



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

July 30, 2008

Mr. J. R. Morris  
Site Vice President  
Duke Power Company, LLC  
d/b/a Duke Energy Carolinas, LLC  
Catawba Site  
4800 Concord Road  
York, SC 29745-9635

SUBJECT: CATAWBA NUCLEAR STATION - NRC INTEGRATED INSPECTION REPORT  
05000413/2008003 AND 05000414/2008003

Dear Mr. Morris:

On June 30, 2008, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Catawba Nuclear Station Units 1 and 2. The enclosed inspection report documents the inspection results, which were discussed on July 21, 2008 with Mr. George Hamrick and other members of your staff.

This report documents two licensee identified violations of very low safety significance (Green) which were determined to be violations of NRC requirements. Because of their very low safety significance, and because they were entered into your corrective action program, the NRC is treating these findings as non-cited violations (NCVs) consistent with Section VI.A of the NRC Enforcement Policy. If you contest the non-cited violations, you should provide a written response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, 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 facility.

DEC

2

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at [www.nrc.gov/reading-rm/adams.html](http://www.nrc.gov/reading-rm/adams.html) (the Public Electronic Reading Room).

Sincerely,

***/RA/***

Steven D. Rose, Acting Chief  
Reactor Projects Branch 1  
Division of Reactor Projects

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

Enclosure: Integrated Inspection Report 05000413/2008003 and 05000414/2008003  
w/Attachment: Supplemental Information

cc w/encl: (See page 3)

DEC

2

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at [www.nrc.gov/reading-rm/adams.html](http://www.nrc.gov/reading-rm/adams.html) (the Public Electronic Reading Room).

Sincerely,

*/RA/*

Steven D. Rose, Acting Chief  
Reactor Projects Branch 1  
Division of Reactor Projects

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

Enclosure: Integrated Inspection Report 05000413/2008003 and 05000414/2008003  
w/Attachment: Supplemental Information

cc w/encl: (See page 3)

X PUBLICLY AVAILABLE       NON-PUBLICLY AVAILABLE       SENSITIVE      X NON-SENSITIVE  
ADAMS:  Yes      ACCESSION NUMBER: \_\_\_\_\_      X SUNSI REVIEW COMPLETE /SDR/

OFFICE	RII:DRP	RII:DRP	RII:DRS	RII:DRS	RII:DRS	RII:DRS	RII:DRS
SIGNATURE	ATS /via email/	JCP /via email/	ATS /via email fot/	RCC /via email/	GHG /via email/	HJG /via email/	NJG /via email/
NAME	ASabisch	JPaige	FEhrhardt	RChou	GGardner	HGepford	NGriffis
DATE	07/23/2008	07/28/2008	07/30/2008	07/23/2008	07/23/2008	07/23/2008	07/24/2008
E-MAIL COPY?	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
OFFICE	RII:DRPS	RII:DRS	RII:DRS	RII:DRS	RII:DRS	RII:DRS	
SIGNATURE	JBH /via email/	GBK /via email/	WTL /via email/	DMP /via email/	RM /via email/	CAP /via email/	
NAME	JHamman	GKuzo	WLoo	DMas-Penaranda	RMoore	CPeabody	
DATE	07/23/2008	07/23/2008	07/29/2008	07/29/2008	07/30/2008	07/23/2008	
E-MAIL COPY?	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO

OFFICIAL RECORD COPY DOCUMENT NAME: I:\RPB1\CATAWBA\INSPECTION REPORTS\08-03\CATAWBA  
2008003.DOC

cc w/encl:

Randy D. Hart  
Regulatory Compliance Manager  
Duke Power Company, LLC d/b/a Duke  
Energy Carolinas, LLC  
Electronic Mail Distribution

R. L. Gill, Jr.  
Manager  
Nuclear Regulatory Issues & Industry Affairs  
Duke Power Company, LLC d/b/a Duke  
Energy Carolinas, LLC  
Electronic Mail Distribution

Dhiaa M. Jamil  
Group Executive and Chief Nuclear Officer  
Duke Energy Carolinas, LLC  
Electronic Mail Distribution

Kathryn B. Nolan  
Senior Counsel  
Duke Energy Corporation  
526 South Church Street-EC07H  
Charlotte, NC 28202

Lisa F. Vaughn  
Associate General Counsel  
Duke Energy Corporation  
526 South Church Street-EC07H  
Charlotte, NC 28202

David A. Repka  
Winston Strawn LLP  
Electronic Mail Distribution

North Carolina MPA-1  
Suite 600  
P.O. Box 29513  
Raleigh, NC 27525-0513

Susan E. Jenkins  
Assistant Director, Division of Waste  
Management  
Bureau of Land and Waste Management  
Department of Health and  
Environmental Control  
Electronic Mail Distribution

R. Mike Gandy  
Division of Radioactive Waste Mgmt.  
S.C. Department of Health and  
Environmental Control  
Electronic Mail Distribution

Beverly O. Hall  
Chief, Radiation Protection Section  
Department of Environmental Health  
N.C. Department of Environment and  
Natural Resources  
Electronic Mail Distribution

Elizabeth McMahon  
Assistant Attorney General  
S.C. Attorney General's Office  
P.O. Box 11549  
Columbia, SC 29211

Vanessa Quinn  
Federal Emergency Management Agency  
500 C Street, SW  
Room 840  
Washington, DC 20472

North Carolina Electric Membership  
Corporation  
Electronic Mail Distribution

County Manager of York County  
York County Courthouse  
York, SC 29745

Piedmont Municipal Power Agency  
Electronic Mail Distribution

Peggy Force  
Assistant Attorney General  
State of North Carolina  
P.O. Box 629  
Raleigh, NC 27602

DEC

4

Letter to J. R. Morris from Steve Rose dated July 30, 2008

SUBJECT: CATAWBA NUCLEAR STATION - NRC INTEGRATED INSPECTION REPORT  
05000413/2008003 AND 05000414/2008003

Distribution w/encl:

C. Evans, RII  
L. Slack, RII  
OE Mail  
RIDSNRRDIRS  
PUBLIC  
J. Stang, NRR

**U. S. NUCLEAR REGULATORY COMMISSION**

**REGION II**

Docket Nos.: 50-413, 50-414

License Nos.: NPF-35, NPF-52

Report No.: 05000413/2008003 and 05000414/2008003

Licensee: Duke Energy Carolinas, LLC

Facility: Catawba Nuclear Station, Units 1 and 2

Location: York, SC 29745

Dates: April 1 through June 30, 2008

Inspectors: A. Sabisch, Senior Resident Inspector  
J. Paige, General Engineer  
F. Ehrhardt, Senior Operations Engineer  
R. Chou, Reactor Inspector (Sections 1R08, 4OA5.3)  
G. Gardner, Reactor Inspector (Section 1R17)  
H. Gepford, Senior Health Physicist (Section 2OS1, 2PS1, 4OA1, 4OA5, 4OA7)  
N. Griffis, Health Physicist (Sections 2OS2, 4OA1)  
J. Hamman, Reactor Inspector (Section 1R17)  
G. Kuzo, Senior Health Physicist (Section 2PS2)  
W. Loo, Senior Health Physicist (Section 2OS2)  
D. Mas-Penaranda, Reactor Inspector (Section 1R17)  
R. Moore, Senior Reactor Inspector (Section 1R17)  
C. Peabody, Reactor Inspector (Section 4OA5.2)

Approved by: Steven D. Rose, Acting Branch Chief  
Reactor Projects Branch 1  
Division of Reactor Projects

Enclosure

## SUMMARY OF FINDINGS

IR 05000413/2008003, 05000414/2008003; 4/1/2008 – 6/30/2008; Catawba Nuclear Station, Units 1 and 2; Integrated Inspection Report.

The report covered a three month period of inspection by one resident inspector, one general engineer and eleven region based inspectors (i.e. one operations engineer, six reactor inspectors, and four health physicists). The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, Reactor Oversight Process (ROP), Revision 4, dated December 2006.

A. NRC-Identified and Self-Revealing Findings

None

B. Licensee-Identified Violations

Two violations of very low safety significance (Green), which were identified by the licensee, have been reviewed by the inspectors. Corrective actions taken by the licensee have been entered into their correction action program. These violations and the licensee's corrective action program tracking numbers are listed in Section 4OA7 of this report.

Enclosure

## REPORT DETAILS

### Summary of Plant Status

Unit 1 began the inspection period operating at 100 percent rated thermal power (RTP). The unit was removed from service on May 3, 2008, for the end-of-cycle (EOC)-17 refueling outage. The reactor was taken critical on June 19, 2008, and reached 100 percent RTP on June 24, 2008. The unit remained at 100 percent RTP for the remainder of the inspection period.

Unit 2 operated at approximately 100 percent RTP throughout the inspection period.

#### 1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity, Emergency Preparedness

#### 1R01 Adverse Weather Protection

##### .1 Severe Weather Condition (Actual)

###### a. Inspection Scope

The inspectors reviewed the licensee's response to a tornado warning that was issued for York County on April 28, 2008. The review included a walkdown of the area immediately adjacent to the plant in order to identify any loose material that could become airborne due to high winds, as well as an assessment of the preparations taken by station personnel once the announcement was made. The inspectors discussed specific measures taken, in-progress, or planned (if required) with operations personnel. A review of work in-progress and planned for later in the day was performed in conjunction with Operations personnel to ensure the overall risk profile was maintained as low as possible. The documents reviewed during this inspection are listed in the Attachment to this report.

###### b. Findings

No findings of significance were identified.

##### .2 Severe Weather Condition (Preparation)

###### a. Inspection Scope

The inspectors reviewed the licensee's preparations for adverse weather associated with high ambient temperatures. This included field walkdowns to assess the material condition and operation of ventilation and cooling equipment, as well as other preparations made to protect plant equipment from high ambient temperature conditions. Risk-significant systems reviewed included the standby shutdown facility, portions of the auxiliary building, and the nuclear service water pump house structure. In addition, the inspectors conducted discussions with operations, engineering, and maintenance

Enclosure



personnel responsible for implementing Catawba's hot weather preparation program in order to assess the licensee's ability to identify and resolve deficient conditions associated with hot weather protection equipment prior to actual hot weather being experienced at the site. The documents reviewed during this inspection are listed in the Attachment to this report.

b. Findings

No findings of significance were identified.

.3 Evaluation of Summer Readiness of Offsite and Alternate AC Power Systems

a. Inspection Scope

The inspectors reviewed the licensee's procedures and measures designed to monitor and maintain availability and reliability of both the offsite AC power system (grid) and the onsite alternate AC power systems prior to the onset of summer weather conditions and the resulting higher load demand on the grid. This included the review of the licensee's station, Nuclear Division, and Power Delivery group procedures defining the coordination of activities that could impact the on-site and offsite AC power systems and the communication protocols established between the Power Delivery group and Catawba to verify that the appropriate information is exchanged when issues arise that could impact the AC power systems. The inspectors also discussed the implementation of the procedural guidance with personnel from operations, engineering and work control. The documents reviewed during this inspection are listed in the Attachment to this report.

b. Findings

No findings of significance were identified.

1R04 Equipment Alignment

.1 Partial Walkdowns

a. Inspection Scope

The inspectors performed partial system walkdowns during the following six activities to assess the operability of redundant or diverse trains and components when safety equipment was inoperable. The inspectors attempted to identify any discrepancies that could impact the function of the system, and, therefore, potentially increase risk. The inspectors reviewed applicable operating procedures, and walked down control systems components, selected breakers, valves, and support equipment to determine if they were in the correct position to support system operation. The inspectors reviewed protected equipment sheets, maintenance plans, and system drawings to determine if the licensee had properly identified and resolved equipment alignment problems that could cause initiating events or impact the capability of mitigating systems or barriers, and entered them into the corrective action program. The documents reviewed during this inspection are listed in the Attachment to this report.

Enclosure

- Protection of designated equipment during the annual Standby Shutdown Facility (SSF) diesel generator maintenance outage
- Protection of designated equipment during the repair and replacement of the 1KF-36 valve in the Unit 1 Spent Fuel Pool cooling water system
- Protection of equipment in the vicinity of the “A” and “B” train Nuclear Service Water (RN) pumps and associated piping during the boring of a 46 inch hole in the wall between the two rooms to support planned outage work
- Protection of “A” train equipment associated with RN and Component Cooling Water (KC) during the replacement of “B” train RN piping as part of the Unit 1 refueling outage
- Protection of “A” Diesel Generator (DG) and associated electrical equipment while the “B” DG was removed from service for planned 18-month maintenance activities
- Protection of “B” train equipment associated with the RN System and KC during the replacement of “B” train RN piping as part of the Unit 1 refueling outage and protection of “B” train Unit 2 equipment when the 1A and 2A RN pumps were removed from service placing Unit 2 in a 72-hour Technical Specification (TS) Limiting Condition for Operations (LCO)

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 auxiliary feedwater (CA) system. The inspectors utilized licensee procedures, as well as licensing and design documents to determine whether the system (i.e., pump, valve, and electrical) alignment was correct. During the walk downs, the inspectors also determined if: valves and pumps exhibit leakage that would impact their function; major portions of the system and components were correctly labeled; hangers and supports were correctly installed and functional; and essential support systems were operational. In addition, pending design and equipment issues were reviewed to determine if the identified deficiencies significantly impacted the system’s functions. Items included in this review were:

- The operator workaround list
- The temporary modification list
- System and Component Health Reports
- Outstanding maintenance work requests/work orders

A review of open Problem Investigation Process reports (PIPs) was also performed to ascertain that the licensee had appropriately characterized and prioritized auxiliary feedwater-related equipment problems for resolution in the corrective action program. The documents reviewed during this inspection are listed in the Attachment to this report.

Enclosure

b. Findings

No findings of significance were identified.

1R05 Fire Protection

Fire Protection Tours

a. Inspection Scope

The inspectors walked down accessible portions of the following eight plant areas to assess the licensee's control of transient combustible material and ignition sources, fire detection and suppression capabilities, fire barriers, and any related compensatory measures. The inspectors observed the fire protection suppression and detection equipment to determine whether any conditions or deficiencies existed which could impair the operability of that equipment. The inspectors selected the areas based on a review of the licensee's safe shutdown analysis probabilistic risk assessment and sensitivity studies for fire-related core damage accident sequences. The documents reviewed during this inspection are listed in the Attachment to this report.

- Unit 2 Auxiliary Shutdown Panels
- Unit 2 CA Pump Room & Pits
- Main Control Room
- Unit 1 Containment Spray (NS) & Residual Heat Removal (ND) Heat Exchanger Rooms
- Unit 1 Interior Doghouse - all elevations
- RN Pump House
- Unit 1 Annulus – all elevations
- Unit 1 Spent Fuel Pool and Truck Bay

b. Findings

No findings of significance were identified.

1R08 In-service Inspection (ISI) Activities - Unit 1

.1 Piping Systems ISI

a. Inspection Scope

The inspectors reviewed the implementation of the licensee's ISI program for monitoring degradation of the reactor coolant system (NC) boundary and risk-significant piping system boundaries. The inspectors reviewed a sample from activities performed during the Unit 1-Spring 2008 Refueling Outage (EOC-17) including: (a) nondestructive examinations (NDE) required by the 1998 Edition through 2000 Addenda of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI; (b) Boric Acid Program activities done in response to General Letter (GL)

Enclosure

88-05; (c) Steam Generator examination activities in accordance with Technical Specifications (TS) and industry guidelines; and (d) augmented examination commitments. The inspectors also reviewed the procedures, equipment, personnel qualifications, and work packages and observed NDE for piping welds. The inspectors reviewed ultrasonic examinations for weld overlays on the pressurizer surge and spray line nozzle-to-safe end welds, related to the implementation of Material Reliability Program (MRP) - 139 and Temporary Instruction (TI) 2515/172. The inspectors reviewed a self-assessment (PIP G-06-00645, Containment Integrity Assessment), which assessed programs related to ISI and Boric Acid Corrosion. Documents reviewed during the inspection are listed in the Attachment to this report.

Specifically, the inspectors reviewed NDE procedures, reports, equipment calibration and certification records, and personnel qualification records for the following NDE activities:

- Ultrasonic examination (UT) of the Pressurizer 14" diameter surge line, nozzle-to-safe end dissimilar overlay weld 1NC26-3V for 1<sup>st</sup> ISI after weld overlay
- UT of the Pressurizer 4" diameter spray line, nozzle-to-safe end dissimilar overlay weld 1NC190-24V for 1<sup>st</sup> ISI after weld overlay
- UTs of the Pressurizer 4" diameter spray line, pipe-to-elbow welds 1NC190-19 and -20
- UT of Main Steam 4" diameter vent pipe, pipe-to-valve weld 1SV33-7
- UT of Safety Injection 18" diameter drain pipe, pipe-to-cap welds 1492-NI.00-97-25, -26, -28, and -29
- Radiographic Examinations of Safety Injection 18" diameter drain pipe, pipe-to-cap welds 1492-NI.00-97-25, -26, -28, and -29
- Liquid Penetrant examinations (PT) of Pressurizer 4" diameter spray line, pipe-to-elbow welds 1NC190-19 and -20
- PTs of Main Steam 4" diameter vent pipe, pipe-to-valve weld 1SV33-7
- Magnetic Examination (MT) examinations of Main Steam 4" diameter vent pipe, pipe-to-valve weld 1SV33-7

The inspectors reviewed the following recordable indications that were accepted by the licensee for continued service since the previous refueling outage:

- PT-06-284 Liquid Penetrant Examination indications on weld 1NV330-6
- UT-08-004 Ultrasonic Examination indication on weld 1NC190-20
- UT-08-011 Ultrasonic Examination indication on weld 1SV33-7

The inspectors reviewed the following Repair/Replacement Activities for compliance with the ASME Code. Specifically, the inspectors reviewed weld process control sheets, welder operating instructions, welding procedure specifications, welding procedure qualification records, welder qualification records, Certified Material Test Reports for weld material, and NDE reports.

- Weld Repair/Replacement Work Order 01748158, Pre-fabrication Piping/Valve for Safety Injection Drain Pipe Welds 1492-NI.00-97-25, -26, -28, and -29

Enclosure

b. Findings

No findings of significance were identified.

.2 Pressurized Water Reactor Vessel Upper Head – Unit 1

The inspection for the vessel upper head and head penetrations in accordance with NRC Order EA-03-009 was completed during the last Unit 1 outage and documented under Section 4OA5.2 of NRC Integrated Inspection Report 05000413,414/2006005, NRC Temporary Instruction 2515/150, Reactor Pressure Vessel Head and Vessel Head Penetration Nozzles (NRC Order EA-03-009) (Unit 1). The licensee was not required to perform the head inspection during this outage, because it is in the low susceptibility category described in the Order.

.3 Boric Acid Corrosion Control (BACC) Program

a. Inspection Scope

The inspectors reviewed the licensee's Boric Acid Corrosion Control Program to ensure compliance with commitments made in response to NRC Generic Letter 88-05, "Boric Acid Corrosion of Carbon Steel Reactor Pressure Boundary," and Bulletin 2002-01, "Reactor Pressure Vessel Head Degradation and Reactor Coolant Pressure Boundary Integrity."

The inspectors conducted an on-site record review, and an independent walkdown of the containment building, which is not normally accessible during at-power operations, to evaluate licensee compliance with program procedures and applicable industry guidance. In particular, the inspectors verified that the licensee's visual examinations focused on locations where boric acid leaks could cause degradation of safety-related components and that degraded or non-conforming conditions were properly identified in the licensee's corrective action program.

b. Findings

No findings of significance were identified.

.4 Steam Generators (SG)

a. Inspection Scope

The inspectors reviewed the Unit 1 SG tube eddy current testing (ECT) activities to ensure compliance with TS, applicable industry operating experience and technical guidance documents, and ASME Code Section XI requirements.

The inspectors reviewed licensee SG inspection activities to ensure that ECT inspections were conducted in accordance with the licensee's SG Program and applicable industry standards. The inspectors reviewed the SG examination scope, ECT acquisition procedures, Examination Technique Specification Sheets, ECT analysis

Enclosure

guidelines, the most recent SG degradation assessment and operational assessment, and also the condition monitoring results as they became available. The inspectors reviewed documentation to ensure that the ECT probes and equipment configurations used were qualified to detect the expected types of SG tube degradation. The inspectors ensured that all tubes evaluated in condition monitoring were appropriately screened for in-situ testing. No tubes met the criteria for in-situ testing. The licensee plugged 10 tubes on SG C and 13 tubes on SG D due to the wear from loose parts of foreign objects on tube outside surfaces.

The inspectors monitored the licensee's secondary side activities, which included a foreign object search and recovery for loose parts, and sludge lancing. The inspectors reviewed data results of tubes for Bobbin Probe and Array Probe Inspection of: (R-Row, C-Column)

- SG A: R108C93; R96C109
- SG B: R119C66; R97C70
- SG C: R15C114; R117C74; R03C94: R75C76; R83C76
- SG D: R90C41; R99C34; R80C45

b. Findings

No findings of significance were identified.

.5 Identification and Resolution of Problems

a. Inspection Scope

The inspectors performed a review of ISI-related problems, including welding, and BACC program that were identified by the licensee and entered into the corrective action program as PIPs. The inspectors reviewed the PIPs to confirm that the licensee had appropriately described the scope of the problem and had initiated corrective actions. The review also included the licensee's consideration and assessment of operating experience events applicable to the plant. The inspectors performed this review to ensure compliance with 10CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," requirements. The corrective action documents reviewed by the inspectors are listed in Attachment to this report.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification

a. Inspection Scope

The inspectors observed Active Simulator Exam ASE-46 to assess the performance of licensed operators during an evaluated simulator session. The exercise included a

Enclosure

failure of a power range nuclear instrument, a steam leak inside containment, an Anticipated Transient Without Scram, and a steam line break. The scenario terminated once the operators terminated safety injection. The inspection focused on high-risk operator actions performed during implementation of the abnormal and emergency operating procedures, and the incorporation of lessons-learned from previous plant and industry events. The entry into the Emergency Plan, as well as the classification and declaration of the event by the Shift Technical Advisor and OSM, was also observed during the scenario. The post-scenario critique conducted by the training instructors and the crew was observed. The documents reviewed during this inspection are listed in the Attachment to this report.

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness

a. Inspection Scope

The inspectors reviewed the four samples listed below for items such as: (1) appropriate work practices; (2) identifying and addressing common cause failures; (3) scoping in accordance with 10 CFR 50.65(b) of the maintenance rule ; (4) characterizing reliability issues for performance; (5) trending key parameters for condition monitoring; (6) charging unavailability for performance; (7) classification and reclassification in accordance with 10 CFR 50.65(a)(1) or (a)(2); and (8) appropriateness of performance criteria for Structures, Systems, and Components (SSCs)/functions classified as (a)(2) and/or appropriateness and adequacy of goals and corrective actions for SSCs/functions classified as (a)(1). For each item selected, the inspectors performed a detailed review of the problem history and surrounding circumstances, evaluated the extent of condition reviews as required, and reviewed the generic implications of the equipment and/or work practice problem. The documents reviewed during this inspection are listed in the Attachment to this report.

- Preventive maintenance activities and work on of the governor on the SSF DG
- Troubleshooting and repair of the automatic makeup controller for the Unit 2 Volume Control Tank (VCT)
- Replacement of spent fuel pool cooling valve 1KF-36 due to being difficult to operate the valve
- Repair of a leak found on reactor head Conoseal #76 which required cooling down to Mode 5 and disassembly of the assembly

b. Findings

No findings of significance were identified.

## 1R13 Maintenance Risk Assessments and Emergent Work Evaluation

### a. Inspection Scope

The inspectors reviewed the following eight activities to determine whether the appropriate risk assessments were performed prior to removing equipment for work. When emergent work was performed, the inspectors assured that the plant risk was promptly reassessed and managed. The inspectors reviewed the appropriate use of the licensee's risk assessment tool and risk categories in accordance with Nuclear System Directive 415, Operational Risk Management (Modes 1-3), and Nuclear System Directive 403, Shutdown Risk Management (Modes 4,5,6, and No Mode), for appropriate guidance to comply with 10 CFR 50.65 (a)(4). The documents reviewed during this inspection are listed in the Attachment to this report.

- Review of planned work associated with the annual dual unit SSF maintenance outage and evaluation of both additional planned and emergent work for impact on overall station risk values
- Repair and replacement of the 1KF-36 (Spent Fuel Pool Purification Loop Outlet Throttle Valve) valve in the Unit 1 Spent Fuel Pool cooling water system which placed the Unit in an Orange ORAM risk profile for a projected 45-hour period
- Review of the test plan and impact on Unit 1 of the main steam safety valve testing conducted immediately prior to the start of the Unit 1 EOC-17 refueling outage
- Review of planned work involving drilling a 46 inch hole through the RN pump house wall between the "A" and "B" rooms with both units at power
- Extension of planned maintenance activities associated with the Allison Creek Black line in the 230kV switchyard requiring re-evaluation of planned and emergent work and assessment of the resulting risk profile
- Review of planned multiple dive activities associated with cleaning and inspections of the RN system during the Unit 1 refueling outage
- Extension of planned maintenance activities associated with the Allison Creek White line in the 230kV switchyard requiring re-evaluation of planned and emergent work and assessment of the resulting risk profile needed to prevent entry into an Orange risk condition
- Review of the planned "A" RN train outage that affected both units and placed the operating unit in a 72-hour TS Limiting Condition for Operation action statement

### b. Findings

No findings of significance were identified

## 1R15 Operability Evaluations

### a. Inspection Scope

For the four operability evaluations listed below, the inspectors evaluated the technical adequacy of the evaluations to ensure that TS operability was properly justified and the subject component or system remained available such that no unrecognized increase in



risk occurred. The inspectors determined that the operability determinations were made as specified by Nuclear System Directive (NSD) 203, Operability. The inspectors reviewed the Updated Final Safety Analysis Report (UFSAR) to ensure that the system or component remained available to perform its intended function. In addition, the inspectors reviewed compensatory measures implemented to determine that the compensatory measures worked as stated and the measures were adequately controlled. The inspectors also reviewed a sampling of PIPs to determine that the licensee was identifying and correcting any deficiencies associated with operability evaluations.

- PIP C-07-7544; Vulnerability exists for a pocket of gas to be trapped in the 18 inch refueling water line to the Unit 2 NS pump A and B suction
- PIP C-08-2028; Flow data for the control room ventilation flow was found to be higher than expected and exceeded the allowable flow rate as defined in the acceptance criteria of the surveillance test
- PIP C-08-2297; Installed tubing for the 2A safety injection pump outboard bearing oil drain line has an upward slope in one segment of piping back to the oil reservoir
- PIP C-08-2229; Documented value for the helium leak rate in MP/0/A/7650/181 for spent fuel cask #38 is more than allowed by the acceptance criteria

b. Findings

No findings of significance were identified.

1R17 Evaluations of Changes, Tests, or Experiments and Permanent Plant Modifications

a. Inspection Scope

The inspectors reviewed selected samples of evaluations to confirm that the licensee had appropriately considered the conditions under which changes to the facility, UFSAR, or procedures may be made, and tests conducted, without prior NRC approval. The inspectors reviewed evaluations for ten changes and additional information, such as drawings, calculations, supporting analyses, the UFSAR, and TS to confirm that the licensee had appropriately concluded that the changes could be accomplished without obtaining a license amendment. The ten evaluations reviewed are listed in the List of Documents Reviewed in the Attachment to this report.

The inspectors reviewed samples of changes for which the licensee had determined that evaluations were not required, to confirm that the licensee's conclusions to "screen out" these changes were correct and consistent with 10CFR50.59. The 27 "screened out" changes reviewed are listed in the List of Documents Reviewed in the Attachment to this report.

The inspectors evaluated engineering design change packages for twenty material and design based modifications to evaluate the modifications for adverse effects on system availability, reliability, and functional capability. The twenty modifications and the associated attributes reviewed are as follows:

CD201469, Resolve Breaker Coordination for 2EDF and EPD, 10/11/2007 (Initiating Events, Mitigating Systems)

- Energy Needs
- Process Medium
- Failure Modes

CD200817, Change fuses and revise drawings for VF circuitry, 06/17/2007 (Initiating Events, Mitigating Systems)

- Energy Needs
- Process Medium
- Materials/Replacement Components
- Equipment Protection

CE201043, Replace time relay 1VCTIRB12-XT2 with equivalent, 03/04/2007 (Initiating Events, Mitigating Systems)

- Energy Needs
- Process Medium
- Materials/Replacement Components
- Control Signals
- Failure Modes

CD500615, Span change for RN level instrumentation, 11/20/2007 (Initiating Events, Mitigating Systems)

- Energy Needs
- Process Medium
- Control Signals
- Failure Modes

CD101269, Replace Motor on 1VC005B with an 1800rpm Motor, 02/05/2007 (Initiating Events, Mitigating Systems)

- Energy Needs
- Process Medium
- Materials/Replacement Components
- Failure Modes

CE 101250, Replacement power supply for Rod Control System, 01/22/2007 (Mitigating Systems, Initiating Events)

- Energy Needs
- Materials/Replacement Components
- Failure Modes

CD106416, Remove fuses for 1NV63B, NCP 1B Seal Return Isolation, AOV to fail in the Open (Fail-Safe) Position, 09/26/2007 (Mitigating Systems, Initiating Events)

- Licensing Basis
- Operations

CE 201406, Replace Agastat relay SCBRX022XXAFA with Agastat relay SCBRX022XXACXA, 05/16/2007 (Mitigating Systems)

- Timing
- Materials/Replacement Components
- Control Signal
- Failure Modes

CD 200989, Diesel Generator Tripped Pressure Switch setting lowered from 50 psi to 40 psi for shutdown cylinder, 01/23/2007 (Mitigating Systems)

- Energy Needs
- Control Signal
- Failure Modes
- Operations

CD 101604, Remove fuse FU4 from control circuit of the YC Chiller A, 10/30/2007 (Mitigating Systems)

- Material/Replacement Components
- Control Signals
- Structural
- Failure Modes
- Operations

CE 100626, Replace Agastat relay 7022AFT with new Agastat relay E7022AET, 04/04/2007 (Mitigating Systems)

- Material/Replacement Components
- Control Signal
- Operation

CD200494, Replace Lube Oil Supply Tubing on the 2B Diesel Generator Turbocharger, 03/30/2006 (Mitigating Systems)

- Materials/Replacement Components
- Structural
- Pressure Boundary
- Post-Modification Testing

CD200611, Install a Pressure Relief Line around 2FW28 and 2FW56, 08/22/2006 (Barrier Integrity)

- Structural
- Pressure Boundary
- Licensing Basis
- Operations

CD201309, Install an Accumulator to Collect Leakage Past NI-184/185, 10/30/2007 (Barrier Integrity)

- Structural
- Pressure Boundary
- Licensing Basis
- Operations

CE100677, 1IAE-5340, Replace Check Valve with Equivalent and Suitable Spare, 12/14/2006 (Barrier Integrity, Mitigating Systems)

- Materials/Replacement Components
- Structural
- Timing (Response Time and Duration)
- Licensing Basis

CE200879, Revise Torque Values for the NV Excess Letdown Heat Exchanger Body-to-Bonnet Flange, 08/21/2006 (Barrier Integrity)

- Pressure Boundary
- Licensing Basis
- Operations

CE201563, Replace Valve 2CA-238 with a New Valve, Item Number 06J-2005, 11/12/2007 (Mitigation Systems)

- Materials/Replacement Components
- Structural
- Licensing Basis

CD 100139, SWP 1EOC16, Install 30 Inch Unit 1 Crossover Line, Auxiliary Building, 05/03/2006 (Initiating Events, Mitigating Systems)

- Materials/Replacement Components
- Flowpaths
- Pressure boundary
- Structural
- Licensing Basis
- Post-modification Testing

CD 100106, SWP, Add Unit 1 Service Water to EDG Jacket Cooling Water (RN/KD) Crossover, 07/02/2007 (Initiating Events, Mitigating Systems)

- Materials/Replacement Components
- Flowpaths
- Pressure boundary
- Structural
- Licensing Basis
- Post-modification Testing

CD 100548, GL 89-10 MOV Actuator Replacements, 1EOC16, 11/08/2006 (Mitigating Systems)

- Energy Needs
- Materials/Replacement Components
- Timing
- Control Signals
- Process Medium
- Licensing Basis

Documents reviewed included procedures, engineering calculations, modification design and implementation packages, work orders, site drawings, corrective action documents,

Enclosure

applicable sections of the UFSAR, supporting analyses, TS, and design basis information. The inspectors additionally reviewed test documentation to ensure adequacy in scope and conclusion. The inspectors verified that all changes were incorporated in licensing and design basis documents and associated plant procedures.

The inspectors also reviewed selected PIPs and the licensee's recent self-assessments associated with modifications and 10 CFR 50.59 screening/evaluation issues to verify that problems were identified at an appropriate threshold, were entered into the corrective action process, and appropriate corrective actions had been initiated and tracked to completion. The application of the 50.59 process to temporary alterations and system/component tagouts installed greater than 90 days was also reviewed.

b. Findings

No findings of significance were identified.

1R18 Plant Modifications

a. Inspection Scope

The inspectors reviewed the following five station modifications to determine whether the individual modifications were properly installed, that the 10CFR50.59 screening was performed as required; to evaluate the modifications for adverse affects on system availability, reliability and functional capability, that drawings and procedures were appropriately updated; and post-modification testing was satisfactorily performed as needed. The documents reviewed during this inspection are listed in the Attachment to this report.

Permanent Plant Modifications

- CD101689; Add stop and modify the arms on the Unit 1 submarine hatch separating upper and lower containment
- CD101299; Modify Unit 1 reactor coolant system loop drains to preclude the inadvertent loss of reactor coolant system inventory through the installation of a spectacle flange in each drain line
- CD100493; Unit 1 Emergency Core Cooling System (ECCS) containment recirculation sump strainer modification
- CD101163; Relocate Unit 1 RN-to-Containment Chilled Water (YV) swap over valves to eliminate the existing dead leg in the piping

Temporary Plant Modifications

- Temporary installation of a toggle switch to serve the function provided by a failed proximity switch on the spent fuel pool upender mechanism to support core offload

b. Findings

No findings of significance were identified.

1R19 Post-Maintenance Testinga. Inspection Scope

The inspectors reviewed the six post-maintenance tests listed below to determine if procedures and test activities ensured system operability and functional capability. The inspectors reviewed the licensee's test procedures to determine if the procedures adequately tested the safety function(s) that may have been affected by the maintenance activities, that the acceptance criteria in the procedures were consistent with information in the applicable licensing basis and/or design basis documents, and that the procedures had been properly reviewed and approved. The inspectors also witnessed the tests and/or reviewed the test data to determine if test results adequately demonstrated restoration of the affected safety function(s). The documents reviewed during this inspection are listed in the Attachment to this report.

- Post maintenance run of the 1A DG following periodic maintenance
- Repair of the proximity switch on the Unit 1 spent fuel pool upender mechanism
- Operability run of the SSF DG following the repair of the SSF engine coolant line
- Rod position indication verification following repair of shutdown bank rods G-3 and E-3 data cables
- Post maintenance run of the 1B DG following periodic maintenance
- Resolution of high vibration identified on the 1A RN pump that had been replaced during the 1EOC17 refueling outage

b. Findings

No findings of significance were identified.

1R20 Refueling and Outage Activitiesa. Inspection Scope

The inspectors evaluated licensee outage activities to determine whether the licensee: considered risk in developing outage schedules, adhered to administrative risk reduction methodologies they developed to control plant configuration, adhered to operating license, TS and Selected Licensee Commitment requirements, and procedural guidance that maintained defense-in-depth, and developed mitigation strategies for losses of the key safety functions identified below:

- Decay Heat Removal
- Inventory Control
- Reactivity Control
- Containment Control
- Spent Fuel Cooling
- Power Availability

The inspectors reviewed the licensee's outage risk control plan to assess the adequacy of the risk assessments that had been conducted and that the licensee had implemented appropriate risk management strategies as required by 10CFR50.65(a)(4).

The inspectors observed the "Just-in-Time" training conducted for the shift involved in the unit shutdown on April, 30, 2008, which simulated bringing the unit from an initial power level of 100 percent RTP to Mode 3.

On May 2, 2008, the inspectors observed the power reduction process, removing the reactor from service and cooldown to establish whether the requirements in the TS and Selected Licensee Commitments were followed. The inspectors conducted a containment entry once Mode 3 had been reached to observe the condition of major, normally-inaccessible equipment inside containment and review that indications of previously unidentified leakage from the reactor coolant system were not present. An inspection of the reactor vessel head penetrations was made during the containment entry to ensure there were no signs of borated water leakage. The inspectors also participated in the ice condenser material condition inspection performed once Mode 5 was reached to observe the overall material condition in the upper and lower ice condensers, identify any foreign material that was present, and observe the performance of lower inlet door as-found testing. Portions of the cooldown process on May 3, 2008, were also observed to verify that TS cooldown restrictions and administrative guidelines were followed.

The inspectors performed an inspection of the reactor vessel bottom head on May 5, 2008, to determine if any potential leakage had occurred at the welds associated with the bottom head penetrations. This inspection was done in conjunction with the licensee's Engineering and Quality Control personnel.

The inspectors observed the items or activities described below, to substantiate that the licensee maintained defense-in-depth commensurate with the outage risk control plan for the key safety functions identified above and applicable TS when taking equipment out of service.

- Clearance activities; hanging and removing safety tags
- Reactor Coolant System Instrumentation
- Realigning electrical power
- Establishing and maintaining Decay Heat Removal
- Maintaining Spent Fuel Pool Cooling
- Inventory control including reduced inventory conditions
- Controlling reactivity
- Establishing and maintaining Containment Closure

The inspectors reviewed the licensee's responses to emergent work and unexpected conditions, to establish that resulting configuration changes were controlled in accordance with the outage risk control plan.

The inspectors observed the removal and replacement of the reactor vessel head to ensure the lift was conducted in accordance with the recently revised procedures that incorporated the guidance for the head lift supported by the new head drop analysis performed by the vendor.

The inspectors observed fuel handling operations during both core offload and core reload in conjunction with other ongoing activities to determine that those operations and activities were being performed in accordance with TS and procedural guidance. Additionally, the inspectors observed refueling activities to substantiate that the location of the fuel assemblies was tracked through core offload and reload. The inspectors viewed the video of the final assembly in-core fuel assembly position verification prior to re-installation of the reactor internals and reactor head.

Prior to mode changes and on a sampling basis, the inspectors reviewed system lineups and/or control board indications to substantiate that TS, license conditions, and other requirements, commitments, and administrative procedure prerequisites for mode changes were met prior to changing modes or plant configurations. Also, the inspectors periodically reviewed the setting and maintenance of containment integrity, to establish that the NC and containment boundaries were in place and had integrity when necessary.

Prior to reactor startup, the inspectors walked down upper and lower containment to observe that debris had not been left which could affect performance of the containment ECCS sumps. In addition, the inspectors performed a walkdown of the upper and lower ice condenser areas to establish that debris had not been left which could affect ice condenser performance when called upon to perform its design function. The inspectors also reviewed the documentation of an "as-left" inspection of the reactor vessel bottom head following cleaning after reactor cavity drain-down.

The inspectors observed the "Just-in-Time" training conducted for the personnel involved in the unit startup on June 12-13, 2008, which simulated bringing the unit from Mode 3 to criticality and then through portions of the power ascension process.

The inspectors observed the reactor startup/pull to criticality on June 19, 2008, and portions of the subsequent power ascension to assure procedure compliance and that systems performed as designed. The inspectors reviewed reactor physics testing results to determine that core operating limit parameters were consistent with the core design.

Periodically, the inspectors reviewed the items that had been entered into the licensee's corrective action program, to establish that the licensee had identified problems related to outage activities at an appropriate threshold and had entered them into the corrective action program.

The documents reviewed in support of the Unit 1 EOC-17 refueling outage are listed in the Attachment to this report.



b. Findings

No findings of significance were identified.

1R22 Surveillance Testinga. Inspection Scope

For the thirteen surveillance tests identified below, the inspectors witnessed testing and/or reviewed the test data, to determine if the systems, SSCs involved in these tests satisfied the requirements described in the TS, the Final Safety Analysis Review, and applicable licensee procedures, and that the tests demonstrated that the SSCs were capable of performing their intended safety functions. The documents reviewed during this inspection are listed in the Attachment to this report.

Surveillance Tests

- PT/2/A/4350/002B, Diesel Generator 2B Operability Test (24 hour performance run); Rev. 90
- PT/0/A/4200/017A, Standby Shutdown Facility Diesel Test, Rev. 1
- PT/2/A/4350/001B, Diesel Generator 1B Operability Test (24 hour performance run); Rev. 115
- MP/0/A/7150/072, Main Steam Safety Valve Setpoint Test, Rev. 018
- PT/1/A/4350/006B, 4160V Essential Power System Train B Test, Rev. 010
- PT/1/A/4550/001D, Reactor Building Manipulator Crane Load test, Rev. 19

In-Service Tests

- PT/2/A/4200/026, NS Valve Inservice Test, Enclosure 13.1 (2NS-1B Valve Inservice Test) and 13.2 (2NS-3B Valve Inservice Test), Rev. 46

Containment Isolation Valve Leak Rate Testing:

- Leak Rate Test for Penetration M-346; Containment Hydrogen Sample and Purge Isolation Valves
- Leak Rate Test for Penetration M-220; Instrument Air Outboard Containment Isolation Valve 1VI-177B
- Leak Rate Test for Penetration M-329; Reactor Coolant Pump Motor Oil Fill Isolation Valve

Ice Condenser Surveillance Testing:

- MP/0/A/7150/006, Ice Condenser Lower Inlet Doors Inspection and Testing, Rev. 029 – As Found testing
- MP/0/A/7150/005, Ice Basket Weight Determination, Rev. 026
- MP/0/A/7150/006, Ice Condenser Lower Inlet Doors Inspection and Testing, Rev. 029 – As-Left testing

b. Findings

No findings of significance were identified.

1EP6 Drill Evaluation

a. Inspection Scope

The inspectors observed and evaluated the licensee's simulated control room and emergency planning performance during a drill conducted on April 17, 2008. The inspectors reviewed licensee activities that occurred in the simulator control room and observed activities that occurred in the Technical Support Center during a simulated event. The NRC's assessment focused on the timeliness and accuracy of the event classification, notification of offsite agencies and the overall response of the personnel involved in the drill from an operations and emergency planning perspective. The performance of the Emergency Response Organization was evaluated against applicable licensee procedures and regulatory requirements. The inspectors attended the post-exercise critique for the drill to evaluate the licensee's self-assessment process for identifying potential deficiencies relating to failures in classification and notification. The inspectors reviewed the completed critique developed by the licensee documenting the overall performance of the Emergency Response Organization. The documents reviewed during this inspection are listed in the Attachment to this report.

b. Findings

No findings of significance were identified.

2. RADIATION SAFETY

Cornerstone: Occupational Radiation Safety

2OS1 Access Control To Radiologically Significant Areas

a. Inspection Scope

Access Control - The inspectors reviewed and evaluated licensee guidance and its implementation for controlling and monitoring worker access to radiologically significant areas and tasks associated with Unit 1 and Unit 2 operations and the Unit 1 EOC-17 Refueling Outage activities. The inspectors evaluated changes to, and adequacy of, procedural guidance; directly observed implementation of established administrative and physical radiation controls; appraised radiation worker (radworker) and health physics technician (HPT) knowledge of, and proficiency in, implementing radiation protection (RP) activities; and assessed radworker exposures to radiation and radioactive material.

The inspectors directly observed controls established for radworker and HPT staff in actual or potential airborne radioactivity area, radiation area, high radiation area (HRA), locked high radiation area (LHRA), and very high radiation area (VHRA) locations. The inspectors verified posting and control of LHRA/VHRA boundaries/doors and evaluated

Enclosure

the adequacy of the licensee's LHRA and VHRA key controls through procedural reviews and supervisory interviews. Established radiological controls were directly observed and evaluated for selected Unit 1 EOC17 tasks including scaffolding, ECCS sump modification, miscellaneous valve/pump work, snubber work, and ultrasonic fuel cleaning. Postings and physical controls established within the radiologically controlled area for access to Unit 1 containment, Unit 1/Unit 2 auxiliary building and turbine building locations, radioactive waste building, and fuel building were evaluated directly during facility tours. The inspectors independently measured radiation dose rates during these tours. In addition, the inspectors directly observed conduct of licensee surveys and results of radiation levels, airborne radionuclide concentrations, and/or surface contamination levels for select areas and equipment associated with outage activities. Results were compared to current licensee surveys and assessed against established postings and established radiation controls.

For select tasks including selected steam generator activities, ECCS sump modification, pressurizer spray valve replacement/modification, and snubber work, the inspectors attended pre-job briefings and reviewed radiation work permit (RWP) details to assess communication of radiological control requirements to workers. Electronic dosimeter (ED) alarm set-points were evaluated against area radiation survey results for select outage and routine operations activities. Radworker adherence to select RWPs and HPT proficiency in providing job coverage were evaluated through direct observations and interviews with licensee staff. During remote observations of work activities such as steam generator nozzle dam installation and pressurizer spray valve replacement, the inspectors assessed the remote monitoring provided by HPTs.

The inspectors walked down the Unit 1 and Unit 2 spent fuel pool (SFP) areas to determine if appropriate controls were applied to materials and equipment stored in the pools and reactor cavity. The inspectors also reviewed the inventory of items stored in the pools. Controls and their implementation for LHRAs and for storage of irradiated material within the SFPs were reviewed and discussed.

The inspectors evaluated implementation and effectiveness of licensee controls for both airborne and external radiation exposures. The inspectors reviewed select whole-body count analyses to evaluate implementation and effectiveness of personnel monitoring and administrative and physical controls including air sampling, barrier integrity, engineering controls, and postings for tasks having the potential for individual worker internal exposures to exceed 30 millirem committed effective dose equivalent. Effectiveness of external radiation exposure controls were evaluated through review and discussion of individual worker dose as measured by ED for select tasks.

Radiation Protection activities were evaluated against the UFSAR, TS, and 10 CFR Parts 19 and 20 requirements. Specific assessment criteria included 10 CFR 19.12; 10 CFR 20, Subparts B, C, F, G, H, and J; TS 5.4, Procedures, and TS 5.7, High Radiation Area; and approved licensee procedures. Licensee guidance documents, records, and data reviewed within this inspection area are listed in Sections 2OS1 and 4OA1 of the Attachment to this report.

Problem Identification and Resolution - The inspectors reviewed and assessed select PIPs associated with access control to radiologically significant areas, radiation worker performance, and HPT proficiency. The inspectors evaluated the licensee's ability to identify, characterize, prioritize, and resolve the identified issues in accordance with procedures Nuclear System Directive (NSD) 208, Problem Identification Process, Rev. 28, and Radiation Protection Management Procedure (RPMP) 7.2, PIP Threshold and Initiation, Rev. 11. In addition, the inspectors reviewed self-assessments conducted related to access controls. Specific corrective action program (CAP) documents associated with access control issues, personnel radiation monitoring, and personnel exposure events reviewed and evaluated during inspection of this program area are identified in Sections 2OS1 and 4OA1 of the Attachment to this report.

The inspectors completed the 21 required line-item samples described in Inspection Procedure (IP) 71121.01.

b. Findings

No findings of significance were identified.

2OS2 ALARA Planning and Controls

a. Inspection Scope

As Low As Reasonably Achievable (ALARA) - The inspectors evaluated ALARA program guidance and its implementation for ongoing Refueling Outage tasks. The inspectors reviewed ALARA work plan documents including dose estimates and prescribed ALARA controls for selected outage work activities expected to incur significant collective doses, and discussed these plans with cognizant licensee staff. Selected reviews and discussions included ECCS sump modification, pressurizer spray valve replacement modification, snubbers in 315 Valve Gallery, and select SG work activities. The inspectors reviewed the implementation of dose reduction initiatives for high person-rem expenditure tasks. These elements of the ALARA program were evaluated for consistency with the methods and practices delineated in applicable licensee procedures.

The implementation and effectiveness of ALARA planning and program initiatives during work in progress were evaluated. The inspectors made direct field or remote video observations of Unit 1 work activities involving ECCS sump modification, pressurizer spray valve replacement for valves 1NC27 and 1NC29, and SG nozzle dam installation. The inspectors interviewed radiation workers and HPTs to assess their understanding of dose reduction initiatives and their current and expected final accumulated occupational doses at completion of the task.

Projected RWP dose expenditure estimates were compared to actual dose expenditures and noted differences were discussed with ALARA staff. These estimate vs. actual dose expenditures comparisons covered Unit 1 EOC-15 through EOC-17 activities. Changes to dose budgets relative to changes in job scope also were identified and discussed for the Unit 1 EOC-17 activities. The inspectors attended pre-job briefings and evaluated

Enclosure

the communication of ALARA goals, RWP requirements, and industry lessons-learned to job crew personnel. In addition, the inspectors reviewed air sampling results and internal dosimetry assessments for adequacy of respiratory protection and engineering controls.

Implementation and effectiveness of selected program initiatives with respect to source-term reduction were evaluated. Shutdown chemistry program actions and cleanup initiatives, including their resultant effect on containment vessel and auxiliary area and equipment dose rates were reviewed and compared to previous refueling outage data. The effectiveness of selected shielding packages installed for the current outage was assessed through independent radiation surveys and comparison to applicable licensee survey records.

The plant collective exposure histories for calendar years 2006 and 2007, taken from data reported to the NRC pursuant to 10 CFR 20.2206, were reviewed and discussed with licensee staff, as were established goals for reducing collective exposure. The inspectors reviewed the applicable guidance and examined select dose records of declared pregnant women from June 2006 to 2008 Year-To-Date to evaluate current gestation doses.

ALARA activities were evaluated against the requirements specified in 10 CFR 19.12; 10 CFR Part 20, Subparts B, C, F, G, H, and J; and approved licensee procedures. In addition, licensee performance was evaluated against Regulatory Guide (RG) 8.8, Information Relevant to Ensuring that Occupational Radiation Exposures at Nuclear Power Stations will be As Low As Reasonably Achievable, and RG 8.13, Instruction Concerning Prenatal Radiation Exposure. Procedures and records reviewed within this inspection area are listed in Section 2OS2 of the Attachment to this report.

Problem Identification and Resolution - Licensee corrective action documents associated with ALARA activities were reviewed and assessed. The inspectors evaluated the licensee's ability to identify, characterize, prioritize, and resolve the identified issues in accordance with the corrective action program. Specific self-assessments and audits were reviewed and evaluated in detail for this inspection area and are identified in Section 2OS2 of the Attachment to this report.

The inspectors completed 24 samples (15 required samples and 9 optional samples based on three year rolling average occupational radiation exposure ranking).

b. Findings

No findings of significance were identified.

2PS1 Radioactive Gaseous and Liquid Effluent Treatment and Monitoring Systems

a. Inspection Scope

Groundwater Monitoring - The inspectors discussed current and future programs for onsite groundwater monitoring with RP supervisors, including number and placement of

Enclosure

monitoring wells and identification of plant systems with the most potential for contaminated leakage. The inspectors also reviewed procedural guidance for identifying and assessing onsite spills and leaks of contaminated fluids. In addition, the inspectors reviewed records of historical contaminated spills retained for decommissioning purposes as required by 10 CFR Part 50.75(g).

The licensee currently has thirty-five groundwater monitoring wells located near waste water retention ponds (WC system) outside the power block, inside the protected area, and outside the protected area. The wells inside/outside the protected area were placed based on the results of hydrological studies performed to determine the optimum location for additional groundwater sample points. An additional seven wells were installed to access the extent of any plume associated with well C213 (Monitor Tank Building East Trench), which has contained tritium levels ranging from 12,400 pCi/l to 39,500 pCi/l. Detectable levels of tritium have also been identified in samples taken from the WC wells, the WZ sumps (french drain system), composite samples from an onsite wetlands area (WC discharge point), and from the Retired Steam Generator Storage Facility sump.

Monitoring for tritium contamination in groundwater is complicated by the fact that Lake Wylie has a relatively high tritium background due to routine effluent discharges from both Catawba Nuclear Station and McGuire Nuclear Station (40 miles upstream). As of January 2007, tritium concentrations in the lake range from 8,998 picocuries per liter (pCi/L) to 16,700 pCi/L based on quarterly composite sample results and have been trending upward since plant startup. This makes it difficult to determine whether positive groundwater sample results are due to leaks in contaminated systems or simply lake water intrusion. No levels exceeding the Environmental Protection Agency drinking water limit of 20,000 pCi/L (corresponding to 4 millirem per year to a member of the public) have been identified in the offsite environs.

b. Findings

No findings of significance were identified.

2PS2 Radioactive Material Processing and Transportation

a. Inspection Scope

Waste Processing and Characterization - The inspectors reviewed and discussed the currently installed radioactive waste (radwaste) processing systems as described in the UFSAR Section 11. In addition, radwaste types and quantities stored on site or shipped offsite for burial at facilities in Calendar Year (CY) 2006 and CY 2007 were discussed with responsible licensee representatives.

The operability and configuration of selected liquid and solid radioactive radwaste processing systems and equipment were evaluated. Inspection activities included document review, interviews with plant personnel, and direct inspection of processing equipment and piping. The inspectors directly observed equipment material condition and configuration for liquid and solid radwaste processing systems and licensee staff

Enclosure

was interviewed regarding equipment function and operability. The licensee's policy regarding abandoned radwaste equipment was reviewed and discussed with cognizant licensee representatives. System engineers and operations staff were interviewed to assess knowledge of radwaste system processing operations. Procedural guidance involving resin dewatering activities and filling of waste packages was reviewed for consistency with the licensee's Process Control Program (PCP) and UFSAR details.

Licensee radionuclide characterizations for selected waste streams were evaluated. For dry active waste (DAW), primary resin, secondary resin, and filters, the inspectors evaluated PCP and licensee procedural guidance against 10 CFR 61.55 and the Branch Technical Position on Radioactive Waste Classification details. 10 CFR Part 61 abundance data and derived scaling factors were reviewed and discussed with licensee representatives for radwaste processed or transferred to licensed burial facilities for the November 30, 2006, through February 25, 2008, period. The licensee's analyses and current scaling factors for quantifying hard-to-detect nuclides were assessed.

The inspectors discussed potential changes to waste streams resulting from plant operations and/or reviewed selected resin, mechanical filter, and dry active waste stream radionuclide data to determine if identified changes were assessed or radionuclide composition remained consistent for the period reviewed.

Transportation - The inspectors evaluated the licensee's activities related to transportation of radioactive material. The evaluation included review of shipping records and procedures, assessment of worker training and proficiency, and direct observation of shipping activities.

The inspectors assessed shipping-related procedures for compliance to applicable regulatory requirements. Selected shipping records were reviewed for completeness and accuracy, and for consistency with licensee procedures. Training for individuals qualified to ship radioactive material was evaluated. Responsible transportation staff members were interviewed to assess their knowledge of package preparation specifications, and applicable radiation and contamination control limits.

Transportation program guidance and implementation were reviewed against regulations detailed in 10 CFR 71, and 49 CFR 170-189 and applicable licensee procedures listed in the Attachment to this report. In addition, training activities were assessed against 49 CFR 172 Subpart H, and the guidance documented in NRC Bulletin 79-19.

Problem Identification and Resolution - Licensee CAP documents associated with radwaste processing and transportation activities were reviewed and assessed. The inspectors evaluated the licensee's ability to identify, characterize, prioritize, and resolve the identified issues in accordance with NSD 208, Problem Investigation Process, Rev. 28. Assessment requirements and selected CAP documents reviewed in detail for this inspection area are identified in Section 2PS2 of the report Attachment.

The inspectors completed 5 of the required 6 samples for IP 71122.02. No radioactive material or radwaste shipments were available for review during the onsite inspection.

Enclosure

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification

.1 Initiating Events and Barrier Integrity Cornerstones

a. Inspection Scope

The inspectors sampled licensee data to confirm the accuracy of reported performance indicator (PI) data for the five indicators during periods listed below. To determine the accuracy of the report PI elements, the reviewed data was assessed against PI definitions and guidance contained in Nuclear Energy Institute (NEI) 99-02, Regulatory Assessment Indicator Guideline, Rev. 5. The documents reviewed during this inspection are listed in the Attachment to this report.

- Unplanned Scrams, Unit 2 - The inspectors reviewed the Unplanned Scrams per 7,000 Critical Hours Performance Indicator results for the period of April 1, 2007 through March 31, 2008, for Unit 2. The inspectors reviewed operating logs, PIPs, and monthly operating reports associated with any manual and automatic scrams that occurred in that period and determined whether the data reported for the PI corresponded to Unit 2's power profile.
- Unplanned Power Changes, Unit 2 - The inspectors reviewed the Unplanned Power Changes Performance Indicator results for the period of April 1, 2007 through March 31, 2008, for Unit 2. The inspectors reviewed operating logs, PIPs, and monthly operating reports associated with any unplanned changes in reactor power of greater than 20 percent full power excluding manual and automatic scrams that occurred in that period and determined whether the data reported for the PI corresponded to Unit 2's performance.
- Reactor Coolant System Activity, Unit 1 - The inspectors reviewed the Reactor Coolant System Activity Performance Indicator results for the period of April 1, 2005 through March 31, 2008, for Unit 1. The inspectors reviewed maximum monthly reactor coolant Dose Equivalent Iodine (DEI-131) activity compared to Technical Specification limiting values.
- Reactor Coolant System Leakage, Unit 1 and 2 - The inspectors reviewed the Reactor Coolant System (NC) Leakage Performance Indicator results for the period of April 1, 2006 through March 31, 2008, for Units 1 and 2. The inspectors reviewed the Auto Log entries which captured the results of the daily NC leakage calculations compared to the TS limiting value of 10 gallons per minute for identified reactor coolant system leakage. In addition, the inspectors reviewed the performance of an



NC system leak rate calculation by control room operators and discussed the results of the completed surveillance with the on-shift personnel.

b. Findings

No findings of significance were identified.

.2 Occupational and Public Radiation Safety Cornerstones

a. Inspection Scope

The inspectors sampled licensee submittals for the two PIs indicated below for the period from October 2007 through March 2008. To verify the accuracy of the PI data reported during that period, PI definitions and guidance contained in NEI 99-02, Regulatory Assessment Performance Indicator Guideline, Rev. 5, were used to verify the basis in reporting for each data element. The inspectors completed two of the required samples for IP 71151, one for the occupational radiation safety PI and one for the public radiation safety PI.

- Occupational Exposure Control Effectiveness - The inspectors reviewed PIP documents generated from October 2007 through March 2008 to ensure that radiological occurrences were properly classified per NEI 99-02 guidance. The inspectors also reviewed electronic dosimeter alarm logs, radioactive material intake records, and monthly PI reports for the same period. In addition, licensee procedural guidance for classifying and reporting PI events was evaluated. Reviewed documents are listed in Section 4OA1 of the Attachment to this report.
- RETS/ODCM Radiological Effluents Occurrence - The inspectors reviewed and evaluated selected radiological liquid and gaseous effluent release data, abnormal release results, cumulative and projected doses to the public, and selected PIPs for the period of October 2007 through March 2008. Documents reviewed are listed in section 4OA1 of the Attachment to this report.

b. Findings

No findings of significance were identified.

4OA2 Identification and Resolution of Problems

.1 Daily Review

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

Enclosure

.2 Semi-Annual Review to Identify Trends

a. Inspection Scope

As required by Inspection Procedure 71152, "Identification and Resolution of Problems," the inspectors performed a review of the licensee's CAP and associated documents to identify trends that could indicate the existence of a more significant safety issue. The inspectors' review was focused on repetitive equipment issues, but also considered the results of daily inspector CAP item screenings discussed in section 4OA2.1 above, licensee trending efforts, and licensee human performance results. The inspectors' review primarily considered the six-month period of January 2008 through June 2008, although some examples expanded beyond those dates when the scope of the trend warranted. The review also included issues documented outside the normal CAP in major equipment problem lists, plant health team lists, Independent Nuclear Oversight reports, system and component health reports, self-assessment reports, maintenance rule reports, and Safety Review Group Monthly Reports. The inspectors compared and contrasted their results with the results contained in the licensee's latest quarterly trend reports. Corrective actions associated with a sample of the issues identified in the licensee's trend report were reviewed for adequacy.

b. Assessment and Observations

Quality Control Inspection Trend Statement

No findings of significance were identified. In general, the licensee has identified trends and has appropriately addressed the trends with their CAP. However, the inspectors identified a trend that the licensee had not previously fully recognized. The trend was associated with the adequacy and thoroughness of inspections performed by Quality Control personnel while participating in surveillance tests, plant maintenance and installation of permanent modifications. The inspections were not consistently effective in ensuring designated hold points were performed in accordance with established station and fleet procedures and management expectations, or that deficient conditions were identified prior to returning equipment to service. This trend was identified based on inspector observations of major activities performed on-site as well as the review of station documents as described in the Inspection Scope section.

Observations included:

- Signing off hold points in a surveillance procedure without physically verifying or observing the action listed in the hold point
- Deficiencies associated with the Unit 1 ECCS containment sump modification installation that were identified after Quality Control (QC) inspections had been performed
- Performing inspections without having the requisite drawings and procedures needed to ensure the inspections were verifying the appropriate information

The inspectors performed a review of the Corrective Action Program documents generated as a result of the inspectors' observations and events that occurred at the

Enclosure

station related to QC personnel. The documents reviewed and used as the basis for this trend statement are listed in the Attachment to this report.

The licensee has also identified the need to focus attention on the QC inspection process to ensure the inspections are consistently done in accordance with approved procedures and departmental guidance. The inspectors will continue to monitor this area and assess the effectiveness of planned and in-progress corrective actions.

#### 4OA3 Event Follow-up

##### Repair of Leaking Reactor Head Core Exit Thermocouple Nozzle Assembly (CETNA) Penetration on Unit 1

During the Mode 3 walkdown performed on June 15, 2008, at full operating pressure and temperature, boron deposits were discovered on reactor head CETNA #76 between the seal housing and the bottom side of the hold down nut. Once the leak was confirmed to be active, the management team made the decision to cool down to Mode 5 and facilitate the repair. Following disassembly, it was determined that an extra stainless steel washer had inadvertently been installed in the CETNA during reassembly. The CETNA was inspected and the appropriate reassembly process followed to ensure the leakage had been addressed. The licensee conducted a root cause evaluation of the event and is in the process of finalizing and then implementing corrective actions to prevent recurrence. The documents reviewed during this inspection are listed in the Attachment to this report.

#### 4OA5 Other Activities

##### .1 Quarterly Resident Inspector Observations of Security Personnel and Activities

###### a. Inspection Scope

During the inspection period, the inspectors conducted observations of security force personnel and activities to ensure that the activities were consistent with licensee security procedures and regulatory requirements relating to nuclear plant security. These observations took place during both normal and off-normal plant working hours. The documents reviewed during this inspection are listed in the Attachment to this report.

These quarterly resident inspector observations of security force personnel and activities did not constitute any additional inspection samples. Rather, they were considered an integral part of the inspectors' normal plant status review and inspection activities.

###### b. Findings

No findings of significance were identified.

.2 (Closed) Temporary Instruction (TI) 2515/166, Pressurized Water Reactor Containment Sump Blockage (NRC Generic Letter (GL) 2004-02) - Unit 1

a. Inspection Scope

The Resident Inspectors reviewed the modification packages for the Containment Building ECCS sump strainer modification installed during the Unit 1 EOC-17, 2008 refueling outage. Initial preparation work had been performed during the preceding refueling outage and these activities had been inspected by the Residents at that time. The inspectors also reviewed variation notices (field changes) and corrective actions related to the sump strainer installation. The inspectors conducted walkdowns of the sump installation to ensure that the installed sump strainer assembly was consistent with drawings and specifications provided in the design change packages. The inspectors performed a final cleanliness inspection of the accessible exterior portions of the sump strainer and observed the videotape record of the internal cleanliness inspection performed prior to entering Mode 4.

In addition to the resident inspectors' efforts, regional inspectors reviewed licensee commitments to GL 2004-02 to verify that plant modifications and procedural changes had been completed and that affected Catawba licensing bases had been properly updated. Regional inspectors also reviewed selected corrective actions to ensure that the conditions adverse to quality were being appropriately identified and corrected.

b. Findings and Observations

No findings of significance were identified.

The inspectors determined the following answers to the Reporting Requirements detailed in TI 2515/166-05 issued May 16, 2007:

- 05.a Duke Energy implemented plant modifications and procedure changes at Catawba committed to in their GL 2004-02 response for Unit 2. A list of commitments and their respective completion dates are listed below.
- 05.b Duke Energy updated Catawba licensing bases to reflect the corrective actions taken in response to GL 2004-02.
- 05.c Previous extensions have been granted for Unit 1, however none are in effect or pending after the Spring 2008 Refueling Outage (RFO).

The licensee's actions stated in their September 1, 2005 response to GL 2004-02 were complete at the end of the refueling outage. The following is a listing of the corrective action commitments listed in the licensee's GL 2004-02 response and the status:

1. Modifications

- a. Removal of interferences in the U1 Containment to Support ECCS sump screen installation during. [Completed during Fall 2006 RFO]

Enclosure

- b. Modify the bottom bowl Steam Generator insulation on U1 – replace blanket insulation. [Completed during Fall 2006 RFO]
  - c. Modify the reactor vessel head flange insulation. [Completed Fall 2006 RFO-U1 and Fall 2007 RFO-U2]
  - d. Install Orifices in Safety Injection System to Allow the Valves to be opened wider. [Completed Spring 2008 RFO-U1 and Fall 2007 RFO-U2]
  - e. Replace Sump Screens. [Completed Spring 2008 RFO-U1 and Fall 2007 RFO-U2]
2. Walkdowns/Inspections
- a. Video inspections will be made inside the previously existing suction piping down to the first elbow. [Completed 6/11/2008]
  - b. Visual Inspections will be performed of readily accessible portions of the strainer. Expansion of these inspections could be required if damage is noted. [Completed U1-4/30/2008, U2-11/2/2007]
3. Operator Training
- a. Complete procedure for Containment Air Return fan early start. Complete operator training read package on Containment Air Return fan early start. [Completed 11/9/2006]
4. Procedure and Process Changes
- a. The Foreign Material Exclusion process will be used during installation of each ECCS Strainer Modification. [Completed 6/11/2008]
  - b. Localized washdowns are performed as needed for Lower Containment. [Completed 3/6/2006]
  - c. Plant labeling enhancements. [Completed 12/20/2006]
  - d. Evaluate the modification process to determine if additional controls are required. [Completed 1/3/2007]
  - e. Increased material accountability logs will be kept for items carried into and out of containment during normal power operations (Modes 1-4). [Completed 12/1/2003]
5. Licensing Basis Changes
- a. Submit a License Amendment Request (LAR) for Limiting Condition for Operations concerning the extension. [Completed 11/30/2006]
  - b. Commitment to revise LAR on trash racks top change SR 3.5.2.8 and UFSAR sections. [Completed 11/9/2007]
  - c. Determine if an LAR is required for Trash Racks and submit, if needed. [Completed 3/29/2007]
6. Content Guide Responses
- a. Request for Additional Information (RAI) Responses and Content Guide Responses. [Completed 2/29/2008]
  - b. Perform Chemical Effects Testing. [Completed 4/30/2008]

TI 2515/166 is closed for Units 1 and 2

This documentation of TI-2515/166 completion, as well as any results of sampling audits of licensee actions, will be reviewed by the NRC staff (Office of Nuclear Reactor Regulation - NRR) as input along with the GL 2004-02 "Potential Impact of Debris Blockage on Emergency Recirculation During Design Basis Accidents at Pressurized Water Reactors" responses to support closure of GL 2004-02 and Generic Safety Issue - 191 "Assessment of Debris Accumulation on Pressurized-Water Reactor Sump Performance." The NRC will notify each licensee by letter of the results of the overall assessment as to whether Generic Safety Issue-191 and GL 2004-02 have been satisfactorily addressed at that licensee's plant(s). Completion of TI-2515/166 does not necessarily indicate that a licensee has finished all testing and analyses needed to demonstrate the adequacy of their modifications and procedure changes. Licensees may also have obtained approval of plant specific extensions that allow for later implementation of plant modifications for which completion may subsequently be verified.

.3 (Open) TI 2515/172, Reactor Coolant System Dissimilar Metal Butt Welds (DMBW's)

a. Inspection Scope

From June 2 - 6, 2008, the inspectors reviewed the licensee's activities related to the inspection and mitigation of dissimilar metal butt welds in the Reactor Coolant System (RCS) to ensure that the licensee activities were consistent with the industry requirements established in the Materials Reliability Program (MRP) document MRP-139, Primary System Piping Butt Weld Inspection and Evaluation Guidelines, July 2005. The inspections covered the following: (a) implementation of actions required by the relief requests; (b) documentation review of the volumetric examination on pressurizer nozzles during this and previous refueling outages which the full structural weld overlays (FSWOL) were performed during the last refueling outage in fall 2006; and (c) review of the MRP-139 program.

b. Findings and Observations

No findings of significance were identified.

TI 2515/172 REPORTING REQUIREMENTS FOR CATAWBA UNITS 1 AND 2

A. MRP-139 Baseline Inspections

(1) Have the baseline inspections been performed or are they scheduled to be performed in accordance with MRP-139 guidance? Were the baseline inspections of the pressurizer temperature DMBS's of the nine plants listed in TI 2515/172, 03.01.b completed during the spring 2008 outages?

No. The licensee did not perform baseline volumetric inspection activities for the six DMBS's on the Pressurizer for both units, required to be completed per MRP-139 Section 1.2, because of the rough surface condition of the welds. The licensee

Enclosure

performed the profile measurement of the weld and pipe surfaces for the preparation of the baseline volumetric examination by Ultrasonic Examination (UT). However, the licensee concluded that the surfaces were difficult to prepare for the UT. The licensee decided to directly perform the full structural weld overlay (FSWOL) for the mitigation and conduct a phased array UT after the completion of the FSWOL on all six Pressurizer DMBWs during refueling outages in 2006 for Unit 1 and 2007 for Unit 2, based on the permission of the Section 6.8, Category H, of MRP-139; and NRC relief requests. Therefore, the licensee indirectly met the implementation deadline requirement set on December 31, 2007, for the MRP-139 for the baseline volumetric examination on Pressurizer DMBWs for both units by performing the FSWOL and conducting UT after the weld overlay.

Yes. The licensee used the conventional UT Procedure PDI-UT-8, "Generic Procedure for the Ultrasonic Examination of the Weld Overlaid Similar and Dissimilar Metal Welds," Revision F, to complete the baseline volumetric examinations for four 5" diameter Reactor Auxiliary Head Adapter Cap Lines (equivalent to the cold leg temperature) at eight DMBWs and also used a visual examination on one DMBW at the 1" diameter reactor head vent line to complete the baseline visual examinations for both units during the Fall 2006 Unit 1 and Spring 2007 Unit 2 refueling outages. Therefore, these DMBWs met the deadline set on December 31, 2007.

There are no Alloy 82/182 DMBWs greater than or equal to 4" Nominal Pipe Size (NPS) and less than 14" NPS exposed to temperatures equivalent to the hot leg for both units.

There are no Alloy 82/182 DMBWs greater than 14" NPS exposed to temperatures equivalent to the hot and cold legs for Unit 1 because of the use of stainless steel welds and piping. Alloy 82/182 DMBWs greater than 14" NPS exposed to temperatures equivalent to the hot and cold legs for Unit 2 will be mitigated by using weld overlays and UTs in Spring 2009 and will meet the MRP-139 implementation deadline of December 31, 2009, for the hot leg temperature and December 31, 2010, for cold leg temperature.

The inspectors reviewed documents for volumetric examinations which covered the following: examination plan, UT procedure and documentation to support its qualification for the intended use, assessment of personnel training and qualification, equipment certification and calibration records, and final examination report.

(2) Is the licensee planning to take any deviations from MRP-139 requirements?

No. The licensee has not taken any deviations or submitted any requests for deviations from MRP-139 requirements.

B. Examinations/Weld Overlays Mitigations Performed

(1) Performed in accordance with the examination guidelines in MRP-139, Section 5.1 for unmitigated welds and consistent with NRC staff relief request authorization for weld overlaid welds?

Enclosure

Yes. The licensee performed FSWOL on Units 1 and 2 Pressurizer Nozzle Welds at the six DMBWs, including one surge, one spray, one relief, and three safety lines, and conducted the phased array UT for all of the welds after the completion of FSWOL based on requirements of the relief requests and the permission of the Section 6.8, Category H, of the MRP-139, although the unmitigated welds were not performed for the UT baseline volumetric examination requirements. The UT prior to the FSWOL is not required per MRP-139 or the relief requests. The UT used to perform the DMBWs after the completion of the FSWOL met the examination guidelines of MRP-139, Section 5.1.

The procedure was qualified in accordance with ASME Section XI, Appendix VIII, as implemented through the EPRI Performance Demonstration Initiative (PDI) Program. Prior to each examination after the weld overlays, the licensee verified the FSWOL surface flatness as well as the surface roughness to ensure that it permitted volumetric examination. The licensee utilized phased array UT technology to perform the examination using procedure PDI SI-UT-126, "Procedure for the Phased Array Ultrasonic Examination of the Weld Overlaid Similar and Dissimilar Metal Welds," Revision D. The UT examiners scanned the FSWOL to the maximum extent practicable in two axial and two circumferential directions. The licensee was able to obtain adequate coverage in the UT performed to detect fabrication flaws in the FSWOL. The examinations resulted in 100% coverage in the circumferential and axial beam directions. For the pre-service examination of the new volume above the dissimilar metal weld, the licensee obtained 100% coverage in the circumferential and axial beam directions.

The inspectors reviewed the procedures, work orders, work packages, examination reports, equipment qualification records, and personnel qualification and certificates.

The inspectors verified that the examination was in accordance with the relief request.

- (2) Performed in accordance with ASME Code welding requirements and consistent with NRC staff relief requests authorizations? Has the licensee submitted a relief request and obtained NRR staff authorization to install the weld overlays?

Yes. The licensee performed the volumetric examinations and FSWOLs at the six DMBWs on the pressurizer nozzles for both units in accordance with the ASME Code welding requirements and consistent with NRC staff relief request authorizations.

Yes. The licensee submitted the relief requests for the FSWOLs and alternative examinations for the pressurizer nozzle DMBWs for both units and obtained NRR staff authorizations. Relief Requests 06-GO-001 for Unit 1 and 07-GO-001 for Unit 2, for Use of Full Structural Weld Overlay and Alternative Examination Techniques on Various Pressurizer Nozzle-to-Safe End Welds were submitted and NRR staff authorizations were obtained for installations on July 25, 2007, for Unit 1 and November 27, 2007, for Unit 2.



The inspectors reviewed welding procedure specifications, procedure qualification records, weld wire certifications, and the welding process control sheets for compliance to ASME Section IX welding requirements and adherence to the relief requests and safety evaluations.

(3) Performed by qualified and knowledgeable personnel?

Yes. The personnel such as welders and conventional or phased array UT examiners involved in the DMBWs at the 5" diameter Reactor Auxiliary Head Adapter Cap Lines and the Pressurizer nozzles for both units for the mitigation using FSWOL were qualified and knowledgeable in accordance with the requirements of MRP-139, the ASME Code, and the relief requests. The examiners were qualified Level II or Level III in the UT methods as required by the UT procedures and in accordance with the vendor's written practice for NDE personnel. The UT examiners were also PDI-qualified for the specific UT procedure they implemented. The final examination reports were reviewed by vendor and/or licensee Level III UT examiners.

The welding personnel were qualified in accordance with the requirements identified in the ASME Code, Section IX. The inspectors reviewed the welder performance qualification test records and compared them with the requirements of the ASME Code. The welding process control sheets were reviewed for compliance with the proposed alternative and ASME Code Section IX requirements.

(4) Performed such that deficiencies were identified, dispositioned, and resolved?

Yes. There were no indications identified in phased array ultrasonic examinations for the weld overlays on the six DMBWs on the Pressurizer for both units.

C. Mechanical Stress Improvement (Not Applicable)

The licensee has not implemented Mechanical Stress Improvement as a mitigation method for DMBWs.

D. In-service Inspection Program

(1) Has licensee prepared an MRP-139 in-service inspection program?

No. The licensee did not have a stand-alone MRP-139 in-service inspection program document. However, the licensee's MRP-139 inservice inspection program is included in the ASME Section XI In-service Inspection Program (ISI Program) and also is attached as augmented inspections to the inservice inspection program. The inspectors reviewed the Catawba Third Interval ISI Plans for both units. The licensee will revise the Third Interval ISI Plans to add more details to the examination methods and frequencies for the MRP-139 ISI requirements.

## (2) Are welds appropriately categorized?

Yes. The welds were appropriately categorized by the licensee responsible engineer. However, the licensee is in the process to integrate the requirements of the examination methods and frequencies for all DMBWs in the Third Interval ISI Plans for both units to meet the MRP-139 ISI requirements. The licensee has enough time to perform this task. The inspectors reviewed all DMBWs categorized at the time of the inspection for appropriate categorization.

The pressurizer nozzles were correctly categorized as Category H welds in their pre-FSWOL condition by not performing the baseline volumetric examinations and categorized as Category B for the ISI program after the FSWOL.

## (3) Are inspection frequencies consistent with the requirements of MRP-139?

Yes. The licensee plans inspection frequencies for welds in the MRP-139 ISI program to be consistent with the requirements of MRP-139.

## (4) What is the licensee's basis for categorizing welds as H or I and plans for addressing potential PWSCC?

The licensee temporarily classified the six DMBWs on the pressurizer nozzle welds for both units as Category H without performing the baseline volumetric examinations prior to the FSWOL and directly performed the FSWOL for all of DMBWs based on the permission of Section 6.8 of the MRP-139. The six DMBWs on the pressurizer for both units were reclassified as Category B after the FSWOL was performed. Therefore, no any DMBWs for the Category H exist in either unit.

## (5) What deviations has the licensee incorporated and what approval process was used?

No deviations to MRP-139 have been incorporated by the licensee.

.4 Independent Spent Fuel Storage Installation (ISFSI) Radiological Controls.a. Inspection Scope

The inspectors conducted independent gamma surveys of the ISFSI facility and compared the results to previous quarterly surveys. The inspectors also observed and evaluated implementation of radiological controls, including radiation work permits and postings, and discussed the controls with Health Physics supervisory staff. Radiological controls for loading NAC-UMS ISFSI casks were reviewed. Selection and appropriate use of neutron survey instrumentation for ISFSI boundary and cask surveys was reviewed and discussed with cognizant licensee personnel. In addition, the inspectors observed placement of thermoluminescent dosimeters around the facility and reviewed direct radiation monitoring results obtained using the dosimeters.

Radiological control activities for the ISFSI were evaluated against 10 CFR Part 20, 10 CFR Part 72, and NAC-UMS Certificate of Compliance No. 721015. Documents reviewed are listed in section 2OS1 of the Attachment to this report. The inspectors completed the radiation protection line-item sample activities specified in IP 60855.

b. Findings

No findings of significance were identified.

4OA6 Meetings, Including Exit

.1 Exit Meeting Summary

On July 21, 2008, the resident inspectors presented the inspection results to Mr. George Hamrick and other members of licensee management, who acknowledged the findings. The inspectors confirmed that any proprietary information provided or examined during the inspection period had been returned.

.2 Annual Assessment Meeting Summary

On April 21, 2008, the Acting Chief of Reactor Projects Branch 1, and the Resident Inspectors assigned to the Catawba Nuclear Station (CNS) met with Duke to discuss the NRC's Reactor Oversight Process (ROP) and the NRC's annual assessment of CNS safety performance for the period of January 1, 2007 - December 31, 2007. The major topics addressed were the NRC's assessment program and the results of the CNS assessment. The meeting was open to the public. A listing of meeting attendees (ML081980508) and information presented during the meeting (ML081980501) are available from the NRC's document system (ADAMS) as accession number. ADAMS is accessible from the NRC Web site at [www.nrc.gov/reading-rm/adams.html](http://www.nrc.gov/reading-rm/adams.html).

4OA7 Licensee Identified Violations

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

- TS 5.4.1 requires procedures as specified in Regulatory Guide (RG) 1.33, Appendix A. Radiation Protection Management Procedure (RPMP) 10.3, Dose Rate Monitoring System (DRMS) Alarm Surveillance and Response, requires the DRMS Alarm Summary screen to be displayed at all times in the S&C work area and that the Alarm Screen be inspected for alarms at least twice per shift. Contrary to the above, on November 4, 2007, the DRMS display had timed out to the screen saver, resulting in dose rate increases on the ND (residual heat removal) piping to go unnoticed. ND pump 2A was started by operations at 1:26 a.m.; the increasing dose rates were not identified until an individual received a dose rate alarm in the B/C fan room in lower containment (posted/controlled as a high radiation area) at approximately 0930. The investigation of the dose rate alarm by HP led to the identification of higher than expected dose rates on the ND piping. HPTs were then

Enclosure

dispatched to survey areas in the auxiliary building containing ND piping; eight rooms were identified to have high radiation area conditions that were not being posted and controlled as high radiation areas. The rooms were posted and controlled as appropriate by approximately 1630. This event is documented in the licensee's CAP as PIPs C-07-6728 and C-07-6732. The violation was evaluated using the Occupational Radiation Safety Significance Determination Process and was determined to be of very low safety significance (Green) because this finding did not involve ALARA planning or work controls, was not an over-exposure, did not have a substantial potential for over-exposure, and the ability to access dose was not compromised.

- TS 5.7.2 requires, for areas with radiation levels greater than 1000 mrem/hr at 30 cm from the radiation source, compliance with the requirements of TS 5.7.1, which states, in part, that any individual permitted to enter such areas shall be provided with a radiation monitoring device that continuously integrates the radiation dose rate in the area and alarms when a preset integrated dose is received. Contrary to the above, on June 7, 2008, a deconner entered the Unit 1 refueling cavity, which was posted and controlled as a locked high radiation area, without a transmitting electronic dosimeter (ED). The worker's ED, which was inadvertently left outside the area, was transmitting; but an HP supervisor and the HP technician performing continuous surveillance observed that only EDs for two of the three individuals in the canal indicated elevated dose rates.

Believing that one of the EDs had failed, HP requested that the individual leave the area. A subsequent survey determined that the work area general area dose rate was 160 to 240 mrem/hr, with the highest general area of 320 to 480 mrem/hr at the plane of the reactor vessel head. Dose rates 30 cm from the upper internals, 3 to 4 feet under the suspended reactor vessel head, were determined to be 1070 mrem/hr. Although the pre-job briefing the previous day had stressed that entry under the suspended reactor vessel head was not allowed because of the inherent industrial safety concerns, there was neither a physical barrier nor an HPT in the cavity to prevent a worker from accessing the location where the LHRA conditions existed. This event is documented in the licensee's CAP as PIPs C-08-3593 and C-08-3588. The violation was evaluated using the Occupational Radiation Safety Significance Determination Process and was determined to be of very low safety significance (Green) because this finding did not involve ALARA planning or work controls, was not an over-exposure, did not have a substantial potential for over-exposure, and the ability to access dose was not compromised.

ATTACHMENT: SUPPLEMENTAL INFORMATION

Enclosure

## **SUPPLEMENTAL INFORMATION**

### **KEY POINTS OF CONTACT**

#### **Licensee Personnel**

E. Beadle, Emergency Planning Manager  
S. Beagles, Chemistry Manager  
E. Brewer, Operations Training Manager  
W. Byers, Security Manager  
J. Caldwell, Modifications Engineering Manager  
W. Callaway, Principal Engineer for Alloy 600 and MRP-139  
M. Dickson, Modification/50.59 Subject Matter Expert  
J. Ferguson, Mechanical, Civil Engineering Manager  
W. Brewer, Safety Assurance Manager  
T. Cabe, ALARA Team Leader  
J. Foster, Radiation Protection Manager  
P. Gillespie, Operations Superintendent  
W. Green, Reactor and Electrical Systems Manager  
G. Hamilton, Training Manager  
G. Hamrick, Engineering Manager  
R. Hart, Regulatory Compliance Manager  
A. Horsley, Major Projects Lead, ECCS Sump Project  
T. Jenkins, Work Control Manager  
G. Kent, 10CFR50.59 Program Consultant  
D. Kulla, Supervisor Modifications Engineer  
J. McArdle, Principal UT Level III  
J. McConnell, Shift Operations Manager  
J. Morris, Catawba Site Vice President  
J. Pitesa, Station Manager  
T. Ray, Maintenance Manager  
M. Sawicki, Regulatory Compliance Engineer  
L. Schlise, RP General Supervisor  
C. Trezise, Reactor and Electrical Systems Manager  
R. Weatherford, Nuclear Training Manager  
T. Wright, RP Supervising Scientist

#### **NRC personnel**

J. Stang, Project Manager, NRR  
R. Bernhard, RII, SRA

## LIST OF ITEMS OPENED, CLOSED, AND REVIEWED

### Opened

None.

### Closed

2515/166	TI	Pressurized Water Reactor Containment Sump Blockage (NRC Generic Letter 2004-02) - Unit 1 (Section 4OA5.2)
----------	----	--

### Reviewed

2515/172	TI	Reactor Coolant System Dissimilar Metal Butt Welds (Section 4OA5.3)
----------	----	---

## LIST OF DOCUMENTS REVIEWED

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

RP/0/A/5000/007; Natural Disaster and Earthquake, Attachment 4.2; "Tornado Warning Issued for York County", Rev. 26

Risk Profile for planned work for April 28, 2008

PT/0/B/4700/039, Hot Weather Protection, Rev. 013

PT/0/B/4700/038, Cold Weather Protection, Rev. 027

NSD 317, Freeze Protection Program, Rev. 03

PIP C-07-2223; RN cooling was realigned to Unit 1 Aux Bldg Supply Units before the Hot Weather PT was performed

PIP C-07-2449; The Hot Weather Protection PT is reactive vs. proactive in that the enclosure is performed in June

PIP C-07-2096; Door between the "A" and "B" rooms in the RN pump house opens rapidly due to ventilation system issues

OP/1/A/6350/001; Normal Power Checklist , Enclosure 4.27, Degraded Grid Response, Rev. 61

OP/2/A/6350/001; Normal Power Checklist , Enclosure 4.26, Degraded Grid Response, Rev. 60

NSD 417, Nuclear Facilities / Generation Status Communications, Rev. 9

RP/0/A/5000/007, Natural Disasters and Earthquake, Rev. 27

Alarm Response Actions for Operator Aid Computer Points C1E1795 (230kV Yellow Bus Voltage) and C1E1797 (230kV Red Bus Voltage)

Alarm Response Actions for Operator Aid Computer Points C2E1795D1 (230kV Yellow Bus Voltage) and C2E1797D1 (230kV Red Bus Voltage)

### **Section 1R04: Equipment Alignment**

#### **[1R04.1: Partial Walkdowns]**

Complex Activity Plan for the annual dual unit SSF outage

SOMP 02-02; Attachment 13.1, Protected Train Posting for Dual SSF Work Week 14 Risk Profile for Week

Attachment

SOMP 02-02; Attachment 13.1; Protected Train Posting for the RN piping replacement performed under modification CD100417 for the A train  
Standardized Protected Equipment Plan for 1EOC17

SOMP 02-02; Attachment 13.1; Protected Train Posting for the RN piping replacement performed under modification CD100417 for the B train

**[1R04.2: Complete System Walkdown]**

Drawing Number CN-1592-1.0; CNS Unit 1 Flow Diagram of CA, Rev. 30  
Drawing Number CN-1592-1.1; CNS Unit 1 Flow Diagram of CA, Rev. 25  
Drawing Number CN-1592-1.2; CNS Unit 1 Flow Diagram of CA, Rev. 0  
Auxiliary Feedwater Health Report, 4<sup>th</sup> Quarter 2007  
PIP C-07-4849; 1CA-42B failed to stroke properly during its IWV  
PIP C-07-1547; 1CA-42B failed in the closed position due to a stuck pushbutton on the main control panel  
NRC MSPI performance thru 1<sup>st</sup> quarter 2008

**Section 1R05: Fire Protection**

NSD 313, Control of Combustible and Flammable Material, Rev. 6  
NSD 314, Hot Work Authorization, Rev. 6  
Station Fire Impairment Log  
Fire Strategy Fire Area 2, Auxiliary Building 543 foot level, Rooms 260 and 260A; Unit 2 CA Pump Room and Motor Driven Pump Pits  
Fire Strategy Fire Area 39, Auxiliary Building 543 foot level, Room 264; Unit 2 Turbine Driven Pump Pit  
Fire Strategy Fire Area 31, Auxiliary Building 543 foot level, Room 262; Unit 2 "A" Train Aux Shutdown Panel  
Fire Strategy Fire Area 33, Auxiliary Building 543 foot level, Room 263; Unit 2 "B" Train Aux Shutdown Panel  
Fire Strategy Fire Area 21, Auxiliary Building 594 foot level, Room 573; Control Room  
Fire Strategy Fire Area 18, Auxiliary Building 577 foot level  
Fire Strategy Fire Area RB-1, Unit 1 Reactor Building  
Fire Strategy Area 24 – Auxiliary Building 605 foot level, Room 600; Unit 1 Spent Fuel Pool

**Section 1R08: In-service Inspection Activities**

Procedures

NDE-10, General Radiography Procedure, Rev. 023  
NDE-12, General Radiography Procedure for Preservice and In-service Inspection, Rev. 012  
NDE-25, Magnetic Particle Examination, Rev. 023  
NDE-35, Liquid Penetrant Examination, Rev. 021  
NDE-60, Visual Examination of Welds and Brazed Joints, Rev. 010  
NDE-68, Visual Examination for Leakage, Rev. 001  
NDE-600, Ultrasonic Examination of Similar Metal Welds in Ferritic and Austenitic Piping, Rev. 017

NDE-640, Ultrasonic Examination Using Longitudinal Wave and Shear Wave, Straight Beam Techniques, Rev. 4  
 PDI-UT-1, Generic Procedure for the Ultrasonic Examination of Ferritic Pipe Welds, Rev. D  
 PDI-UT-2, Generic Procedure for the Ultrasonic Examination of Austenitic Pipe Welds, Rev. C  
 PDI-UT-8, Generic Procedure for the Ultrasonic Examination of Weld Overlaid Similar and Dissimilar Metal Welds, Rev. F  
 PDI-UT-10, Generic Procedure for the Ultrasonic Examination of Dissimilar Metal Welds, Rev. C  
 Duke NGD Welding Functional Area Manual, Guidelines for Controlling Station Welding and Associated Processes  
 Duke ASME Section IX Welding Program Manual, Rev. 10  
 Duke WPM 503, Site Welding Activities, Rev. 1  
 SM/0/A/8140/001, Welding of QA and Non-QA Piping, Valves, and Components, Rev. 022  
 PT/1/A/4150-001H, Inside Containment Boric Acid Check, Rev. 013  
 MP/0/A/7650/040, Inspection, Evaluation, and Cleanup of Boric Acid on Plant Materials, Rev. 016  
 Duke Directive 322, Boric Acid Corrosion Program, Rev. 0  
 Areva 03-9072867, Eddy Current Guidelines for Duke Power Company CFR 80 Steam Generators Including Acquisition, Analysis, and Resolution, Rev. 001  
 Brooks 83-0092, Remote Examination and Removal of Foreign Objects from Steam Generator Secondary Side Catawba Unit 1, Rev. 001

#### Corrective Action and Evaluation Documents

PIP C-08-02951, NRC Exit for Improvement of a Penetrant Examination Document Process and Clarification for a Welding Procedure for the Surface Preparation of Ultrasonic Examination  
 PIP C-07-5248, 2007 CNS Boric Acid Corrosion Program Assessment  
 PIP C-07-6915, a Boron Film Was Identified on the External Surface of the Reactor Vessel Head Mirror Insulation  
 PIP C-08-02476, Evaluation, Repair, and Disposition for 1EOC 17 Mode 3 Shutdown Containment Boric Acid Leakage Walkdown Findings  
 PIP C-08-02793, Valve 1NV-34 Shows Evidence of Bonnet-to-Body Boron Leakage  
 PIP C-06-07708, Containment ISI General Visual Examination per PT/1/A/4200/078  
 PIP C-07-00259, Containment/Shielding Building Conditions Requiring Corrective Maintenance  
 PIP C-08-02822, Conflicting Information within Procedure SM/0/A/8140/001 Regarding Prep for ISI

#### Other Records

Procedure PT/1/A/4150/001H, Inside Containment Boric Acid Check Performed on May 3, 2008  
 MP/0/A/7650/040, Inspection, Evaluation, and Cleanup of Boric Acid on Plant Materials Performed on May 11 and 15, 2008  
 MP/0/A/7650/088A, Controlling Procedure for System Pressure Testing of ISI Applications for ASME Section XI Duke Class A, B, & C Systems and Components Performed on July 25, 2006  
 Procedure MP/0/A/4400/008A, RN Flow Balance Train A, Rev. 052, Performed on April 7, 2008  
 Procedure MP/0/A/4400/008B, RN Flow Balance Train B, Rev. 047, Performed on February 28, 2008  
 Areva 51-9036531-000, Catawba Unit 1 1EOC16 RPV Head Penetration Inspection Report



Work Order (WO) 01771053-11, 1SMHXB (SG B), PFM Sludge Lance/Secondary Side Inspection

1EOC Steam Generator Outage Status, Dated May 22 & 23, 2008

WO 01748158, PF CD 101308 Pre-Fabrication Piping/Valve Accumulator for NI-184/185 for Welds 1492-NI.00-97-25, -26, -28, and -29 Included Materials, Weld Process Control, and Reports PT-08-005 and PT-08-006, Pressurizer 4" diameter spray line, pipe-to-elbow welds 1NC190-19 and -20

Report MT-08-001, Main Steam 4" diameter vent pipe

Report UT-08-017, Presurizer Surge Nozzle Weld Overlay

Report UT-08-012, Presurizer Spray Nozzle Weld Overlay

Reports UT-08-003 and UT-08-004, Pressurizer 4" diameter spray line, pipe-to-elbow welds 1NC190-19 and -20

Report UT-08-011, Main Steam 4" diameter vent pipe

### **Section 1R11: Licensed Operator Requalification**

Catawba Active Simulator Exam ASE-46, Rev. 02

ASE-46 Critique package from the April 23, 2008 simulator session

EP/1/A/5000/FR-s.1; Response to Nuclear Generation / ATWS, Rev. 017

### **Section 1R12: Maintenance Effectiveness**

PT/0/A/4600/117; Standby Shutdown Facility, Rev. 1

PT/0/A/4200/019A, Standby Shutdown Facility Diesel Generator Operating Parameters, Rev. 1

PT/0/A/4200/017A, Standby Shutdown Facility Diesel Test, Rev. 1

E1 Work Request 00950043, Inspect / repair the SSF DG breaker tripping on reverse power

PIP C-08-1256; Unit 2 VCT Auto Makeup system failure

Tag outs 08-912 and 08-988 to support the SSF DG PM activities

Complex Activity Plan for the routine PM activities and replacement of the governor for the SSF DG

Retest instructions for the Unit 2 VCT auto-makeup controller repair

SOER 91-01 Activity Plan, Replacement of Spent Fuel Pool Cooling valve 1KF-36

Weekly Risk Profile for Work Week 15, Unit 1, Rev. 02

PIP C-08-3804; During the Mode 3 Up walkdown performed on 6/15/08, an accumulation of boron was noted on Conoseal 76

WR 856246; Repair leak found on Conoseal 76 during NOT / NOP containment walkdown

MP/1/A/7150/115; Core Exit Thermocouple Nozzle Disassembly and Reassembly

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

Complex Activity Plan for the annual dual unit SSF outage

Complex Activity Plan for work activities associated with the Unit 1 Main Steam Safety Valve

Testing to support 1EOC17 refueling outage

SOMP 02-03; Attachment 13.1, Protected Train Posting for Dual SSF Work; Week 14

SOMP 02-03; Attachment 13.1, Protected Train Posting for 1KF-36 Replacement Work Week 15

Weekly Risk Profile for Week 14, Unit 1 and Unit 2

Weekly Risk Profile for Week 15, Unit 1

Weekly Risk Profile for Week 18, Unit 1  
 Weekly Risk Profile for Week 20, Unit 1 and Unit 2, Rev. 01 and 02  
 SOER 91-01 Activity Plan; 1KF-36 Hard to Cycle  
 AP/1/A/5500/001, Loss of SFP Level, Rev. 01  
 OP/1/B/6100/010N, Annunciator Response for Panel 1AD-13, Rev. 46  
 Critical Activity Plan associated with the 1A RN pump installation and A Train pit work

## **Section 1R17: Evaluations of Changes, Tests, or Experiments and Permanent Plant Modifications**

### Full Evaluations

05-CN-004, OP/1(2)/a/6450/017, Rev. 58(51), Enclosure 4.9, Abnormal Air Release Mode, 12/06/2005  
 06-CN-006, (Plant Fire), Revision 0 Issuance, 10/19/2006  
 07-CN-003, CD-101416-1NV-63B (NCP Seal Return Isolation) AOV Failed-to-Close, 09/12/2007  
 07-CN-005, CD100702/200705 Restore Auxiliary Building Filtered Exhaust Ventilation Dampers to allow for Normal Bypass Operation, 09/12/2007  
 05-CN-002, Design change CD 200384, Disable Lower containment ventilations Unit 2D Low speed Operation, dated 08/10/2005  
 05-CN-005, CD 100105, Swap 1A and 1B EDG after Cooler Cooling Water from RN to YD/YM, dated 03/21/2006  
 06-CN-002, Compensatory Actions and EP/AP Procedure Changes Associated with PIP c-05-02259, dated 03/27/2006  
 06-CN-007, Replacement of Containment and Unit Vent Airborne Particulate Monitors and Deletion of Continuous Iodine Monitors, 06/27/2006  
 06-CN-003, Unit 2 RTD Response Time, 02/14/2006  
 06-CN-013, Revision to MNS & CNS TS Bases 3.16.13 & associated UFSAR Sections, 11/30/2006

### Screened Out Items

CD201309, Install an Accumulator to Collect Leakage Past NI-184/185, Rev. 0, 07/13/2007  
 CD201309, Install an Accumulator to Collect Leakage Past NI-184/185, Rev. 1, 06/13/2007  
 CD201309, Install an Accumulator to Collect Leakage Past NI-184/185, Rev. 2, 09/04/2007  
 CE200879, Revise Torque Values for the NV Excess Letdown Heat Exchanger Body-to-Bonnet Flange, 08/21/2006  
 CD200494, Replace Lube Oil Supply Tubing on the 2B Diesel Generator Turbocharger, 03/30/2006  
 CD 100139, SWP 1EOC16, Install 30 Inch Unit 1 Crossover Line, Auxiliary Building, 04/27/2006  
 Variation Notice (VN) CD 100139VNF, Temporary Locking Device on 1 RNP-22, 11/01/2006  
 VN CD 100139VNT, Cable Tray Support Interference for Installation of 30" Unit 1 Crossover, 2/02/2006  
 CD 100106, SWP, Add Unit 1 Service Water to EDG Jacket Cooling Water (RN/KD) Crossover, 07/02/2007  
 CD 100548, GL 89-10 MOV Actuator Replacements, 1EOC16, 11/08/2006

Change Setpoint for 1EQCPS5040 and 1EQCPS5050, EDG Unit Tripped Reset Pressure Switch – CD 100988, 06/19/2006  
 CD200099, Perform Various 89-10, MOV Test/Operator Replacements, 03/09/2006  
 CE73287, Corrective Modification with Field Work to Replace 2NM424 and 2NM425 with New Item No. 09J-638, 09/27/2004  
 CD 201557, Replace Bearing Housing on RL-IJ Centrifugal Charging Pump, 10/19/2007  
 CE 101250, Replacement Power Supply for Rod Control System, 01/22/2007  
 CE 201406, Replace Agastat relay SCBRX022XXAFA with Agastat relay SCBRX022XXACXA, 05/16/2007  
 CD 200989, Diesel Generator Tripped Pressure Switch setting lowered from 50 psi to 40 psi for shutdown cylinder, 01/23/2007  
 CD 101604, Remove fuse FU4 from control circuit of the YC Chiller A, 10/30/2007  
 CE 100626, Replace Agastat relay 7022AFT with new Agastat relay E7022AET, 04/04/2007  
 CE 101250, Replacement power supply for Rod Control System, 01/22/2007  
 CD101269, Replace Motor on 1VC005B with an 1800rpm Motor, 02/05/2007  
 CD 500746, Revise TAC sheets for KC heat exchangers, 05/24/2006  
 CD 500800, Optional Use of Tube for Oil Drain Line in NI Pump, 08/21/2006  
 CD201469, Resolve Breaker Coordination for 2EDF and EPD, 10/11/2007  
 CD200817, Change fuses and revise drawings for VF circuitry, 06/17/2007  
 CE201043, Replace time relay 1VCTIRB12-XT2 with equivalent, 03/04/2007  
 CD500615, Span change for RN level instrumentation, 11/20/2007

#### Design Basis Documents

Technical Specifications, Current  
 Updated Final Safety Analysis Report, Current  
 Technical Requirements Manual, Requirements for Browns Ferry Nuclear Plant Unit 3, Current  
 Technical Requirements Manual, Bases for Browns Ferry Nuclear Plant Unit 3, Current  
 CNS- 1609.LD-00-0001, Design Basis Specification for the Diesel Generator Lube Oil System, Rev. 18  
 CNS-1571.FW-00-0001, Design Basis Specification for the Refueling Water (FW) System, Rev. 16  
 CNS-1561.ND-00-0001, Design Basis Specification for the Residual Heat Removal (ND) System, Rev. 25  
 CNS-1465.00-0003, Design Basis Specification for Containment Process Penetrations, Rev. 9  
 CNS-1562.NI-00-0001, Design Basis Specification for Safety Injection System, Rev. 33  
 CNS-1465.00-0014, Standby Shutdown Facility Design Basis, Rev.5

#### Problem Investigation Process

C-02-05663, Excessive number of RN Pit level instrumentation OOTs in last two and a half years, 10/17/2002  
 C-05-00026, Time delay Relay 1VCTIRB12-XT2 damaged during calibration, 01/04/2005  
 C-07-02458, Potential breaker coordination/cable routing issue associated with Safe Shutdown capability, 05/16/2007  
 C-05-03386, Dose analysis may not appropriately account for effluent pathways during some postulated core damage events, 06/01/2005

C-07-0367, Breaker 1EPD-14 branch 02 ground fault (for 1NV-63B, NCP-1B seal return isolation), 07/22/2007  
 C-04-04205, Indications problems on 2NS-018A, 04/20/2004  
 C-06-01623, Modification test plans (MTPs) for three safety related (SR) and our non-SR four systems do not coincide with the functional test work orders, 01/06/2006  
 C-06-02402, MTPs for already-implemented design changes could not be located in DCRM, 02/04/2006  
 C-08-00448, Safety tags hanging greater than 90 days, 01/04/2008  
 C-07-06880, Water noted in area under containment sump suction piping (2NI-184B Bonnet vent closed), 03/08/2007  
 C-07-05515, No mechanism for tracking temporary alterations for greater than 90 days, 04/15/2007  
 C-07-03525, NV-63B ground MOV resolution – temporary alterations process control issue, 03/05/2007  
 C-07-06479, A YC Chiller failed to start during A train ESF testing on Unit 2, 10/26/2007  
 C-00-03760, Particulate, iodine and noble gas monitors associated with containment atmosphere failing at increased frequency, 07/27/2000  
 C-07-05098-001, New thrust bearing housing supplied from vendor with order does not match old housing, 09/19/2007  
 C-07-00199-000, One of the redundant rod control power supplies failed, 01/16/2007  
 C-04-05302-004, Pressure drop between Diesel Engine Control Panel and Overspeed Trip Solenoid Valve, 10/10/2005

#### Self Assessment

G-06-00493, Level 2 assessment of the quality of 10 CFR 50.59 screening  
 G-06-00492, Level 2 assessment of the quality of 10 CFR 50.59 evaluations  
 GO-07-16 (NPA) (ENG), Engineering Functional Area Evaluation, June 4 – August 13, 2007

#### Procedures

MP/0/A/7150/006, Ice Condenser Lower Inlet Doors Inspection and Testing, Rev. 29  
 MP/0/A/7650/062, Controlling Procedure for Pressure Testing Class “A”, “B”, & “C” Piping systems, Rev. 021  
 MP/0/A/7650/175, Open system or Component Foreign Material Exclusion, Rev. 005  
 MP/0/A/7600/180, New/Spare Valve Bench Testing for Simulated Type C Leak Rate Tests or Engineering Specification, Rev. 001  
 PT/1/A/4200/001c, As Left Containment Isolation Valve Leak Rate Test, Rev. 114  
 CNM 1201.06-09.46-00, Torque Requirements for Excess Let Down Heat Exchanger Flange, Rev. 14  
 OP/1(2)/A/6450/017, Abnormal Air Release, Rev. 58(51)  
 AP/0/A/5500/045, Plant Fire, Rev. 005  
 OP/0/B/6100/13, Standby Shutdown Facility Operations, Rev. 047  
 IP/0/B/3314/086 H, Rev. 18, Process High Range Monitor Channel Calibration  
 IP/0/A/3710/002, Rev. 044, Battery Removal, Replacement, Storage and Handling  
 IP/2/A/3710/052, Rev. 005, 125 EDC Essential Diesel Auxiliary Power System (EPQ) Battery Weekly and Quarterly Inspection

Work Orders

0176002211, Per CD 210309 "B" Train, Install Accumulator for NI-164B Back-Leakage, 10/18/2007  
 01732294-01, 1EPL: Investigate & Locate Grounds on IEDD Distribution Center, 07/20/2007  
 01758268-01, CD101416 1NV-63B: Temp Mod: Remove Fuses for Ground Alarm on 1EPD, 07/20/2007  
 01129230, CD200817>2ATC CA EATC05: Replace Fuse, 03/26/2007  
 01129231, CD200817>2ATC CA EATC08: Replace Fuse, 06/04/2007  
 01706699, CE201043>2ATC CA EATC17: Replace Relay 1VCTIRB12-XT2, 02/28/2007  
 01700490, OVC – Perform Cal on all Train B timers, 02/28/2007  
 01758744, CD201469: Install fuse block in 2EDF, 10/30/2007  
 01765169, CD201469: Install fuse block in 2EPD, 10/19/2007  
 01765057, 2RNLT7370-ACOT/CAL. RN Pit B Level Inst., 09/11/2007  
 01742844, 0RNLT7370-ACOT/CAL. RN Pit B Diff. Level Across Screen, 09/04/2007  
 01103996, 1VC 005B; Refurbish Limitorque Actuator, 01/29/2007

Calculations

CNC-1223.21-00-0020, ND Suction Pressure Control Setpoint Determination for 1(2) FW96 and 1(2) FW97, Rev. 0  
 CNC-2206.02-74-2003, Seismic evaluation for CE201563, Rev. 0  
 CNC-1552.08.00-0300 Appendix G, Rev. 4, Analysis for Power Up Rate to 101.7% of 3411 MWt  
 CNC-1552.08-00-0305 Appendix F, Rev 001, CNS-2 Mini Up rate RETRAN and VIPRE analysis  
 CNEI-0400-134, Rev. 0, Revised Catawba Unit 2 RTD Response Time Criteria  
 CNC-1210.04-00-0026, Instrument Loop Accuracy for RN Pump Intake Pit Level Transmitters  
 RNLT7370/7390/8260/8270, Rev. 10  
 DCP-1201.17-00-0006(CNC-1201.17-00-0020, MCC-1201.17-00-0030), Design and Licensing Bases for Ice Condenser Lower Inlet door Technical Specification Surveillance Requirements, 40-Degree Opening, Closing and Frictional Torques, Rev. 0

Drawings

CN-2592-1.1, Flow Diagram Auxiliary Feedwater system, Rev. 30  
 CN-1522-09.46-00, Piping Layout Instrument Air (VI) Auxiliary Building El. 605'+10', Rev.16  
 CN-2562-1.3, Flow diagram Safety Injection System, Rev. 21  
 CN-2492-NI00-139/140/141/142, Piping Layout Diagram Safety Injection System, Rev. 0  
 CNEE-0157-03.09, Elementary Diagram Chemical Volume Control System Solenoid Valves, Rev.10  
 CN-2491-CA.00-005, Reactor Building/Doghouse Auxiliary Feedwater System, Rev. 17  
 CN-2571-1.0, Flow diagram Refueling Water System, Rev.19  
 CN-1609-2.2, LD System Flow Diagram, Rev. 22.  
 CN-2609-2.2, LD System Flow Diagram, Rev. 21.  
 CN-2561-1.00, Flow Diagram Residual Heat Removal System, Rev. 25  
 CN-2561-1.01, Flow Diagram Residual Heat Removal System, Rev. 19  
 CN-2562-01.03, Flow Diagram Safety Injection System, Rev. 16  
 CN-1585-1.0, Flow Diagram Containment Air Release and Addition System, Rev. 12  
 CN-1577-1.0, Flow Diagram Auxiliary Building ventilation System, Rev. 9

CNEE-01(2).52-01.08, Electrical Elementary Drawings for Valve 1(2) VQ13, Rev. 2  
 19FA, Rev. D1, Carrier 19FA Chiller Impeller, Refrigerator and Bearing Sensor Connection  
 Diagram  
 CNEE-0138-01.78, Elementary Diagram Nuclear Service Water System (RN) PIT A Lake to  
 SNSWP Transfer Controls, Rev. 15  
 CNEE-0138-01.78, Elementary Diagram Nuclear Service Water System (RN) PIT A Lake to  
 SNSWP Transfer Controls, Rev. 17  
 CNEE-0238-01.35, Elementary diagram Nuclear Service Water System (RN) NSW Heat  
 Exchanger 2B Outlet Isolation Valve 2RN229B, Rev. 6  
 CN-1759-13.02, Connection Diagram Battery Test Set/Constant Current Charger Connection  
 Box, Rev. 8  
 CN-1499-RN. 08-02, Instrument detail NSW Pit Screen Diff. Level & Pump Intake Pit Level  
 Layout-Plan, Rev. 27  
 CN-1499-RN. 08-03, Instrument detail NSW Pit Screen Diff. Level & Pump Intake Pit Level  
 Layout-Sections, Rev. 16  
 CN-1499-RN8.06, Instrument Detail Nuclear Service Water Pit Screen Differential Level, Rev. 0  
 CNEE-0131-06.21, Elementary Diagram Control Room Area Vent. Sys (VC) Channel B Outside  
 Intake Isolation Valve 1VC005B, Rev. 9  
 CNEE-0256-04.18, Elementary Diagram Fuel Pool Ventilation System-VF Miscellaneous  
 Instrumentation Train A, Rev. 7  
 CNEE-0256-04.19, Elementary Diagram Fuel Pool Ventilation System-VF Miscellaneous  
 Instrumentation Train B, Rev. 8  
 CNEE-0156-04.19, Elementary Diagram Fuel Pool Ventilation System-VF Miscellaneous  
 Instrumentation Train B, Rev. 12  
 CNEE-0156-04.18, Elementary Diagram Fuel Pool Ventilation System-VF Miscellaneous  
 Instrumentation Train A, Rev. 10

#### Miscellaneous documents

PT/1/A/4200/013C, RN Valve In-service Test (QU), performed 11/23/2006  
 Work Order (WO) 01106827, Weld Process Control for Weld 1492-RN.00-436-6, 10/26/2006  
 MP/0/A/7650/088, Controlling Procedure for Systems Pressure Testing for Repair/Replacement  
 of ASME Section XI, duke class A, B, and C Systems and components, 12/14/2006  
 WO 01103278, CD 100139 Unit 1, 1A Train RN Essential Header, 12/21/2006  
 PT/1/A/4200/020, FW Valve In-service Test (QU), 11/30/2006  
 IP/0/A/3820/004, Operating, Checkout for Limitorque and Rotork Valve Actuators, 11/24/2006  
 Drawing CN-1574-1.1, Flow Diagram of Nuclear Service Water system, Rev. 47  
 Nuclear Station Directive (NSD)-415, Operational Risk Management (Modes 1-3) per 10 CFR  
 50.65(a) (4) Rev. 4  
 ST1648, Temporary Alteration Report, 04/23/2008  
 PT/0/A/4700/058 A, Operations Safety Tag Verifications for Compliance with the Maintenance  
 Rule, 02/11/2008  
 DPR-1205.01-00-0004, Technical requirements Document for 09J-2049, ¾"SS, class 1878  
 Check Valve with Adjustable Checking, Rev. 1  
 CN-11440/00, Final Scope Document, 02/08/2007 with CD200989  
 CN-21447/00, Final Scope Document, 01/12/2006 with 06-CN-007  
 Dockets 50-413 and 50-414, Correspondence between Duke Power and  
 USNRC, 07/19/2004, 03/08/2005, 03/22/2005

Problem Investigation Process Reports Written as a Result of the Inspection

C-08-02297, Installed tubing for 2A NI pump outboard bearing oil drain line has upward slope in one segment of piping back to oil reservoir, 04/24/2008

**Section 1R18: Plant Modifications**

PIP C-06-8777; Abnormal Operating Procedures entered due to an explained loss of RCS inventory during the Unit 1 startup following a refueling outage  
 PIP C-07-2911; Unexpected entry into TSAIL due to the Unit 2 submarine hatch found unsecured  
 PIP C-07-2912; Unexpected entry into TSAIL due to the Unit 1 submarine hatch found unsecured  
 PIP C-07-2911; Documentation of the inspection of the submarine hatches  
 PIP C-03-1163; Long term management plan for the RN system at Catawba  
 MP/0/A/7150/096; Submarine Hatch Inspection and Tamper-Proof Seal Installation, Rev. 015  
 UFSAR Section 6.2.2; Containment Heat Removal Systems  
 PT/0/A/4200/002; Containment Cleanliness Inspection, Rev. 030  
 10CFR50.59 Screen 00224875; Fuel Transfer System Operation OP/1/A/6550/008 Temporary Change (Installation of a toggle switch to simulate the function of the failed proximity switch OP/1/A/6550/008; Fuel Transfer System Operation, Rev. 11B

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

PT/1/A/4600/001; RCCA Movement Test, Rev. 42  
 PIP C-08-3719; Inservice Test data for the 1A RN pump fell within the alert range following replacement of the pump  
 PT/0/A/4400/022A, Nuclear Service Water Pump Train A Performance Test, Rev. 83  
 PT/1/A/4350/002A; Diesel Generator 1A Operability Test, Rev. 118  
 PT/1/A/4350/002B; Diesel Generator 1B Operability Test, Rev. 115  
 PT/0/A/4200/017; Standby Shutdown Facility Diesel Test, Rev. 35

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

1EOC-17-IRT Unit 1 Outage Risk Assessment  
 Site Directive 3.1.30, Unit Shutdown Configuration Control (Modes 4, 5, 6 or No Mode), Rev. 35  
 Nuclear System Directive, NSD-403, Shutdown Risk Management (Modes 4, 5, 6 and No Mode), per 10CFR50.65(a)(4); Rev. 16  
 NSD 500; Red Tags / Configuration Control Tags; Rev. 24  
 OP/0/A/6100/014, Penetration Control for Modes 5 and 6; Rev.32  
 OP/0/A/6550/015; Receipt, Inspection and Storage of New Fuel, Rev. 31  
 OP/1/A/6150/006, Draining the Reactor Coolant System, Rev. 71  
 OP/1/A/6200/005, Spent Fuel Cooling System, Rev. 78  
 OP/1/A/6150/001, Filling and Venting the Reactor Coolant System, Enclosure 4.16, Reactor Coolant System Vacuum Refill without Solid Operation; Rev. 96  
 OP/1/A/6550/006, Transferring Fuel with the Spent Fuel Manipulator Crane; Rev. 59  
 OP/1/A/6550/007, Reactor Building Manipulator Crane Operation; Rev. 37  
 OP/1/A/6550/008, Fuel Transfer System Operation; Rev. 11

OP/0/A/6100/006; Reactivity Balance Calculation, Rev. 73  
 OP/1/A/6100/001, Controlling Procedure for Unit Startup; Rev. 213  
 OP/1/A/6100/002; Controlling Procedure for Unit Shutdown; Rev. 162  
 OP/1/A/6100/003, Controlling Procedure for Unit Operations; Rev. 100  
 OP/1/B/6300/001, Turbine Generator Startup; Rev. 85  
 OP-CN-JITT-ZPPT/Turbine; Just In Time Training Package; Initial Startup / Zero Power Physics Testing / Turbine On-Line; Rev. 6  
 MP/0/A/7150/139; Ice Condenser Walkdown and Inspection, Rev. 002  
 MP/0/A/7150/006; Ice Condenser Lower Inlet Doors Inspection and Testing, Rev. 029  
 MP/0/A/7150/042D, Reactor Vessel Head Penetration Visual Inspection, Rev. 003  
 MP/0/A/7150/042E, Reactor Vessel Bottom Head Penetration Visual Inspection, Rev. 001  
 MP/0/B/7150/012, Refueling Canal Cleanliness; Rev. 07  
 MP/0/A/7150/005; Ice Basket Weight Determination, Rev. 26  
 MP/1/A/7150/042; Rx Vessel Head Removal & Replacement, Rev. 50  
 PT/0/A/4150/29A; New Fuel and Component Inspection, Rev. 02  
 PT/1/A/4550/001F, Preparation for New Fuel Receipt, Rev. 03  
 PT/1/A/4350/003, Electrical Power Source Alignment Verification, Rev. 46  
 PT/0/A/4150/037, Fuel / Component Movement Accounting; Enclosure 13.2; Unload Transfer Sheet for Unit 1 EOC17 core unload  
 PT/0/A/4150/037, Fuel / Component Movement Accounting; Enclosure 13.3; Reload Transfer Sheet for Unit 1 EOC17 core reload  
 PT/0/A/4150/037, Fuel / Component Movement Accounting; Enclosure 13.2; Reload Transfer Sheet for Unit 1 EOC17 core reload; Rev. 11  
 PT/0/A/4150/038; Controlling Procedure for Fuel / Component Work, Rev. 08  
 PT/1/A/4200/002C, Containment Closure Verification (Part I); Rev. 77  
 PT/1/A/4200/002I, Containment Closure Verification (Part II); Rev. 34  
 PT/1/A/4200/002J, Containment Closure Verification Penetration Status Change; Rev. 11  
 PT/1/A/4550/001B; Reactor Building and Fuel Transfer Refueling Component Test, Rev. 34  
 PT/1/A/4550/001C, Refueling Communications Test; Rev. 13  
 PT/1/A/4550/001D; Reactor Building Manipulator Crane Load test; Rev. 19  
 PT/1/A/4550/001E; Spent Fuel Building Manipulator Crane Load test; Rev. 11  
 PT/0/A/4550/003 C; Post Refueling Core Verification, Rev. 9  
 PT/0/A/4150/17, Total Core Offloading; Rev. 38  
 PT/0/A/4150/022, Total Core Reloading; Rev. 41  
 PT/0/A/4150/037; Fuel / Component Movement Accountability, Rev. 11  
 PT/0/A/4200/002, Containment Cleanliness Inspection; Rev. 30  
 PT/1/A/4600/001; RCCA Movement Test, Rev. 42  
 PT/0/A/4150/019; 1/M Approach to Criticality; Rev. 34  
 PT/0/A/4150/001J, Zero Power Physics Testing; Rev. 3  
 PT/0/A/4150/001, Controlling Procedure for Startup Physics Testing; Rev. 41  
 PT/0/A/4150/019B, NC System Dilution Following Refueling, Rev. 15  
 PT/0/A/4150/001J, Zero Power Physics Testing Pre-Job Briefing Package  
 SM/0/A/8510/008, Ice Condenser FME Inspection; Rev. 3 (completed procedure)

#### OTHER DOCUMENTS

Operations Written Pre-Job Briefing for Power Decrease per OP/X/A/6100/003 conducted during shutdown JITT on April 30, 2008  
 Calculation CN-MRCDA-07-94; Reactor Head Drop Impact Analysis, Rev. 0



SCD320; Receipt Inspection of Nuclear Fuel and Core Components  
CNEI-0400-154, Catawba 1 Cycle 18 Core Operating Limits Report, Rev. 2  
CNEI-0400-157; Final Core Map for Catawba Unit 1 Cycle 18, Rev. 1  
CNEI-0400-029; Catawba Unit 1 Cycle 18 Final Core Design, Rev. 24  
PIP C-07-4838; Assessment of industry initiative of heavy load lifts  
PIP C-08-2147; Assessment of 1EOC17 IRT (Risk Profile for Unit 1 refueling outage)  
PIP C-08-2453; 1HW-59 failed closed when controller was shifted from "Auto" to "Manual" mode of operation  
PIP C-08-2454; Key elements involve procedure steps for verification of Steam Dump operation and placing BDMS in service impacted the start of the cooldown  
PIP C-08-2461; One hour critical path outage delay due to 235°F ND pump limitation  
PIP C-08-2464; Ice Condenser Mode 5 FME/walk down inspection  
PIP C-08-2470; Boron residue found on reactor head in the vicinity of CRDMs.  
PIP C-08-2474; DID Containment Control Safety Function unplanned color change to yellow, SRG IRT required to review this status change  
PIP C-08-2476; On 5/3/2008, 1EOC17 Mode 3 Shutdown Walkdown was performed per PT/1/A/4150/001H, Inside Containment Boric Acid Check, identifying forty-nine (49) new work activities for the refueling outage  
PIP C-08-2746; NRC inspector identified foreign material within the low pressure turbine FME zone that had not been logged in the FME log as required resulting in a stand down of all personnel involved in the work group  
PIP C-08-2678; The NRC Resident identified concerns and potential problems associated with FME boundaries and control processes in the reactor building and spent fuel pool  
PIP C-08-2680; Core offload suspended due to the upender permissive light on the Spent Fuel Pool side not illuminating  
PIP C-08-2701; Spent Fuel Pool and Fuel Transfer Canal boron sample taken on 5/7/08 significantly lower than previous sample  
PIP C-08-2586; No NDE QC inspectors on night shift of 5/5/08 delayed the start of the PM on the Vessel Head Lift Rig  
PIP C-08-2535; Thin boron residue, staining, trails found on the lower portions of CRDM latch housings above Rx Head.  
PIP C-08-2453; 1HW-59 failed closed when controller was shifted from "Auto" to "Manual" mode of operation  
PIP C-08-2454; Delay in initiating cooldown to Mode 5 on Unit 1  
PIP C-08-2461; One hour critical path outage delay due to 235°F ND pump limitation  
PIP C-08-2464; Ice Condenser Mode 5 FME/walkdown Inspection results  
PIP C-08-1806; 1EOC17 Readiness Items  
PIP C-08-1703; Catawba Maintenance 1EOC17 Outage Readiness Review - Reactor Services  
PIP C-08-1822; Catawba UFSAR Section 9.1.4.2.2 (Refueling Procedure) needs to be updated to align with the Catawba practice of reactor vessel head removal and replacement.  
PIP C-08-2147; 1EOC17 IRT Assessment  
PIP C-08-3331; Documentation of the CRDM thermal sleeve inspection performed during 1EOC17  
PIP C-08-3334; implementation actions for License Amendments 241/236 (Ice Fusion Issue)  
PIP C-08-3392; The four MOX lead test assemblies (LTAs) will not be inserted into Catawba Unit 1 Cycle 18 and the UFSAR needs to be reviewed to ensure it remains accurate  
PIP C-08-3423; On 5-30-08 a fire extinguisher discharged in the containment building (reference PIP 08-03398). During the investigation of the impact on equipment sprayed

during the discharge it was discovered that the fire extinguisher had not been tested per the Power Chemistry Materials Guide (PCMG) Program for surface applied category  
 PIP C-08-3398; Inadvertent fire extinguisher discharge in the pipe chase near the new ECCS sump  
 PIP C-08-3773, NRC Inspection of Unit 1 upper containment cleanliness following Operations PT performance  
 PIP C-08-3759, NRC Inspection of Unit 1 lower containment cleanliness following Operations PT performance  
 PIP C-08-3804; During the Mode 3 walkdown performed on 6/15/08, boron deposits were found on CETNA #76 indicating an active leak  
 PIP C-08-3757; Seismic concerns associated with scaffolding on 577' elevation in the Aux Bldg by the NRC Resident  
 PIP C-08-3760; INOS assessment of the reactor head heavy load lift  
 PIP C-08-3768; Containment cleanliness discrepancies  
 PIP C-08-3755; During "A" train Aux Safeguards testing, several components failed to actuate  
 PIP C-08-3573; "A" RN pit level failed to respond as expected following restoration of the "A" train of RN to service  
 PIP C-08-3907; NC System total makeup integrator malfunction during 1/M approach to criticality  
 PIP C-08-3949; 1<sup>st</sup> Stage pressure transient during performance of the Control Valve movement surveillance

### **Section 1R22: Surveillance Testing**

PT/0/A/4150/035; Unit Configuration for MSSV Testing at Power, Rev. 009  
 PT/1/A/4200/001D, Containment Hydrogen Sample and Purge Isolation Valve Leak Rate Test, Rev. 013, Enclosure 13.2 (Valves 1YV-17A and 1YV-18B)  
 Complex Activity Plan for work activities associated with the Unit 1 Main Steam Safety Valve (MSSV) testing  
 Risk Profile for Work Week 18, Unit 1  
 PT/1/A/4200/001C, As Left Containment Isolation Valve Leak Rate Test, Rev. 115, Enclosure 13.5 (Valve 1VI-77B)  
 Complex Activity Plan for work activities associated with the Unit 1 Main Steam Safety Valve (MSSV) testing  
 Risk Profile for Work Week 18, Unit 1

### **Section 1EP6: Drill Evaluation**

Scenario Guide for Emergency Response Organization (ERO) Drill 08-02  
 Catawba Nuclear Station TSC/EOF log report for the April 17, 2008 ERO drill  
 PIP C-08-2265; Catawba ERO Drill performance summary  
 Catawba ERO Drill 08-2 Emergency Notification Forms

### **Section 2OS1: Access Control To Radiologically Significant Areas**

Procedures, Instructions, Guidance Documents, and Operating Manuals  
 Nuclear System Directive (NSD) 501, Temporary Storage of Radioactive Material in the Spent Fuel Pool, Rev. 5

Health Physics Procedure (HP)/0/B/1009/008, Contamination Control of Injured Individuals, Rev. 15  
 Shared Standard Health Physics Procedure (SH)/0/B/2000/003, Preparation of a Radiation Work Permit, Rev. 7  
 SH/0/B/2000/012, Access Controls for High, Locked High, and Very High Radiation Areas, Rev. 8  
 SH/0/B/2001/001, Internal Dose Assessment, RA 0 1100 020, Surveillance and Controls for Pit Activities, Rev. 1  
 Standard Radiation Protection Management Procedure (SRPMP) 8.2, Investigation of Unusual Radiological Occurrence, Rev. 1  
 Radiation Protection Management Procedure (RPMP) 2.14, ALARA Control Area Documentation, Key Control, and Locking Hardware Control Guidelines, Rev. 1  
 RPMP 2.4, LHRA and VHRA Documentation and Locking Hardware Control Guidelines, Rev.12  
 RPMP 10.3, Dose Rate Monitoring System Alarm Surveillance and Response, Revs. 3 and 4  
 RPMP 10.4, Use and Control of Hoist Locks, Rev. 3

#### Records and Data

Radiation Work Permit (RWP) 28, Reactor building annulus entry (Modes 1 through 4), Rev. 16  
 RWP 1117, Mechanical valve work (1EOC17 LC), Rev. 19  
 RWP 1159, ECCS sump demo/re-route/restoration (1EOC17 LC/OS), Rev. 3  
 RWP 1163, ECCS sump insulation/coatings activities (1EOC17 LC/OS), Rev. 2  
 RWP 1165, Insulation/coatings activities (1EOC17 LC/ANN), Rev. 6  
 RWP 1421, Mechanical valve work (1EOC17 UC), Rev. 10  
 RWP 1431, Fuel movement in SFP (1EOC17), Rev. 14  
 RWP 1809, SG B/C install/remove nozzle dams (1EOC17 LC), Rev. 16  
 RWP 1812, SG A/D ECT (1EOC17 LC), Rev. 19  
 RWP 1822, SG sludge lance (1EOC17 LC/UC), Rev. 7  
 RWP 5002, Head tool decon/refurbishment/weir gate/inspections, Rev. 30  
 RWP 5010, Fuel cleaning and system removal in Unit 1 and Unit 2 spent fuel pool, Rev. 13  
 RWP 5040, Entry into LHRA room 550 and 404 for removal of spilled resin, Rev. 1  
 Survey M-050508-40, Aux Bldg 577 Elevation Room 404  
 Survey M-022808-7, Aux Bldg 577 Elevation Room 404  
 Survey M-050508-42, Aux Bldg 577 Elevation Rooms 476 and 477  
 Survey M-051408-15, U1 Rx Bldg Shallow End of Cavity  
 Survey M-050208-16, Initial Entry Survey  
 Survey M-051108-27, U1 Rx Bldg Lower Containment PC 552  
 Survey M-051008-7, U1 Rx Bldg Lower Containment PC 552  
 Survey M-082907-20, Liner CL40769-15  
 Survey M-082007-6, Aux Bldg 577 Elevation Room 550  
 Survey M-101907-23, Aux Bldg 577 Elevation Room 550  
 Survey M-101907-10, Aux Bldg 577 Elevation Room 550  
 Air Sample: U1 SFP Transfer Canal Limit Switch Work, 5/10/08 14:40:00  
 Air Sample: U1 SFP Canal Limit Switch Work, 5/10/08 15:35:00  
 Air Sample: U1 Removal of Limit Switch Assembly from SFP, 5/11/08 05:56:00  
 Air Sample: U1 SFP Upender Limit Switch Replacement, 5/11/08 07:20:00  
 Air Sample: U1 SFP Upender Limit Switch Repair, 5/11/08 07:20:00  
 Air Sample: U1 Switch Replacement on OP Deck in SFP, 5/10/08 21:41:00  
 Air Sample: U1 Valve 27/28, 5/14/08 01:25:00

Air Sample: U1 29/3, 0 Valve, 5/13/08 18:30:00  
 Air Sample: U1 29/30 Valve, 5/13/08 20:20:00  
 Air Sample: U1 Valve, 5/13/08 19:56:00  
 Air Sample: U1 Cut on 1NC 29, 5/14/08 05:30:00  
 Air Sample: U1 Valve 29/30, 5/14/08 01:25:00  
 DAC-hour Log, RWP 1431 (Upender Limit Switch Repair), 5/10/08  
 DAC-hour Log, RWP 1417 (Removal of Proximity Switch), 5/10/08  
 CNS ED Dose Rate Alarms Above 1 rem/hour  
 2008 Personnel Contamination Event (PCE) Log Sheet, 5/6/08 – 5/14/08  
 Whole Body Counts, PCEs 08-008, 08-009, and 08-011  
 ND Dose Rate Trends. 11/4/07 0:00:00 to 11/4/07 23:00:00

#### Corrective Action Program (CAP) Documents

RPS-11-08, Assessment of RP Controls for Access to Radiologically Significant Areas, 3/31/08  
 RPS-02-08, Assessment of RCA Entries for Work Order Input, 2/4/08  
 RPS-28-07, Annual LHRA Door Operability Assessment, 12/12/07  
 PIP C-08-03522, Problem with RP storage area  
     plan view, 6/03/08  
 PIP C-07-1618, Boron inspection stopped by encounter with a 350 mR/hr field, 3/19/08  
 PIP C-07-4554, During downgrading room 404, RP technicians found 1 of 2 keys had been  
     placed in a different key box, 8/27/07  
 PIP C-07-5039, Loss of key control for hoist lock that controls the waste solidification pad  
     hoist, 9/18/07  
 PIP C-07-5254, RP management expectations not met for LHRA controls during Rx head  
     removal, 9/23/07  
 PIP C-07-5453, RP related S/G work delays for night shift, 9/28/07  
 PIP C-07-6153, Reactor head lifted on 10/15/07 from reactor vessel to storage stand with  
     the equipment hatch fully opened, 10/15/07  
 PIP C-07-6316, RP management expectations/standards not met for radiological support of  
 PM work on resin batching tank mixer motor, 10/20/07  
 PIP C-07-6728, ND piping dose rates have increased significantly over the last ten hours,  
     11/4/07  
 PIP C-08-1196, Assessment to summarize and evaluation station performance in personnel  
     contamination control practices for fall 2007 refueling outage, 2/28/08  
 PIP C-08-2465, During MERT response to U1 lower containment, RP Compliance personnel  
     were not immediately notified of a potential contaminated injury, 5/3/08  
 PIP C-08-2517, Determination of contaminated vs clean status of heat stress victim  
     insufficiently made, 5/5/08  
 PIP C-08-2723, Work on the proximity instruments for the upender system in the SFP  
     resulted in five PCEs due to inadequate radiological controls, 5/11/08

#### **Section 20S2: ALARA Planning and Controls**

##### Procedures, Instructions, Guidance Documents, and Operating Manuals

Duke Power Company (DPC), System ALARA Manual, Section V, Temporary Shielding,  
 Rev. 14, Dated 01/01/02

DPC, System ALARA Manual, Section IV, ALARA Planning, Rev. 17, Dated 01/01/06

DPC, System ALARA Manual, Section VIII, Station ALARA Committee, Rev. 15, Dated 10/01/03

DPC, System ALARA Manual, Section X, Exposure Goals, Rev. 09, Dated 02/17/97  
 DPC, System ALARA Manual, Section IX, ALARA Training and Awareness, Rev. 14,  
 Dated 01/01/02  
 DPC, System ALARA Manual, Appendix C, Engineering ALARA Guidance  
 Duke Energy Carolinas Long Range ALARA Plan, 2005-2010 (2007 Update)  
 MP/0/A/7600/060, Stellite Control, Rev. 4  
 SH/0/B/2000/003, Preparation of a Radiation Work Permit, Rev. 7  
 SH/0/B/2000/004, Taking, Counting and Recording Surveys, Rev. 9  
 SH/0/B/2002/002, Exposure Extension and Reduction, Rev. 1  
 SRPMP 10-3, Annual Radiation Protection Source Term Data Review, Rev. 0

### Records and Data

1EOC15 S/G Bowl Dose Rates Vs. 1EOC17 S/G Bowl Dose Rates, Not Dated  
 ALARA Planning Worksheet (APW), 1EOC17 ECCS Sump Modification Including Chemical  
 Decontamination, Dated 04/16/08  
 APW, 1EOC17 S/G Eddy Current and Plugging Support, Dated 04/14/08  
 APW, 1EOC17 S/G FOSAR (Secondary Side), Dated 04/14/08  
 APW, 1EOC17 S/G Install/Remove Nozzle Dams, Dated 04/10/08  
 APW, 1EOC17 S/G Removal/Install Primary Manways, Dated 04/10/08  
 APW, 1EOC17 S/G Remove Diaphragms & RP Survey, Dated 04/10/08  
 APW, 1EOC17 S/G Sludge Lance, Dated 04/14/08  
 APW, Design Change CD100708 PZR Spray Valve Replacement Mod (1 NC 27 & 1 NC 29),  
 Dated 04/21/08  
 Catawba Nuclear Station, Survey Nos. M-051308-37, Aux Bldg\560 Elevation\Room 315,  
 Dated 05/13/08; M-051308-48, U1 Rx Bldg\1NC0027-1NC0029\552 Elevation,  
 Dated 05/13/08; M-051408-3, "A" S/G, Dated 05/14/08; M-051408-6, "D" S/G, Dated 05/14/08;  
 M-051408-27, U1 Rx Bldg Outage\TSR103A, Dated 05/14/08; M-051408-32, "B" S/G,  
 Dated 05/14/08; M-051408-33, "C" S/G, Dated 05/14/08; M-051408-49, U-1 Rx Bldg Outage\  
 TSR103A, Dated 05/14/08; M-051508-7, U1 Rx Bldg\1NC0027-1NC0029\552 Elevation,  
 Dated 05/15/08; and M-051508-13, U1 Rx Bldg\1NC0027-1NC0029\552 Elevation,  
 Dated 05/15/08  
 Dose Records of all declared pregnant workers (6) during the period 06/01/2006 to 06/01/2008  
 Memorandums for File, Catawba Nuclear Station, ALARA Committee Meeting Minutes,  
 File: CN-750.20, Dated 04/16/07, 05/01/07, 09/27/07, 01/03/08, and 03/03/08; and CNS  
 Unit 2 EOC15 Refueling and Maintenance Outage, Summary of Personnel Radiation  
 Exposures, File No. CN-750.20, Dated 01/30/08  
 Radiation Work Permit No. 1662, Rev. 1, Locked High Radiation Entry into U-1 Auxiliary  
 Building Room 315 Valve Gallery (1EOC17)  
 Summary of 2007 Fourth Quarter and Annual Personnel Radiation Exposure at Duke Energy  
 Nuclear Stations, File: GS-750.20, Dated 02/29/08  
 Summary of Source Term Reduction Plan/Status of Actions Taken or Planned, Not Dated  
 Catawba Nuclear Station Valve Replacement Evaluation package for VN #CE101642  
 Catawba Nuclear Station Valve Replacement Evaluation package for VN #CE101736A

### Corrective Action Program Documents

PIP C-07-01516, Work Locations were not accurate for Work Orders, Dated 03/28/08  
 PIP C-07-01958, Documentation PIP for 2EOC15 Dose Reduction Plans, Dated 04/23/07

PIP C-08-00092, This PIP is being written to allow Chemistry to approve changes to the crud burst process prior to the issuance of the Primary Optimization Plan in time for the Spring outages, Dated 01/07/08  
 PIP C-08-00546, 2EOC15 ALARA Report Form, Dated 01/30/08  
 PIP C-08-01293, Power entries made for ECCS Sump Modification Scoping, Dated 03/01/08  
 PIP C-08-01618, Boron inspection stopped by encounter with a 350 mr field, Dated 03/19/08  
 PIP C-08-02018, The PIP documents the completion of Assessment RPS-07-08 NRC Prep Audit 71121.02 ALARA Planning & Controls, Dated 04/10/08  
 PIP C-08-02370, Exposure estimate exceeded to assemble the ultrasonic fuel cleaner/vacuum system, Dated 04/29/08  
 PIP C-08-02813, ALARA Committee Meeting Minutes From 04/14/08, Dated 05/13/08  
 PIP C-08-03294, Special ALARA Committee meeting held, Dated 05/27/08  
 PIP C-08-03524, Display of GEDDS electronic dosimeter information, Dated 06/04/08

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

### Procedures, Guidance Documents and Manuals

SRPMP 9-1, Groundwater Wall Sampling Protocol, Rev. 1  
 NSD 517, Radiological Ground Water Protection Program, Rev. 0

### Records and Data

Radiological Data: CNS Quarterly Composite for WZ-A, WZ-B, WZ-C (Sampled 4/1/08)  
 Drawing CN-1680-241-01, Ground Water Monitoring Wells, Site Plan, Well Locations  
 30-Day Report Pursuant to the Groundwater Protection Initiative Concerning Catawba nuclear Station Groundwater Monitoring Well 213, 11/7/07  
 50.75(g) File Summary

### CAP Documents

PIP C-07-5892, A sample obtained from groundwater monitoring well #213 was found to contain tritium levels that triggered the communication protocol of the NEI initiative 10/8/07  
 PIP C-07-6175, Drinking water a demin water leaks identified in the West Monitor Tank Building trench during piping inspections, 10/16/07  
 PIP C-07-6427, Samples taken on 10/16/07 from Monitor Tank Building west trench rainwater sump indicated the presence of tritium, 10/24/07  
 PIP C-08-2277, Self-assessment of Groundwater Protection Initiative, 4/24/08  
 PIP C-08-2882, CNS groundwater sump (WZ A) composite sample indicated a positive result for strontium-89, 5/14/08

## **Section 2PS2: Radioactive Material Processing and Transportation**

### Procedures, Guidance Documents and Manuals

Nuclear System Directive: 507, Radiation Protection, Section 507.9.4, Radioactive material shipments and receipts (non-waste), Revision (Rev.) 13

Shared Standard Procedure (SH)/0/B/2000/004, Taking, Counting and Recording Surveys, Rev. 009  
 SH/0/B/2000/002, Taking, Counting and Recording Surveys, Rev. 00  
 SH/0/B/2000/008, Operational Alpha Program, Rev. 5  
 SH/0/B/2004/001, Preparation and Shipment of Radioactive Material, Rev. 006  
 SH/0/B/2004/002, Preparation and Shipment of Radioactive Waste, Rev. 006  
 HP/0/B/1006/002, Collection and Processing of Radioactive Trash and Filters and Use of Radioactive Container Storage Areas, Rev. 11  
 HP/O/B/1006/003, Receipt and Opening of Radioactive Material Packages, Rev. 12  
 RA/0/1500/001, Review Radioactive Waste Classification Program: Determination of Waste Classification Scaling Factors, Rev. 0  
 Radioactive Materials Control Handbook, Rev. 15  
 Maintenance Procedure (MP)/0/A/7550/008, Energy Solutions Cask CNS 8-120A Handling, Loading and Unloading, Rev. 14  
 MP/0/A/7550/011, Energy Solutions Cask CNS 8-120B Handling, Loading and Unloading, Rev. 24  
 Nuclear Supply Chain Process Manual, Supply Chain directive: Section 410.4.1, Unloading and initial receipt checks, Revs. 10 and 11

#### Records and Data

Waste Classification Technical Review Form Data 02/25/2008: determine most applicable sample for waste stream and filter limits for canal vacuum filters, ultrasonic fuel cleaning filters, and KF system filters  
 Waste Classification Technical Review Form Data 06/14/2007 for DAW, Filter (Primary, KF, NB, Resins) for 10/6/2004 through 06/14/2007  
 Waste Classification Technical Review Form Data 10/18/2007 for establishment of new filter type (size and weight) based on modification CNCE-73063  
 Waste Stream Data Documentation Form 11/08/2006: 2006 Unit 2 Ultrasonic fuel Cleaning Sample for 10CFR61 including smear composite in-house gamma-spectroscopy analyses 09/06 ; vendor laboratory 10 CFR Part 50/61 Certificate of Analysis Results; CNS/Vendor Laboratory Gamma spectroscopy analysis comparison data results  
 Waste Stream Documentation Form: 2006 DAW Composite Sample for 10 CFR61, 06/14/ 2007  
 Waste Stream Documentation Form: 2006 KF Filter Sample for 10 CFR61, 6/14/ 2007  
 Waste Stream Documentation Form: 2006 RBT Resin Composite Sample for 10 CFR61, 6/14/ 2007  
 Waste Stream Documentation Form: 2006 PST Resin Composite Sample for 10 CFR61, 6/14/ 2007  
 Waste Stream Documentation Form: 2006 Unit 1 VA 1A Charcoal Composite Sample for 10 CFR 61, 6/14/ 2007  
 Waste Stream Documentation Form: 2006 Unit 2 Secondary Bead Resin Composite Sample for 10 FR61, 6/14/ 2007  
 Waste Stream Documentation Form: 2007 Unit 2 Pipe Chase Concrete Sample for 10 FR61, 11/08/ 2007  
 Radioactive Shipment Record (RSR) CNS 07-0049, Radioactive Material, Low Specific Activity (LSA-II), 7, UN3321, Fissile Excepted, RQ – Radionuclides, Dewatered Ion Exchange Media (1) HC, 11/15/07  
 RSR No. CNS 07-0041, Radioactive material, Type B(U) package, 7 UN2916, Fissile

Excepted, RQ-Radionuclides, Dewatered Mechanical filter (1) HIC), 10/26/07  
 RSR No. CNS 07-0012, Radioactive Material, Type A package, 7, UN2915, BPRA Tool,  
 04/19/07  
 RSR No. CNS 07-0016, Radioactive Material, Type A package, 7, UN2915, Dry Active Waste,  
 05/10/07

### CAP Documents

PIP No. C-08-02769, evaluate integrity of sealant containers in yard used to hold radioactive material, 05/12/08  
 PIP No. C-08-01904 Assessment RPS-08-08, NRC Prep Audit of Radioactive Material Processing and Transportation using NRC Inspection Plan 71122.02, 04/03/08  
 PIP No. C-08-00408, One of three B25 boxes of resin stored outside of monitor tank building contained several inches of water  
 PIP No. C-07-05602, Inspection equipment brought to CNS from Turkey Point had smearable levels of alpha contamination, 10/01/07  
 PIP No. C-07-05029, Onsite disposal of sludge (soil) and activated charcoal having low levels of contamination – approval by state, 09/18/07  
 PIP No. C-07-03052, Initiate study and modification process to construct radioactive waste storage facility, 06/18/07  
 PIP No. C-07-02195, QA inspector did not have DOT Hazmat Training in accordance with 49CFR172.700-49CFR172.704, 05/02/07  
 PIP No. C-06-07407, Filters with different manufacturers used interchangeably for KF post filters potentially affecting 10 CFR Waste Classification, 11/09/06  
 PIP No. C-07-01432, Requirements for receiving radioactive material per 10CFR20.1906 were challenged, 03/22/07  
 PIP No. C-04-03305, Fifty-five gallon drum compactor no longer used by RP/RMC, removed from equipment database and abandoned in place, 07/07/04

### **Section 40A1: Performance Indicator Verification**

#### **[40A1.1: Initiating Events and Barrier Integrity Cornerstones]**

NSD 225, NRC Performance Indicators, Rev. 3  
 NEI 99-02, Regulatory Assessment Performance Indicator Guideline, Rev. 5  
 Control Room Autolog daily entries for selected periods containing reactor coolant system leakage calculation results  
 Licensee Performance Indicator Validation / Approval Forms and associated supporting data  
 CHEMDESK results for Dose Equivalent Iodine on Unit 2 covering January, 2007 through March 2008

#### **[40A1.2: Occupational and Public Radiation Safety Cornerstones]**

##### Procedures

SRPMP 10-1, NRC Performance Indicator Data Collection, Validation, Review and Approval, Rev. 002

##### Records and Data

NRC Performance Indicator Data Review for October 2007, November 2007, December 2007, January 2008, February 2008, and March 2008  
 CNS ED Dose Alarm Summary, 01/01/04 – 03/31/08



CNS Dose Rate Alarms Above 1 rem/hour, 6/01/07 – 3/31/08  
Catawba Nuclear Station Annual Radioactive Effluent Release Report for 2007  
Monthly Performance Indicator Packages for October 2007 through May 2008, File No.  
CN-854.05  
Liquid Waste Release Permit Report for LWR Number 2007112, Dated 06/05/08  
TSAIL printout for Out-of Service EMF Monitors August 2007 – April 2008

Corrective Action Program Documents

PIP No. C-07-6732, ED Dose Alarm, 11/4/07

PIP No. C-07-4866, ED Dose Alarm, 9/13/07

**Section 40A2: Identification and Resolution of Problems**

PIP C-08-02546, Observation of QC work practices while performing testing of Main Steam Vent valves in the Unit 1 exterior doghouse.

PIP C-08-02965, Did not obtain Mechanical QC signature on grout pad installation prior to pouring pad

PIP C-08-03190, QC Inspection of ECCS sump plenum bolts

PIP C-08-03362, Random inspections by QC identified 12 anchor bolts installed without washers

PIP C-08-03385, Craft requested that night shift QC to re-inspect a fit-up that had been signed off by Welding QC on day shift.

PIP C-08-03577, Mechanical joints on the ECCS sump were fitted without being torqued.

PIP C-08-03644, Cable tray installed without VN or drawing revision.

PIP C-08-4208, QA/QC self assessment needed to review inspection programs and practices

**Section 40A3: Event Followup**

PIP C-08-3804, During the Mode 3 Up walkdown performed on 6/15/08, an accumulation of boron was noted on Conoseal 76

WR 856246, Repair leak found on Conoseal 76 during NOT / NOP containment walkdown  
MP/1/A/7150/115, Core Exit Thermocouple Nozzle Disassembly and Reassembly

**Section 40A5: Other Activities**

**[40A5.1: Quarterly Resident Inspector Observations of Security Personnel and Activities]**

Duke Power Company Physical Security Plan

**[40A5.2: TI-166]**

Corrective Actions (PIPs)

C-08-01229, This is to document a on sight surveillance of Unit 1 Catawba Reactor Building Sump fabrication preformed at Transco Inc. in Streator IL, 2/29/2008

C-08-01816, Weld undersized on 1/2" threaded studs, welded to two center section plenums from the manufacture, 3/31/2008

C-08-02732, Coatings cure time on the west wing of the sump was scheduled to complete at 1030 today. At 1700 the paint had not cured, still had soft spots, 5/11/2008

- C-08-02965, Did not obtain Mechanical QC signature on grout pad installation prior to pouring pad, 5/17/2008
- C-08-03000, Curing compound applied in violation of procedure, 5/18/2008
- C-08-03190, Craft loosen plenum bolts after QC complete, 5/23/2008
- C-08-03214, Plenum gap exceeded Maximum allowable dimension, 5/24/2008
- C-08-03274, Pipe Support not erected correctly, 5/26/2008
- C-08-03350, (CMP Sump) Shims found to be loose between shim plates and plenums, 5/29/2008
- C-08-03362, Random inspections by QC identified 12 anchor bolts were installed without washers, 5/29/2008
- C-08-03366, Stud appears to be bent in plenum WW-FP3 when plenum was being aligned and checking plenum gaps, 5/29/2008
- C-08-03610, Loose jam nuts were found on sealing bands during QA Surveillance, 6/8/2008
- C-08-03641, Incorrect top hat installed during the ECCS Containment Recirculation Sump Strainer Assembly project, 6/9/2008
- C-08-03674, Video inspection inside the Unit 1 ECCS Containment Recirculation Sump Strainer Assembly revealed two (2) areas of concern that require further evaluation, 6/10/2008
- C-08-03769, This PIP is to document the condition of ECCS floor coatings, 6/13/2008

#### Letters from Duke Energy to USNRC

- Response to NRC Bulletin 2003-01: Potential Impact of Debris Blockage on Emergency Sump Recirculation at Pressurized Water Reactors, 8/7/2003
- Response to Request for Additional Information, NRC Bulletin 2003-01, Potential Impact of Debris Blockage on Emergency Sump Recirculation at Pressurized Water Reactors, 6/9/2005
- Response to NRC Generic Letter 2004-02, Potential Impact of Debris Blockage on Emergency Recirculation During Design Basis Accidents at Pressurized Water Reactors, 9/1/2005
- NRC Generic Letter 2004-02, Potential Impact of Debris Blockage on Emergency Recirculation During Design Basis Accidents at Pressurized Water Reactors, Commitment Status Update, 6/28/2006
- NRC Generic Letter 2004-02, Potential Impact of Debris Blockage on Emergency Recirculation During Design Basis Accidents at Pressurized-Water Reactors, Request for Relief from December 31, 2007 Implementation, 11/1/2006
- NRC Generic Letter (GL) 2004-02, Potential Impact of Debris Blockage on Emergency Recirculation During Design Basis Accidents at Pressurized Water Reactors, Commitment Change Request, 1/31/2007
- Response to a RAI concerning the Catawba Nuclear Station Units 1 and 2 Proposal to Revise Commitments to USNRC Regulatory Guide 1.82, Rev.0 "Sumps For Emergency Core Cooling and Containment Spray Systems" and Revising Technical Specification Surveillance Requirement (SR) 3.5.2.8 and Associated Bases (TAC Nos. MD5163 and MD5164), 10/9/2007
- Response to a RAI concerning the Catawba Nuclear Station Units 1 and 2 Proposal to Revise Commitments to USNRC Regulatory Guide 1.82, Rev.0 "Sumps For Emergency Core Cooling and Containment Spray Systems" and Revising Technical Specification Surveillance Requirement (SR) 3.5.2.8 and Associated Bases (TAC Nos. MD5163 and MD5164), 10/12/2007
- NRC Generic Letter 2004-02, "Potential Impact of Debris Blockage on Emergency Recirculation During Design Basis Accidents at Pressurized Water Reactors, 2/29/2008

**[40A5.3: TI-172]**Procedures and Specifications

Duke Engineering Support Document for Alloy 600 Aging Management of Oconee, McGuire, and Catawba Nuclear Stations, Rev. 3  
 Specification No. DPS-1201.01-00-004, Procurement Specification for the Repair of Pressurizer Locations Containing Alloy 600 Materials, Rev. 1  
 Procedure TN/0/A/7550/033, Pressurizer Safety/Relief Nozzle Repair Using Overlay (WOL) Method, Welding Service Inc, (WSI) Traveler No. 103441-003, Rev. 000  
 Procedure TN/0/A/7550/034, Pressurizer Surge Nozzle Repair Using Overlay (WOL) Method, WSI, Traveler No. 103441-004, Rev. 000  
 Procedure PDI-UT-1, Generic Procedure for the Ultrasonic Examination of Ferritic Pipe Welds, Rev. A  
 Procedure PDI-UT-2, Generic Procedure for the Ultrasonic Examination of Austenitic Pipe Welds, Rev. A  
 Procedure PDI-UT-8, Generic Procedure for the Ultrasonic Examination of the Weld Overlay Similar and Dissimilar Metal Welds, Rev. F  
 Procedure PDI SI-UT-126, Procedure for the Phased Array Ultrasonic Examination of the Weld Overlay Similar and Dissimilar Metal Welds, Rev. D  
 WSI QAP 9.6, Liquid Penetrant Inspection Procedure, Rev. 10  
 WSI QAP 9.3, Workmanship and Visual Inspection Criteria for ASME Welding

Corrective Action Documents

PIP C-05-04844, Required Actions by the EPRI for MRP-139, Primary System Piping Butt Weld Inspection and Evaluation Guidelines  
 PIP C-06-02098, Ultrasonic Examinations on Reactor Vessel Inlet and Outlet Nozzles and Auxiliary Head Adapter Welds per MRP-139 Requirements  
 PIP C-07-01590, 1EOC16 Alloy 600 Pressurizer Weld Overlay Lessons and Brief Outage Summary  
 PIP C-07-07406, MRP Letters MRP 2007-038 and MRP 2007-09 Provide Interim Guidance on Visual and Volumetric Inspection of Smaller Diameter Alloy 600 Butt Welds  
 PIP G-05-00030, Required Actions by the EPRI for MRP-126, Generic Guidance for Alloy 600 Management

Other Records

Approved Letter Including Safety Evaluation from NRC for Relief Request 06-GO-001, for Use of Full Structural Weld Overlay and Alternative Examination Techniques on Various Pressurizer Nozzle-to-Safe End Welds for Catawba Unit 1 and McGuire Unit 2, July 25, 2007  
 Approved Letter Including Safety Evaluation from NRC for Relief Request 07-GO-001, for Use of Full Structural Weld Overlay and Alternative Examination Techniques on Various Pressurizer Nozzle-to-Safe End Welds for Catawba Unit 2 and McGuire Unit 1, November 27, 2007  
 Work Order (WO) 01704233-08, CD100829 Unit 1 Pressurizer Alloy 600 Weld Overlay Nozzle 4B of the Safety Line Including Baseline PT/UT

Work Order (WO) 01704237-08, CD100829 Unit 1 Pressurizer Alloy 600 Weld Overlay Nozzle 1 of the Surge Line Including Baseline PT/UT  
 Work Package Nos. 103441-001, -002, -003, -004, -010, and -020, WSI  
 WSI Work Traveler for Pressurizer Nozzle Overlays Common Prerequisites and Closures for Catawba Unit 1, Traveler No. 103441-001  
 WSI Work Traveler for Pressurizer Nozzle Repair Overlay Indication Removal for Catawba Unit 1, Traveler No. 103441-020  
 WSI Welding Procedure Specification and Welder Maintenance Log  
 WSI ASME Section IX – Welder Performance Qualification (WPQ) Vision Examination Record  
 UT Level II PDI Weld Overlay Qualifications for Detection and Sizing  
 Drawing DUKE-42Q-02, Pressurizer Surge Nozzle Weld Overlay Design, Rev. 1  
 Drawing DUKE-42Q-06, Pressurizer Safety/Relief Nozzle Weld Overlay Design, Rev. 1  
 Final Report of the Phased Array UT of Pressurizer Nozzle to Safe End on Surge Nozzle Weld Overlay 1NC26-3V for Weld No. 1-PZR-W1SE / CN-1NC26-3, Dated December 6, 2006, Structural Integrity Associates  
 Final Report of the Phased Array UT of Pressurizer Nozzle to Safe End on Safety Nozzle Weld Overlay 1NC258-1V for Weld No. 1-PZR-W4BSE / CN-1NC258-1, Dated December 6, 2006, Structural Integrity Associates  
 Westinghouse Letter LTR-PCAM-06-63, Duke Power PWROG PA-MS-0233 Task 2 Component Fabrication Details for Alloy 600/82/182 Locations within the Primary Pressure Boundary, Dated September 28, 2006  
 Drawings for Reactor Auxiliary Head Adapter 5” Diameter Cap Pipes, Units 1 and 2  
 Drawings for Reactor Head 1” Diameter Vent Pipe, Units 1 and 2  
 Calculation No. CNC-1201.01-00-0027, Weld Overlay Sizing for the Pressurizer Surge Nozzle for Catawba Units 1 and 2, Rev. 0  
 Calculation No. CNC-1201.01-00-0030, Thermal and Mechanical Stress Analysis of Pressurizer Surge Nozzle with Weld Overlay Repair for Catawba Units 1 and 2, Rev. 0  
 Calculation No. CNC-1201.01-00-0033, Crack Growth Evaluation of Pressurizer Surge Nozzle with Weld Overlay Repair for Catawba Units 1 and 2, Rev. 0  
 UT Pipe Weld Examination Reports of Components 2RPV-W79-101SE, 2RPV-W80-101SE, 2RPV-W81-101SE, and 2RPV-W82-101SE for Reactor Auxiliary Head Adapter Cap Pipes for Unit 2, Dated October 2007  
 PT and Phased Array UT Examination Reports of Surge and Spray Nozzle Weld Overlays for Unit 2, Dated October 2007  
 Third Ten Year Interval Inservice, Augmented, and Elective Inspection Status for 1EOC16, Catawba Unit 1  
 Certificate of Personnel and Equipment Qualification for Phased Array UT Examiners and Equipment, SIA

#### **[40A5.4: Independent Spent Fuel Storage Installation]**

##### Procedures and Guidance Documents

RP-1105, Training and Qualification Guide, Operation of a Portable Neutron Survey Instrument, Rev. 5  
 RP-2600, Training and Qualification Guide, Selection and Operation of Portable Survey Instruments, Rev. 11B  
 SH/0/B/2008/003, Operation of Radiation Protection Portable Survey Instruments, Rev. 2

RA/0/1400/008, Source Response Determination for REM 500, Rev. 1  
 RA 1 1100 006, Unit 1 Controls and Surveillance for Loading Spent Fuel Assemblies into NAC-  
 UMS Casks, Rev. 4

#### Records and Data

RWP 1052, U1 dry cask storage (includes dry run, loading, and transport), Rev. 1  
 CNS RCA/RCZ Boundary TLD Study (1<sup>st</sup> Quarter 2007 – 4<sup>th</sup> Quarter 2007)  
 Drawing: CNS ISFSI Boundary TLD Locations  
 Survey M-081107-10, ISFSI Pad Survey  
 Survey M-102307-29, Before survey (yard outside monthly routine)  
 Survey M-102407-22, Survey with RO-20 (yard outside monthly routine)  
 Survey M-122007-8, ISFSI Pad Survey  
 Survey M-032608-6, ISFSI Pad Survey  
 Survey M-080707-6, ISFSI Weld TSC Shield Lid (Cask 28)  
 Survey M-080707-2, ISFSI TSC Lid Pre-Weld (Cask 28)  
 Survey M-080807-1, ISFSI TSC Lid Pre-Weld (Cask 28)  
 Survey M-080907-1, ISFSI TSC Lid Pre-Weld (Cask 28)  
 Survey M-080907-13, ISFSI TSC Lid Pre-Weld (Cask 28)  
 Survey M-080907-14, ISFSI TSC Lid Pre-Weld (Cask 28)  
 Survey M-081107-9, ISFSI VCC in Truck Bay (Cask 28)  
 Survey M-073107-6, Cask 45 Tech Spec Survey  
 Survey M-081107-8, Cask 28 Tech Spec Survey  
 Survey M-021508-5, Cask 38 Tech Spec Survey

#### **LIST OF ACRONYMS USED**

ALARA	-	As Low As Reasonably Achievable
APW	-	ALARA Planning Worksheet
ASME	-	American Society of Mechanical Engineers
CA	-	Auxiliary Feedwater
BACC	-	Boric Acid Corrosion Control
CAP	-	Corrective Action Program
CETNA	-	Core Exit Thermocouple Nozzle Assembly
CFR	-	Code of Federal Regulations
CY	-	Calendar Year
DAC-hour	-	Derived Air Concentration-hour
DAW	-	Dry Active Waste
DG	-	Diesel Generator
DOT	-	Department of Transportation
DMBW	-	Dissimilar Metal Butt Weld
DPC	-	Duke Power Corporation
DRMS	-	Dose Rate Monitoring System
ECCS	-	Emergency Core Cooling System
ECT	-	Eddy Current Testing
ED	-	Electronic Dosimeter
EOC	-	End of Cycle
ETSS	-	Examination Technique Specification Sheet

FOSAR	-	Foreign Object Search and Recovery
FSWOL	-	Full Structural Weld Overlays
GL	-	Generic Letter
GM	-	Geiger-Mueller
HP	-	Health Physics Procedure
HPT	-	Health Physics Technician
IP	-	Inspection Procedure
ISFSI	-	Independent Spent Fuel Storage Installation
ISI	-	In-service Inspection
KC	-	Component Cooling
LAR	-	License Amendment Request
LHRA	-	Locked High Radiation Area
MP	-	Maintenance Procedure
mrem/hr	-	millirem/hour
MRP	-	Material Reliability Program
MT	-	Magnetic Examination
NC	-	Reactor Coolant System
NCV	-	Non-Cited Violation
ND	-	Residual Heat Removal
NDE	-	Nondestructive Examinations
NPS	-	Nominal Pipe Size
NRC	-	Nuclear Regulatory Commission
NS	-	Containment Spray
NSD	-	Nuclear System Directive
OA	-	Other Activities
ORAM	-	Outage Risk Assessment Model
OS	-	Occupational Radiation Safety
OSM	-	Operations Shift Manager
PCE	-	Personnel Contamination Event
PCP	-	Process Control Program
PI	-	Performance Indicator
PIP	-	Problem Investigation Process (report)
PT	-	Liquid Penetrant Examination
QC	-	Quality Control
radwaste	-	radioactive waste
radworker	-	radiation worker
RAI	-	Request for Additional Information
RFO	-	Refueling Outage
RG	-	Regulatory Guide
RP	-	Radiation Protection
RPMP	-	Radiation Protection Management Procedure
RN	-	Nuclear Service Water
RSR	-	Radioactive Shipment Record
RWP	-	Radiation Work Permit
SFP	-	Spent Fuel Pool
SG	-	Steam Generator
SH	-	Shared Standard Health Physics Procedure
SOC	-	System Operations Center

SRO	-	Senior Reactor Operator
SSC	-	Structures, Systems and Components
SSF	-	Standby Shutdown Facility
TI	-	Temporary Instruction
TS	-	Technical Specification
UFSAR	-	Updated Final Safety Analysis Report
UT	-	Ultrasonic Examination
VCT	-	Volume Control Tank
VHRA	-	very high radiation area
YV	-	Containment Chilled Water