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

Report Nos.: 50-269/83-25, 50-270/83-25, and 50-287/83-25

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

Docket Nos.: 50-269, 50-270, and 50-287

License Nos.: DPR-38, DPR-47, and DPR-55

Facility Name: Oconee 1, 2, and 3

Inspection at Oconee site near Seneca, South Carolina

Inspector: Karen E. Davenport 9/6/83
K. E. Davenport Date Signed

Approved by: Frank Jape 9/7/83
F. Jape, Section Chief Date Signed
Engineering Program Branch
Division of Engineering and Operational Programs

SUMMARY

Inspection on August 9-11, 1983

Areas Inspected

This routine, unannounced inspection involved 47 inspector-hours on site in the areas of zero power physics testing and power escalation testing.

Results

Of the two areas inspected, no violations or deviations were identified.

REPORT DETAILS

1. Persons Contacted

   Licensee Employees

   *J. E. Smith, Plant Manager
   *T. Matthews, Licensing Technical Specialist
   T. Curtis, Reactor Engineer
   J. Collier, Acting Reactor Engineer
   *H. Woodall, Licensing Engineer
   M. Presnell, Assistant Engineer
   M. Elder, Assistant Engineer
   *T. Barr, Acting Superintendent of Technical Services
   *G. Davenport, Acting Performance Engineer

   Other licensee employees contacted included seven data analysts.

   Other Organizations

   Babcock and Wilcox Personnel

   H. Lyles
   S. Robertson

   NRC Resident Inspector

   *D. Falconer

   *Attended exit interview

2. Exit Interview

   The inspection scope and findings were summarized on August 11, 1983, with those persons indicated in paragraph 1 above. The licensee acknowledged the inspection findings.

3. Licensee Action on Previous Enforcement Matters

   Not inspected.

4. Unresolved Items

   Unresolved items were not identified during this inspection.

5. Zero Power Physics Testing (72572, 72572, 61708, 61710, 72700)

The inspector reviewed test procedure TT/1/A/711/08 "Unit 1 Cycle 8 Zero Power Physics Test (ZPPT)" and witnessed portions of test performance.

This procedure provides the sequence for performing required tests and activities during ZPPT. The tests are performed to verify the safety analysis and technical specifications. This inspection confirmed that the tests were performed in the sequence specified, given initial review, and met the established acceptance criteria. The following tests were reviewed for technical adequacy and witnessed by the inspector.

a. Inverse Multiplication (1/M) Plots Approach to Criticality

The initial approach to criticality was the rod withdrawal for the Control Rod Drop (CRD) Trip Time Test. Control rod groups 1-7 were fully withdrawn with RCS boron concentration at 1593 + 30/-0 ppm. 1/M plots were used to determine the necessary boron concentration change. CRD Time Test was performed and the acceptance criteria verified.

b. Determination of Sensible Heat and NI Overlap

The NI overlap was determined when at least one decade of overlap was verified to exist between the source and intermediate range instrumentation when reactor power was increased. The intermediate range level at which sensible heat was observed was divided by 3.3 to set the upper limit on power level for ZPPT measurements.

c. Reactimeter Checkout

The reactimeter checkout was performed to verify proper response. Doubling times were determined and verified to agree within the allowable limits with the predicted values.

d. All Rods Out Boron Concentration

The Hot Zero Power (HZP) critical boron concentration with rod groups 1-7 at 100% withdrawn and rod group 8 at 37.5% withdrawn was determined to be within the acceptance criteria of 1593 ± 50 ppm Boron.

e. Temperature Coefficient Measurement at All Rods Out (ARO) Zero Power

From a critical equilibrium condition, RCS temperature is changed and the associated reactivity insertion measured. This defines the temperature coefficient. The moderator coefficient is determined by subtracting the isothermal power Doppler coefficient (calculated) from the measured temperature coefficient. The measured temperature and moderator coefficients met the established acceptance criteria.

f. Control Rod Group Worths and Differential Boron Worth Measurement

The boron swap method is used to determine hot zero power, cycle 8 control rod group, and differential boron worth for Control Rod Assembly (CRA) groups 5, 6, and 7. This method sets a deboration rate and compensates for the change in reactivity by small step changes in rod group position

These step insertions are determined graphically from the reactivity trace on the reactimeter strip chart and then summed to obtain total rod worths. Differential boron worth is determined by dividing the measured total reactivity change by the measured total boron concentration change. The measured individual group worth met the acceptance criteria of ±15% deviation from predicted. The total rod worth measurement met the acceptance criteria of ±10% deviation from predicted and differential boron worth acceptance criteria of ±15% deviation from predicted and less than 1.33% Δk/k/100 ppm boron was met.

g. Temperature Coefficients at All Rods In (ARI) Zero Power

With all regulating rods fully inserted, the RCS temperature is changed and the associated reactivity insertion measured. The moderator coefficient is determined by subtracting the isothermal power Doppler coefficient (calculated from the measured temperature coefficient). The measure temperature and moderator coefficients met the established acceptance criteria.

6. Power Escalation Testing (61702)

The inspector reviewed the following procedure: TT/1/A/811/8 "Unit 1 Cycle 8 Power Escalation Test".

This procedure outlines the steps taken during the escalation of reactor power from 0 to 100% following completion of ZPPT. The purpose is to verify the core design upon which the Unit 1 Cycle 8 Safety Analysis and Technical Specifications are based. Testing plateaus are 40% and 100% FP.

No violations or deviations were identified.

7. Report Review (92706)

The proposed amendment to the Oconee operating license and proposed revision to Technical Specification (TS) concerning expansion of the storage capacity of Unit 3 spent fuel pool was reviewed.

The proposed amendment is to be achieved by reracking the spent fuel pool with poison racks to expand a storage capacity of 474 spaces to 825 spaces. The inspector reviewed the proposed TS changes and Poison Rerack Licensing Submittal including the rack design, spent fuel interface, rack installation, radiation protection and safety analysis.

The racks will utilize a neutron absorbing material, Boroflex. The design analysis in the following areas verified the ability of the rack design to perform required functions: 1) Structural and seismic; 2) Nuclear Criticality; 3) Thermal-hydraulic; and 4) Poison material. Underwater divers will be used to install the racks. The station radiation protection staff will ensure that personnel exposures are maintained as low as reasonably achieveable (ALARA). The safety analysis included postulated accidents associated with operations in and around the spent fuel pool; construction accident, cask/heavy-load accident and loss of forced cooling.

There were no violations or deviations identified.