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

AUG 15 1986

Report Nos.: 50-269/86-21, 50-270/86-21, and 50-287/86-21

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 Nuclear Station

Inspection Conducted: July 8 - August 11, 1986

Inspectors: T A Peebles for 8-15-86
J. C. Bryant Date Signed

T A Peebles for 8-15-86
M. K. Sasser Date Signed

Approved by: T A Peebles 8-15-86
T. A. Peebles, Section Chief Date Signed
Division of Reactor Projects

SUMMARY

Scope: This routine, announced inspection involved resident inspector inspection on-site in the areas of operations, surveillance, maintenance, verification of engineered safety features lineups, followup of events, followup items of non-compliance, and performance indicators. This report includes an information meeting held with Duke Power Company personnel and Regional management in the Region II office in Atlanta on August 1, 1986 (Para. 10).

Results: Of the seven areas inspected, no items of non-compliance or deviations were identified.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

#*M. S. Tuckman, Station Manager
#T. B. Owen, Maintenance Superintendent
*R. L. Sweigart, Operations Superintendent
*T. S. Barr, Technical Services Superintendent
#*C. L. Harlin, Compliance Engineer
*D. S. Compton, Assistant Engineer, Compliance
#R. T. Entrekin, Assistant Engineer
#N. E. Estep, Assistant Engineer
#N. A. Rutherford, System Engineer, Licensing
J.T. McIntosh, Station Services Superintendent
T.K. McQuarrie, Contract Services Coordinator
B. McAllister, Support Engineer
B. Thompson, Assistant Engineer

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.
#Attended Information Meeting in Region II, Atlanta, August 1, 1986.

2. Exit Interview

The inspection scope and findings were summarized on August 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

85-20-01 - Violation (Closed) Failure to list inoperable monitors in semi annual report.

85-37-01 - Violation (Closed) Failure to document malfunction of valve 3LP2 in RO or SRO log.

The inspectors reviewed the licensee corrective actions concerning these two violations and have no further questions.

4. Unresolved Items

Unresolved items were not identified during 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
Units 1 and 2 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
Keowee Hydro Station Battery Room

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

Unit 1 began the report period at 100% power. At 8:15 a.m. on August 6, 1986, the unit began shutting down due to a steam generator (SG) tube leak(s). Maximum calculated leakage was 0.26 gallons per minute (gpm) during a transient condition. Reactor power had been reduced from 100% to 55% during the night. Maximum leakage calculated at 100% power was 0.08 gpm and steady state leakage at 55% power was 0.12.

The first indication of a possible tube leak was on July 24; however, the calculated leak rate was so small that the leaking tube(s) probably could not have been detected had the unit been shut down at that time. The technical specification limit for a steam generator tube leak on Unit 1 is 0.3 gpm.

At the close of the report period a leaking tube had been found in each of the two steam generators. Eddy current testing had found additional tubes with wall thickness less than the minimum required. The exact number had not been determined. Further details will be provided in the next monthly report. The unit is expected to be back on line by August 15.

Unit 2 began the report period at 100% power. On July 8 the unit tripped on an anticipatory turbine trip following the failure of a feedwater flow transmitter which provides input to the integrated control system (ICS). The unit was returned to power operations later that same day, operating at 100% until July 23 at which time a reactor coolant flow transmitter failed. The failure of this transmitter's input to the ICS resulted in a transient similar to the July 8 trip with the reactor tripping on an anticipatory turbine trip. The reactor returned to power operations later the same day and operated at 100% power throughout the remainder of the report period. Both reactor trips are discussed in greater detail in paragraph 9.

On August 9 at 5:45 p.m., Unit 2 experienced a runback when the 2A main feedwater pump (MFWP) tripped. The unit was stabilized at approximately 60% power. Extensive troubleshooting on the MFWP found no problems. The 2A MFWP was placed back into service at 2:20 a.m. on August 10.

Reactor power was being increased and was at 90% when the 2A MFWP again tripped off at 4:56 a.m. The integrated control system again initiated a unit runback; the reactor being stabilized at 70% power. Subsequent investigation of the MFWP this time revealed problems in the thrust bearing wear circuit. The problem was resolved and the 2A MFWP was in service at 1:35 p.m. on August 10. The reactor was then returned to 100% power.

Unit 3 operated at 100% power until July 16 at which time the 3D2 heater drain pump (HDP) experienced a mechanical seal failure. Power was reduced to 85% power during the time the pump was taken out of service for replacement. A new pump was installed on July 17; however, alignment problems prevented placing the HDP in service until July 25. Following the HDP return to service, the unit returned to 100% power. The unit remained at essentially 100% power for the remainder 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 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.

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 reviewed:

PT/2/A/1103/15	Reactivity Balance, Estimated Critical Rod Position
PT/2/A/1103/15	Reactivity Balance, Shutdown Boron Concentration
PT/2/A/305/1	Reactor Manual Trip Test
PT/2/A/600/10	Reactor Coolant Leakage
PT/2/A/610/18	Emergency Power Switching Logic Operability Test
PT/2/A/230/15	High Pressure Injection Cooler Flow Test
WR 55128A	Control Battery ICA, ICB Daily Test
WR 55968A	SSF 125VDC Daily Battery Test
WR 55129A	230KV Switchyard Battery Daily Test

Surveillances witnessed in whole or part:

PT/1/A/251/1	Low Pressure Service Water Pump Performance Test
IP/0/B/3000/21	Inspection of FNA Fuses
IP/0/A/3000/1	Daily Battery Check, Unit 3
PT/0/A/290/4	Turbine Stop Valve Movement
PT/0/A/290/3	Turbine Control Valve Movement

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 01162C	Repair 1D1D Static Inverter
WR 51946	Change or Jumper Cell 2 of 2CA, Cell has Low Voltage
WR 51980E	Upgrade Cell 2 of 2CA
WR 52714E	Inspect Internal Wiring on Limitorque, 1PR-9
WR 52713E	Inspect Internal Wiring on Limitorque, 1PR-7
WR 52701E	Inspect Internal Wiring on Limitorque, 1CC-7

Maintenance work requests reviewed in detail:

WR 50640	Obtain Design Information Data for Unit 1 Bulletin 85-03 Valves and Operators.
WR 54024D	Inspect and Refurbish Limitorque Operator for 1-MS-79

WR 54023D	Inspect and Refurbish Lim orque Operator 1-MS-76
WR 50105E	MOVATS Testing of 1-MS-84
WR 52436	Perform Equalizing Charge on 2CA Batteries

No violations or deviations were identified.

8. Resident Inspector Safeguards Inspection (IP 71707)

In the course of the monthly activities, the Resident Inspectors included a review of the licensee's physical security program. The performance of various shifts of the security force was observed in the conduct of daily activities which included; protected and vital areas access controls, searching of personnel, packages and vehicles, badge issuance and retrieval, escorting of visitors, patrols and compensatory posts. In addition, the Resident Inspectors observed protected area lighting, protected and vital areas' barrier integrity and verified an interface between the security organization and operations or maintenance.

One violation was identified and is discussed in Report No. 50-269/86-22.

9. Unit 2 Trips Due to Failed Transmitters

a. July 8, 1986, Failed Feedwater (FDW) Flow Transmitter

On July 8, with the reactor at 100% power, the 2A FDW flow transmitter failed low. There was no actual loss of feedwater flow. This caused a reactor cross limits (mismatched power generation and heat removal) signal to the Integrated Control System (ICS), resulting in increased FDW flow and a reactor power runback. At the time of the flow transmitter failure, 2A steam generator was operating at about 85% and 2B at 90% of the operating range level. The operating limit is set at 92% and the trip set at 96%.

By the time reactor power had been reduced to 92%, the 2B steam generator level had increased to 96%, causing a FDW and turbine generator trip. The reactor then tripped on an anticipatory trip due to turbine failure. All systems responded normally. All three emergency feedwater pumps started and there was no ESF actuation.

When the transmitter failed, reactor control operators took manual control of feedwater flow but were unable to reduce it sufficiently in the short time interval prior to the SG high level trip. Following corrective action and the post trip review, the reactor was returned to critical at 3:55 a.m. on August 9, and the turbine was placed on line at 9:10 a.m.

b. July 23, Failed Reactor Coolant (RC) Flow Transmitter

At 9:44 a.m. on July 23, with the reactor at 100% power, the A loop RC flow transmitter, which provides input to the Integrated Control System (ICS), failed low. The ICS response was to immediately re-ratio

feedwater flow, decreasing flow to the A steam generator and increasing flow to the B steam generator. Re-ratio of feedwater caused the 'B'steam generator level, which was already high (90%) due to crud buildup, to increase very quickly past its operating limit (92%) and trip setpoint (96%). At 96% steam generator level, both main feedwater pumps and the turbine generator automatically tripped. The reactor subsequently tripped on an anticipatory turbine trip.

Only 7 seconds elapsed from the time of transmitter failure until the reactor tripped. The ICS initiated an RC flow runback when the steam generator reached the 92% operating limit; however, no appreciable effect was seen prior to the trip due to the short time from transmitter failure to reactor trip.

All systems responded as designed following the trip. The emergency feedwater system actuated, maintaining the steam generators at their post trip levels. There was no Engineered Safety Features actuation.

Following the post trip review and corrective actions, the reactor was returned to critical at 1:06 p.m. on July 23. The generator was placed on-line at 6:26 p.m. the same day.

10. Information Meeting Concerning IE Bulletin 85-03 and Enhanced Motor Operated Valve Refurbishment

On August 1, 1986, Duke Power Company representatives from the Oconee site and Duke corporate offices met with NRC management in the Region II offices to describe the Oconee motor operated valve (MOV) rework program. The licensee made an excellent presentation describing the immediate and long range programs which will refurbish, test and, in some cases, modify approximately 100 MOV's during each refueling outage until the 900 onsite MOV's have been completed in about five years.

The presentation described refurbishment (disassembly, cleaning and replacement of any worn or damaged parts) and MOVAT's testing of all Limitorque gate and globe valve operators, and refurbishment of butterfly/diaphram valves. Also, Rotork operators for gate valves will be refurbished.

Teams for the valve refurbishment and testing are being trained extensively for the program. Teams will include Babcox and Wilcox support personnel and, initially, will include vendor specialists.

The licensee also described the controls being established to verify correct lubrication of all valves.

11. Licensee Event Reports

LER 50-269/85-14, (Closed) Reactor Building Spray Valve Operability. This Licensee Event Report concerned a design review which determined that under a degraded voltage condition, there could possibly be insufficient voltage

to operate six building spray valves due to long conductor runs from the motor control center to the valve operator. Corrective action was to replace the deficient conductors with a larger size.

12. Unusual Events Due to Slight Earth Tremors

At 6:30 p.m. on July 14, 1986, a slight earthquake was felt at Oconee by a few persons. An Unusual Event was declared at 6:50 p.m. after verifying with the Jocassee plant that the event had occurred. Jocassee recorded a disturbance of 2.2 on the Richter scale with a duration of 97 seconds. Notifications were made and a plant inspection was performed. The Unusual Event was terminated at 8:15 p.m.

At 1:45 p.m. on July 15, 1986, another Unusual Event was declared for a slight tremor. This event measured 2.6 on the Richter scale. One of the resident inspectors was in or near the control room at the time and did not feel or hear anything unusual. Notifications and an inspection were made. The Unusual Event was terminated at 2:55 p.m.

The epicenter for the two events was about ten miles northwest of Oconee.

13. Inspection of Bussman Type FNA Fuses

The licensee continues to perform weekly inspections of Bussman type FNA fuses installed at the station. The weekly inspections were initiated following licensee discussions with Region II and documented in a July 2 letter from the licensee. Mechanical failure of this type fuse has been identified as a problem at other nuclear plants. Mechanical failure of the fuses could result in undetected component inoperability such that the component's safety related function would not be performed.

The licensee has identified 211 Bussman FNA fuses installed at the Oconee Station; about 200 of which are associated with the Standby Shutdown Facility. Through the end of the report period, only one failed fuse has been found. The fuse in question was located in a non-safety related circuit in a security system for which the installation was not complete at the time. It is believed that the fuse failure was electrical and not mechanical in nature.

The weekly surveillance will continue until resolution of the deficiency currently associated with Bussman FNA fuses either through modification or replacement with an alternate type fuse.

14. Inspection of Wiring on Enviromentally Qualified (EQ) Limitorque Valves

As a result of deficiencies found at other Duke stations in the wiring of EQ Limitorque operators, the Oconee maintenance department initiated a program to inspect wiring on all EQ Limitorque operators. The deficiencies involve the use of non-environmentally qualified wires for internal jumpers in the operators.

During the Unit 1 maintenance/steam generator tube repair outage all EQ Limitorques are being inspected and non-EQ wires replaced. Initial inspections found many operators with limit switch jumpers using Hypalon wire which is not qualified. All EQ operators will be inspected and upgraded, as necessary, prior to restart of Unit 1.

Because of problems found during inspection of Unit 1, the licensee began a limited inspection of Unit 3 Limitorques and initiated discussions with Region II management to justify continued operation (JCO) of Units 2 and 3.

Limited inspection of Unit 3 inside containment valves revealed the same Hypalon wire and, in one case, a white jumper wire. The licensee's JCO states that Hypalon wire, though not qualified, could withstand the postulated Oconee post accident environment for up to 15 hours. The licensee feels the white jumper wire is acceptable based on its similarity to wire which has been qualified.

All EQ valves in Unit 3 containment which are accessible have been inspected and upgraded as necessary. Other inside containment valves, where possible, are deenergized in their safe, post engineered safety feature actuation position. Several valves which could not be deenergized or upgraded with the unit at power were added to a procedure change requiring the nuclear control operators to deenergize the valves in their safe position within 30 minutes following a containment isolation signal generated during an accident. Outside containment Limitorques are to be inspected and upgraded within the next six weeks.

Unit 2 is scheduled to begin a refueling outage on August 16. The licensee plans to inspect and upgrade all EQ valves on the unit during the outage.

The resident inspectors will follow the licensee's activities in this area until all EQ Limitorque operators have been inspected and upgraded as necessary. This will be tracked as inspector followup item; IFI 269, 270, 287/86-21-01, Inspection of Internal Wiring on EQ Limitorque Operators.