



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

Report Nos: 50-269/86-34, 50-270/86-34, and 50-287/86-34

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

Facility Name: Oconee Nuclear Station

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

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

Inspection Conducted: November 11 - January 12, 1986

Inspector: J. C. Bryant J. C. Bryant 1-23-87
Date Signed

Approved by: T. Peebles T. Peebles 1-23-87
T. Peebles, Section Chief
Division of Reactor Projects
Date Signed

SUMMARY

Scope: This routine, announced inspection involved resident inspection on-site in the areas of operations, surveillance, maintenance, verification of engineered safety features lineups, followup of events, emergency drills and performance indicators.

Results: Of the seven areas inspected, no violations or deviations were identified.

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REPORT DETAILS

1. Licensee Employees Contacted

- *M. S. Tuckman, Station Manager
- T. B. Owen, Maintenance Superintendent
- R. L. Sweigart, Operations Superintendent
- J. M. Davis, Technical Services Superintendent
- *C. L. Harlin, Compliance Engineer
- *F. E. Owens, Assistant Engineer, Compliance
- N. A. Rutherford, System Engineer, Licensing

Other licensee employees contacted included technicians, operators, mechanics, security force members, and staff engineers.

Resident Inspector:

- *J. C. Bryant, Resident Inspector

*Attended exit interview.

2. Exit Interview

The inspection scope and findings were summarized on January 12, 1986 with those persons indicated in paragraph 1 above. The licensee did not identify as proprietary any of the materials provided to or reviewed by the inspectors during this inspection.

3. Licensee Action on Previous Enforcement Matters

Not inspected.

4. Unresolved Items

No unresolved items were identified during this inspection.

5. Plant Operations

The inspector reviewed plant operations throughout the reporting period to verify conformance with regulatory requirements, technical specifications (TS), and administrative controls. Control room logs, shift turnover records, and equipment removal and restoration records were reviewed routinely. Interviews were conducted with plant operations, maintenance, chemistry, health physics and performance personnel.

Activities within the control rooms were monitored on an almost daily basis. Inspections were conducted on day and on night shifts, during week days and on weekends. Some inspections were made during shift change in order to evaluate shift turnover performance. Actions observed were conducted as required by Operations Management Procedure 2-1. The complement of licensed personnel on each shift inspected met or exceeded the requirements of TS. Operators were responsive to plant annunciator alarms and were cognizant of plant conditions.

Plant tours were taken throughout the reporting period on a routine basis. The areas toured included the following:

- Turbine Building
- Auxiliary Building
- Units 1,2, and 3 Electrical Equipment Rooms
- Units 1,2, and 3 Cable Spreading Rooms
- Station Yard Zone within the Protected Area
- Standby Shutdown Facility

During the plant tours, ongoing activities, housekeeping, security, equipment status, and radiation control practices were observed.

Unit 1 began the report period operating at 99% power, restricted to that power by high steam generator level in B steam generator. The unit continued operation at 98% power throughout the report period.

Unit 2 began the report period restricted to 92% power by high level in B steam generator. On November 30 vibration increased in No. 11 bearing of the turbine generator. Vibration increased to 10 mils and power reduction began at 7:30 p.m. on December 1 (power reduction was stopped at 15% power). The unit was taken off line at 11:08 p.m. with reactor power maintained at 15%. Bearing examination, repair and realignment were completed at 7:30 p.m. on December 3. Unit 2 was returned to 94% power and remained at that level throughout the report period.

Unit 3 began the report period in a 3 reactor coolant pump operation mode at 72% power. As described in the previous report, reactor coolant pump (RCP) B1 had been shut down due to apparent internal damage to the pump. Three pump operation continued until December 17 when Unit 1 was shut down due to increasing symptoms of pump problems in RCP-B1 and increasing vibration in RCP-B2. This event is discussed in more detail in paragraph 9. Unit 3 will be refueled during this outage.

No violations or deviations were identified.

6. Surveillance Testing

The surveillance tests listed below were reviewed by the inspector to verify procedural and performance adequacy.

The completed tests reviewed were examined for necessary test prerequisites, instructions, acceptance criteria, technical content, authorization to begin work, data collection, independent verification where required, handling of deficiencies noted, and review of completed work.

Surveillances reviewed included:

WR 59002 B Monthly PM Inspection of Keowee Hydro Generator
 WR 54580 E Check and Calibrate RPS Loop A Reactor Coolant
 Flow Transmitter
 WR 59003 B Test Keowee Electro Mechanical Trip Circuitry
 WR 56921 PM on 16 Cylinder Diesel Generator
 WR 56922 PM on 12 Cylinder Diesel Generator

No violations or deviations were identified.

7. Maintenance Activities

Maintenance activities were reviewed during the reporting period to verify that work was performed by qualified personnel and that approved procedures in use adequately described work that was not within the skill of the trade. Procedures and work requests were examined to verify proper authorization to begin work, provisions for fire, cleanliness, and exposure control, proper return of equipment to service, and that limiting conditions for operation were met.

Work requests reviewed included:

WR 54759 C Replace missing washers on hydraulic snubbers
 WR 04863 C Valve 2 BS4: Investigate failure to open from control
 room and repair
 WR 04886 C Investigate and repair reactor building fire alarm
 WR 04619 C Investigate and repair 1 HP16 - will not open
 WR 52514 E Repair cracked electrical penetration
 WR 02672 C Repair valve 1 AS 39 - Has extreme back leakage
 WR 03948 C Repair relief valve 1 MS 92 at TDEFDWP; valve leaks
 past seat

No violations or deviations were identified.

8. Design, Design Changes, and Modifications (IP37700)

The inspector reviewed several design changes and modifications to verify that they were in conformance with 10 CFR 50.59 and Technical Specifications (TS), and that they were reviewed and approved in accordance with TS and established QA/QC controls. The inspector also verified that the changes were adequately tested, operator training packages were issued when appropriate, and that signoffs for independent verification were recorded where required. Modifications were inspected in work and/or after completion.

Station modifications examined included the following:

- a. Modifications to condenser circulating water pumps (Report No. 86-26)
- b. Modifications to Keowee battery racks and installation of new batteries (Report No. 86-20)
- c. Installation of buried, protected cables to CCW 8 and 9, installation of a new terminal box, and termination of cables.
- d. Standby Shutdown Facility (SSF) Modifications including:
 - (1) SSF submersible pump and power source
 - (2) Air eductor for SSF auxiliary service water pump suction line.
 - (3) Installation of yard discharge for SSF service water pump.

Review of these modifications determined that requirements had been met. The licensee's program for temporary modifications, lifted leads and jumpers and implementation of the program was reviewed and reported in Report No. 50/86-20. An earlier report stated that the licensee had brought approximately 14 corporate engineers on site to reduce the number of outstanding modifications by expediting completion, elimination of duplication, or determination that the change was no longer needed. To date, the number of open design changes has been reduced from 1000 down to 500. The goal is to reduce it to 300, considered by the licensee to be a workable number. All but 20 items have now been scheduled for completion or for review.

No violations or deviations were identified.

9. Unit 3 - Shutdown Due to Reactor Coolant Pump Problems

Report No. 86-33 describes shut down of reactor coolant pump (RCP) 3B1 due to increased motor frame vibration and possible loose parts on October 30, 1986, and to subsequent reactor operation at 72% power with only 3 RCP's in operation.

On November 5, loose parts monitor (LPM) alarms were received for about 35 seconds from LPM sensors located on incore instrument tubes (bottom of the reactor vessel). A Justification for Continued Operation was issued and additional LPM equipment was obtained from the vendor, Babcock and Wilcox (B&W). More sophisticated equipment for analysis of impacts was later added. Impacts were analyzed and taped. It was believed that there were several small parts of 1 to 2 ounce size and 1 or 2 pieces weighing several pounds but which moved very little.

On December 15 some change was noted in patterns of vibration on RCP's 3B2 and 3A1. Reactor coolant chemistry began showing indications of possible fuel damage and of some wear particles in the coolant system, which indicated that possibly 3B2 pump was beginning to wear. During the night of December 16 and morning of December 17, vibration of RCP 3B2 pump shaft began increasing rapidly. Unit 3 was taken off line at 5:42 p.m. on December 17 and shut down.

Unit 3 will remain shut down for refueling, with startup scheduled for March 12, 1987. RCP's 3B1 and 3B2 will be rebuilt, and 3A1 will receive some rework. In mid 1985 RCP 3A2 was rebuilt with some modifications and 3A1 was rebuilt to the extent that spare parts permitted.

To date, RCP's 3B1 and 3B2 have been removed and examined. RCP 3B2 has shown no appreciable damage but 3B1 has extensive damage to the impeller, the wear ring and the suction adapter. No significant damage to the pump casing has been detected. Pump damage will be discussed in considerable detail in Report No. 50-287/87-01 by a Regional inspector and will not be discussed here.

No violations or deviations were identified.

10. Emergency Drill

An emergency drill, beginning at 3:00 a.m. on December 15, 1986, was held at the Oconee site to verify proper response by appropriate personnel within the required time frame. A site assembly was conducted and the Technical Support Center and Operations Support Center were activated. All personnel arrived within the time requirements. The resident inspector was present and monitored the drill.

No violations were identified.

11. Licensee Event Reports and Inspector Followup Items

The inspector reviewed nonroutine event reports to verify the report details met license requirements, identified the cause of the event, described corrective actions appropriate for the identified cause, and adequately addressed the event and any generic implications. In addition, as appropriate, the inspectors examined operating and maintenance logs, and records and internal investigation reports.

Where appropriate, personnel were interviewed to verify that the report accurately reflected the circumstances of the event, that the corrective action had been taken or responsibility assigned to assure completion, and that the event was reviewed by the licensee, as stipulated in the Technical Specifications. The following event reports were reviewed:

(Closed) LER 269/86-06: End of Cycle Moderator Temperature Coefficient. This item was closed based on the Licensees description of the event and NRR letter of November 26, 1986 which accepted the Licensee's evaluation.

(Closed) IFI 269/86-18-01: Correct Post Trip Review Deficiencies. The inspector reviewed changes to the Performance Manual and to the procedure for post trip review. Changes include the following: Qualifications of those authorized to make post trip reviews; requirement for a list of those authorized to make post trip reviews; lists those parts of the procedure which must be completed prior to approval for restart; and describes proper completion of the procedure.

12. Enforcement Conference

An enforcement conference was held with Duke Power Company (DPC) officials in the Region II offices on December 22, 1986. The purpose of the meeting was to discuss findings of the Safety System Functional Inspection conducted at Oconee in May and June 1986. Also, findings concerning loss of suction to the Emergency Condenser Circulating Water system were discussed. Action to be taken has not been finalized at this time.