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

January 19, 2001

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

SUBJECT: CATAWBA NUCLEAR STATION - NRC INTEGRATED INSPECTION REPORT 50-413/00-05, 50-414/00-05

Dear Mr. Peterson:

On December 23, 2000, the NRC completed an inspection at your Catawba Units 1 and 2 facilities. The enclosed report documents the inspection findings which were discussed on December 20, 2000, with Mr. Ron Jones and other members of your staff.

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

No findings of significance were identified.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/NRC/ADAMS/index.html (the Public Electronic Reading Room).

Sincerely,

/RA/

Robert C. Haag, Chief
Reactor Projects Branch 1
Division of Reactor Projects

Docket No.: 50-413, 50-414
License No.: NPF-35, NPF-52

Enclosure: Inspection Report 50-413/00-05, 50-414/00-05
w/Attached NRC's Revised Reactor Oversight Process

cc w/encl:
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REGION II

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|---|---|
| Docket Nos: | 50-413, 50-414 |
| License Nos: | NPF-35, NPF-52 |
| Report No: | 50-413/00-05, 50-414/00-05 |
| Licensee: | Duke Energy Corporation |
| Facility: | Catawba Nuclear Station, Units 1 and 2 |
| Location: | 4800 Concord Road<br>York, SC 29745 |
| Dates: | September 24 - December 23, 2000 |
| Inspectors: | D. Roberts, Senior Resident Inspector<br>R. Franovich, Resident Inspector<br>M. Giles, Resident Inspector<br>R. Carrion, Radiation Specialist (2OS1, 2OS2, 2PS1, and 2PS3)<br>J. Coley, Reactor Inspector (1R07 and 1R08)<br>D. Thompson, Physical Security Inspector (4OA1.2) |
| Approved by: | R. Haag, Chief<br>Reactor Projects Branch 1<br>Division of Reactor Projects |

Enclosure

# SUMMARY OF FINDINGS

IR 05000413-00-05, IR 05000414-00-05, on 09/24 - 12/23/2000, Duke Energy Corporation, Catawba Nuclear Station, Units 1 & 2, resident inspector report.

The inspection was conducted by resident inspectors, a regional reactor inspector, a regional physical security inspector, and a radiation specialist.

A. Inspector Identified Findings

No findings of significance were identified.

B. Licensee Identified Violations

A violation of very low significance, which was identified by the licensee, has been reviewed by the inspectors. Corrective actions taken or planned by the licensee appear reasonable. The violation is listed in Section 4OA7 of this report.

## Report Details

Summary of Plant Status: On September 25, 2000, while at 100 percent power, Unit 1 began an end-of-cycle (EOC) coastdown and reached 88 percent power on October 8, 2000. Operators initiated a unit shutdown to begin the 1EOC12 refueling outage on October 13, 2000. A unit startup was commenced on November 20, 2000, and the plant reached 97 percent power on November 23, 2000. Reactor power ascension was halted at that level after problems were experienced with the 1A main feedwater (CF) pump speed control system. Operators performed a rapid power reduction to 58 percent and removed the feedwater pump from service for control circuit repairs. Following successful repairs, on November 24, 2000, the unit power increase was started, and 100 percent power was achieved on November 25, 2000. An automatic turbine runback from 100 to 61 percent occurred on December 23, 2000, following a trip of the 1A CF pump due to problems encountered with the pump's overspeed trip testing circuitry during performance of a weekly test. This problem appeared to be unrelated to the earlier problems with the speed control circuit. The unit ended the period at 61 percent power while troubleshooting of the pump's failure continued.

Unit 2 operated at 100 percent power throughout the inspection period, except for a brief period from December 22 to December 23, 2000, when reactor power was reduced to 87 percent to facilitate main turbine control valve movement testing.

### 1. REACTOR SAFETY
### Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

1R01 Adverse Weather Protection

a. Inspection Scope

The inspectors reviewed the licensee's preparations for cold weather, including annual inspections, preventive and corrective maintenance, and programmatic controls, to ensure that risk-significant systems, structures and components (SSCs) were adequately protected from cold or freezing conditions. The inspectors also visually inspected the refueling water storage tank (FWST) level transmitter boxes and instrument lines to ensure that boxes were adequately heated, heat trace was installed and insulation was in good material condition.

b. Findings

No findings of significance were identified.

1R04 Equipment Alignment

a. Inspection Scope

The inspectors performed partial walkdowns of the Unit 2 auxiliary feedwater (CA) system (Train B), breaker alignments associated with containment isolation valves in the seal water injection system, and the A train of the component cooling water (KC) system

to verify the availability of SSCs. The inspectors primarily focused on time periods when redundant trains or systems relied upon for maintaining defense-in-depth were unavailable.

b. Findings

No findings of significance were identified.

1R05 Fire Protection

a. Inspection Scope

The inspectors toured six areas important to reactor safety to verify that combustibles and ignition sources were properly controlled, and that fire detection and suppression capabilities were intact. For areas where fire detection equipment was out of service, the inspectors verified that compensatory measures (i.e., fire watch tours) were properly implemented. For dry-pipe suppression systems, the inspectors verified that pre-fire plans specified proper steps for fire brigade personnel to activate the systems when needed. The inspectors verified that fire brigade drills incorporated timed responses from health physics personnel who could authorize the crossing of radiation protection posted boundaries by fire brigade members, as required, to access fire suppression equipment. The inspectors selected these areas based on a review of the licensee's safe shutdown analysis, probabilistic risk assessment (PRA)-based sensitivity studies for fire-related core damage accident sequences, and summary statements related to the licensee's 1992 Initial Plant Examination for External Events submittal to the NRC. Areas toured this quarter included the Unit 1 and 2 cable spreading rooms, the Unit 1 and 2 vital instrument and control areas, the Unit 2 CA pump room, the Unit 1 reactor trip breaker switchgear area, the Unit 2 reactor trip breaker switchgear area, and the main control room (shared between both units).

b. Findings

No findings of significance were identified.

1R06 Flood Protection Measures

a. Inspection Scope

The inspectors performed a review of the licensee's security procedure (Procedure No. SP#202, Rev. 33, Protected Area Patrol) associated with external flood mitigation to verify that it contained provisions for ensuring that flood mitigation barriers are functional during external flood conditions. Design basis documentation associated with external flood mitigation was also reviewed to determine if the ground water drainage (WZ) system is constructed and operated in accordance with the design basis documentation. The inspectors also performed visual inspections of the groundwater drainage sumps, sump pumps and sump level monitoring instrumentation, and reviewed corrective actions taken in response to a 1999 internal flood event at the McGuire Nuclear Station.

b. Findings

No findings of significance were identified.

1R07 Heat Sink Performance

a. Inspection Scope

The inspectors reviewed the licensee's response to NRC Generic Letter 89-13, Service Water System Problems Affecting Safety-Related Equipment, and held discussions with the service water system engineer and the engineer responsible for heat exchangers. Walkdown inspections were performed on the KC heat exchangers and the diesel engine jacket water (KD) coolers, as well as the KC pumps and a new chemical injection facility associated with the nuclear service water (RN) system. In addition, documents associated with the following subjects were reviewed: methods of testing and/or cleaning performed; bases for the frequency of testing; completed test procedures; bases for test acceptance criteria; completed maintenance procedures; trended test results for flow, fouling, and differential pressure (dp) tests from 1990 to present; methods for detecting leaking tubes; eddy current examination results from 1993 to present; tube plugging criteria; video tapes of the methods and results of the RN system supply-side pipe cleaning from the service water pump screens to the intake of the KC heat exchangers performed during the Unit 1 fall refueling outage in 2000; and chemicals used for injection in the RN system. The discussions held with the engineers and the documentation reviewed were used to assess the effectiveness of the licensee's program for determining and maintaining the heat transfer capabilities of their heat exchangers. Three Problem Investigation Process (PIP) reports related to heat exchangers were also reviewed to determine whether corrective actions taken by the licensee were appropriate for the issues identified. The specific documents reviewed are listed in the "Documents Reviewed" section at the end of this report.

b. Findings

No findings of significance were identified.

1R08 Inservice Inspection (ISI)

a. Inspection Scope

The inspectors evaluated ISI activities during the October 2000 Unit 1 1EOC12 refueling outage to determine if the licensee's American Society of Mechanical Engineers (ASME) Code ISI program for monitoring degradation of the reactor coolant (NC) system boundary, risk-significant piping system boundaries, and the containment boundary was effective. Three types of nondestructive examination (NDE) activities were observed: ultrasonic shear wave examination of a 14-inch diameter pressurizer surge line weld; five 12" X 12" grid locations that received ultrasonic thickness examinations on the reactor containment vessel; and four augmented liquid penetrant examinations, one on each reactor vessel nozzle to hot leg pipe weld. These examinations were observed to verify that the NDE activities were performed in accordance with the Sections XI and V of the ASME Code and that indications or defects, if present, were properly dispositioned. Five Code repair or replacement work order (WO) packages pertaining to

the service water system, the letdown system, and the CA system were also reviewed to determine whether these activities met Code requirements. In addition, 15 PIPs were reviewed to verify that licensee identified problems associated with the licensee's ASME Section XI Program had received appropriate corrective action. The specific documents reviewed are listed in the "Documents Reviewed" section at the end of this report. The following inspection areas and/or welds were examined by the inspectors:

Welds Examined

| | | |
|---|---|---|
| 1NC24-01/1RPV-W15-SE | 1A NC Coolant Hotleg | Liquid Penetrant Inspection |
| 1NC22-01/1RPV-W16-SE | 1B NC Coolant Hotleg | Liquid Penetrant Inspection |
| 1NC25-01/1RPV-W17-SE | 1C NC Coolant Hotleg | Liquid Penetrant Inspection |
| 1NC23-01/1RPV-W18-SE | 1D NC Coolant Hotleg | Liquid Penetrant Inspection |

Reactor Containment Vessel Grid Areas Examined

1Grid -A273 Ultrasonic Thickness Inspection
1Grid -A292 Ultrasonic Thickness Inspection
1Grid -A305 Ultrasonic Thickness Inspection
1Grid -A306 Ultrasonic Thickness Inspection
1Grid -A320 Ultrasonic Thickness Inspection

Pressurizer Surge Line Weld Examined

| | | |
|---|---|---|
| 1NC26-2 | 14" Diameter Surge Line Weld | Ultrasonic Shear Wave Inspection |

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification

a. Inspection Scope

The inspectors observed a control room simulator training scenario on October 4, 2000, to assess licensed reactor operator and senior reactor operator performance. The training scenario involved a steam generator tube rupture coincident with a loss of offsite power. The inspectors focused on the performance of the operators in implementing the emergency plan, plant procedures, and Technical Specifications (TS). The inspectors also observed the post-simulator critique to assess the licensee's ability to identify operator or simulator performance issues.

b. Findings

No findings of significance were identified.

1R12 Maintenance Rule Implementation

a. Inspection Scope

The inspectors reviewed the licensee's implementation of the maintenance rule (10 CFR 50.65) to determine whether responsible personnel were properly evaluating the effectiveness of maintenance on equipment important to safety. To this end, the inspectors verified that the licensee was properly classifying maintenance preventable functional failures. Certain SSCs were also reviewed for proper scoping and risk categorization within the licensee's tracking system. The inspectors conducted this inspection with respect to the six equipment issues/SSCs identified in the following PIPs:

| PIP Number | Equipment Problem |
|---|---|
| C-99-01006<br>C-99-02333<br>C-00-01000<br>C-00-04318<br>C-00-04332<br>C-00-04393 | Recurring Unit 1 standby makeup pump flow indication problems |
| C-00-05228 | Capillary tubes associated with containment spray (NS) pressure switches were empty (improper calibration) |
| C-00-05082 | Failure of valve 1RN-3A to stroke to the open position during RN system alignment changes |
| C-00-02714 | Broken stem on valve 2SA-145 (turbine-driven CA pump trip and throttle valve) |
| C-99-03023 | Repeat failures of safety-related WZ sump pumps during electrical testing due to humidity in sump area |
| C-99-04777 | Safety-related WZ sump pump B2 tripped following equipment rotation |

b. Findings

No findings of significance were identified.

1R13 Maintenance Risk Assessments and Emergent Work Evaluation

a. Inspection Scope

The inspectors reviewed the licensee's assessments of the risk impact of removing from service those components associated with the six emergent and planned work items listed below, focusing primarily on activities determined to be risk-significant within the maintenance rule, to verify that on-line risk was being properly managed. The inspectors also verified that the licensee adequately identified and resolved problems associated with the maintenance risk assessment program.

| Component or System | Reason for Removal from Service |
|---|---|
| 2A Emergency Diesel Generator (EDG) | High bearing temperature trip on October 12, 2000 |
| Unit 1 and 2 RN train A | Extended system outage during pipe cleaning and modifications in October 2000 |
| 1B EDG and associated 4160 V bus | Potential transformer failure and subsequent EDG trip |
| 1A residual heat removal (ND) pump | Pump failure during testing due to possible system gas entrainment |
| 2B KC heat exchanger | Heat exchanger tube leak due to failed plug |
| Unit 1 KC train A | Isolation of pump minimum flow path to facilitate calibrations |

b. Findings

No findings of significance were identified.

1R14 Personnel Performance During Non-routine Plant Evolutions

a. Inspection Scope

The inspectors observed or reviewed licensee performance during non-routine plant evolutions, including: a Unit 1 shutdown on October 13, 2000, in preparation for refueling outage 1EOC12; and an infrequently performed procedure to vent the Unit 1 pressurizer gas space to the plant vent stack on October 14, 2000, in preparation for solid plant operations during the outage. These reviews were conducted to determine if operator actions were appropriate and in accordance with plant procedures and training. The inspectors also reviewed the procedures for adequacy.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations

a. Inspection Scope

The inspectors reviewed the operability determinations (or justifications for continued operation) to verify that safety system operability was properly established, that the affected component or system remained available to perform its intended safety function, and that no unrecognized increase in plant or public risk occurred. Operability evaluations were reviewed for the issues described in the following PIPs:

| PIP Number | Issue |
|---|---|
| C-00-05455 | RN Train A operability with unisolable vent pipe leakage |
| C-00-03366 | RN pump suction pit isolation valves' operability following discovery of common-mode failure potential associated with valve 1RN-3A |
| C-00-06162 | Control room ventilation system chiller tripping on compressor high bearing oil temperature |
| C-00-04978 & C-00-05771 | Ice condenser temperature exceeded 27 degrees during refueling outage (and general intermediate deck area reached 60 degrees) |
| C-00-05369 | Standby shutdown facility (SSF) battery specific gravity test results were questionable |
| Not Applicable | Licensee's decision not to replace 1A EDG electronic governor per vendor-recommended 10-year interval |

b. Findings

No findings of significance were identified.

1R16 Operator Workarounds

a. Inspection Scope

The inspectors reviewed the list of operator workarounds in place during the week of November 12-18, 2000, to assess individual workarounds and determine their cumulative impact on plant risk. A specific item documented in PIP C-00-02538 involved a recurring problem with sporadic automatic starts of the RN pump strainers due to false high dp signals. Because of this problem, operators were required to vent air from the instrument tubing connected to a differential pressure gauge. The erroneously high dp signals were caused by air trapped in the instrument tubing following RN pump starts. The inspectors reviewed this workaround to verify that it would not prevent the RN system from performing its normal and emergency functions, and that it did not detract from the operators' ability to safely operate the plant.

b. Findings

No findings of significance were identified.

1R17 Permanent Plant Modifications

a. Inspection Scope

The inspectors reviewed the following modifications to: (1) verify that the design bases, licensing bases, and performance capability of risk significant SSCs have not been degraded through the modifications; and (2) verify that the modifications performed during risk-significant configurations did not place the plant in an unsafe condition.

| Nuclear Station Modification Number | Description |
|---|---|
| CNCE-70562 | RN valve modification using a split gland design with changes in gland dimensions. This valve modification installed a split gland to eliminate the potential failure mechanism caused by a design deficiency on pit suction valves 1RN-1A, 1RN-2B, 1RN-3A |
| CN-11405<br>TN/1/A/1405/00/02E | Installation of ND and NS pump area sump interlock modification and subsequent testing |

b. Findings

No findings of significance were identified.

1R19 Post-Maintenance Testing

a. Inspection Scope

The inspectors observed or reviewed post-maintenance tests associated with the following six work activities to verify that equipment was properly returned to service and that proper testing was specified and conducted to ensure that the equipment could perform its intended safety function following maintenance.

| Test Procedure/ WO Number | Maintenance/Test Activity |
|---|---|
| PT/1/4200/013A, Rev. 54/ WO 98270651 01 | Stroke test following planned maintenance on valve 1NI-150B to replace quick connects |
| PT/0/A/4400/008A, Rev. 35 | RN Train A flow balance following major pipe cleaning |
| PT/1/A/4200/007A, Rev. 45 | 1A centrifugal charging pump test following rotating element/seal replacement |
| PT/2/A/4200/031, Rev. 51 WO 98256464 | Retest required following relocation of the junction box for 2SV-28, the block valve for 2B steam generator power operated relief valve |
| IP/0/B/3710/022, Rev. 20, Encl. 11.4 | SSF battery test after recharge following battery charger breaker trip and battery discharge |
| PT/1/A/4200/10A, Rev. 65 | Test of 1A ND pump after venting and test instrument change-out (earlier test failure due to potential gas entrainment) |

b. Findings

No findings of significance were identified.

1R20 Refueling and Outage Activities

a. Inspection Scope

The inspectors observed or reviewed several activities during the 1EOC12 refueling outage, which occurred from October 14 to November 20, 2000. Specific activities included verification that NC system cooldown rates were within TS limits; verification of containment closure and the availability of other defense-in-depth mechanisms during high-risk plant configurations; observation of reduced inventory and midloop operations; and observation of the NC system vacuum refill process. The inspectors also observed the licensee's new fuel receipt inspections, as well as core reload and core mapping activities, to verify the material condition of the new fuel and to verify that fuel reload was in accordance with core design for the upcoming operating cycle. The licensee's spent fuel inspection activities were reviewed to assess their efforts in identifying potentially leaking fuel assemblies. Outage-related surveillance test activities were reviewed in accordance with Inspection Procedure 71111.22, Surveillance Testing. Additionally, the inspectors performed an ice condenser closeout inspection; conducted a containment building walkdown (to verify that debris was not present that could affect operability of the containment sump for the emergency core cooling system); observed the reactor startup; and reviewed low power physics testing results to verify compliance with the upcoming operating cycle's core operating limits report. Procedures observed and/or reviewed to support the above activities included the following:

| Procedure Number | Title |
|---|---|
| Site Directive 3.1.30, Rev. 24 | Catawba Nuclear Station Unit Shutdown Configuration Control (Mode 5, 6, or No Mode) |
| PT/0/A/4150/001, Rev. 24 | Controlling Procedure for Start-up Physics Testing |
| PT/0/A/4150/001A, Rev. 3 | Zero Power Physics Testing |
| N/A | Catawba Unit 1 C1C13 Start-up and Operational Report, October 2000 |
| MP/0/A/7150/020, Rev. 21 | Equipment Hatch Removal and Replacement |
| PT/0/A/4550/003C, Rev. 7 | Core Verification |
| OP/1/A/6150/006, Rev. 58 | Draining the Reactor Coolant System |
| OP/0/A/6100/014, Rev. 20 | Penetration Control for Mode 5 and 6 |
| OP/1/A/6150/001, Rev. 85 | Filling and Venting the Reactor Coolant System |

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing

a. Inspection Scope

The inspectors reviewed the six surveillance test procedures listed below to verify that TS requirements were properly incorporated and that test acceptance criteria were properly specified. The inspectors observed actual performance of some of the tests, reviewed the basis for test acceptance criteria, and reviewed completed procedures to verify that acceptance criteria had been met. The inspectors also verified that proper test conditions were established in the procedures and that no equipment preconditioning activities were being conducted.

| Procedure Number | Title |
|---|---|
| PT/2/A/4200/09, Rev. 167 | Engineered Safety Features Actuation Periodic Test |
| IP/1/A/3010/006A, Rev. 22 | Main Feedwater System Doghouse Water Level Instrumentation |
| PT/2/A/4400/003B, Rev. 35 | KC Train 2B Performance Test IWP Testing of the 2B1 KC Pump |
| PT/1/A/4350/002A, Rev. 98 | 1A EDG Monthly Periodic Test |
| PT/1/A/4200/010B, Rev. 80 | Residual Heat Removal Pump 1B Performance Test |
| PT/1/A/4200/001A, Rev. 19A | Containment Integrated Leak Rate Test |

b. Findings

No findings of significance were identified.

1R23 Temporary Plant Modifications

a. Inspection Scope

The inspectors reviewed one temporary modification this quarter to verify that the functions of important safety systems were not affected. Included in this review was a review of the associated 10CFR 50.59 safety evaluation to ensure regulatory compliance. The modification was implemented by the following procedure enclosures:

| Procedure Number, Title, and Enclosures | Description |
|---|---|
| OP/2/A/6400/005, Rev. 62, Component Cooling Water System, Enclosure 4.8, KC Train Alignment for KC HX 2B Cleaning; and Enclosure 4.9, KC Train 2B Alignment For KC HX 2A Cleaning | Defeated potential auto closure of the KC system cross-connect valves upon receipt of a Phase B containment isolation signal or a safety injection actuation signal coincident with a low FWST level. |

b. Findings

No findings of significance were identified.

**Cornerstone: Emergency Preparedness**

1EP6 Drill Evaluation

a. Inspection Scope

The inspectors observed a control room simulator training scenario on October 4, 2000, to assess licensed operators' performance in the area of emergency preparedness. The inspectors verified that the operators made the correct drill event declaration (site area emergency) and that associated follow-up actions were performed in accordance with regulatory requirements and the licensee's procedures. The observed scenario (a steam generator tube rupture and loss of offsite power) was performed in conjunction with the licensed operator requalification program.

b. Findings

No findings of significance were identified.

## 2. RADIATION SAFETY
**Cornerstones: Occupational Radiation Safety and Public Radiation Safety**

2OS1 Access Control to Radiologically-Significant Areas

a. Inspection Scope

The inspectors reviewed licensee procedures SH/0/B/2000/012, Revision 001, Access Controls for High, Extra High, and Very High Radiation Areas, and SH/0/B/2000/005, Posting of Radiation Control Zones, Revision 001. The inspectors performed plant walkdowns, independently measured dose rates, and verified postings and control of access to radiologically-controlled areas, including high radiation areas and extra high radiation areas, to assess the licensee's implementation of these procedures. The inspectors reviewed the licensee's control and storage of highly activated materials (e.g., fuel channels and low power range monitor sources) underwater in the Spent Fuel Pool (SFP) on short hangers, which could be raised inadvertently to the pool surface thereby creating a high radiation area or extra high radiation area. The inspectors reviewed the licensee's implementation of its Nuclear System Directive 501, Temporary Storage of Radioactive Material in the Spent Fuel Pool, effective January 17, 2000, including the inventory of temporarily stored items currently in the SFP. The inspectors also reviewed selected health physics-identified items in the licensee's PIP program for assignment, closeout timeliness, and trending.

b. Findings

No findings of significance were identified.

2OS2 ALARA Planning and Controls

a. Inspection Scope

The inspectors reviewed the summary of personnel radiation exposures and radiation protection activities from the Unit 2 End of Cycle 10 (2EOC10) refueling outage (RFO) report, which primarily addressed routine refueling and maintenance activities during the Spring 2000 Unit 2 RFO, to assess the licensee's performance in maintaining radiation exposures as low as reasonably achievable (ALARA). The inspectors also reviewed PIP C-00-02614, associated with the summary and used as a planning tool for future work, i.e., for the 1EOC12 refueling outage. Implementation of ALARA controls and radiation worker performance for work in radiation areas were observed during the inspection; specifically, Radiation Work Permit (RWP) Number 1615 and the work done during the replacement of a seal on the 1A NV pump using Procedure MP/O/A/7150/016A, Revision 037, Centrifugal Charging Pump Corrective Maintenance. Exposure to declared pregnant workers during calendar year 2000 was discussed with the ALARA supervisor. Plant source term monitoring records were reviewed to assess the licensee's source term reduction program, including a plot of the crud burst results over a three-day period at the beginning of the 1EOC12 outage which illustrated the effectiveness of chemical decontamination. The inspectors reviewed policies, procedures, and records regarding plant ALARA activities. Specific program elements reviewed included: selected ALARA work planning packages, plant collective exposure history, current exposure dose trends, annual dose goals, and radiation exposure tracking, and temporary shielding installation and removal. The effectiveness of problem identification and resolution of selected ALARA-related issues identified during calendar year 2000 (year-to-date) was also evaluated by the inspectors during the review of selected PIP Reports.

b. Findings

No findings of significance were identified.

2PS1 Radioactive Gaseous and Liquid Effluent Treatment and Monitoring Systems

a. Inspection Scope

To assess the licensee's implementation of its effluent release program, the inspectors reviewed the Catawba Nuclear Station 1999 Annual Liquid and Gaseous Effluent Report and compared the results to the requirements of the Offsite Dose Calculation Manual (ODCM), Revision 42; the Selected Licensee Commitments Manual, Section 16.11, Radiological Effluents Controls; 10 CFR 50.36a(2); and 10 CFR 20.1302. The inspectors reviewed licensee self-assessment SA-00–05(ALL)(RA)(RP), the Duke Power Company Assessment Report on Radiation Protection, conducted at Catawba from February 21 through 24, 2000, to assess its effectiveness in identifying issues in the licensee's effluent control program, the ODCM, and the environmental monitoring program.

b. Findings

No findings of significance were identified.

2PS3 Radiological Environmental Monitoring Program

a. Inspection Scope

The inspectors reviewed ENRAD Laboratory Procedure Manual, Procedure 3, Operational Radiological Environmental Sample Collection Program for Catawba Nuclear Station, Revision 4, and observed environmental sampling for milk, surface water, and air to assess whether sampling was being performed as required by the ODCM. To assess the licensee's implementation of its radiological environmental monitoring program, the inspectors reviewed the Catawba Nuclear Station 1999 Annual Radiological Environmental Operating Report and compared the results to the requirements of the ODCM, Revision 42; the Selected Licensee Commitments Manual, Section 16.11, Radiological Effluents Controls; 10 CFR 50.36a(2); 10 CFR 20.1302; and Appendix I of 10 CFR Part 50.

b. Findings

No findings of significance were identified.

## 4. OTHER ACTIVITIES

4OA1 Performance Indicator (PI) Verification

.1 Reactor Safety PIs

a. Inspection Scope

The inspectors conducted annual reviews of the following two Reactor Safety PIs, as submitted to the NRC by the licensee, for accuracy:

| Cornerstone | PI |
|---|---|
| Mitigating Systems | Safety System Unavailability - Residual Heat Removal System |
| Mitigating Systems | Safety System Unavailability - High Pressure Safety Injection System |

This review was conducted for third quarter 2000 PI data submitted on or about December 21, 2000. To verify the PI data, the inspectors reviewed control room logs, TS Action Item Log entries, work management system data, and maintenance rule data. The inspectors also reviewed specific periods of unavailability of the RN system during the fourth quarter 2000. The RN system provides a support function for the two monitored systems above. The licensee conducted extended RN system outages during fourth quarter to support modifications and major pipe cleaning efforts, which resulted in train-specific unavailability for the two monitored systems above, as well as the EDGs. The inspectors reviewed and discussed with the licensee their plans to exclude the RN-related work from the unavailability calculations for these systems.

b. Findings

No findings of significance were identified.

.2 Safeguards PIs

a. Inspection Scope

The inspector reviewed Catawba Nuclear Power Station's programs for gathering and submitting data for the Fitness-for-Duty, Personnel Screening, and Protected Area Security Equipment PIs. The review included the licensee's tracking and trending reports and security event reports for the PI data submitted from the first quarter 2000 to the fourth quarter of 2000.

b. Findings

No findings of significance were identified.

4OA3 Event Followup

.1 (Closed) Licensee Event Report (LER) 50-413/99-016-01: Operation Prohibited by Technical Specification 3.8.1 and 3.7.8 Due to Inoperable Diesel Generator 1B for Greater than 72 Hours.

The original LER was closed in inspection report 50-413,414/00-02. This supplemental LER was issued to revise the root cause statement after a more detailed failure analysis of the 1B EDG governor was completed. The inspectors considered the revised root cause determination, which was improper tuning of the governor following maintenance, and verified that no licensee performance issues existed. This item did not constitute a violation of NRC requirements.

.2 (Closed) LER 50-413/00-005-00: Engineered Safety Feature Actuation - 1B 4160 Volt Bus De-Energized Due to 1B EDG Potential Transformer Failure.

This event, which occurred when Unit 1 was shutdown in Mode 6, was captured in the licensee's corrective action program as PIP C-00-05691. The inspectors reviewed the LER and no findings were identified.

.3 Release of Gaseous Effluents

a. Inspection Scope

The inspectors reviewed the circumstances and licensee actions regarding a release of gaseous effluents, which occurred when the licensee was venting the Unit 1 pressurizer gas space to the plant vent stack on October 14, 2000. The licensee initially thought that this release exceeded 10 CFR Part 20 limits and made a four-hour notification to NRC headquarters. This event notification was retracted when the licensee later determined that the release had not exceeded regulatory limits. The inspectors verified

that the licensee's revised dose projections were accurate. A procedure-related licensee-identified violation of very low safety significance was identified and is listed in Section 4OA7 of this report.

b. Findings

No findings of significance were identified.

4OA6 Meetings

Exit Meeting Summary

The inspectors presented the inspection results to Mr. Ron Jones, Station Manager, and other members of licensee management at the conclusion of the inspection on December 20, 2000. The licensee acknowledged the findings presented.

The inspectors asked the licensee whether any of the material examined during the inspection should be considered proprietary. No proprietary information was identified.

4OA7 Licensee Identified Violations The following finding of very low significance was identified by the licensee and is a violation of NRC requirements, which meets the criteria of Section VI of the NRC Enforcement Policy, NUREG-1600, for being dispositioned as a Non-Cited Violation (NCV).

| NCV Tracking Number | Requirement Licensee Failed to Meet |
|---|---|
| NCV 413,414/00005-1 | Technical Specification 5.4.1 and Regulatory Guide 1.33, Section 7, for failing to have adequate procedures to control the release of radioactive material during a pressurizer gas space venting evolution on October 14, 2000, as described in the licensee's corrective action program. Reference PIPs C-00-04914 and 05241. |

## PARTIAL LIST OF PERSONS CONTACTED

Licensee

E. Beadle, Emergency Preparedness Manager
R. Beagles, Safety Review Group Manager
M. Boyle, Radiation Protection Manager
G. Gilbert, Regulatory Compliance Manager
R. Glover, Operations Superintendent
W. Green, Work Control Superintendent
P. Grobusky, Human Resources Manager
P. Herran, Engineering Manager
R. Jones, Station Manager
R. Parker, Maintenance Superintendent
G. Peterson, Catawba Site Vice President
F. Smith, Chemistry Manager
R. Sweigart, Safety Assurance Manager

## ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None

Closed

| | | |
|---|---|---|
| 50-413/99-016-01 | LER | Operation Prohibited by Technical Specification 3.8.1 and 3.7.8 Due to Inoperable Diesel Generator 1B for Greater than 72 Hours (Section 4OA3.1) |
| 50-413/00-005-00 | LER | Engineered Safety Feature Actuation - 1B 4160 Volt Bus De-Energized Due to 1B EDG Potential Transformer Failure (Section 4OA3.2) |

Discussed

None

## DOCUMENTS REVIEWED

The following is a list of documents reviewed during the inspection discussed in Section 1RO7:

- Catawba Nuclear Station, January 26, 1990, Response to Generic Letter 89-13, Service Water System Problems Affecting Safety-Related Equipment
- Duke Power's Service Water System Program Manual (SWSPM-Revision 1) Section 12.7.9.4 Heat Transfer Testing and Section 12.7.22 Diesel Generator Cooling Water Heat Exchangers
- Catawba Nuclear Station, Unit 2, KC System Test Acceptance Criteria, KC HX 2A Heat Capacity Test, Dwg. Nos. CNTC-2573-KC-H001-01 Revision 1, H001-02 Revision 3 and H001-03 Revision .3
- Catawba Nuclear Station, Units 1 & 2 RN System Test Acceptance Criteria, RN System Flow Balance, Dwg. Nos. CNTC-1574-RN.S002-01 Revision 1, S002-02 Revision 6 and S002-03 Revision 4
- Catawba Nuclear Station, Unit 2, KD System Test Acceptance Criteria, KD HX 2A Heat Capacity Test, Dwg. Nos. CNTC-2609-KD.H001-01 Revision 4, H001-02 Revision 4 and H001-03 Revision 3
- Catawba Nuclear Station, Unit 1, KD System Test Acceptance Criteria, KD HX 1B Heat Capacity Test, Dwg. Nos. CNTC-1609-KD.H002-01 Revision 4, H002-02 Revision 3, H002-03 Revision 3
- Catawba Nuclear Station, Unit 1, KC HX 1A Heat Capacity Test, Dwg. No. CNTC-1573-KC.H001-01 Revision 2, H001-02 Revision 5 and H001-03 Revision 5
- WO 98187701-01, Clean and Inspect D/G Jacket Water Cooler 2KD HX B2 (Diesel Engine Jacket Water Heat Exchanger Corrective Maintenance Procedure No. MP/0/A/7650/056-D Revision 005) Performed March 22-25, 2000
- WO 98187698-01, Clean and Inspect 2 KC HX A, "KC" Heat Exchanger Corrective Maintenance Procedure No. MP/0/A/7650/056-C Revision 009, Performed March 17, 2000
- Catawba Nuclear Station Final Safety Analysis Report, Section 9.2 and Appendix 9 Chapter 9 Tables and Figures
- System Health Report for 3Q00 RN
- Major Component Health Report for 3Q00 HX's KC Component Cooling
- Major Component Health Report for 3Q00 HX's KD Diesel Engine Jacket Water Cooling
- Catawba Nuclear Station Test Procedure No. PT/1/A/4400/009 Revision 48,

Cooling Water Flow Monitoring for Asiatic Clams and Mussels Quarterly Test, for KC HX 1A Performed: January 25, 2000 August 8, 2000, August 10,2000 and September 6, 2000

- Catawba Nuclear Station Test Procedure No. PT/2/AA/4400/009 Revision 28, Cooling Water Flow Monitoring for Asiatic Clams and Mussels Quarterly Test, for KD HX 2B Performed: April 25, 2000, May 18, 2000, June 20, 2000 and 2A KC HX, Performed: August 10, 2000

- Catawba Nuclear Station Procedure No. PT/1/A/4400/006C Revision 10, KC Heat Exchanger 1A Heat Capacity Test, dated 11/29-30/97 and 10/15/2000

- Catawba Nuclear Station Procedure No. PT/2/A/4400/006C Revision 6, KC Heat Exchanger 2A Heat Capacity Test, dated 9-6-98 and 6-13-90

- Catawba Nuclear Station Procedure No. PT/1/A/4400/006E Revision 15, KD Heat Exchanger 1A Heat Capacity Test, Performed: August 8-9, 2000

- Catawba Nuclear Station Procedure No. PT/2/A/4400/006F Revision13, KD Heat Exchanger 2B Heat Capacity Test, Performed: April 25, 2000

- Unit 1 &2 KC Component Cooling Hxs Service Records for cleaning, eddy current inspection and plugging, dating from 1993 to present

- Unit 1 and 2 KD Diesel Generator Jacket Water Coolers Service Records for cleaning, eddy current inspection and plugging, dating from 1993 to present

- RN 1A Balance Component Flows, trended test data (from October 1990 to present)

- RN 2A Balance Component Flows, trended test data (from October 1990 to present)

- RN 2B Balance Component Flows, trended test data (from August 1990 to present)

- KD 1A Heat Exchanger Fouling, trended test data (from June 1986 to present)

- KD 2B Heat Exchanger Fouling, trended test data ( from June 1987 to present)

- Unit 1 & 2 KC tube plugging historical record

- KC Heat Exchanger Clam PT Flow Coefficient, trended test data (from March 1985 to present)

- PIP Report No. C-98-04282

- PIP Report No. C-98-03191
- PIP Report No. C-99-01675

The following is a list of documents reviewed during the inspection discussed in Section 1RO8:

Procedures Reviewed

Procedure No. NDE-600 Rev.13, Ultrasonic Examination of Similar Metal Welds in Ferrtitic and Austenitic Piping

Nondestructive Evaluation Program Manual Procedure No. NDE-951 Rev. 1, Ultrasonic Thickness Measurement of Metallic Containment Structure

Liquid Penetrant Examination Procedure No. NDE-35 Rev. 18

Procedure No. SM/0/A/8140/001 Rev. 8, Welding of QA and Non QA Piping, Valves and Components

Repair and Replacement WOs Reviewed

| | |
|---|---|
| WO 98240944-03 | WU004 1RN310B Shop and In-plant Prefab |
| WO 98313372-01 | 1NV-320: I/R Seat Leak |
| WO 98213414-01 | WUO2 Install 1RN Header & Change to 8" |
| WO 98240938-01 | PF Shop Prefab of IA Piping |
| WO 98240938-03 | WU03 1RN250A Shop & In-plant Prefab |

PIPs Reviewed

PIP C-98-02129
PIP C-98-02103
PIP C-98-02885
PIP C-98-03036
PIP C-99-04265
PIP C-00-01446
PIP C-99-01832
PIP C-99-02453
PIP C-98-03036
PIP C-98-03659
PIP C-00-02655
PIP C-00-04315
PIP C-00-02071
PIP C-00-02889
PIP C-00-01555

## LIST OF ACRONYMS USED

| | | |
|---|---|---|
| ALARA | - | As Low As Reasonably Achievable |
| CA | - | Auxiliary Feedwater System |
| CF | - | Main Feedwater |
| CFR | - | Code of Federal Regulations |
| ASME | - | American Society of Mechanical Engineers |
| dp | - | differential pressure |
| EDG | - | Emergency Diesel Generator |
| EOC | - | End of Cycle |
| FWST | - | Refueling Water Storage Tank |
| HX | - | Heat Exchanger |
| ISI | - | Inservice Inspection |
| KC | - | Component Cooling Water System |
| KD | - | Jacket Water |
| LER | - | Licensee Event Report |
| OCDM | - | Offsite Dose Calculation Manual |
| NC | - | Reactor Coolant System |
| NCV | - | Non-Cited Violation |
| ND | - | Residual Heat Removal System |
| NDE | - | Nondestructive Examination |
| NRC | - | Nuclear Regulatory Commission |
| NRR | - | (Office of) Nuclear Reactor Regulation |
| NS | - | Containment Spray |
| PI | - | Performance Indicator |
| PIP | - | Problem Investigation Process |
| PRA | - | Probabilistic Risk Assessment |
| RN | - | Nuclear Service Water System |
| SFP | - | Spent Fuel Pool |
| SSC | - | Systems, Structures and Components |
| SSF | - | Standby Shutdown Facility |
| TS | - | Technical Specification |
| WO | - | Work Order |
| WZ | - | Ground Water Drainage System |

# NRC's REVISED REACTOR OVERSIGHT PROCESS

The federal Nuclear Regulatory Commission (NRC) recently revamped its inspection, assessment, and enforcement programs for commercial nuclear power plants. The new process takes into account improvements in the performance of the nuclear industry over the past 25 years and improved approaches of inspecting and assessing safety performance at NRC licensed plants.

The new process monitors licensee performance in three broad areas (called strategic performance areas): reactor safety (avoiding accidents and reducing the consequences of accidents if they occur), radiation safety (protecting plant employees and the public during routine operations), and safeguards (protecting the plant against sabotage or other security threats). The process focuses on licensee performance within each of seven cornerstones of safety in the three areas:

| Reactor Safety | Radiation Safety | Safeguards |
|---|---|---|
| ● Initiating Events | ● Occupational | ● Physical Protection |
| ● Mitigating Systems | ● Public | |
| ● Barrier Integrity | | |
| ● Emergency Preparedness | | |

To monitor these seven cornerstones of safety, the NRC uses two processes that generate information about the safety significance of plant operations: inspections and performance indicators. Inspection findings will be evaluated according to their potential significance for safety, using the Significance Determination Process, and assigned colors of GREEN, WHITE, YELLOW or RED. GREEN findings are indicative of issues that, while they may not be desirable, represent very low safety significance. WHITE findings indicate issues that are of low to moderate safety significance. YELLOW findings are issues that are of substantial safety significance. RED findings represent issues that are of high safety significance with a significant reduction in safety margin.

Performance indicator data will be compared to established criteria for measuring licensee performance in terms of potential safety. Based on prescribed thresholds, the indicators will be classified by color representing varying levels of performance and incremental degradation in safety: GREEN, WHITE, YELLOW, and RED. GREEN indicators represent performance at a level requiring no additional NRC oversight beyond the baseline inspections. WHITE corresponds to performance that may result in increased NRC oversight. YELLOW represents performance that minimally reduces safety margin and requires even more NRC oversight. And RED indicates performance that represents a significant reduction in safety margin but still provides adequate protection to public health and safety.

The assessment process integrates performance indicators and inspection so the agency can reach objective conclusions regarding overall plant performance. The agency will use an Action Matrix to determine in a systematic, predictable manner which regulatory actions should be taken based on a licensee's performance. The NRC's actions in response to the significance (as represented by the color) of issues will be the same for performance indicators as for inspection findings. As a licensee's safety performance degrades, the NRC will take more and increasingly significant action, which can include shutting down a plant, as described in the Action Matrix.

More information can be found at: http://www.nrc.gov/NRR/OVERSIGHT/index.html.

Attachment