UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA ST., N.W., SUITE 3100
ATLANTA, GEORGIA 30303

Report Nos. 50-269/82-23, 50-270/82-23 and 50-287/82-23

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

Facility Name: Oconee Nuclear Station

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

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

Inspection at Oconee site near Seneca, South Carolina

Inspectors: J. C. Bryant for — 7/9/82
W. Orders — Date Signed

J. C. Bryant for — 7/9/82
D. Falconer — Date Signed

Approved by: J. C. Bryant — 7/9/82
J. C. Bryant, Section Chief, Division of Project and Resident Programs — Date Signed

SUMMARY

Inspection on May 10 - June 10, 1982

Areas Inspected

This routine, announced inspection involved 320 resident inspector-hours on site in the areas of operations, safety verification, surveillance testing, maintenance activities, plant trips, and post refueling startup activities.

Results

Of the five areas inspected, no items of noncompliance or deviations were identified in three areas, three items of noncompliance were found in two areas. Violation: Failure to follow procedures, resulting in a plant trip (50-270/82-23-01) Violation: Inadequate procedure resulting in the improper reassembly of safety-related valve (50-270/82-23-02) Violation: failure to report or document conditions adverse to quality (50-269/82-23-01)

DETAILS

1. Persons Contacted

   Licensee Employees

   *J. Ed Smith, Station Manager
   *G. Vaughn, Superintendent of Maintenance
   *J. N. Pope, Supervisor Operations
   *T. Owen, Supervisor Technical Services
   *T. Cribbe, Licensing & Project Engineer

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

   *Attended exit interview

2. Exit Interview

   The inspection scope and findings were summarized on June 11, 1982, with those persons indicated in paragraph 1 above. The licensee voiced cognizance and concern over the findings contained herein.

3. Licensee Action on Previous Inspection Findings

   (Closed) Violation (50-287/81-10-01): Valve 3CS-124 manually defeated since construction hydro. The licensee unblocked the valve and removed it from the line for testing. The valve was reinstalled and reset. Valves 1CS-124 and 2CS-124 were verified not to be "gagged." This item is closed.

   (Closed) Violation (50-270/82-04-01): Containment integrity during refueling. The licensee has counseled all crew members involved and revised the appropriate procedure to require an inspection of the sealing surfaces to meet the intent of Technical Specification 3.8.6. This item is closed.

   (Closed) Unresolved Item (50-269/80-06-01): Review of exemption request for air lock testing. On November 6, 1981, the NRC issued license Ammendments 104, 104 and 101 which included air leakage testing requirements in the common Oconee Technical Specifications (TS). The TS require that full pressure test (i.e., Pa=59 psig) be performed quarterly and at the end of periods when containment integrity is not required if the airlock was opened. In addition, the TS require that within three days, either a full hatch leak test or a leak test of the outer door double seal at a pressure of 59 psig be performed if the airlock door is opened when containment integrity is required. This item is closed.

   (Closed) Unresolved Item (50-269/82-04-02): Valve LPSW-256 found throttled. Investigation by the licensee has revealed that valve LPSW-256 was vibrating

to an intermediate position during unit operation. To prevent this occurrence in the future, the licensee has procedurally required that valve LPSW-256 be locked open. This item is closed.

4. Unresolved Items

Unresolved Items are matters about which more information is required to determine whether they are acceptable or may involve noncompliance or deviations. New unresolved items identified during this inspection are discussed in paragraph 14.

5. Licensee Action on Inspector Identified Items

(Closed) Open item (50-269/81-02-03): Failure of AK2 relays in CRD system. A preventive maintenance program has been established employing maintenance procedure MP/O/A/2001/03, ACB Inspection and Maintenance. This item is closed.

(Closed) Open Item (50-269/81-02-01): Unit trip from VAR adjustment. The resident inspection staff has reviewed the reactor trip and no violations or deviations have been identified. This item is closed.

(Closed) Open Item (50-269/81-10-01): TMI item I.C.5 implementation inadequate. The licensee has established the Nuclear Station Safety Review Group (SRG).

The SRG functions as the onsite independent technical review group for the purposes of examining and making detailed recommendations to management on plant operating characteristics, NRC issuances, Licensing Information Service Advisories, and other appropriate plant design and operating experience information from INPO, NSSS suppliers, etc. that may enhance or improve plant safety; reviews and audits routine plant activities to verify that plant operations and maintenance activities are performed correctly, and makes recommendations that may improve plant safety and operational performance; and conducts station incident investigations and prepares required reports pursuant to the requirements of NUREG-0737 item I.C.5.

(Closed) Open Item (50-287/81-02-01): Reactor building spray pump impellar fastner. All applicable impellar fastners have had a positive locking device installed. This item is closed.

6. Plant Operations

The inspector reviewed plant operations throughout the report period, May 10 - June 10, 1982 to verify conformance with regulatory requirements, technical specifications and administrative controls. Control room logs, shift supervisors logs, shift turnover records and equipment removal and restoration records for the three units were routinely perused. Interviews were conducted with plant operations, maintenance, chemistry, health physics, and performance personnel on day and night shifts.

Activities within the control rooms were monitored during all shifts and at shift changes. Actions and/or activities observed were conducted as prescribed in the Station Directives. The complement of licensed personnel on each shift met or exceeded the minimum required by technical specifications. Operators were responsive to plant annunciator alarms and appeared to be cognizant of plant conditions.

Plant tours were taken throughout the reporting period on a continual basis. The areas toured included, but were not limited to the following:

Turbine Building
Auxiliary Building
Units 1, 2 and 3 Electrical Equipment Rooms
Unit 1, 2 and 3 Cable Spreading Rooms
Station Yard Zone Within The Protected area
Unit 1 Reactor Building

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

Unit 1 began the report period operating at a limited power of 96 percent due to tube leaks in the B1 feedwater heater.

On May 21, reactor power was reduced from 96 percent to 85 percent to perform a control rod drive (CRD) movement test. During the test, the CRD stator of group 1 rod 8 failed and the control rod dropped into the core. Due to asymmetric rod considerations a manual reduction in power was initiated. When reactor power had been reduced to 30 percent, the 'B' main feedwater pump was unloaded and manually tripped per normal operations. Feedwater flow decreased inordinately causing a primary to secondary mismatch
resulting in a reactor trip at 10:10 p.m. due to high reactor coolant system pressure.

During the trip, the main steam safety valves lifted as expected, however, one main steam safety valve failed to reseat within tolerence. RC pressure remained below the setpoint of the PORV and pressurizer code safety valves, primary and secondary level remained on scale, no ES set points were reached nor was emergency feedwater initiated.

The unit was placed in cold shutdown on April 22 to repair the failed CRD stator and to inspect the vertical secondary shield wall tendons as detailed elsewhere in this report. Currently, the licensee is evaluating the feedwater response that resulted in the April 21 reactor trip. The main steam safety valve reseat setpoint was reset. Anticipated on-line date is June 13, 1982.

Unit 2 began the report period at cold shutdown to repair valve 2CF-1 and replace the vertical shield wall tendons.

Repairs were completed on May 14 and the unit attained criticality at 12:20 a.m. on May 17. At 8:11 a.m. that same morning, the unit tripped on over power during zero power physics testing as detailed elsewhere in this report.

The unit experienced another trip during startup at 4:28 a.m. on May 18. The unit tripped on turbine trip due to the licensees failure to reset the turbine trip contact buffers as detailed elsewhere in this report.

The unit attained 60 percent power on May 21. Power has been limited to 60 percent due to the '2A' high pressure pump being inoperable.

Unit 3 began the report period in a refueling and 10 year inservice inspection (ISI) outage. On May 28, defueling was completed in preparation for the ISI. Auxiliary feedwater header inspection and evaluation continued throughout the report period as detailed elsewhere in this report.

On June 6, 1982, at 9:21 p.m., the unit experienced an inadvertent Engineered Safety Features (ESF) actuation due to a momentary voltage reduction on ESF logic power supplies. At 1:35 a.m., on June 7, 1982, the unit experienced a second inadvertent ESF while troubleshooting the earlier ESF actuation.

Both Keowee units started on each ESF actuation. The licensee is evaluating the cause of the voltage reduction.

On May 21, 1982, the licensee discovered two Unit 3 fuel assemblies to have broken holddown springs. The two degraded fuel assemblies were to be returned to the core for the next cycle. Reload considerations are being evaluated. The NRC was notified of the discovery on June 10, 1982.

7. Unit 2 Turbine Trip - Reactor Trip

On May 19, 1982 at 4:28 a.m., Oconee Unit 2 tripped from 20 percent power due to a turbine overspeed trip. The unit was in power escalation at the time, and had just achieved 20 percent power at which point the anticipatory reactor trip armed itself resulting in the trip.

Operations had been conducting turbine generator startup pursuant to procedure OP-2-A-1106-01 which included turbine overspeed trip testing. Subsequent to completion of turbine testing the controlling procedure for startup OP-2-A-1102-01 requires that the main turbine trip contact buffers (RPS logic interface) be reset. This step in the procedure was completed and signed off, however, subsequent to the reset, further turbine overspeed trip testing was accomplished. The contact buffers were not reset after completion of testing, and ultimately, when the unit reached 20 percent power the reactor tripped.

The unit responded as expected during the incident. RCS pressure remained below the setpoint of the PORV and pressurizer code safety valves, primary

and secondary levels remained on scale, no ES setpoints were reached nor was emergency feedwater initiated.

The cause of the trip was the failure of licensee personnel to reset the aforementioned logic prior to attaining 20 percent power as required by step 3.2.112 of procedure OP-2-A-1102-01. The above detailed evolution constitutes a failure to abide by the requirements of a written, approved procedure. This is a Violation (50-270/82-23-01)

8. Reactor Building Spray Pump Destruction

On March 2, 1982 at 1:37 p.m. while Unit 1 was operating at 100 percent power, the 1A reactor building spray pump was found to be inoperable during an attempt to perform a pump operability test (PT-1-A-204-07). Subsequent investigation revealed the pump shaft to be sheared. The failure was apparently the result of running the pump for approximately 3 hours on February 23, 1982 without suction flow. The evolutions leading up to the event are as follows:

On February 22 at 9:33 p.m. while Unit 1 was heating up, the 1A building spray pump was employed to recirculate the borated water storage tank (BWST) in preparation for collecting a chemistry sample. At 3:56 a.m. on February 23, 1982, the low pressure injection system (LPI) was aligned to the engineered safeguards (ES) mode pursuant to procedure OP-1-A-1104. The Procedure requires in part that valve LP-21 be shut. LP-21 was supplying suction flow for the building spray pump from the BSWT as earlier discussed.

At 7:08 a.m. on February 23 an operator discovered that LP-21 was shut with the building spray pump running. The pump was stopped, LP-21 was opened and the pump started to observe motor current. The operator erroneously concluded from what appeared to be normal pump motor current, that the pump was undamaged. Pump flow was not checked.

The operator made no mention of the event in the reactor operator log, did not report the event to his supervisor nor to other operators.

On March 2 the pump was discovered to be inoperable. Inspection revealed that the impellar wear ring was galled and the pump shaft was broken. the pump was replaced with a rebuilt unit and returned to service at 3:11 a.m. on March 5, 1982.

Both trains of the reactor building spray system are required by technical specification 3.3.6 to be operable when reactor coolant system conditions are 350 psig or greater, temperature is 250°F or greater, and the reactor is critical. Oconee 1 received a violation in Report No. 50-269/82-11 for inoperability of the A train of building spray due to an inoperable instrument. That citation covered the same time period that A train was inoperable due to pump damage.

10 CFR 50 appendix B Criterion XVI as implemented by Duke Power Company Topical Report Duke-1A, section 17.2.16 requires the licensee to document and report conditions adverse to quality, the cause of the condition and the corrective action to preclude recurrence, to appropriate levels of management.

Contrary to the above stated requirement, the operator did not report the incident described herein nor did he document the fact in the reactor operator log. This is a Violation (50-269/82-23-01)

9. Zero Power Physics Test

The Zero Power Physics Test (ZPPT) is performed to verify the nuclear parameters upon which the safety analysis and technical specifications are based. The inspectors witnessed portions of the Unit 2, Cycle 6 ZPPT conducted May 15 - May 17, 1982. No violations or deviations were identified.

Portions of the RCS flow measurement, all rods out critical boron concentration measurement, temperature coefficient measurement, and ejected rod worth measurement were witnessed by the resident inspection staff. The inspectors verified that the precautions and prerequisites were met, plant conditions corresponded to those conditions assumed in the analytical predictions, and measured values met the acceptance criteria.

The unit experienced a reactor trip on over power during the ZPPT at 8:11 a.m., on May 17. The Group 8, axial power shaping rods, had been manually driven into the core to provide a positive power ramp for doubling time measurements. At the top of the ZPPT power band, the operator attempted to terminate the ramp by withdrawing Group 8. However, a Group 8 withdraw inhibit had been initiated by an erratic high NI-3 signal. Power continued to increase until the ZPPT over power trip setpoint of 0.4 percent power was reached.

10. Surveillance Testing

The surveillance tests detailed below were analyzed and/or witnessed by the inspector to ascertain procedural and performance adequacy.

The completed test procedures examined were analyzed for embodiment of the necessary test prerequisites, preparations, instructions, acceptance criteria and sufficiency of technical content.

The selected tests witnessed were examined to ascertain that current written approved procedures were available and in use, that test equipment in use was calibrated, that test prerequisites were met, system restoration completed and test results were adequate.

The selected procedures perused attested conformance with applicable Technical Specifications, they appeared to have received the required administrative review and they apparently were performed within the surveillance frequency prescribed.

Procedure	Title
PT-0-A-230-15	HPI Motor Coolant Flow
PT-0-A-230-01	Radiation Monitor Check
PT-1-A-600-01	Periodic Instrument Surveillance
PT-0-A-200-46	R.C. System Leak Test
PT-1-A-600-10	RC Leakage Evaluation Test
PT-0-A-305-1	RX Manual Trip Test
PT-0-A-150-8A	RX Building Air Lock
PT-0-A-150-25	Liquid Waste Disposal Leak Test
PT-0-A-600-18	Emergency Feedwater Train
PT-0-A-201-04	PORV Operability Test
PT-0-A-251-13	Component Cooling Check Valve
PT-0-A-250-05	HPSW Pumps/Power Test

The inspector employed one or more of the following acceptance criteria for evaluating the above items:

10 CFR
ANSI N18.7
Oconee Technical Specifications
Oconee Station Directive
Duke Administrative Policy Manual

Within the areas inspected no items of noncompliance or deviations were identified.

11. Maintenance Activities

Maintenance activities were observed and/or reviewed throughout the report period to ascertain that the work was being performed by qualified personnel and that activities were accomplished employing approved procedures or the activity was within the skill of the trade. Limiting conditions for operation were examined to ensure that technical specification requirements were satisfied. Activities, procedures, and work requests were examined to ensure adequate fire protection, cleanliness control and radiation protection measures were observed and that equipment was properly returned to service.

Acceptance criteria employed for this review included but was not limited to:

Station Directives
Administrative Policy Manual
Technical Specifications
Title 10 CFR

Detailed below are six maintenance activities which were observed and/or reviewed during the report period:

Work Request	Component/System
51883B	2HP-14
42518	1 RCW 186
97111	Waste Compactor
96969	RCP Start Interlock
96911	Saturation monitor
57021A	Unit 3 Spent Fuel Pool

On May 21, the Unit 1 reactor was placed in cold shutdown to repair a failed control rod drive (CRD) that had resulted in a rod drop and reactor trip as detailed elsewhere in this report.

Upon inspection of the CRD, the licensee found that the CRD stator had shorted due to a leaking CRD vent valve. The failed CRD stator was replaced and 42 other CRD stators were removed, cleaned, dried, and replaced. The leaking CRD vent valve was repaired.

The resident inspection staff witnessed portions of the Unit 1 CRD stator maintenance activities. No violations or deviations were identified.

On April 20, 1982, Unit 2 operators found that valve 2HP-14 would not pass the required flow. Subsequent investigation revealed that the valve had been incorrectly reassembled following maintenance completed on April 18, 1982. The valve was repaired and returned to service on April 22, 1982.

Valve 2HP-14 is a Fisher YY type, double disc, three-way valve that directs flow to either the make-up filters or to the deborating demineralizers and the bleed hold-up tanks. The valve is safety-related and interlocked to preclude an unplanned boron dilution of the reactor coolant system.

On April 15, 1982, the valve was cut from the system and dismantled to investigate and repair suspected seat leakage using maintenance procedure MP/O/A/1200/27, Dissassembly and Reassembly of Fisher YY Type Valve. Upon

reassembly of the valve, the actuator was mistakenly reconnected to an outlet port due to misorienting the valve during the maintenance.

Discussions with maintenance personnel and the review of the valve instruction manual revealed that the Fisher YY model valve is susceptible to orientation related maintenance and installation errors due to the unique symmetry of the valve body.

The instructions of maintenance procedure MP/O/A/1200/27, Disassembly and Reassembly of Fisher YY Type Valves were not sufficient to preclude these errors. Failure to provide an adequate procedure for maintenance on the safety-related Fisher YY type valve violated the requirements of Technical Specification 6.4.1 which requires the station to be maintained in accordance with approved procedures entailing appropriate instructions.

This is a violation (50-270/82-23-02)

12. Emergency Feedwater Header Repair

As previoulsy reported (287/82-15) due to steam generator internal emergency feedwater header damage discovered at Davis Besse and Rancho Seco, and the generic nature of the problem, Oconee Unit 3 was shutdown on April 23, 1982. Visual inspection revealed damage similar to that found at Davis Besse and Rancho Seco.

Subsequent to the last report the licensee opted to discontinue the use of and stabilize the internal header and install external headers similar to those employed on Oconee Units 1 and 2 and other earlier model B&W units.

The design entails drilling a five inch diamter hole just below each of the dowel pin locations that cannot be reached from the manway (6 on each OTSG). The dowel pin will be removed, and the tabs cut off. A fillet weld will then be made between the bottom of the header and the top of the shroud at each point of access. The internal emergency feedwater header nozzle will be blanked off and an external ring header, risers, and thermal sleeves of the new design will then be attached. The new external system will operate in a manner similar to Unit 1&2's. No welding will be done to the OTSG shell; all new connections will be bolted flanges. Repairs are scheduled to be completed by mid to late August. At the close of the reporting period, all the five inch holes had been drilled in the shell of the "A" steam generator and the pilot holes had been drilled in the "B" steam generator.

The resident inspection staff will continue to monitor the modification effort.

13. Secondary Shield Wall Tendons

Secondary shield wall tendon inspection and replacement has continued. Six Unit 2 vertical secondary shield wall tendons required replacement due to degradation as detailed in report 270/82-15.

A detailed inspection of the Unit 3 secondary shield wall tendons revealed similar phenomena. Three of the vertical secondary shield wall tendons failed to meet the degradation acceptance criteria. These tendons will be replaced at a convenient time during the present refueling/ISI outage.

Unit 1 tendons were detensioned and inspected during the forced outage which began on April 21, 1982. Similar phenomena were observed; however, all of the tendons met the degradation acceptance criteria. Two of the Unit 1 vertical tendons were damaged during retensioning. An excessive number of their strand members experienced shear and tensile failures when load was applied to retension the tendon. These tendons are being replaced and the licensee is evaluating the method of retensioning.

The resident inspection staff witnessed portions of the tendon inspection and replacement activities.

No violations or deviations were identified.

14. Mobile Crane Training

On December 22, 1981 at 12:02 p.m. a radwaste shipping cask liner containing solidified radioactive waste was dropped 12 feet to the ground when the mobile crane employed to move it tipped to one side. There were no injuries nor radioactive release. The cask liner was not damaged and was subsequently shipped to Barnwell, SC.

The crane apparently tipped due to the outriggers not being fully extended during the lift.

Resident staff inspection and conversation with appropriate licensee management revealed that the incident was caused by the failure of the crane operator to fully extend the outriggers due to the congested area in which the lift was performed. The licensee stated at the time that the importance of full outrigger extension was to be stressed to the crane operators in the future.

The incident appeared to be an isolated case, and more the result of the situation than lack of expertise or training on the part of the crane operator.

On May 4, 1982 at 11:10 a.m. another radwaste shipping cask liner containing solidified radioactive waste was being loaded into a cask when the mobile crane tipped forward dropping the cask liner into the cask to a point at which it wedged in place. The apparent cause of the incident was the overextension of the crane boom.

The resident inspection staff in reviewing the events detected what appears to be inadequacies in the station's training program.

Crane operators at Oconee perform under the skill of the craft concept rather than by explicit procedure. A review of the Oconee cranes and hoists

training program and selected personnel training folders reveal that there was no established formal training program or qualification requirements for mobile crane operators.

10 CFR Appendix B, Criterion II as implemented at Oconee through Duke Topical Report 1-A which incorporates the guidance offered in Regulatory Guide 1.8 and ANSI N18.1-1971 specify that a training program be established to maintain a fully trained and qualified organization based on the employee's experience and intended position. The objective of the training program is to ensure safe and efficient operation of the facility.

Extensive interviews and documentation review revealed that although there was no formal mobile crane training program established and maintained through the station training section, informal training was conducted in the maintenance section. The licensee is currently developing a formal training/qualification program to be implemented in the near future. Pending inspector review of the formal program this area will be maintained as an Unresolved Item (50-269/82-23-02).