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

Report Nos. 50-413/89-05 and 50-414/89-05

Licensee: Duke Power Company
422 South Church Street
Charlotte, N.C. 28242

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

Facility Name: Catawba 1 and 2

Inspection Conducted: February 4, 1989 - February 25, 1989

Inspector: [signature] for 3/22/89
W. T. Orders Date Signed

Inspector: [signature] for 3/22/89
M. S. Lesser Date Signed

Approved by: [signature] for 3/29/89
M. B. Shymlock, Section Chief Date Signed
Projects Branch 3
Division of Reactor Projects

SUMMARY

Scope: This routine, resident inspection was conducted on site inspecting in the areas of review of plant operations; surveillance observation; maintenance observation; review of licensee nonroutine event reports; and followup of previously identified items and part 21 reports.

Results: In the areas inspected one violation was identified involving an inadequate test procedure to ensure that auxiliary feedwater piping was vented after filling, paragraph 7. One unresolved item was identified involving personnel errors associated with two safety injections on Unit 2.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

*H. Barron, Operations Superintendent
W. Beaver, Performance Engineer
R. Charest, Station Chemistry Supervisor
T. Crawford, Integrated Scheduling Superintendent
W. Deal, Health Physics Supervisor
*J. Forbes, Technical Services Superintendent
*R. Glover, Compliance Engineer
T. Harrall, Design Engineering
R. Jones, Maintenance Engineering Services Engineer
F. Mack, Project Services Engineer
W. McCollough, Mechanical Maintenance Engineer
W. McCollum, Maintenance Superintendent
*T. Owen, Station Manager
J. Stackley, Instrumentation and Electrical Engineer
D. Tower, Shift Operating Engineer
R. Wardell, Station Services Superintendent

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

NRC Resident Inspectors

*W. Orders
M. Lesser

*Attended exit interview.

2. Unresolved Items

An Unresolved Item is a matter about which more information is required to determine whether it is acceptable or may involve a violation. There was one unresolved item identified in this report.

3. Plant Operations Review (71707 and 71710)

a. The inspectors reviewed plant operations throughout the reporting period to verify conformance with regulatory requirements, Technical Specifications (TS), and administrative controls. Control room logs, danger tag logs, Technical Specification Action Item Log, and the removal and restoration log were routinely reviewed. Shift turnovers were observed to verify that they were conducted in accordance with approved procedures.

The inspectors verified by observation and interviews, that the 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.

In addition to the areas discussed above, the areas toured were observed for fire prevention and protection activities. These included such things as combustible material control, fire protection systems and materials, and fire protection associated with maintenance activities. The inspectors reviewed Problem Investigation Reports to determine if the licensee was appropriately documenting problems and implementing corrective actions.

b. Unit 1 Summary

Unit 1 began the report period in Mode 2 performing zero power physics testing (ZPT) associated with the completion of the end of cycle (EOC) 3 refueling outage. By February 6, ZPT testing was complete and the outage was essentially over. The outage duration was 74 days, and was originally targeted for 60 days. On February 7 when the turbine was rolled, it was found that the B low pressure turbine rotor was slightly bowed which had given rise to a high vibration indication. The turbine was manually tripped and efforts began to "unbow" the turbine which had apparently bowed as the result of uneven heating. By the following day, the rotor had been repaired and the unit was at 17% power. On February 13, with testing continuing, the unit reached 82% power and the following day the unit achieved 100% power where it remained throughout the remainder of the report period.

c. Unit 2 Summary

Unit 2 began the report period at 94% power, limited to that power level by the previously reported problems of main feedwater flow to the C steam generator (S/G). The unit operated at this power level with no major problems until February 21, when at 1:15 a.m. instrument technicians were attempting to determine why the 90% open test light was not illuminating on main steam isolation valve (MSIV) 2SM-3 when performing surveillance procedure PT-2-A-4250-01A, "Main Steam Isolation Valve Movement Test." The MSIV closed when the technicians placed an improper electrical jumper which short circuited the power supply to the MSIV control circuity. When the MSIV closed, the unit suffered a reactor trip on low low level in the C S/G due to the resultant pressure increase, and void collapse. Three steam line code safeties and one S/G power operated relief valve (PORV) opened due to the pressure transient which in turn lead

to a safety injection on steam line negative pressure rate. Preliminary inspection findings indicate that the transient was the result of inappropriate trouble shooting/maintenance techniques associated with placing the above referenced jumper. Inspection efforts were incomplete at the end of the report period. The inspector's have requested completed work request 42768 OPS to determine actual work performed and procedures in use at the time. This item will be carried as unresolved pending completion of review.

At 1:26 p.m. on February 21, unit 2 was in mode 3 recovering from the above referenced safety injection and reactor trip, when a second safety injection occurred on low steam line pressure. The unit was at approximately 530 degrees F and 800 psig steam pressure. A cooldown had been initiated earlier in the day when the unit entered Technical Specification (TS) 3.0.3 based on information in post trip data which indicated both diesel generator sequencers were degraded.

Preliminary indications are that the operating crew was in the process of terminating the cooldown, thought that steam generator pressures/temperatures had stabilized and diverted their attention to other duties when pressure in the A steam generator began decreasing. The rate of decrease was sufficient to cause a low steam line pressure safety injection.

Inspection efforts relative to this event are incomplete. A review of the data generated during the trip, procedures being employed during the cooldown and discussions with the operators will be completed and documented in report 89-07. Until that review is complete, this issue will be carried as Unresolved Item 414/89-05-01: Personnel Errors Causing Two Safety Injections

No violations or deviations were identified.

4. Surveillance Observation (61726)

a. During the inspection period, the inspector verified plant operations were in compliance with various TS requirements. Typical of these requirements were confirmation of compliance with the TS for reactor coolant chemistry, refueling water tank, emergency power systems, safety injection, emergency safeguards systems, control room ventilation, and direct current electrical power sources. The inspector verified that surveillance testing was performed in accordance with the 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 requirements and were reviewed by personnel other than the individual directing the test, and that any deficiencies identified during the testing were properly reviewed and resolved by appropriate management personnel.

b. The inspectors witnessed or reviewed the following surveillances:

PT/2/A/4350/02B	Diesel Generator 2B Operability Test
PT/0/A/4200/02	Standby Shutdown Facility Diesel Test

No violations or deviations were identified.

5. Maintenance Observations (62703)

a. Station maintenance activities of selected systems and components were observed/reviewed to ascertain that they were conducted in accordance with the requirements. The inspector verified licensee conformance to the requirements in the following areas of inspection: the 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 status of outstanding jobs and to assure that priority is assigned to safety-related equipment maintenance which may effect system performance.

b. The inspectors witnessed or reviewed the following maintenance activities:

44660 OPS	Inspect Why 1SV-19 Failed to Indicate Open
44716 OPS	Inspect Why 1SV-13 Will Not Open
5545 MNT	Repack Valve 1SV-13
44717 OPS	Inspect Why 1SV-1 Will Not Open

No violations or deviations were identified.

6. Review of Licensee Non Routine Event Reports (92700)

a. The below listed Licensee Event Reports (LER) 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. Additional inplant reviews and discussion with plant personnel, as appropriate, were conducted for those reports indicated by an (*). The following LERs are closed:

*413/88-26	Engineered Safeguards Features Actuation Caused by Momentary Inverter Low Voltage

*414/88-26 Technical Specification Required Shutdown due to an Inoperable Chemical and Volume Control Centrifugal Charging pump

No violations or deviations were identified.

7. Follow-up on Previous Inspection Findings (92701 and 92702)

a. (OPEN) Unresolved Item 413/88-38-01: Gravity Drain of FWST to Refueling Cavity. On January 7, at approximately 4:00 p.m. it was determined that the deep end of the refueling canal had been overfilled allowing water to flow around the vertical missile shields to the reactor vessel. Water was approximately one inch deep at vessel flange and flowed through the temporary nozzle covers and cavity seal to lower containment. Water level was subsequently lowered in the deep end of the canal and the vessel flange area was flushed with demineralized water. The cavity was cleaned/decontaminated and a visual inspection of the vessel flange area showed areas of rust and slight traces of boron on five studs. These areas were recleaned.

Discussions with operations personnel indicated that the incident may have been caused by inadequate procedural guidance. Procedure OP/1/A/6200/13 which controls the filling, draining and purification of the refueling cavity does not appear to adequately take into consideration the possibility of having the Refueling Water Storage Tank (FWST) in the purification mode. This in turn led the operators to overlook the fact that valve FW-23 was open. This valve is a bypass around the refueling water recirculation pump and provided a gravity drain flowpath from the FWST to the refueling cavity.

The review of this event is incomplete. An analysis of the interface between all applicable procedures in force at the time of the event, and an evaluation of the safety significance of the equipment which was wet by the event and discussions with the operating staff has begun, but is not complete. The licensee's review of the event which is being carried as Problem Investigation Report (PIR) 1-C89-0067 is also incomplete. Efforts will continue in this area and results will be documented in report 89-07.

b. (OPEN) Unresolved Item (413/88-38-03): Turbine drive CA Pump Pressure Seal Failure. On January 27, 1989, the licensee attempted to start the turbine driven auxiliary feedwater pump (CAPT) on unit 1 for the first time since the refueling outage. The unit had entered mode 3 at 2:41 a.m. on January 26 and was in a 72 hour action statement per TS 3.7.1.2 until the CAPT could be tested. Operators stopped the pump when the turbine reached 2000 rpm with no corresponding indicated flow. A second start resulted in pump seizure.

The inspectors reviewed activities which had recently been performed on the pump. On January 18 the licensee drained portions of the pump

suction piping per PT/1/A/4200/55, "CA Check Valve Leak Rate Test," to perform a leak rate test on 1CA-8. The inspectors reviewed this procedure and determined that the system restoration, performed later that day, failed to vent the piping after filling it. Specifically high point vents 1CA-141 and 1CA-195 were closed in steps 12.20.2 and 12.20.9 prior to the line being filled in step 12.20.10

A review of the system isometric elevation drawings and a walkdown of the piping revealed the potential for air to be trapped after filling the system. It cannot as yet be concluded whether or not this contributed to the pump seizure, however, the fact that the procedure was inadequate to ensure the piping was vented is identified as violation 413/89-05-02: Inadequate Test Procedure to Ensure Auxiliary Feedwater Piping is Vented After Filling. Portions of the unresolved item remain open until the failure mechanism of the pump is determined by the licensee.

c. (OPEN) Unresolved Item 413/88-38-04: Valve stroke program inadequacies. The licensee's valve stroke test program was reviewed in order to assess their current practice of testing motor operated valve stroke times from limit switch to limit switch.

The licensee requested and was granted relief from measuring full stroke time of these valves. When a valve is timed from limit switch to limit switch "full" stroke time is not measured as is required by 10CFR50.55 a(g) Realistically, only 90 to 95% of valve stroke is measured. Further, this method does not account for the time between initiation of the actuating signal and the start of valve motion. Finally, the licensee has in place, per procedure IP-0-A-3820-04 a mechanism through which the OPEN limit switch can be adjusted to 95% of full stroke on motor operated gate and butterfly valves which do not meet response time requirements. In essence, this shortens the stroke time . Identified on enclosure 11.5 of that procedure are 20 valves which have required the OPEN limit switch setting to be adjusted in order to meet response time requirements. During this report period, this matter was forwarded to NRR for review, and will remain Unresolved pending completion of that review.

One violation was identified in paragraph 7b above.

8. Part 21 Inspections (36100)

(OPEN) P2188-08 Defective Intercooler Inlet Adapter Provided as Part of IMO Declared Standby Diesel Engine Generator.

The 10CFR21 involved a report on the air diffuser plate in a Delaval diesel engine's intercooler inlet adapter which had broken loose due to failure of the weld heat affected zone on September 15, 1988. The broken piece ruptured intercooler tubes. Catawba Nuclear Station had observed broken welds on its diffusers (air distribution vane) as early as 1984. The licensee initially suspected the problem to be localized to the right bank intercooler due to previously discovered vibration problems. The

licensee modified the welds on the right bank intercoolers to correct the problem. On August 18, 1986 a failure of the air distribution vane to the left bank intercooler occurred on the 1B Diesel which resulted in a rupture of a cooling tube. Non-Conforming Item (NCI) CN-457 documented the event and corrective action which included repairs made similar to those on the right bank. This failure was the same as that experienced in the 10CFR21 report.

In 1986, the licensee determined their failures to be not reportable under 10CFR21. The inspectors requested the licensee to provide the basis for the evaluation, considering the repetitive weld failures experienced at Catawba from 1984-1986.

This item remains open pending NRC review of the licensee's evaluation.

9. Exit Interview

The inspection scope and findings were summarized on February 27, 1989 1988, 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.

Item Number	Description and Reference
Unresolved Item 414/89-05-01	Personnel Errors causing Two Safety Injections
Violation 413/89-05-02	Inadequate Test Procedure to Ensure Auxiliary Feedwater Piping is Vented After Filling.