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

Report Nos.: 50-269/91-06, 50-270/91-06, 50-287/91-06

Licensee: Duke Power Company
P. O. Box 1007
Charlotte, NC 28201-1007

Docket Nos.: 50-269, 50-270, 50-287, 72-4

License Nos.: DPR-38, DPR-47, DPR-55, SNM-2503

Facility Name: Oconee Nuclear Station

Inspection Conducted: February 24 - March 23, 1991

Inspector: _____ 4/03/91
P. H. Skinner, Senior Resident Inspector Date Signed

_____ 4/03/91
B. B. Desai, Resident Inspector Date Signed

_____ 4/03/91
W. K. Poertner, Resident Inspector Date Signed

Approved by: _____ 4/3/91
G. A. Belisle, Section Chief Date Signed
Division of Reactor Projects

SUMMARY

Scope: This routine, announced inspection involved inspection on-site in the areas of operations, surveillance testing, maintenance activities, and operation during reduced inventory conditions.

Results: A weakness was identified during operation in a reduced inventory condition when the licensee did not use temporary radiation instrumentation in containment that would notify control room operators of changing radiation levels if an emergency condition were to occur (paragraph 5).

REPORT DETAILS

1. Persons Contacted

Licensee Employees

*H. Barron, Station Manager
D. Couch, Keowee Hydrostation Manager
*T. Curtis, Compliance Manager
J. Davis, Technical Services Superintendent
D. Deatherage, Operations Support Manager
B. Dolan, Design Engineering Manager, Oconee Site Office
*W. Foster, Maintenance Superintendent
T. Glenn, Engineering Supervisor
*O. Kohler, Compliance Engineer
C. Little, Instrument and Electrical Manager
*H. Lowery, Chairman, Oconee Safety Review Group
B. Millsap, Maintenance Engineer
M. Patrick, Performance Engineer
D. Powell, Station Services Superintendent
*G. Rothenberger, Integrated Scheduling Superintendent
*R. Sweigart, Operations Superintendent

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

NRC Resident Inspectors:

*P. Skinner
W. Poertner
B. Desai

*Attended exit interview.

2. Plant Operations (71707)

a. General

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, temporary modification log and equipment removal and restoration records were reviewed routinely. Discussions were conducted with plant operations, maintenance, chemistry, health physics, instrument & electrical (I&E), 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 weekdays and on weekends. Some inspections were made during shift change in order to evaluate shift turnover performance. Actions observed were conducted as required by the licensee's

Administrative Procedures. 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
CCW Intake Structure
Independent Spent Fuel Storage Facility
Units 1, 2 and 3 Electrical Equipment Rooms
Units 1, 2 and 3 Cable Spreading Rooms
Units 1, 2 and 3 Penetration Rooms
Units 1, 2 and 3 Spent Fuel Pool Rooms
Unit 2 Containment
Station Yard Zone within the Protected Area
Standby Shutdown Facility
Keowee Hydro Station

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

b. Plant Status

Unit 1 began this reporting period at 100 percent power. On February 2, the unit reduced power to 60 percent due to a low level alarm on the 1A1 reactor coolant pump (RCP) lower oil pot so that the pump could be removed from service. On February 3 power level was reduced to 40 percent so that a containment entry could be made to add oil and to return the pump to service. On February 4 the unit was returned to 100 percent power and continued operation at this level until February 26. At this time a load reduction occurred due to a low oil level in the 1B1 RCP which was removed from service. Power level was further reduced to approximately 40 percent, oil added and the pump returned to service. Power level was increased to 100 percent on February 27 and remained at that level for the rest of this reporting period.

Unit 2 operated at or near 100 percent power the entire reporting period.

Unit 3 was in a refueling shutdown during the entire reporting period. On March 8, 1991, a loss of decay heat removal capabilities were lost for a period of ten minutes. This is addressed in Augmented Inspection Team Report 50-269,270,287/91-08.

c. Fuel Handling Activities

Unit 3 was shutdown for a scheduled refueling outage on February 13, 1991, and core defueling and refueling activities were performed during this reporting period. Detail written procedures were available for the fuel handling activities and neutron flux and

radiation levels were continuously monitored during defueling as well as refueling. Water clarity in the Spent Fuel Pool as well as the Fuel Transfer Canal was maintained. In addition, the licensee has installed a new high intensity device on the Spent Fuel Pool bridge that made identification of fuel assembly location easier.

During fuel handling operations, radiation levels in the Reactor Building refueling area are required to be monitored by Radiation Indication Alarm (RIA) 2 and RIA 3 as required by TS 3.8.1. TS allows use of appropriate portable survey instrumentation in the event that RIA 2 or RIA 3 become inoperable. RIA 2 and RIA 3 have been inoperable for several years and the licensee has relied on portable instruments which are mounted on the Main Fuel Transfer Bridge and on the Auxiliary Fuel Transfer Bridge.

Before commencing fuel movement, the fuel handling procedure OP/3/A/1502/007, Refueling Procedure requires RIA 2 and RIA 3 or the portable instruments to be operational. Only the Main Fuel Transfer Bridge was going to be used during fuel movement. A Senior Reactor Operator (SRO) interpreted that since the Auxiliary Fuel Transfer Bridge was not going to be used, the portable radiation monitoring instrument need not be operable, and he only ensured that the portable instrument on the Main Bridge was operable. As a result, defueling activities were performed on several shifts without one of the portable instruments being operable. This problem was discovered by another SRO during a later shift and he thought that the portable instrument on the Auxiliary Bridge also had to be operable. These radiation instruments monitor radiation levels and provide indication of an unsafe condition for the protection of individuals involved in refueling operations. The licensee reviewed this condition and determined that since each individual on the refueling bridge had a self-reading alarming dosimeter and a portable instrument was in operation on the bridge, TS 3.8.1 requirements were met even though there was no portable instrument installed on the auxiliary bridge.

No violations or deviations were identified.

3. Surveillance Testing (61726)

Surveillance tests were reviewed 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 and witnessed in whole or in part:

IP/2/A/305/3A	Diode Monitor Test
MP/0/A/1210/11	Limotorque Operator Assemble/Disassembly
MP/0/A/1210/04	Limotorque Operator SB/SMP Assembly/Disassembly
IP/0/A/3000/05	Diode Monitor Test
MP/0/A/2001/3	ACB Inspection and Maintenance
PT/3/A/0150/22R	Refueling Valve Stroke Test
PT/0/A/201/04	PORV Operability Test
PT/3/A/203/04	LPI System Leakage Test
PT/3/A/0150/22S	Core Flood Tank Inlet Check Valve Stroke Test
PT/3/A/251/09	LPI/HPI Check Valve Functional Test
TT/3/A/0600/08	Motor Driven Emergency Feedwater Pump Test
PT/3/A/0610/01J	Emergency Power Switching Logic Functional Test

No violations or deviations were identified.

4. Maintenance Activities (62703)

a. 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 reviewed and witnessed in whole or in part:

WR 53030J	Perform Regulator Replacement on Valve
WR 52852J	Determine Valve Position Upon Loss of Instrument Air for 3FDW-106
WR 57696D	Replace Packing on FDW 106
WR 28509	Replace Seat Leak on 3HP-25
WR 99150	Replace Existing Flow Transmitters on RB Spray Headers (TN/3/A/2588/AK1)

b. Loss of 1DID DC Panelboard, 1DID Inverter and 1KVID Vital AC Bus During Performance of Diode Monitor Test on Unit 1

On February 26, 1991, while Instrument and Electrical (I&E) technicians were performing Instrumentation Procedure (IP)/0/A/3000/05, Diode Monitor Test, on Unit 1, the unit experienced a loss of the 1DID dc panelboard, 1DID inverter, and 1KVID 120 volt vital ac bus. This resulted in Reactor Protection System (RPS) channel D tripping, DC Control Rod Drive breakers CB-3 and 4 tripping, Turbine Driven Emergency Feedwater and the Standby High Pressure Injection pumps starting and the loss of several Radiation Instrumentation System alarms. The performance of the IP was stopped. The 1DID inverter was bypassed and the regulated ac source was manually aligned to the 1KVID bus, thereby restoring the lost power. Equipment was restored to their required condition. The Isolating Diode assemblies, including ADD1 and ADD2, discriminate

and pass the higher of the voltage supplied by the units dc bus load (primary) and the alternate dc source provided by another units dc bus load. ADD1 is associated with the primary supply and ADD2 is associated with the alternate supply.

The IP being conducted includes verification of availability of the alternate source prior to isolating 1ADD1. When I&E technicians isolated 1ADD1 for testing, the buses downstream of the Diode including 1DID inverter, 1DID panelboard, and 1KVID panelboard were lost. Upon this loss, the I&E technician swapped 1KDID to the regulated ac source, bypassed inverter 1DID and reclosed the 1ADD1 supply breaker. At this time the cause of the losses could not be determined. The technicians thought that the problem was caused by a faulty inverter. The cognizant engineer and operation staff reviewed this problem and concluded that a procedure error probably was the cause of the inverter loss with a resulting transient on the DC panelboard. Operators did not record any annunicator alarms that indicated a complete loss of the DC panelboard. The inverter was checked and determined to be functioning correctly. Isolated Isolating Diode 1ADD1 and inverter 1DID were returned to service and I&E considered that the dc distribution system was restored to its normal state. The licensee decided to perform a retest the following day but several higher priority jobs were scheduled and the retest was postponed.

The decision was made to repeat the test on March 4. On March 4 a loss of the DC panels occurred. Troubleshooting was performed on March 4 and at that time the output breaker on the alternate supply Diode assembly 1ADD2 was identified as having failed. A ceramic material used for the arc shoot in the breaker had broken, causing the debris to fall into the breaker. This non-conducting debris prevented the breaker from making contact and therefore, even with the breaker closed, there was no current flowing past the breaker. The operability of the 1ADD2 output breaker was not verified prior to performing the IP; only the availability of the alternate source was verified. The alternate source was available up to the output breaker. When 1ADD1 was isolated per the IP, all loads downstream of the Diode assemblies were deprived of power.

Diode assembly 1ADD2 is allowed by TS 3.7 to be inoperable for no more than 24 hours. Following the discovery of the failure of the breaker, Unit 1 entered a 24 hour Limiting Condition for Operation (LCO). A breaker taken from Unit 3, which was shutdown for refueling, was installed and the dc system was restored to normal. This incident will be reported pursuant to requirements of 10 CFR 50.73 (a)(2)(i)(B). Additionally, TS 3.7.9 requires the licensee to report to the NRC Region II office within 24 hours any degradation beyond specification 3.7.2. This notification was also made.

No violations or deviations were identified.

5. Unit 3 Mid-loop Operations

The inspectors reviewed the licensee's actions with regard to reducing RCS level to mid-loop operations on March 16, 1991, to remove the Steam Generator cold leg dams. The licensee had installed two ultrasonic level indicators on the RCS prior to draining the RCS to less than fifty inches on LT-5. One level detector is installed on a RCS hot leg and the other is installed on a RCS cold leg. These level indicators indicate over a very narrow range of RCS level, i.e. centerline of the hot and cold leg to the top and bottom of the RCS hot and cold legs. The instruments installed for this outage are permanently installed indicators, provide indication via the plant computer and provide a low level alarm in the control room.

The licensee had all provisions in place for conducting this draindown. Although the review of maintenance and testing activities indicated no activities were to be performed during this period that would have an adverse effect on systems and components required for decay heat removal, one concern was identified by the inspectors. At this time there are no permanent plant radiation detectors functioning due to a modification being implemented. There is no indication in the control room that would notify the operators of a significant increase in radiation levels in containment. Locally installed portable instruments are being used but these do not have any type of information transfer to the control room. This problem is also addressed in NRC Inspection Report 50-269,270,287/91-08. The inspectors consider the failure to use temporary instrumentation for the operators in the control room to be a weakness.

No violations of deviations were identified.

6. Testing of Air Operated Valves as Required by Generic Letter 88-14

On March 5, 1991, a portion of a special test developed by the licensee to address concerns of Generic Letter (GL) 88-14 was being performed on 1LPSW-516, Unit 1A Motor Driven Emergency Feedwater (MDEFW) pump motor cooling water valve. When Instrument Air (IA) was isolated from the valve operator, the valve did not fail to its required open position. This valve was subsequently failed to the open position to ensure cooling of the MDEFW pump motor. Additionally, the cooling water valve, 1LPSW-525, to the 1B MDEFW pump motor as well as both the cooling water valves on Unit 2 were also failed to the open position. Unit 3 was shutdown for a refueling outage. Similar problems with these valves had occurred during performance testing in December 1990. Details of the failures as well as operation of the valve were discussed and are being reviewed as Inspector Followup Item 50-269,270,287/90-34-01.

Following corrective actions taken as discussed in Inspection Report 50-269,270,287/90-34-01, the valves were declared operational and returned to their normally closed position in January 1991. As part of this corrective action, a monthly performance test was also performed following the testing pursuant to the requirements of GL 88-14.

The cause of the failure of the valve to go to its required position upon isolation of IA has not yet been fully determined. It is postulated that a leak in the air accumulator tank had insufficient capacity to store the required amount of air to ensure opening of the valve.

Due to the complexity of this valve, the licensee is pursuing replacement of the valves on all three units with a different valve design. Scheduled replacement for Units 1 and 2 is not available at this time. The valves for Unit 3 were replaced during this outage with a spring loaded Keystone Operator on a Marwin manufactured valve. Testing is in progress at this time for Unit 3. While reviewing this activity, the inspectors observed testing and reviewed the work request for IA operated valve testing on Unit 3. The inspectors noted that all valve testing was covered under generic temporary procedures (TI)0/A/0100/002, Failure Position Test of Active/Passive Air Operated Valves. In review of various WRs, the inspectors noted that WRs for testing the operators on valves MS-87, FDW-315 and FDW-106 had been marked as being non-QA, non-TS related. These valves are part of the EFW system and containment integrity systems. The inspectors considered that that these WR should have been marked as TS related and QA condition 1.

In discussions with the planning group, the inspectors were informed that the valves, operators and solenoid valves were safety-related but the tubing, fittings and air were not. Since no work was authorized for each of these valves, the WR were identified as non-QA, non-safety-related. Since the procedure was safety-related and approved by appropriate personnel and no work was performed, the inspectors considered this to be acceptable.

No violations or deviations were identified.

7. Exit Interview (30703)

The inspection scope and findings were summarized on March 22, 1991, with those persons indicated in paragraph 1 above. The inspectors described the areas inspected and discussed in detail the inspection findings. The licensee did not identify as proprietary any of the material provided to or reviewed by the inspectors during this inspection.