



UNITED STATES
 NUCLEAR REGULATORY COMMISSION
 REGION II
 101 MARIETTA STREET, N.W.
 ATLANTA, GEORGIA 30323

Report Nos.: 50-413/90-32 and 50-414/90-32

Licensee: Duke Power Company
 P.O. Box 1007
 Charlotte, N.C. 28201-1007

Docket Nos.: 50-413 and 50-414

License Nos.: NPF-35 and NPF-52

Facility Name: Catawba Nuclear Station Units 1 and 2

Inspection Conducted: December 9, 1990 - January 5, 1991

Inspector:	<u>William H. Miller</u>	<u>1-24-91</u>
	W. T. Orders, Senior Resident Inspector	Date Signed
	<u>William H. Miller</u>	<u>1-24-91</u>
	P. C. Hopkins, Resident Inspector	Date Signed
	<u>William H. Miller</u>	<u>1-24-91</u>
	J. Zeiler, Resident Inspector	Date Signed

Approved by:	<u>George A. Belisle</u>	<u>1/28/91</u>
	George A. Belisle, Chief Projects Section 3A Division of Reactor Projects	Date Signed

SUMMARY

Scope: This routine, resident inspection was conducted in the areas of review of plant operations; cold weather preparations; surveillance observations; maintenance observations; special nuclear material procedures reviews; licensee event reports; Part 21 reports; and followup of previously identified items.

Results: One violation was identified involving the failure to review procedures incorporated in the licensee's Performance Manual (Paragraph 7).

One Non-Cited Violation was identified involving an operators failure to follow procedures (Paragraph 10.b).

REPORT DETAILS

1. Persons Contacted

Licensee Employees

- B. Caldwell, Station Services Superintendent
- *R. Casler, Operations Superintendent
- T. Crawford, Integrated Scheduling Superintendent
- R. Ferguson, Shift Operations Manager
- *J. Forbes, Technical Services Superintendent
- R. Glover, Performance Manager
- J. Hampton, Station Manager
- T. Harrall, Design Engineering
- *L. Hartzell, Compliance Manager
- R. Jones, Maintenance Engineering Services Manager
- *V. King, Compliance
- *F. Mack, Project Services Manager
- *W. McCollum, Maintenance Superintendent

Other licensee employees contacted included technicians, operators, mechanics, security force members, and office personnel.

NRC Resident Inspectors

- *W. Orders
- P. Hopkins
- *J. Zeiler

*Attended exit interview.

2. Plant Operations Review and ESF System Walkdown (71707 and 71710)

The inspectors reviewed plant operations throughout the reporting period to verify conformance with regulatory requirements, Technical Specifications (TS), and administrative controls. Control Room logs, the Technical Specification Action Item Log, and the Removal and Restoration (R&R) log were routinely reviewed. Shift turnovers were observed to verify that they were conducted in accordance with approved procedures. Daily plant status meetings were routinely attended.

The inspectors verified by observation and interviews that measures taken to assure physical protection of the facility met current requirements. Areas inspected included the security organization, the establishment and maintenance of gates, doors, and isolation zones in the proper conditions,

and that access control and badging were proper and procedures followed. On December 12, during a routine plant tour, the inspector detected a Violation of the requirements pertaining to vehicle control. This issue was discussed with Region II Security personnel and will be reviewed during their next scheduled Security inspection.

In addition to the areas discussed above, the areas toured were observed for fire prevention and protection activities and radiological control practices.

During this report period, the inspectors conducted a detailed walkdown of accessible portions of both trains of the Unit 1 Residual Heat Removal (ND) System. The as-built configuration was reviewed against the current plant ND system drawings. Selected ND system equipment and components were examined to ensure that there were no conditions which might degrade the system's performance. Selected piping supports and restraints were observed for deficiencies. Using the licensee's ND System lineup procedure, OP/1/A/6200/04, the inspectors verified that main system flowpath valves were in their proper positions. This activity was accomplished by using the control room board indication as well as local observation. Valves were verified to be installed correctly, and did not exhibit signs of packing leakage, bent stems, or improper labeling. Selected instrumentation was examined to ensure proper installation, functioning, and that local process parameters were consistent with expected values and control room indication. In addition, general housekeeping conditions were examined to ensure that the required levels of cleanliness were being observed.

Aside from some minor housekeeping items, which the licensee indicated would be corrected, no discrepancies were identified.

3. Units 1 and 2 Summary

Unit 1 began the report period operating at full rated power and remained at power until January 4, when the unit was shut down in order to troubleshoot an intermittent ground indication on the main electrical generator.

The forced outage afforded the licensee the opportunity to perform a visual inspection of ice condenser basket U-bolts which had been identified as a problem at the McGuire Nuclear Station. The results and details of the U-bolt inspection will be documented in NRC Inspection Report No. 50-413, 414/91-03.

Unit 1 completed the report period in Mode 4.

Unit 2 began the report period operating at 98 percent power. Based on the results of ice condenser U-bolt inspection on Unit 1, the licensee decided to shut down Unit 2 for a similar inspection. Unit shutdown began at 12:35 a.m. on the morning of January 5, 1991, and the unit ended the report period in Mode 3.

The results and details of the U-bolt inspection will be documented in NRC Inspection Report No. 50-413, 414/91-03.

Within this area, no violations or deviations were identified.

4. Cold Weather Preparations (71714)

An evaluation of Catawba's cold weather protection program was performed in order to determine whether the licensee has maintained effective implementation of a program of protective measures for extreme cold weather. The evaluation included but was not limited to the following elements:

- Verification that the licensee has inspected systems susceptible to freezing to ensure the presence of heat tracing, space heaters, and/or insulation; the proper setting of thermostats; and that the heat tracing and space heating circuits have been energized.
- Verification that the licensee has inspected systems which have been subjected to maintenance and/or modification during the past year to determine if cold weather protective measures have been reestablished.
- Verification that the licensee has determined, during periods of prolonged shutdown, if the areas that are no longer kept warm by normal plant operations are adequately protected.

The program is implemented by procedure PT/O/B/4700/38, Cold Weather Protection. The procedure includes, but is not limited to the verification of the following:

- Heating Water System in service
- Instrumentation and Electrical (I&E) work requests 5410SWR and 3057SWR, which ensure that all trace heating is operational and has been completed
- Electrical heaters in select remote structures are operational
- Instrument Air dryers in service

The program appears adequate to prevent plant operation impact by cold weather conditions.

A review of work in progress revealed that although the procedure had not yet been completed, there were no critical items outstanding.

No violations or deviations identified.

5. Surveillance Observation (61726)

a. General

During the inspection period, the inspectors verified plant operations were in compliance with various TS requirements. Typical of these requirements were confirmation of compliance with the TS for reactivity control systems, reactor coolant systems, safety injection systems, emergency safeguards systems, emergency power systems, containment, and other important plant support systems. The inspectors verified that: surveillance testing was performed in accordance with approved written procedures; test instrumentation was calibrated; limiting conditions for operation were met; appropriate removal and restoration of the affected equipment was accomplished; test results met acceptance criteria and were reviewed by personnel other than the individual directing the test; and, any deficiencies identified during the testing were properly reviewed and resolved by appropriate management personnel.

b. Procedure Review

The inspectors witnessed or reviewed the following surveillances:

PT/0/A/4400/22A	Nuclear Service Water Pump Train A Performance Test
IP/0/A/3240/14	Excure Nuclear Instrumentation System Incore Cross Calibration
PT/1/A/4200/01E	Upper Containment Personnel Air Lock Leak Rate Test
PT/1/A/4200/07C	Standby Makeup Pump Performance Test
PT/1/A/4200/13E	CA Valve Inservice Test
PT/1/B/4250/04A	Feedwater Pump Turbine Weekly Test
PT/1/A/4250/04B	Main Feedwater Stop Valve Movement Test
PT/1/B/4250/05	General Core Monitor Monthly Test
PT/1/A/4350/02B	Diesel Generator Operability Test
PT/1/A/4400/03A	Component Cooling Train 1A Performance Test
PT/1/A/4450/03B	Annulus Ventilation System Train B
PT/1/A/4450/13B	Auxiliary Feedwater Pump Room CO2 Weekly Test
PT/1/A/4550/04A	Diesel Generator Fuel Oil Storage Tank Water Inspection
PT/1/A/4600/02A	Mode 1 Periodic Surveillance Items

PT/2/A/4150/01D	NC System Leaking Calculation
PT/2/A/4200/01F	Lower Containment Personnel Airlock Test
PT/2/A/4200/06C	Containment Spray Valve Lineup Verification
PT/2/A/4200/09	ESF Actuation Periodic Test
PT/2/A/4250/02C	Turbine Control Valve Movement Test
PT/2/A/4250/06	Auxiliary Feedwater Pump Head and Valve Verification
PT/2/A/4450/09A	Spent Fuel Ventilation System Train A Operability Test
PT/2/A/4600/02A	Mode 1 Periodic Surveillance Items

No violations or deviations were identified.

6. Maintenance Observations (62703)

a. General

Station maintenance activities of selected systems and components were observed/reviewed to ensure that they were conducted in accordance with the applicable requirements. The inspectors verified licensee conformance to the requirements in the following areas of inspection: activities were accomplished using approved procedures; and functional testing and/or calibrations were performed prior to returning components or systems to service; quality control records were maintained; activities performed were accomplished by qualified personnel; and materials used were properly certified. Work requests were reviewed to determine the status of outstanding jobs and to assure that priority was assigned to safety-related equipment maintenance which may affect system performance.

b. Maintenance Activity Review

The inspectors witnessed or reviewed the following maintenance activities:

03933 SWR	Perform Incore-Excore Cross Calibration on N-42
11008 SWR	Perform Force Check on Auxiliary Feedwater Turbine Pump Governor
11894 SWR	Perform Periodic Maintenance on Auxiliary Feedwater Turbine Pump
47724 SWR	Repair Hotwell Level Indicator
55151 SWR	Investigate and Repair Turbine "Load Limit-Limiting" Light not Operating
56684 OPS	1B Condensate Booster Pump
47752 OPS	Investigate and Repair Valve 2NI-96B
03730 MES	Unit 1 Ice Condenser U-Bolt Visual Inspection
03729 MES	Unit 2 Ice Condenser U-Bolt Visual Inspection

No violations or deviations were identified.

7. Special Nuclear Material (SNM) Procedures Review

During a review of procedures associated with SNM accountability, it was noted that the licensee was not performing periodic reviews of certain Performance Group procedures. The review revealed that the Performance Manual, which incorporates virtually all of the administrative procedures governing the operation of the group, includes a number of procedures which have not been reviewed since being written 5-10 years ago. Procedures incorporated in the Performance Manual include, but are not limited to the following:

<u>Procedure Number</u>	<u>Title</u>	<u>Rev. Date</u>
1.3	Control of Test and Measuring Equipment	6/15/81
1.5	Valve Throttle Position	5/20/83
3.7	Retest (Systems & Components)	4/14/83
4.0	Transient Investigation (Post Trip Review)	(no date)
4.2.1	Flux Map Processing	(no date)
4.3	Special Nuclear Materials File Document Control	1/27/84
4.3.1	Guidance for SNM-Related Paperwork	(no date)
5.1	Surveillance Testing Schedule	(no date)
5.2	Valve Inservice Test Program (IWV)	6/14/82

Discussions with Performance Section personnel revealed that the reason they had not been periodically reviewing these procedures was based on an erroneous assumption that the aforementioned procedures were not "procedures" but "guidelines."

Later discussions with the Manager of the Performance Group revealed that upon further review, it had been concluded that the aforementioned guidelines did, in fact, constitute procedures and should be reviewed on a periodic basis.

Performance personnel are currently reviewing all Performance procedures, a process which should be completed by March 1991.

Technical Specification 6.8.1 requires that written procedures be established, implemented, and maintained covering the activities referenced in Appendix A of Regulatory Guide 1.33, Revision 2, February 1978 including administrative procedures, test procedures and material control procedures.

Technical Specification 6.8.2 requires that each procedure required by Specification 6.8.1, and changes thereto, shall be reviewed and approved prior to implementation and periodically reviewed as set forth in administrative procedures.

Station Directive 4.2.1, Development, Approval and Use of Station Procedures, requires in Section 14.0, Periodic Review of Procedures, that comprehensive periodic review of all station procedures be performed, at intervals not to exceed 2 years for safety-related and not to exceed 5 years for non-safety related procedures.

Contrary to the above, the procedures incorporated in the Performance Manual were not being reviewed on a periodic basis as required by Station Directive 4.2.1. This is considered a Violation of both Technical Specifications 6.8.1 and 6.8.2, and is documented as Violation 413, 414/90-32-01: Failure to Review Procedures on a Periodic Basis.

One Violation was identified.

8. Review of Licensee Event Reports (92700)

The below listed Licensee Event Reports (LERs) were reviewed to determine if the information provided met NRC requirements. The determination included: adequacy of description; verification of compliance with Technical Specifications and regulatory requirements; corrective action taken; existence of potential generic problems; reporting requirements satisfied; and the relative safety significance of each event. Based on this review the following LER were closed:

LER 413/90-30	Technical Specification 3.0.3 Entered Due To Two Inoperable Trains Of The Control Room Area Ventilation System Due To Equipment Failure.
LER 414/90-13	Main Feedwater Pump Trip Due To Equipment Failure Resulting In A Reactor And Main Turbine Trip.
LER 413/90-17	Technical Specification 3.0.3 Entry Due To Loss Of Control Rod Position Indications Due To Equipment Failure.

No violations or deviations were identified.

9. Part 21 Reports (36100)

(Closed) P2188-03: Gamma-Metrics Cable Assemblies Installed as Part of the Neutron Monitoring System May Possibly Leak.

The licensee received a Part 21 notification from Gamma-Metrics on February 22, 1988, regarding a potential problem with the In-Containment Cable Assemblies for their Post-Accident Neutron Flux Monitors. There was a possibility of leaks in the solder connections, fitting joints, or metal hose near the solder connections during a design basis event. Moisture intrusion into the cable may occur at these potential leakage points, which could cause degraded monitor performance or failure during a design basis accident.

The licensee reviewed the potential problems and proposed to repair the neutron flux cables using a special hermetic seal repair kit to be supplied by Gamma-Metrics. In the interim, the licensee determined that there was not an operability concern with the monitors based on the relatively low accident pressure (15 psi) assumed in Catawba's design basis analysis. Gamma-Metrics had not observed leakage in the fittings when the assemblies were pressure tested at 15 psi. Also, at Catawba, those points most likely to exhibit leakage were protected from direct spray by junction boxes.

Between July and December 1990, the licensee's Corporate Design Engineering staff reviewed the vendor's qualification plan for the repair kits. The plans were accepted in early January 1991. Once the on-site engineering staff reviews and accepts the plans, the repair kits will be purchased from Gamma-Metrics. The licensee has initiated an urgent plant modification and will install the repair kits during the Unit 1 End-of-Cycle 5 and Unit 2 End-of-Cycle 4 refueling outages. This item is closed based on the licensee's proposed actions to resolve the problem.

10. Followup on Previous Inspection Findings (92701 and 92702)

- a. (Closed) Unresolved Item (JRI) 413, 414/88-15-02: Clogging of Steam Generator Sample Lines and Blocking Flow to EMF-34.

A previous inspection discussed the repeated sample line flow problems the licensee was having with both Units' Steam Generator (S/G) Water Sample Monitor (EMF-34). Pending resolution of the problems, the Unit 1 monitor was removed from service on October 19, 1988, and the Unit 2 monitor was removed from service on November 2, 1988. Both monitors have remained inoperable since those dates.

The inspectors have monitored the licensee's actions pertaining to the TS requirements (3.3.3.10) regarding the operability of the EMF-34 monitor. With an inoperable monitor, the Action Statement requires that gaseous effluent releases via the atmospheric vent valves, (located off the S/G blowdown tank), may continue provided grab samples of S/G water are analyzed for radioactivity once every 12 or 24 hours depending on the specific activity of the secondary coolant. When the monitors were removed from service on the dates discussed above, the atmospheric vent valves were secured closed, thereby preventing any potential gaseous release to the environment should a S/G primary to secondary leak occur. With the atmospheric vent valves closed while the monitors are inoperable, the licensee is in compliance with the TS Action Statement.

The licensee had determined that Kerotest isolation valves used in the monitoring systems were susceptible to plugging from corrosive products (magnetite), present in the sample flow. Also, these Kerotest valves were not designed for throttling flow to accommodate differences in S/G pressure. Without this throttling capability, the S/G with the greatest pressure would provide the majority of the flow to the monitor and could possibly isolate flow from the other generators if the pressure differential was large enough.

In July 1990, during the Unit 2 refueling outage, the licensee modified the monitoring systems on both units. The Kerotest valves which were identified as being susceptible to plugging or otherwise obstructing flow were eliminated from the sampling lines. Manual control valves were installed upstream of the monitors in order to provide throttling capability to account for S/G pressure changes. Ultrasonic flow meters were installed in order to accurately balance S/G flows to the monitor. Flow testing on the modified system was initiated on Unit 2 when the unit returned to service in September 1990. Test results indicated that sample flow temperature to the monitor was higher than the monitor could withstand. Also, S/G sample line flow to the monitor could not be controlled without repeated adjustments to the newly installed throttle valves.

At the time of this inspection, the licensee was evaluating options to correct for the high sample line temperature and sample line flow control problems. Options being considered are the installation of a heat exchanger at the inlet to the EMF monitor and the installation of automatically controlled throttling valves to replace the manual valves.

This URI is considered closed based on the licensee's planned corrective actions to resolve the problems associated with the EMF Monitors. The resident inspectors will, however, continue to track

the licensee's progress in resolving the current problems associated with the monitors. This is identified as Inspector Followup Item (IFI) 413, 414/90-32-02: Review Licensee Resolution of EMF-34 Problems.

- b. (Closed) URI 413/88-38-01: Gravity Drain of FWST Refueling Cavity.

On January 7, 1989, with Unit 1 in Mode 5, operations personnel inadvertently overfilled the deep end of the refueling canal, allowing water to flow around the vertical missile shield to the reactor vessel flange area. Water level reached a depth of one inch above the vessel flange, flowing through the temporary nozzle covers and cavity seal to lower containment.

After further review by the inspectors, it was concluded that this incident was caused by an operators failure to ensure that valve FW-23, a bypass valve around the Refueling Water System (FW) pump, was closed prior to draining the refueling cavity. With FW-23 open, a gravity drain flowpath was created from the FWST to the refueling cavity. FW-23 had originally been opened in accordance with the performance of OP/1/A/6200/14, Enclosure 4.6, FWST Purification. In the purification mode, FWST water is recirculated through the Spent Fuel Cooling (KF) System demineralizers and filters. FW-23 is maintained in the open position during this period. Before completing OP/1/A/6200/14, which would have returned FW-23 to its normally closed position, an operator started OP/1/A/6200/13, Enclosure 4.7, Draining the Refueling Cavity via the FW Pump. Initial Condition 1.6 of this procedure required that the FW System be aligned according to the normal system lineup prescribed in Enclosure 4.2 of the same procedure, which required FW-23 to be closed. When the operator reviewed all procedures which were in progress just before starting OP/1/A/6200/13, he failed to notice that FW-23 had been opened in OP/1/A/6200/14.

As corrective action, the licensee discussed the incident with the operator involved emphasizing the need of attention to detail and being more aware of the consequences of performing procedures simultaneously on the same system. The incident was also discussed at a Shift Supervisor's Meeting held on February 3, 1989, so that all shifts were aware of the problem. NRC inspection Report No. 50-413, 414/88-38 ended February 4, 1989; therefore, all licensee corrective actions were completed before the end of the inspection.

This issue is identified as a violation of the requirements of Technical Specification 6.8.1 which requires in part that activities be performed in accordance with written, approved procedures. After review of the circumstances relative to this issue, it was determined that this violation will not be cited in that the criteria specified

in Section V.A. of the NRC Enforcement Policy were satisfied. This is documented as Not-Cited Violation (NCV) 413/90-32-03: Failure to Follow Operations Procedure.

One NCV was identified in Paragraph 10.b.

11. Exit Interview

The inspection scope and findings were summarized on January 10, 1991, with those persons indicated in paragraph 1. The inspector described the areas inspected and discussed in detail the inspection findings listed below. No dissenting comments were received from the licensee. The licensee did not identify as proprietary any of the materials provided to or reviewed by the inspectors during this inspection.

<u>Item Number</u>	<u>Description and Reference</u>
VIO 413, 414/90-32-01	Failure to perform procedure review as required by Station Directive 4.2.1 (Paragraph 5).
IFI 413, 414/90-32-02	Review Licensee Resolution of EMF-34 Problems (Paragraph 8.a).
NCV 413/90-32-03	Failure to Follow Operations Procedure (Paragraph 8.b).