



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA STREET, N.W.
ATLANTA, GEORGIA 30303

Report No.: 50-413/84-40

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

Docket No.: 50-413

License No.: CPPR-116

Facility Name: Catawba

Inspection at Catawba Nuclear Station site near Rock Hill, South Carolina

Inspector: Frank Jape 1/26/84
for P. T. Burnett Date Signed

Approved by: Frank Jape 1/26/84
F. Jape, Section Chief Date Signed
Engineering Branch
Division of Reactor Safety

SUMMARY

Inspection on April 9 - 12, 1984

Areas Inspected

This routine, unannounced inspection involved 31 inspector-hours on site in the area of reviewing startup test procedures.

Results

No violations or deviations were identified.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

- *J. W. Hampton, Station Manager
- *J. W. Cox, Technical Services Superintendent
- *C. W. Graves, Operations Superintendent
- *D. M. Robinson, Reactor Engineer
- *C. L. Hartzell, Licensing and Projects Engineer
- *S. W. Dressler, Project Engineer
- A. Bhatnagar, Test Engineer
- Z. Taylor, Associate Engineer

NRC Resident Inspector

- *P. H. Skinner, Senior Resident Inspector

*Attended exit interview

2. Exit Interview

The inspection scope and findings were summarized on April 12, 1984, with those persons indicated in paragraph 1 above. Three inspector followup items were identified.

413/84-40-01: Further Review NC Manual Leakage Calculation - paragraph 5.b.

413/84-40-02: Resolved Differences in Procedure and FSAR Descriptions of Power Coefficient Test - Paragraph 5.f.

413/84-40-03: Revise Loss of Control Room Test to Better Simulate Emergency Conditions - paragraph 5.f.

3. Licensee Action on Previous Enforcement Matters

Not inspected.

4. Unresolved Items

Unresolved items were not identified during this inspection.

5. Review of Startup Test Procedures

a. Overall Startup Test Program (72400)

The following documents were reviewed:

- (1) Catawba Nuclear Station (CNS) FSAR: Chapter 14 and Volume on Requests for Additional Information, Tab 640, and
- (2) CNS Directive 4.2.1, Development, Approval, and Use of Station Procedures

From review of these documents, review of test procedures described later in this report, and discussion with plant personnel, the inspector concluded that the licensee had established a test program, a test organization, measures to administer the program, and measures to control test program documents. The licensee's control of special test and measurement equipment will be addressed in a later inspection.

b. Initial Fuel Loading Procedure Review (72500)

The following procedures were reviewed:

- (1) TP/1/A/1550/04, (DRAFT) Initial Core Assembly Insert Verification
- (2) TP/1/A/2650/01, Initial Fuel Loading, approved February 2, 1984, and change one approved March 14, 1984, and
- (3) PT/1/A/4550/03C, (DRAFT) Core Verification

Collectively these procedures assure that fuel assemblies are properly constituted prior to loading into the core, are loaded into the assigned (analyzed) locations, while being monitored for reactivity effect, and are reverified to be correctly located and oriented prior installing the upper internals package. Statistical tests are provided for verifying proper operation of the source range monitors used in monitoring inverse multiplication.

Checkout of fuel handling equipment, and surveillance activities required in mode 6 are addressed in other procedures, which will be reviewed in a future inspection.

c. Pre-Critical Test Procedure Review (72566)

The following procedures were reviewed:

- (1) PT/1/A/4150/01A, Reactor Coolant Systems Leak Test, approved February 11, 1984
- (2) PT/1/A/4150/01B, NC Manual Leakage Calculations, approved November 7, 1983. The calculations of mass change in enclosure

13.5 appear to be unnecessarily complex. If the level indications for the pressurizer (PZR), pressurizer relief tank (PRT), nuclear coolant drain tank (NCDT), and volume control tank (VCT) are derived from uncompensated differential pressure cells, calibrated at one temperature, then no further temperature correction is necessary. The mass change in each tank is then the product of the indicated volume change multiplied by the density of water at the temperature at which the level indicator was calibrated. For the PZR, the density to use is the difference of water and steam densities at the calibration temperature and pressure. Further, as defined in the procedure the change in mass in the PRT and NCDT will be negative in sign. Thus the expression for unidentified leakage should be $M(\text{unid}) = M(\text{tot}) + M(\text{id})$. The licensee's response to these observations will be tracked as inspector followup item 413/84-40-01: Further review of PT/1/A/4150/01B.

- (3) TP/1/A/2150/13 (DRAFT), Pressurizer Functional Test. No questions were identified regarding this test.

d. Initial Criticality Procedure Review (72570)

PT/1/A/4150/19 (DRAFT). 1/M Approach to Criticality was reviewed. The procedure describes an appropriately conservative approach to initial criticality. Steps are provided to avoid over diluting the VCT and for reducing dilution rate at ICRR=0.2. Together these actions should avoid any need for extensive rod insertion to maintain criticality. Following discussions with licensee personnel, the inspector had no further questions on this procedure.

e. Low Power Test Procedure Review (72572)

The following documents and procedures were reviewed:

- (1) WCAP10422, The Nuclear Design and Core Physics Characteristics of the Catawba Unit 1 Nuclear Power Plant, Cycle 1, issued February 1984
- (2) TP/1/A/2100/02, Zero Power Physics Testing Controlling Procedure, approved January 11, 1984. Enclosures 13.6, 13.7, and 13.10 were not included in the approved version. Steps 8.4, 12.1.2, 12.2.4 and 12.4.25 (note) require additional information.
- (3) PT/1/A/4150/11A (DRAFT), Control Rod Worth Measurement by Boration/Dilution
- (4) PT/1/A/4150/10, Boron Endpoint Measurement, approved January 11, 1984
- (5) TP/1/2150/06A, Pseudo Rod Ejection Test (Zero Power), approved January 21, 1984

(6) TP/1/A/2650/13 (DRAFT) Natural Circulation Verification Test

The test methods and acceptance criteria conformed to the description and requirements of FSAR Chapter 14. Following discussions with plant personnel the inspector had no further questions.

f. Power Escalation Test (7256, 72580, 72583)

The procedures listed below were reviewed:

- (1) TP/1/A/2150/04, Doppler Power Coefficient Verification Test, approved January 5, 1984. Enclosure 13.6 was not complete. The test is similar to tests performed successfully at other facilities. However, it is not the test described in FSAR Chapter 14. The licensee's resolution of the differences between the test procedure and the FSAR test description will be tracked as inspector followup item 413/84-40-02.
- (2) PT/1/A/4150/08 (DRAFT), Target Flux Difference Calculation
- (3) PT/1/A/4150/05 (DRAFT), Core Power Distribution
- (4) TP/1/A/2650/07 (DRAFT), Turbine Trip
- (5) TP/1/A/2650/05 (DRAFT), Unit Load Transient Test
- (6) TP/1/A/2100/01 (DRAFT), Controlling Procedure for Power Escalation
- (7) TP/1/A/2650/03 (DRAFT) Loss of Control Room Functional Test. This test invokes AP/1/A/5500/17, Loss of Control Room, to accomplish the required test. In this AP the reactor is tripped from the control room, and evacuating the control room is the eighth step in the procedure. The test does not simulate the emergency condition in which the control room must be evacuated instantly and the reactor trip as well as all other operations performed from outside the control room. Further development of this test procedure will be tracked as inspector followup item 413/84-40-03.

With the exceptions noted, the test methods and acceptance criteria conformed to the descriptions and requirements for FSAR Chapter 14.

All other questions were resolved by discussions with plant personnel.

Within the areas inspected, no violations or deviations were identified.