



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

Report Nos: 50-269/86-04, 50-270/86-04 and 50-287/86-04

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: February 11 - March 10, 1986

Inspectors: M. K. Sasser for 4/4/86  
 J. C. Bryant Date Signed

M. K. Sasser 4/4/86  
 M. K. Sasser Date Signed

Approved by: V. L. Brownlee 4/4/86  
 V. L. Brownlee, Section Chief, (Acting) Date Signed  
 Division of Reactor Projects

SUMMARY

Scope: This routine, announced inspection entailed 303 inspector-hours on site in the areas of operations, surveillance, maintenance, verification of engineered safety features lineups, and refueling activities.

Results: Of the five areas inspected, no violations were identified.

## REPORT DETAILS

### 1. Licensee Employees Contacted

- \*M. S. Tuckman, Station Manager
- J. N. Pope, Superintendent of Operations
- \*T. B. Owen, Superintendent of Maintenance
- R. T. Bond, Compliance Engineer
- \*T. C. Matthews, Technical Specialist

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

#### Resident Inspectors

- \*J. C. Bryant
- \*M. K. Sasser

\*Attended exit interview.

### 2. Exit Interview

The inspection scope and findings were summarized on March 11, 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

Unresolved items were not identified on this inspection.

### 5. Plant Operations

The inspectors 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
- Unit 1 Reactor Building
- Units 1 and 3 Penetration Rooms
- 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
- Units 1 and 2 Spent Fuel Pool

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

Unit 1 operated at essentially full power until taken off line on February 13 for the scheduled cycle 9 refueling outage. The unit continued to be shutdown at the end of the report period, with a scheduled April 10 startup. Major work to be performed during the outage is discussed in paragraph 9 of this report.

Unit 2 operated at essentially full power throughout the report period.

Unit 3 operated at essentially full power until March 3 when power was reduced to 85% in order to remove from service and repair the 3D1 heater drain pump. The unit was returned to full power on March 6 after completion of repairs on the heater drain pump. The unit continued to operate at full power through the end of the report period.

No violations or deviations were identified.

## 6. Surveillance Testing

The surveillance tests listed below were reviewed and/or witnessed by the inspectors to verify procedural and performance adequacy.

The tests witnessed, in whole or in part, were inspected to determine that approved procedures were available, test equipment was calibrated, prerequisites were met, tests were conducted according to procedure, test results were acceptable and systems restoration was completed.

Surveillances witnessed in whole or in part are as follows:

- PT/1/A/610/15 Emergency Power Transfer Test
- PT/1/A/270/38 Main Feedwater Regulating Valve Leakage Measurement

PT/1/A/600/12 Turbine Driven Emergency Feedwater Performance Test,  
 Operation of Valve 1MS-93  
 PR/O/A/0750/1 Spent Fuel Pool Verification Procedure

No violations or deviations were identified.

#### 7. Maintenance Activities

Maintenance activities were observed and/or 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. Activities, 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.

Maintenance witnessed in whole or in part:

WR 54872D Analysis of Valve 1LP-18 Using MOVATS (Motor Operated Valve Analysis and Test System).  
 WR 50103E MOVATS Analysis of 1MS-79.  
 WR 54001D Disassembly and Maintenance on 1RC-4, PORV Block Valve  
 WR 53456 Sludge Lancing of OTSGs 1A and 1B  
 TT/1/A/425/2 Water Slap Cleaning of OTSGs 1A and 1B

Maintenance work requests reviewed in detail:

WR 54009D Inspect and Refurbish Limitorque Operator 1BS-4

No violations or deviations were identified.

#### 8. Unusual Event - Seismic Activity

A minor seismic event occurred in the area at 6:43 a.m. on February 13. The epicenter was subsequently reported to be about 35 miles northwest of the Oconee site and to measure 3.5 on the Richter scale. At the time, Oconee Unit 1 was in the process of reducing power for a refueling outage; Units 2 and 3 were operating at 100% power.

The resident inspectors, who were in the Unit 1-2 control room at the time, heard a loud noise and felt some vibration which they thought could have been the result of a major line break or water hammer in the turbine building.

Immediate investigation by site personnel and the residents revealed no site problem. Within several minutes, telephone calls were received at the plant switchboard from surrounding areas inquiring if there had been an explosion at the Oconee plant. The nature of the calls and the areas from which they came indicated that the disturbance had been seismic.

Subsequent detailed inspection revealed no plant damage. No alarms were received in the control room. Plant seismic detectors did not record the event. Calibration of the instruments was checked immediately and found to be in order. The seismic activity had not been sufficient to activate the instruments. No damage from the event was reported in surrounding areas.

An Unusual Event was declared, as required by procedure. The event was terminated later in the morning.

#### 9. Unit 1 Cycle 9 Refueling Outage

On February 13, Unit 1 was shut down to begin a scheduled 53-day refueling and maintenance outage. Significant work items scheduled during the outage include:

1. Mechanical cleaning of the A and B steam generators using sludge lance and water slap pulse cleaning techniques.
2. Installation of the Reactor Vessel Level Instrumentation System (RVLIS) required by NUREG 0737.
3. Maintenance on the A and B low pressure turbines and the four turbine control valves.
4. Eddy current inspection of steam generator tubes; a minimum of 3000 in the A generator and 8000 in B.
5. Tendon inspection and replacement of 1 internal shield wall tendon.
6. Repair work on over 500 valves.
7. Perform reactor building integrated leak rate test.

At the end of the report period, indications had been found in several turbine blade pins when they were ultrasonically examined. Also, "C" low pressure turbine had been removed. These events could extend the refueling shutdown by 10 to 20 days.

#### 10. Refueling Activities (60710)

The inspectors continued an inspection of unit 1 refueling outage activities throughout the report period. Prior to the defueling of the Unit 1 reactor, the inspectors reviewed the approved refueling procedure to ensure adequate licensee review and approvals. In addition, the prerequisites were reviewed to ensure that all Technical Specification requirements for fuel movement were addressed. The inspectors verified completion of these requirements during their inspection.

The inspectors reviewed the reactor conditions required for fuel movement (e.g. boron concentration, reactor vessel water level, core monitoring), verifying compliance by the licensee. The inspectors observed the hold down spring inspection of 43 fuel assemblies prior to removal of the assemblies from the core. Verification of fuel assemblies and components in the spent fuel pool was observed.

No violations or deviations were identified.

#### 11. Mechanical Cleaning of Unit 1 Steam Generators

An inspection of the Unit 1 steam generator mechanical cleaning was conducted while these activities were being performed during the refueling outage. In summary, the sludge lance and water slap techniques were used to clean the steam generators up to the ninth support plate. The techniques had been developed as a cleaning mechanism in lieu of chemical cleaning.

The inspectors completed a detailed review of the safety evaluation of the water slap cleaning. The analyses show that stress to the internal components of the steam generators, including the tubes, are not excessive.

No violations or deviations were identified.

#### 12. TMI Action Items (NUREG-0737)

##### II.F.2.3 (Open) Inadequate Core Cooling Instrumentation.

The inspectors reviewed the licensee's installation of the Unit 1 Reactor Vessel Level Instrumentation System (RVLIS) during the Unit 1 refueling outage. During the inspection, the residents reviewed design documents, QA documents, and field installation of components. The RVLIS is scheduled to be placed in service for Unit 1 following the outage. Units 2 and 3 instrumentation will be installed on their next refueling outages.

#### 13. Inadvertent Electrical Disconnect of Building Spray Valve

On February 14, 1986, IE mechanics disconnected electrical leads to the Limitorque operator of 2BS-4, Unit 2 reactor building spray pump suction valve. At the time, Unit 2 was at 100% power. As required by Technical Specifications, 2BS-4 was open and remained open; therefore, the building spray system would have performed correctly if called upon by an ESF signal. The error was detected immediately by control room operators and the system was restored within the hour.

IE and mechanical maintenance personnel had been assigned to remove, for preventive maintenance, the Limitorque operator of the corresponding Unit 1 valve, 1 BS-4. Unit 1 was in refueling shutdown at the time. Reactor operators opened and tagged the breakers for 1 BS-4. The IE mechanics then went to the pump room, signed Work Request No. 54009D as having properly identified and independently verified the Limitorque operator for valve 1 BS-4, then disconnected the operator for valve 2 BS-4.

After 2 BS-4 had been reconnected and 1 BS-4 disconnected, mechanical maintenance personnel identified and verified 1 BS-4 under procedure MP/O/A/1210/7, for Limitorque removal and replacement, and removed the operator.

The Units 1 and 2 spray pumps are side by side and the suction valves are adjacent to their respective pumps in the same relative position and are about eight feet apart. The valve identification is on a plastic sign, about 1 1/2 by 4 inches, just above eye level and close to the valve operator electrical leads. Unit 1 has a green sign with white letters inscribed 1 BS-4. Unit 2 has a red sign with white letters inscribed 2 BS-4

The event is an apparent violation for failure to follow procedure. The violation will not be cited since IE Report Nos. 50-269,270,287/86-01 for an inspection ending February 10, 1986 carries a violation for failure to follow procedure in which IE mechanics tripped an Oconee reactor by opening the wrong breaker during a surveillance. Again, the action had been independently verified. That report had not yet been sent to the licensee, and a response has not been received. The adequacy of the response will be reviewed by the inspectors.

#### 14. TMI Item Status

The status and, where applicable, the equipment of the following NUREG-0737 items were reviewed by the inspectors:

1.C.1.2 (Closed) Short Term Accident and Procedures Review - Inadequate Core Cooling. All procedures are completed and in place, and all training has been completed.

1.D.2 (Open) Plant Safety Parameter Display Console. All SPDS equipment was installed and operable as of July 1, 1985, as stated in IE Report 50-269,270,287/85-32. In a letter of July 19, 1985, Tucker to Denton, the licensee provided, as requested, additional information on SPDS. Final acceptance has not been reviewed. Also the SPDS can not be completed until RVLIS is operable.

II.F.2.3 (Open) Instrumentation For Detection of Inadequate Core Cooling.

Part 1 - Installation of upgraded thermocouples was completed under NSM 2256.

Part 2 - RVLIS (level monitoring system) is currently being installed on Unit 1 and will be complete in April 1986. Unit 2 will be completed during End of Cycle (EOC) 8 refueling outage scheduled for August 1986. Unit 3 will be completed during EOC 9 outage scheduled in the spring of 1987.

Six months after Unit 3 EOC 9, all training and procedures will be in effect.

II.K.2.9 (Closed) Failure Mode Effects Analysis (FMEA). Separation of emergency feedwater from the integrated control system was completed under NSM 1275 for Unit 1 in December 1979, Unit 2 in May 1980 and Unit 3 in May 1980. A letter from NRR of February 3, 1982, found the modification acceptable.

III.A.1.2 and III.A.2 (Open) Emergency Preparedness Procedures were approved by NRC on 7/18/83. Meteorological system upgrade is complete. System will be inspected in Final ERF approval. Site has been purchased for remote EOF. Date of completion will be provided by licensee when design is complete. Inspection will be made in final ERF approval.

III.D.3.4 (Open) Control Room Habitability. Modifications have been completed to improve control room ventilation on Units 1, 2 and 3. Results of tests provided to NRR on June 24, 1985, awaiting approval. Chlorine detector has been installed; calibration to be complete on March 21, 1986. Communication on the subject of habitability, between the Licensee and NRR, continues.