-00-0011, Rev. 0; Design Basis Specifications for Water Level Determination
UFSAR Chapter 11; Excessive leakage in Auxiliary Building Equipment
WO 98738723 -01; Unclog floor drains needed for ND flush
WO 98738723-03; Route hose through mapp to 543 elevation
WO 92081151-01; Verify integrity of sealed water barrier
WO 98706901; OWCPPSYS perform underground survey
WO 98699704; Weld repair required
WO 98685208; 1WL: perform calibration of level switch
WO 98707755; 2WL: perform calibration of level switch
WO 98690990; Perform annual yard drain inspection
OP/0/B/6500/092; Radwaste annunciator response for panel WPLCP (Waste Processing Liquid Panel)
OP/0/A/6500/091, Radwaste Annunciator Response for panel 1ELCC0013, Auxiliary Waste Processing Panel
OP/1/A/6500/014, Enc. 47, Valve Checklist
PIP C-04-04245; NRC inspectors noted a large amount of standing water near the north end of the Unit 2 turbine building indicating that the storm drain basin was not functioning properly.
WR 98323978; Catch basin 355 not draining properly
WR 98331108; Repair Drain piping at CB-35 failure
Drawing Number CN-1565-1.1, Flow Diagram of Liquid Radwaste System (WL), Rev. 29

Section 1R07: Heat Sink Performance

Preventive Maintenance Work Instructions

OP/1/A/6400/064, Rev. 14, Addition of Chemicals to NS Wet lay-up
OP/0/A/6400/075, Rev. 23, RN system Chemical Addition

Completed Work Orders

98683348, Clean and Inspect D/G Jacket Water 1 KD HX B (TYPICAL)
98670915, Check accuracy of 2 RN LT 7400
98718827, PT/0/A/4400/08A RN Tr-A Flow Balance
98644720, Replace “NS” HX
98647890, Clean Titanium Tubes on NS HX 1B
98729899, Repair Leak at Valve 1RN-848B

Completed Procedures

PT/1/A/4350/002A, Encl 13.1 to .3, Diesel Generator 1A Operability Test, dated 7/5/5
PT/1/A/4350/002B, Encl 13.1 to .3, Diesel Generator 1B Operability Test, dated 6/21/5 (TYPICAL)
PT/0/A/4200/083, RN Pond Swap Logic Test, 6/26/03
PT/1/A/4700/13, Auxiliary Shutdown Panel 1A Functional Test, 6/18/96
OP/0/A/6400/005C, Nuclear Service Water System, 5/11/5
PT/0/A/4200/083, RN Pond Swap Logic Test, 5/5/5
IP/0/A/3112/001A, Calibration Procedure for RN Intake Pit A Level Instrumentation, 11/16/4

Problem Investigation Process Reports (PIPs)

C-04-3937, Operability of the RN 1 to 6 Valves
C-02-5663, RN Pit Level Instrumentation OOTs
C-04-4169, Lake to Pump House Piping Inspection
C-04-3058, RN Inlet Temperature Trending Upward
C-04-2386, Repeated RN Conduit Manhole Walkdowns
C-04-3548, 1B NS HX Fouling Factor High
C-05-3221, Repair Leak at Valve 1RN-848B

Miscellaneous

Bingham Willamette Company Pump Curve drawing 35634, Nuclear Service Water Pump S.N. 230376
Bingham Willamette Company Letter, May 3, 1979 to Mr. V. H. Shellhorse
Calculation CNC-1223-24-00-0034, Design Parameters for RN Pit Inlet Isolation Valves Pond/Lake Elevations, Attachment II, page 1/1
Catawba N.S. System Health Reports for Period 1005T1, RN, KD, and NS
PIP 05-3880, RN Recovery Plan Assessment
PT1/A/4400/09 KD 1A Flow Verification Data for the last 2 years (TYPICAL)
PT1/A/4400/06E, 1A KD Heat Capacity Data for the last 2 years (TYPICAL)
DRWG CN-1040-12, Nuclear Service Water Pump Structure General Arrangement, Rev. 0
PT/1/A/4400/09 NS HX Flow Verification Data

Section 1R12: Routine Maintenance Effectiveness

PIP C-05-04581; RN pump 2B Discharge valve 2RN38B failed to close when pump was secured
PIP C-05-04584; Recent failure recurrence of relay AA and fuse in valve circuit for RN pump
C-05-04651; A manufacturing defect has been identified with a Struthers-Dunn relay part.
C-97-01225; Hope Creek nuclear station has seen an increasing number of Struthers-Dunn 219 NE series relay failures
PIP C-04-04802; The process and procedures by which operations system valve checklists are developed, performed and retained can be revised to improve the overall quality of plant system configuration control.
PIP C-05-04656; TSAIL entry for 2B RN pump due to faulty relay associated with 2RN038B

PIP C-05-04655; TSAIL entry for 1B RN pump due to faulty relay associated with 1RN020B relay
PIP C-05-04652; TSAIL entry for 2A RN pump due to faulty relay associated with 2RS28A
CGD-3009.01-03-0001, Commercial grade item evaluation of Struthers-Dunn 219 frame relays and accessories
Nuclear Supply Chain Process Manual, SCD230, Rev. 2 Commercial Grade Items
CGPA-3000.00-00-0118; Commercial Grade Program Procurement and Acceptance Manual
WO 98741246-01; 2RN0038B Failure to close
WO 97033097-01; 2RN Replace relay AA/2EATC11
Receiving Inspection Report, Purchase Order NE12244 Relay
Starter/Contactors Health Report
WO 9874303801; Exercise power Driven Potentiometer

Section 1R13: Maintenance Risk Assessments and Emergent Work Evaluation

RP/0/A/5000/007, Natural Disasters and Earthquake
Critical Evolution Plan associated with the 2A KC Heat Exchanger Tube Cleaning
Risk Management Actions for 2A KC Heat Exchanger Tube Cleaning
OMP 2-18, Attachment 10.3; Protected Equipment Posting Requirements associated with the 2A KC HX cleaning
Weekly Risk Profile, Unit 2 - 05W30 (Covering the 2A KC heat exchanger cleaning evolution)
Critical Evolution Plan associated with the 1B KC Heat Exchanger Tube Cleaning (Week 05W31)

<u>PIPs generated as a result of this inspection</u>

PIP C-05-5272; Enhancements can be made to the process for allowing excavation activities to occur while minimizing additional risks associated with plant operation
PIP C-05-5336; Oram / Sentinel risk codes not properly identified and scheduled for planned RN project excavation activities
PIP C-05-5358; Question on how NUREG 0612; Control of Heavy Loads at Nuclear Power Plants; was being implemented
PIP C-05-5372; Questions raised by the NRC Resident regarding the adequacy of the lift plan and associated complex evolution plan for the cofferdam construction around the RN lake intake structure

Section 1R15: Operability Evaluations

WO 98741216; I/R valve 2VQ-3B
Calculation CNC-1206.02-84-2014, Revision 64, Attachment T; NRC Generic Letter 90-05 Evaluation of a Through Wall Leak near Weld 1RN221-11
Flow diagram CN-1574-1.5; RN System, Unit 1
PIP C-04-2965; Test data taken on valve body, 2RN-291, was less than minimum required thickness

Section 1R19: Post-Maintenance Testing

PT/2/A/4350/002B; Diesel Generator 2B Operability Test, performed on August 10, 2005
PIP C-05-4813; During performance of PT/2/A/4350/002B, voltage and power factor indications

began to oscillate
PIP C-05-4811; 2B1 Diesel Generator Room Emergency Vent Fan failed to start during the performance of PT/2/A/4350/002B
PIP C-05-5400; Diesel Generator Emergency Ventilation fans 2B1 and 2B2 did not auto start when the 2B diesel generator was started for Auxiliary Safeguard Testing
PT/2/A/4350/002B; Diesel Generator 2B Operability Test, conducted on 09/07/05
WO 98742820; Inspect & repair D/G 2B ventilation fans
WO 98741360; PM Aux Feedwater Pump (CAPT #2)
PT/2/A/4250/003 C; Turbine Driven Auxiliary Feedwater Pump #2 Performance Test
WO 98741246-01; 2RN0038B Failure to close

Section 1R22: Surveillance Testing

OP/2/A/6200/034; Unit 2 NM Automation Sampling System
CP/0/B/8200/006; Determination of Dose Equivalent Iodine-131
CP/0/B/8200/002; Determination of gross Specific Activity and XE-133 equivalent activity in reactor Coolant
PT/1/A/4350/020; Diesel Generator Simultaneous Start
PT/1/A/4350/002B; Diesel Generator 1B Operability Test
PT/2/A/4150/001D; NC System Leakage Calculation
Autolog entries for Unit 2 control room for September 18, 2005
PT/2/A/4150/001D; NC System Leakage Calculation
Autolog entries for Unit 2 control room for September 18, 2005

Section 1R23: Temporary Plant Modifications

WO 98745957; Defeat power relay for 2EPA CA ATE
Temporary Modification Package CD200601; Defeat Loss of Power relay for 2ATE

Section 2OS1: Access Control To Radiologically Significant Areas

Procedures, Guidance Documents, and Manuals

Shared Health Physics Procedure (SH)/0/B/2000/004, Taking, Counting and Recording Surveys, Revision (Rev.) 006
SH/0/B/2000/009, Neutron Dose Tracking, Rev. 002
SH/0/B/2000/003, Preparation of a Radiation Work Permit, Rev. 006
SH/0/B/2000/012, Access Controls for High, Extra High, and Very High Radiation Areas, Rev. 4
SH/0/B/2001/0031, Internal Dose Assessment, Rev. 002
SH/0/B/2001/003, Investigation of Skin and Clothing Contaminations, Rev 006
Radiation Protection Section Procedure (RA)/0/1100/004, Filter Change and Storage, Rev. 007
Radiation Protection Management Procedure (RPMP) 2.2, Radiation Control Zones, Rev. 5
RPMP 2.4, EHRA and VHRA Documentation and Locking Hardware Control Guidelines, Rev. 5
Radiation Protection Policy Manual Policy II-09, Internal Dose Assessment, Rev. 2
Radiation Protection Policy Manual Policy III-15, Access Controls for High, Extra High, and Very High Radiation Areas, Rev. 4
RA/1/1100/003, Controls for Unit 1 Reactor Building Entry Under Power, Rev.10

Radiation Work Permit (RWP) Number (No.) 5, Entry for Minor Corrective Maintenance, Rev. 16
RWP No. 26, Reactor Building Pipe Chase and Seal Table Entry During Power Operations, Rev. 25
RWP No. 1024, Unit 1 NC Filter Change Out for Filters Up to 1000 R/HR on Filter Housing (Includes Entry Into Filter Funker Room, Rev. 16)
RWP No. 1952, Extra High Rad Entry Into U-1 Auxiliary Building Room 315 Valve Gallery, Rev. 8
RWP No. 1954, Extra High Radiation Area Entry into U-1 Auxiliary Building Room 311 Pipe Trench, Rev. 8
RWP No. 2046, Unit 2 Lower Containment Entry B/C Side of Pipe Chase, Rev. 1
RWP No. 2952, Extra High Radiation Entry into U2 Auxiliary Building Room 222, 222A, 222B Spent Resin Storage Tanks, Rev. 4
RWP No 2954, Extra High Radiation Area Entry Into U2 Auxiliary Building Room 308A Pipe Trench, Rev. 7
RWP No 2958, General Entry Into Room 306 Extra High Radiation Area, Rev. 6
Radiation Protection Pre-Job Briefing Documentation Including the Following Tasks: Entry Into Lower Containment/Pipechase (Outside of Crane Wall) At Power, Lower Containment Pipe Chase, conducted 08/24/08; Air Lock Vestibule conducted 08/24/05

Records and Data Reviewed

Personnel Contamination Event (PCE) Log Sheets: Calendar Year (CY) 2004 and Year-to-Date (YTD) 2005
PCE Followup Data Including: Personnel Contamination Summary Data, Personnel Contamination Calculation, Personnel Contamination Surveys, and Supervisor Checklist for Personnel Contamination for PCE Nos. 05-028, 05-035, 05-014, 05-017, 04-064, 04-016, No. 05-015
CY 2004 and YTD 2005 Internal Dose Data Including: Positive and Routine and Termination Body Burden Analyses (BBA) ; Investigational BBA; > 2 Percent Annual Limit of Intake (ALI); Dose Assessments;
Deep Dose Equivalent Radiation Exposure Data CY 2004 and January - June 2005.
CNS Job Dosecard Report Unit1 and Unit 2 Reactor Building Pipe Chase and Seal Table Entry During Power Operations, August 23, 2004 Through August 23, 2005
Catawba Nuclear Station (CNS) Auxiliary Building 560 foot Elevation (AB 560 ‘ Elev) Room 306 Surveys: No. -080205-13; No. -031805-01; No. -040405-4; and No. -020205-14
CNS AB 560' Elev Room 308A Surveys: No. -100604-15; and No. -093004-10
CNS AB 543' Elev Room 222-A-B Surveys: No. -061505-12, No. 061605-4
CNS Unit 2 Reactor Building (U2 RB) Lower Containment Surveys: -062005-17
CNS AB 560' Elev Room 311 Surveys: No. -060805-9; and No. M0070705-50;
CNS AB Elev. 560' Room Surveys: No. -080305-12; No. -053105-16; and No. -0302005-2
CNS U2 RB Lower Containment Surveys: No. -062905-4; No. -062905-3; No. -061505-9; No. 040505-3; No. -031605-5; No. -030405-1; No. -020805-9; and No. -020205-5
CNS AB 522' Elev. Surveys: Room No 103, -07/29/05-5; and Room 108, No. -07/29/05-4
CNS AB 560' Elev. Surveys: Room 319, No. -080105-3; Room 309, and No. -080105-2
CNS Intrastation Letter, File No.: CN-750.00, Material Stored In Spent Fuel Pools, dated July 18, 2005

Appendix B. 501. Temporary Storage Request for Radioactive Material IN SFP/RC - TriNuke Filter, 03/17/03

Corrective Action Program (CAP) Documents

Duke Power Company (DPC) Assessment Report No. RPS-10-04, RP Self-Assessment on Radiation Work Permit (RWP) Electronic Dosimeter (ED) Dose and Dose Rate Alarm Set Points, conducted June 24-29,2004
DPC Assessment Report No. RPS-17-05, Assessment of Radiation Protection Controls for Access to Radiologically Significant Areas, conducted June 13-30, 2005
Problem Investigation Process (PIP) C-05-00197, RP Self-Assessment on Improving Radiation Worker Practices, conducted January 10-12, 2005
PIP C-05-03616, RP Self Assessment of Radiation Worker Practice Initiatives for 1 EOC15, conducted June 6-8, 2005.
PIP C-05-03377, Extra High Radiation Area (EHRA) core change out key issued to Mechanical Maintenance site locksmith, 06/01/05
PIP C-05-02119, Discovered Two Old Master Lock Master Keys (from lock series no longer used at Catawba) in the10 rem per hour key box that could open > 10 rem/hr padlocks currently used at CNS, 04/21/2005.
PIP C-04-05812, Exposure reports indicate an individual entered a posted EHRA logged on the incorrect RWP (the correct RWP was discussed during the pre-job brief), 10/26/2004
PIP-05-02188, Head crew office posted requiring RP notification prior to entry due to Resin HIC Movement in progress with crew member inside, 04/20/05

Section 2OS3: Radiation Monitoring Instrumentation and Protective Equipment

Procedures, Guidance Documents, and Manuals

Catawba Nuclear Station Radiation Monitoring System (EMF) Engineering Support Document, Rev. 8, dated 6/24/2004
Health Physics Procedure (HP) HP/0/B/1001/031, Operation and Calibration of Canberra Autoscan Whole Body Counter, Rev. 2
HP/0/B/1003/066, Operation of Portable Neutron Survey Meters, Rev. 0
HP/0/B/1003/068, Set-up and Calibration of Eberline PCM-1C Personnel Monitor, Rev. 2
HP/0/B/1003/071, Calibration of NNC SYS20 Gamma-60 Portal Monitor, Rev. 1
HP/0/B/1003/075, Set-up, Calibration and Response Check of PCM-2, Rev. 1
HP/0/B/1005/013, Respiratory Protection Equipment Issue, Rev. 1
RA/0/1400/005, Calibration of the SAM-9 and SAM-11 Small Articles Monitor (SAM), Rev. 0
RA/0/1400/006, In-Service Radiation Protection Instrument Source Check, Rev. 1
RA/0/1400/007, Portable Equipment Selection, Check out and Return, Rev. 0
RA/0/1600/001, Radiological Respirators, Rev. 2
SH/0/B/2008/001, Calibration and Quality Assurance of Canberra Argos-4AB Contamination Monitors, Rev. 1
Policy III-08, Personnel Contamination Monitoring, Radiation Protection Policy Manual, Rev.3
Nuclear System Directive (NSD) 208, PIP, Rev. 27

Records and Data Reviewed

Work Order (WO) 98595142-01 Calibration Packet for U1 Charging Pump Area Monitor 1EMF-4, 06/04/2003
Calibration Data for Area Monitors, Channels 1EMF-4, 1 EMF-11, 2 EMF-11, EMF-23, 0EMF- 43A (Transcripted Data Provided)
Flow Calibration for RD-32 Offline Gas Monitor (0EMF-43A), 8/18/2005
Certificates of Calibrations for RO-20 Ion Chamber Serial Number (S/N) 1419, conducted 09/16/04 and 03/10/05; RO-20 Ion Chamber S/N 3449, conducted 01/13/2005 and 07/07/2005; 6112B Teletector, S/N 31465, conducted 10/05/2004 and 04/11/2005; and RM-14 Frisker S/N 2054, dated 02/28/2005 and 04/14/2005
Certificates of Calibrations for MGP Electronic Dosimeters S/N 200720 conducted 03/22/2004 and 04/23/2005, S/N 194730 conducted 01/21/2004 and 04/26/2005, S/N 193624 conducted 03/22/2004 and 04/21/2005, S/N 210372 conducted 09/09/2003 and 01/10/2005, and S/N 199697 conducted 03/22/2004 and 04/21/2004
10CFR61 Waste Classification Confirmatory Analysis Review at Catawba, 10/06/2004
VB System Breathing Air Quality Analysis, 08/31/2004 and 11/23/04
Maintenance on Vital Components (ProCheck3 Test Results) for MSA Custom 4500 II SCBA, S/N RP178084 and 01628, conducted 09/09/2003 and 05/06/2005
SCBA Qualification Records, Control Room Operators, current as of 08/23/2005
MSA Certifications, 2 Individuals Qualified to Maintain/Repair SCBA Components, 06/07/04
Radiological and Non-Radiological SCBA Monthly QA Report, 07/21/2005
Certificate of Calibrations for Co-60 Source No. 68308-85, dated 06/04/04; Cs-137 Source No. 68310-85, dated 06/04/04; and Co-60 Source No. 68294-85, dated 06/04/04
Annual Verification of the J.L Shepherd Model 89 Shielded Calibration Range Irradiator (Memo to Respiratory and Instrument Calibration Staff Supervisor), dated September 13, 2004

CAP Documents

PIP C-01-04478, Tracking of implementation of activities associated with amendments eliminating Post Accident Sampling System at CNS, 09/25/2001
PIP C-04-03238, Equipment Assessment - Radiation Monitoring Instrumentation, 07/02/2004
PIP 04-05157, All three ARGOS personnel contamination monitors at the Single Point Access (SPA) took themselves out of service early this morning, 10/01/2004
PIP C-05-02166, RP/RIC Technicians failed to perform sections of RA/0/1600/001, 04/21/2005
PIP C-05-02253, Radiological Respiratory Program Group Self Assessment, 04/28/2005
PIP C-05-03048, NPAS Audit of Radiation Protection Program, GO-05-014, 05/23/2005
PIP C-05-03850, Shepherd Calibrator blew a fuse rendering it inoperable, 06/20/2005
PIP C-05-04843, Develop and implement a pump performance test for new EMF sample pumps,
08/10/2005
PIP C-05-05032, Unexpected TSAIL Entry C0-05-2019 for 0EMF43A, 08/18/2005
PIP C-05-05062, Unexpected TSAIL Entry C0-05-2040 for 0EMF43A, 08/19/2005
PIP C-05-05082, NRC Prep Audit Radiation Monitoring Instrumentation, 08/22/2005

Section 2PS1: Radioactive Gaseous and Liquid Effluent Treatment and Monitoring Systems

Procedures, Guidance Documents, and Manuals

HP/0/B/1004/005, Radioactive Gaseous Waste Release - VQ & VP System, Rev. 48
HP/0/B/1004/004, Radioactive Liquid Waste Release, Rev. 34
HP/0/B/1001/029, Genie/CAS Gamma Spectroscopy System Operation and Calibration, Rev. 6
HP/0/B/1000/010, Determination of Radiation Monitor Setpoints, Rev. 49
HP/0/B/1004/004, Radioactive Liquid Waste Release, Rev. 34
HP/0/B/1009/011, EMF Loss
IP/0/B/3314/049F, Flow Calibration for 0EMF49, Rev. 2
IP/0/B/3314/049Q, 0EMF49 Quarterly Channel Operation Test, Rev. 12
PT/1/A/4450/017, Unit Vent Flow Manual Calculation, Rev. 12
NSD 219, Instrument and Electrical Device Calibration Out of Tolerance, Rev. 2
Duke Power Company Radiation Protection Policy Manual, Rev. 2
Guidance for Review of Gamma Spectroscopy Analysis Results, 12/25/01
2005 Offsite Dose Calculation Manual, Rev. 47
2004 Offsite Dose Calculation Manual, Rev. 46

Records and Data Reviewed

CNS Annual Radioactive Effluent Release Reports for 2002, 2003 and 2004
Liquid Waste Release (LWR) 2005050, 6 Auxiliary Monitor Tank 'B', 7/15/05
LWR 2005051, 5 Auxiliary Monitor Tank 'A', 7/21/05
LWR 2005057, 5 Auxiliary Monitor Tank 'A', 8/19/05
Gaseous Waste Release (GWR) 2005062, (9) Unit 1 Containment Air Release & Addition (VQ), 7/5/05
GWR 2005063, (10) Unit 2 Cont Air Release & Addition (VQ), 7/11/05
RETDAS Effluent Dose Calculations - December 2004, 4th Quarter 2004, Calendar Year 2004
Calibration Report on Model RD-35-01Iodine Gamma Monitor, General Atomics Company, September 1978
Calibration Report on Model RD-32-06 Offline Beta Monitor, General Atomics Company, June 1976
Calibration Report for Model RD-36-05 Particulate Monitor, General Atomics Company, June 1976
Calibration Report on Model RD-33-15 Offline Gamma Monitor for Liquid Effluents, June 1976
Radiation Monitoring System for Catawba Nuclear Station, Operation and Maintenance Manual, General Atomics, August 1979. Factory Data for Process Channels.
Certificate of Transfer Source, S/N 92-1506, 8/6/92
Source Certificates for EMF Primary Liquid Calibrations, File No. CN-768.05, 12/9/96
Original Detector Calibration Data, Catawba Nuclear Station Radiation Monitors, 1/14/91
Quality Assurance (QA) /Quality Control (QC) Chart for LS-1294, December 2004 - August 2005
QA/QC Control Charts for Germanium Detector Nos 1, 2, 3, and 4, December 2004 - August 2005
QA/QC Control Chart for LS-1293, December 2004-August 2005

QA/QC Control Chart for Auto Planchet Counting System (APC)-1295, April - August 2005
Quarterly Interlaboratory cross check analysis results, 1st quarter 2003 through 1st quarter 2005
WO 98607024, 1VQ Fl B; I/R HEPA Filter Bypass Leakage, 8/20/04
Gamma Spectroscopy Results 2003-111, Waste Liquid AMT B Grab, 8/19/03; 2003-113, Waste Liquid WMT A Laundry Grab, 8/26/03; 2003-084, Waste Liquid AMT C Grab, 5/5/03; 2004-064, Waste Liquid AMT C Grab, 9/30/04; 2004-047, Waste Liquid WMT A Laundry, 9/13/04; 2003-090, Waste Liquid AMT B Grab, 5/21/03; 2003-093, Waste Liquid AMT C Grab, 6/4/03; 2003-088, Waste Liquid AMT A Grab, 5/14/03; 2003-135, Waste Liquid AMT B Grab, 11/3/03
WO 98712129, Perform Flow Instrumentation Calibration and Channel Calibration on EMF-41, 03/17/05
1 EMF-36 Channel Calibration Data: WO 98376149 completed 5/14/01; WO 98530812, completed 9/30/02; and WO 98641235, completed 5/12/04
1-EMF-35 Channel Calibration and Flow Instrumentation Calibration Data: WO 98477428, completed 4/10/02; WO 98610134, completed 8/27/03; and WO 98624118, completed 5/12/04
1 EMF-37 Unit Vent Iodine Monitor Channel Calibration Performance Data: WO 98344821, completed 4/4/01; WO 98495177, completed 10/10/02; and WO 98645176, completed 5/12/04
VQ1A Containment Air Release and Addition Filter Train Performance Test Data completed 8/26/04
VQ1B Containment Air Release and Addition Filter Train Performance Test Data: Completed 6/26/03, 8/21/03, and 12/7/04
VQ2B Containment Air Release and Addition Filter Train Performance Test conducted 5/2/03 and 6/16/04
Germanium Detector No. 2 Calibration Records: 50 ml bottle @ 7 cm, completed 8/15/04, and Rheodyne @ 7 cm, 8/16/04
Germanium Detector No. 4 Calibration Records: Particulate Filter @ 25 cm, completed 7/14/05; Charcoal Cartridge @ 3 cm, completed 7/17/05
Liquid Scintillation LS-1293 Calibration Data, completed 10/3/03; Verification Record completed 6/15/04
Set-up and Initial Calibration Record for: APC-1295, completed 4/20/05; APC-1299 completed 4/20/05

CAP Documents

Duke Power Company Assessment Report RPS-14-05, RP Self Assessment of Radioactive and Liquid Effluent Treatment and Monitoring Systems, June 27-July 20, 2005
NPA Assessment GO-04-007(NPA)(RP)(ALL), Radiation Protection Functional Area Evaluation, April 14, 2004
PIP C-03-03764, Found high bypass leakage on 1B VQ filter unit HEPA filters, 6/26/03
PIP C-04-00357, The EMF System is Maintenance Rule status A1 based on repeat maintenance preventable functional failures, ½2/04
PIP C-04-02261, Need a tritium monitoring/management plan at CNS, 5/10/04
PIP C-05-01202, EMF50 has steadily risen from 600 cpm to 950 cpm, 3/3/05
PIP C-05-02864, On 5/18/05 VP was started on Unit 1 with sample pump for 1EMF39 off when GWR package specified 1EMF39 as the release monitor

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

Procedures and Guidance Documents

SH/0/B/2007/001, Procedure Radiological Environmental Monitoring Program Data Evaluation, Rev. 0
SH/0/B/2007/002, Land Use Census, Rev. 0
Radiological Environmental Monitoring Program Policy IV-07, Rev. 3
Interlaboratory Cross Check Program Policy V-01, Rev. 2,
IP/0/B/3343/013, Meteorological Monitoring System (EEB) Calibration and Maintenance Procedure, Rev. 037
IP/0/B/3343/001, Meteorological Monitoring System Check, Rev. 50
Meteorological Monitoring System (EEB) calibration and Maintenance Procedure, Rev. 37
Environmental Radiation (EnRad) Laboratories, Procedure 723, Ground Water Sampling at Catawba Nuclear Station, Rev. 0
EnRad Laboratories, Procedure 721, Airborne Radio iodine and Airborne Particulate Sampling at Catawba Nuclear Station, Rev. 2
EnRad Laboratories, Procedure 722, Water Sampling at Catawba Nuclear Station, Rev. 0
EnRad Laboratories, Procedure 727, Direct Radiation Measurement (TLDs) at Catawba Nuclear Station, Rev. 2
EnRad Laboratories, Procedure 317, Low Volume Air Sampler Calibration Procedure, Rev. 2
RP Group Self-Assessment, Radiological Environmental Monitoring Program (REMP) and Radioactive Material Control Program, 07/18 - 27/05
2004 RP Assessment checklist, GO-04-007(NPA)(RP)(ALL), Rev. 1 - 12/05/03
Duke Energy Corporation Topical Report Quality Assurance Program, Amendment 32
Duke Power Company (DPC), Nuclear Assessment Functional Area Manual (NAFAM); Section RA 5.1, Functional Area Evaluations, Rev. 9
DPC, NAFAM, Section RA 5.4, Nuclear Performance Assessment Processes, Rev. 7

Records and Data Reviewed

Calibration Data for NE America Small Article Monitor (SAM)-9 for Catawba Health Physics Instrument Number (CHP No. 3240), conducted 12/16/2003 and 07/10/04
Calibration Data for Canberra ARGOS-4AB Contamination Monitor CHP No. 4279, conducted 06/25/2004 and 07/09/2005
Calibration Data for NNC SYS20 Gamma-60 Portal Monitor (CHP No. 3271), conducted 01/06/2004
Low Volume Air Sampler Calibration Data Sheet, Air Sampler S/N 00353, dated 06/06/05; S/N 00297, dated 09/13/04; S/N 00303, dated 09/13/04; S/N 00329, dated 01/31/05; S/N 00292, dated 05/12/05; and S/N 00336, dated 03/22/05

Corrective Action Program Documents

PIP G-03-00217, REMP Sample Site Assessment, 04/16/03
PIP G-03-00433, Evaluate Iodine Collection Efficiencies Associated With REMP Air Monitoring Charcoal Media, 08/26/03
PIP G-04-00032, Review of Fish Sampling Needs, 01/20/04
PIP G–04-00441, REMP Sample Site Assessment, 11/09/04
PIP G-04-00483, Results of EnRad Records Assessment, 12/15/04
PIP G-05-00099, REMP Sample Site Assessment, 03/08/05
PIP G-05-00160, REMP Sample Site Assessment, 05/10/05
PIP G-04-00140, Implementation and Timeliness of Interlaboratory Cross Check Program, 03/29/04
PIP C-04-05506, A Small Amount of Radioactivity Was Identified During the Entrance BBA for a Bartlett Contractor Reporting to Shearon Harris After Working CNS 2 EOC13, 10/13/04
PIP C-04-05627, The HB Robinson RPM informed the CNS RPM that a Bartlett Employee Stationed at his Site had Worked at CNS last Weekend and 8 - 10 nCi of Co-58 was identified on the individuals lanyard during a BBA, 10/18/04
PIP C-04-05820, REMP Water Site 208 Located at the CNS Discharge Canal Has A Loss of Flow, 10/26/04
PIP C-04-00785, REMP Water Site 208 Located at the CNS Discharge Canal Has A Loss of Flow, 02/17/04
PIP C-04-06227, Perform Maintenance on REMP Sampling Equipment, 11/16/04
PIP C-03-05726, Evaluate Elevated Tritium Levels of Third Quarter Surface Water Composite Sample, 10/22/03
PIP C-03-04674, Unexpected TSAIL Entry Lower Wind Direction, 08/22/03
PIP C-04-00419, Unexpected TSAIL Entry Lower Wind Speed and Direction, 01/28/04
PIP C-05-00228, Unexpected TSAIL Entry Lower Wind Speed and Direction, 01/29/05
PIP C-05-02169, Upper Wind Speed Inoperable, 04/25/05
RP Group Self-Assessment, Radiological Environmental Monitoring Program (REMP) and Radioactive Material Control Program, 07/18 - 27/05
Audit Assessment Plan, GO-04-007(NPA)(RP)(ALL), Radiation Protection Functional Area Evaluation, January 9, 2004
Audit Report, GO-04-007(NPA)(RP)(ALL), Radiation Protection Functional Area Evaluation, April 14, 2004
Record of Lead Auditor Qualifications

LIST OF ACRONYMS USED

2EOC13	-	Unit 2 End of Cycle 13
AB	-	auxiliary building
AC	-	Alternating Current
ANSI	-	American National Standards Institute
APC	-	automatic planchet counting
ARM	-	area radiation monitor
CA	-	Auxiliary Feedwater System
CAM	-	continuous air monitor
CAP	-	Corrective Action Program

CFR	-	Code of Federal Regulations
CNS	-	Catawba Nuclear Station
Co	-	cobalt
CP	-	chemistry procedure
CRD	-	control rod drive
CY	-	calendar year
DPC	-	Duke Power Company
ED	-	electronic dosimeter
EHRA	-	Extra High Radiation Area
EMF	-	effluent monitoring function
EnRad	-	Environmental Radiation Procedure
FWST	-	Refueling Water Storage Tank
GWR	-	gaseous waste release
HEPA	-	high efficiency particulate air
HP	-	Health Physics Procedure
HPT	-	Health Physics Technician
HRA	-	high radiation area
HX	-	Heat Exchanger
IE	-	Inspection and Enforcement
IMC	-	Inspection Manual Chapter
KC	-	Component Cooling
LLD	-	lower limit of detection
LS	-	liquid scintillation
LWR	-	liquid waste release
MOV	-	Motor Operated Valve
NC	-	Reactor Coolant System
nCi	-	Nanocuries
NCV	-	Non-Cited Violation
ND	-	Residual Heat Removal
NEI	-	Nuclear Energy Institute
NRC	-	Nuclear Regulatory Commission
NS	-	Containment Spray
NSD	-	Nuclear System Directive
NSD	-	Nuclear System Directive
NW	-	Containment Valve Injection System
OA	-	Other Activities
ODCM	-	Offsite Dose Calculation Manual
OOS	-	Out-of-Service
OS	-	Occupational Radiation Safety
PASS	-	Post-Accident Sampling System
PI	-	Performance Indicator
PIP	-	Problem Investigation Process (report)
PM	-	Portal Monitor
PS	-	Public Radiation Safety
PT	-	Periodic Test
PT	-	performance test
QA	-	Quality Assurance

QC	-	quality control
RA	-	Radiation Protection Section Procedure
RCA	-	Radiologically Controlled Area
REMP	-	Radiological Environmental Monitoring Program
RETS	-	Radiological Environmental Technical Specification
RG	-	Regulatory Guide
RN	-	Nuclear Service Water
RP	-	radiation protection
RPMP	-	Radiation Protection Management Procedure
RTP	-	Rated Thermal Power
RWP	-	radiation work permit
S/N	-	serial number
SAM	-	Small Article Monitor
SCBA	-	Self-contained Breathing Apparatus
SDP	-	Significance Determination Process
SFP	-	Spent Fuel Pool
SH	-	Shared Health Physics Procedure
SLC	-	Selected Licensee Commitment
SNSWP	-	Standby Nuclear Service Water Pond
TI	-	Temporary Instruction
TLD	-	thermoluminescent dosimeter
TS	-	Technical Specification
TSAIL	-	Technical Specification Action Item Log
U1	-	Unit 1
U2	-	Unit 2
UFSAR	-	Updated Final Safety Evaluation Report
VQ	-	Containment Air Addition/Release
WBC	-	whole-body counter
WO	-	Work Order