



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

Report Nos.: 50-413/85-04 and 50-414/85-04

Licensee: Duke Power Company
422 South Church Street
Charlotte, NC 28242

Docket Nos.: 50-413 and 50-414

License Nos.: NPF-35 and CPPR-117

Facility Name: Catawba 1 and 2

Inspection Conducted: January 28 to February 1, 1985

Inspectors: *P. T. Burnett*

P. T. Burnett

25 Feb 85
Date Signed

S. P. Burris

S. P. Burris

25 Feb 85
Date Signed

for
M. Thomas

Frank Jape

2/26/85
Date Signed

Approved by:

Frank Jape
F. Jape, Section Chief
Engineering Branch
Division of Reactor Projects

2/26/85
Date Signed

SUMMARY

Scope: This routine, unannounced inspection entailed 92 inspector-hours on site in the areas of witnessing the station black out and loss of control room tests, reviewing completed startup test procedures (Unit 1), and reviewing the overall preoperational test program for Unit 2.

Results: One violation was identified - Failure to maintain fire watch and log for an impaired fire barrier - paragraph 9.

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REPORT DETAILS

1. Licensee Employees Contacted

- *J. W. Hampton, Station Manager
- *W. F. Beaver, Performance Engineer
- *W. H. Bradley, QA Supervisor
- *B. F. Caldwell, Superintendent, Station Services
- S. S. Cooper, Shift Supervisor
- *J. W. Cox, Superintendent, Technical Services
- T. E. Crawford, Operating Engineer, Unit 1
- M. Elder, Engineer
- C. W. Graves, Superintendent of Operations
- B. H. Hamilton, Unit 2 Startup Manager
- *C. L. Hartzell, Compliance Engineer
- M. Hawes, Associate Engineer
- C. Jenson, Unit 2 Schedule Engineer
- R. Jones, Unit 2 Test Engineer
- *P. G. LeRoy, Licensing Engineer
- *C. E. Muse, Operating Engineer
- *D. M. Robinson, Reactor Engineer
- Z. L. Taylor, Associate Engineer, Test
- *R. L. White, Chairman, CSRG

Other licensee employees contacted included two shift supervisors, six reactor operators, and four office personnel.

NRC Resident Inspectors

- *P. H. Skinner, Senior Resident Inspector - Operations
- *P. K. VanDoorn, Senior Resident Inspector - Construction

*Attended exit interview

2. Exit Interview

The inspection scope and findings were summarized on February 1, 1985, with those persons indicated in paragraph 1 above. The inspectors described the areas inspected and discussed, in detail, the inspection findings listed below. No dissenting comments were received from the licensee.

Inspector Followup Item 413/85-04-01: Assure the acceptance criterion for the ejected rod test was satisfied - paragraph 7.

Violation 413/85-04-02: Failure to maintain fire watch and log on an impaired fire barrier - paragraph 9.

Inspector Followup Item 413/85-04-03, Resolution of control circuit design error identified during loss of control room functional test - paragraph 6.

The licensee did not identify as proprietary any of the material provided to or reviewed by the inspectors during this inspection.

3. Licensee Action on Previous Enforcement Matters

This subject was not addressed in the inspection.

4. Unresolved Items

Unresolved items were not identified during this inspection.

5. Station Blackout Test (72582, 70302)

In accordance with procedure TP/1/A/2650/12, the station blackout test was performed on January 29, 1985, beginning at about 1200 hours. The inspectors witnessed control room activities throughout the test. No difficulties in controlling the plant were observed. The test data confirmed that natural circulation was maintained for thirty minutes with a minimum subcooling margin of 87°F.

No violations or deviations were identified.

6. Loss of Control Room Functional Test (72583, 72302)

The loss of control room functional test was performed on January 31, 1985, in accordance with procedure TP/1/A/2650/03. The test was initiated at 1420 hours with all participants, a minimum shift crew, in the control room, and the reactor operating at 20 percent thermal power. By 1423 hours, the reactor had been tripped remotely from breaker cabinets outside the control room, and the minimum crew was on their way to the auxiliary shutdown panels (ASPs) and auxiliary feedwater control station.

Throughout the test, the inspectors observed the activities of control room personnel and test personnel observing the ASPs to ensure that only the minimum crew performed activities essential to the control of the plant. Further, no information was transmitted to the minimum crew to assure that they could and did rely solely on the information provided at the ASPs and auxiliary feedwater station. Control room personnel were allowed to perform activities necessary to protect equipment not in use in the test, such as placing the turbine on the turning gear. They were also allowed to backup the reported actions at the ASPs to facilitate the eventual return of control to the control room.

At 1438, the plant was considered stable. The unit was held at hot standby conditions until 1548 hours, at which time a cooldown of 50 degrees F was begun. At 1727 hours, pressure dropped below 1845 psig, and two cold leg injection valves opened on the SI signal and injected water for about four minutes until manually closed by the minimum crew. These valves should have been blocked closed on the transfer of control to the ASPs. A control circuit design error was identified. The licensee stated that their design organization is reviewing this problem in order to determine the necessary corrective actions. Licensee resolution of this problem will be reviewed during a subsequent inspection. This item is identified for followup as inspector followup item 413/85-04-03, Resolution of control circuit design error identified during loss of control room functional test. The cooldown was completed at 1802 hours. Transfer of control to the control room was completed at 1806 hours, terminating the test.

Upon attending the licensee's post-test critique, it was clear that one major benefit of the test, beyond completing an FSAR test requirement, was the increased confidence of the operators in their ability to control the plant from the ASPs. This observation was made to management at the exit interview, along with encouragement to provide a means to share the experience with the non-participating operators.

No violations or deviations were identified.

7. Review of Completed Test Procedures (72576, 72572, 72301)

The following completed, low-power, test procedures were reviewed:

- a. TP/1/A/2650/13, Natural Circulation Verification, performed on January 19 - 20, 1985. The acceptance criteria for highest loop delta T, highest loop average temperature, pressurizer level, and steam generator level were all satisfied.
- b. PT/1/A/4150/11A, Control Rod Worth by Boration - Control Rod Banks in Overlap. The inspector independently evaluated 17 of the reactivity increments from the reactivity computer chart traces and obtained good agreement with those recorded by the licensee.
- c. TP/1/A/2150/06A, Pseudo Rod Ejection Test (Zero Power), Performed on January 16 - 18, 1985. As described in FSAR Table 14.2.F2-2 (page 15), this test is performed by withdrawing the most reactive inserted rod during boration, and summing up the reactivity insertions as the rod is withdrawn to its outer limit. The licensee's initial result, when analyzing the result by the 10% uncertainty traditionally used in rodworth measurements, was in excess of the 780 pcm acceptance criterion. The licensee then chose to remeasure the ejected rod worth by diluting it back to the inserted position while summing the reactivity increments. Prior to this second test, the reactor had been

at 3.5% power for an extended period for flux distribution measurements. Consequently, when power was reduced for the reactivity measurements, the reactor was undergoing a xenon-reactivity transient during the second measurement of ejected rod worth. Therefore, the result of the second test is unacceptable for consideration because of system conditions as well as for deviating from the FSAR test description.

The licensee then chose to re-evaluate the IBM reactivity computer traces, and obtained a result that, even when increased by 10%, met the acceptance criterion. Upon reviewing those traces, the inspector concluded the traces contained so much noise-induced structure that the second result could not be considered any more valid than the first.

The original withdrawal of the ejected rod had also been monitored by the Westinghouse reactivity computer, which appeared to the inspector to provide cleaner traces with less latitude for interpretation. Unfortunately, the first 45 steps of rod withdrawal had not been recorded by that computer. When the licensee evaluated the available reactivity increments from the Westinghouse computer, the result was in good agreement with that obtained earlier by the inspector. However, when the most conservative (highest) values from the IBM computer for the first 45 steps were added, and the sum increased by 10%, the acceptance criterion was still exceeded slightly (787 pcm vice 780 pcm). The licensee's results would also seem to be corroborated by boron endpoint measurements used with their measured value for boron reactivity worth. However, the boron worth is, like all rod worths, derived from reactivity computer measurements, and would seem to require the addition of the same 10% uncertainty.

At the exit interview, the licensee agreed to further review the test to assure that the acceptance criterion had been met. Inspector Followup Item 413/85-04-01, Assure the acceptance criterion for the ejected rod test was satisfied.

No violations or deviations were identified.

8. Review of Instrument Procedures (72596)

The following completed instrument surveillance procedures were reviewed to assure that all nuclear instruments were operable prior to initial criticality:

IP/1/A/3240/04D (N31), completed January 4, 1985,
 IP/1/A/3240/04E (N32), completed January 4, 1985,
 IP/1/A/3240/04F (N35), completed January 6, 1985,
 IP/1/A/3240/04G (N36), completed January 6, 1985,
 IP/1/A/3240/04H (N41), completed January 6, 1985,
 IP/1/A/3240/04I (N42), completed January 6, 1985,
 IP/1/A/3240/04J (N43), completed January 6, 1985, and
 IP/1/A/3240/04K (N44), completed January 6, 1985.

No violations or deviations were identified.

9. Independent Inspection Effort (92706)

The inspectors toured portions of the Unit 1 reactor building, turbine building, auxiliary building, auxiliary shutdown panels and auxiliary feedwater control station to observe ongoing activities for compliance with NRC requirements and license commitments. In addition to this tour, the inspectors reviewed Catawba Nuclear Station's adherence to proper housekeeping and formal behavior in the control room. The inspectors noted that all observed personnel appeared to be attentive to their respective assigned duties and responsibilities. In general, the control room appeared to be maintained in a clean and orderly manner.

On January 29, 1985, during the dayshift testing for station blackout, the inspectors, while enroute to the control room, noticed that security had blocked open fire door S-400 (main entrance to control room). The inspectors questioned the reason for blocking this door open and were told by the security guard on duty that there was a mechanical problem with the door mechanism. The inspectors subsequently reviewed Catawba Nuclear Station's Fire Watch Log to ensure that this nonfunctional fire barrier was logged and any necessary compensatory requirements were instituted. However, after reviewing the fire watch log the inspectors concluded that fire door S-400 was not logged as required by Operations Management Procedure 2-29, Technical Specifications Logbook and Catawba Nuclear Station Directive 2.12.6(SS), Fire Impairment Reporting.

Further inspection showed that several other fire penetrations were blocked open and had not been reported as required. These penetrations are identified as AX-352-C and AX-657-J.

While discussing these concerns with various security and operations personnel (shift supervisor, NCO) it was apparent that the personnel were not familiar with requirements of the previously identified procedures, in that:

- a. Personnel blocking open a fire barrier were not reporting it to operations group as required by the administrative procedures.
- b. Operations group, although aware that at least one fire barrier was breached during this period, did not note this event during shift turnover log review.
- c. Some of the posted security personnel were not aware that they were to perform a fire watch function as well as security function.
- d. Operations personnel were not certain as to which of the posted numbers on the fire barrier penetration were used in the Fire Watch Log.
- e. Fire Watch Patrol Verification Form could not be verified as to the current date it was in effect.

All of the above identified problems were brought to management's attention at the time of discovery and during the exit meeting on February 1, 1985. These items were identified as a violation:

Violation 413/85-04-02, Failure to maintain fire watch and log on an impaired fire barrier.

No other violations or deviations were identified in the areas inspected.

10. Overall Preoperational Test Program Review (70301) - Unit 2

The inspectors reviewed the following selected administrative controls which have been issued to control the preoperational test program at the Catawba Nuclear Station:

- a. Station Directive 3.2.1, Revision 4, Development and Conduct of the Preoperational Test Program
- b. Construction Procedure CP-770, Revision 2, Transfer and Control of Systems/Components After Completion of Erection Activities and Prior to Provisional Turnover (Unit 2 only)

The above documents were reviewed to verify that:

- The areas of testing have been identified and responsibilities for conducting these activities have been assigned.
- The majority of the preoperational tests have been identified.
- The format and content of preoperational test procedures have been specified.
- The lines of authority and responsibility of test personnel have been specified.
- Administrative controls have been established for jurisdictional control of systems, components, and instrumentation, before, during, and subsequent to testing.

Additionally, the inspectors reviewed the status of procedure development and system turnovers necessary for the Unit 2 reactor coolant system cold hydrostatic test, which is currently scheduled to begin late March 1985.

No violations or deviations were identified in the areas inspected.

11. Followup On Previously Identified Inspection Findings

(Closed) Inspector Followup Item (IFI) 413/84-35-02, Clarification of statement intent in Station Directive 4.2.1. The inspectors reviewed the licensee's corrective actions which clarified and expanded the identification and subsequent resolution of discrepancies during test conduct.

The inspectors consider this item closed.