UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA STREET, N.W., SUITE 2900
ATLANTA, GEORGIA 30323-0199

Report Nos.: 50-269/93-24, 50-270/93-24 and 50-287/93-24

Licensee: Duke Power Company
422 South Church Street
Charlotte, NC 28242-0001

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: August 29 - September 25, 1993

Inspector: RFLesser FOR — 10/18/93
P. E. Harmon, Senior Resident Inspector — Date Signed

RFLesser FOR — 10/18/93
W. K. Poertner, Resident Inspector — Date Signed

RFLesser FOR — 10/18/93
L. A. Keller, Resident Inspector — Date Signed

RFLesser FOR — 10/18/93
W. H. Miller, Jr., Project Engineer — Date Signed

Approved by: RFLesser — 10/18/93
M. S. Lesser, Section Chief, — Date Signed
Reactor Projects Section 3A

SUMMARY

Scope: This routine, resident inspection was conducted in the areas of plant operations, surveillance testing, maintenance activities, Keowee issues, review of licensee event reports and review of licensee's employee concerns program (Attachment 1).

Results: Two violations were identified. The first violation involved inadequacies in the licensee's test program which resulted in a Unit 3 load shed channel being inoperable for approximately six years (paragraph 2.h). The second violation involved a failure to implement the fire protection plan testing requirements contained in the Selected Licensee Commitments Manual (paragraph 6).

REPORT DETAILS

1. Persons Contacted

Licensee Employees

*H. Barron, Station Manager
S. Benesole, Safety Review Manager
D. Coyle, Systems Engineering Manager
*J. Davis, Safety Assurance Manager
T. Coutu, Operations Support Manager
B. Dolan, Manager, Mechanical/Nuclear Engineering
W. Foster, Superintendent, Mechanical Maintenance
*J. Hampton, Vice President, Oconee Site
D. Hubbard, Component Engineering Manager
C. Little, Superintendent, Instrument and Electrical (I&E)
*M. Patrick, Regulatory Compliance Manager
*B. Peele, Engineering Manager
*S. Perry, Regulatory Compliance
*G. Rothenberger, Operations Superintendent
R. Sweigart, Work Control Superintendent

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

NRC Resident Inspectors

P. Harmon
*W. Poertner
*L. Keller

*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 engineering personnel.

Activities within the control rooms were monitored on an almost daily basis. Inspections were conducted on day and night shifts, during weekdays and on weekends. Inspectors attended some shift

changes 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
Station Yard 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

Units 1, 2, and 3 operated at power the entire reporting period.

c. LPSW Valve Failure

At 1:10 p.m. on September 1, valve 2LPSW-51 failed close while in the automatic mode of operation. Valve 2LPSW-51 is the Unit 2 main turbine oil cooler temperature control valve and throttles low pressure service water (LPSW) flow to the main turbine oil tank to maintain oil temperature at setpoint. When 2LPSW-51 failed close, oil temperatures increased until a main turbine oil cooler outlet temperature alarm (117 degrees) was received in the control room. Temperature alarms were also received on turbine bearings 4 and 5. The operators immediately diagnosed the cause of the temperature alarms and placed the 2LPSW-51 controller in manual and opened the valve to reestablish LPSW flow to the oil cooler. The licensee determined that the oil temperature detector had failed low resulting in a close signal being applied to the valve controller. The licensee repaired the temperature detector and returned the valve to automatic control.

d. Mispositioned Containment Isolation Valve

On September 2, the licensee found valve 2CF-41 approximately 7 turns open. Valve 2CF-41 is a normally closed 3/4 inch instrument

root valve on the Core Flood Tank 2B fill line and is a containment isolation valve. The mispositioned valve was identified by a non-licensed operator during makeup to Core Flood Tank 2B when 600 psig was indicated on the local gage downstream of valve 2CF-41. The non-licensed operator notified the control room and the valve was determined to be approximately 7 turns open. Valve 2CF-41 was closed and the operators verified that the root valve on the Core Flood Tank 2A fill line was closed and that the corresponding valves on Units 1 and 3 were also in their required positions. Subsequent to finding valve 2CF-41 open, the licensee reperformed the Outside Reactor Building Manual Isolation Valve Checklist, PT/2/A/115/08, Enclosure 13.3. No other containment isolation valves were found mispositioned.

PT/2/A/115/08, Enclosure 13.3, had last been completed on June 18. The licensee did not identify any evolutions since the last completion date of the procedure that would have opened valve 2CF-41. The licensee will issue a Licensee Event Report (LER) as required by 10 CFR 50.73. The inspectors will follow this item by review of the licensee LER.

e. Inoperable Reactor Building Radiation Monitors.

At 10:10 p.m. on September 3, the licensee declared the Unit 3 reactor building radiation monitors 3RIA-47,48,49 and 49A inoperable due to water intrusion in the sample lines. The sample lines were drained, however, subsequent monitoring determined that water accumulation continued to occur in the sample lines. A reactor building entry was made at 2:15 a.m. on September 5 and the licensee determined that valve 3FDW-253 had a bonnet to body leak and that steam was being entrained in the monitor sample piping inlets. Valve 3FDW-253 is a 1 inch vent valve located on the 3B steam generator feedwater line inside the reactor building. The licensee redirected the steam leak by draping the valve with welding cloth and securing it to the piping. The licensee returned the instruments to service and monitored for water intrusion. The instruments were declared operable at 3:00 p.m. on September 5 after the instruments exhibited expected radiation values and trends. The licensee performed an online leak repair of valve 3FDW-253 on September 8 to stop the body to bonnet leak and prevent further steam cutting of the valve.

f. C LPSW Pump Motor Replacement

At 2:32 p.m. on September 15, the licensee removed Units 1 and 2, C LPSW pump from service to replace the pump motor due to elevated motor winding temperatures. The licensee had previously replaced the B LPSW pump motor for Units 1 and 2 on April 29, 1993, due to elevated stator temperatures and had replaced the 3A LPSW pump motor on June 30, 1993, due to a motor failure caused by insulation breakdown on the X phase motor winding. The C LPSW pump motor was replaced and the pump returned to service at

6:03 a.m. on September 16. The pump motor replacement went smoothly and the pump was returned to service within the TS required time frame.

g. Independent Spent Fuel Storage Installation (ISFSI) Cask Mispositioned in the Unit 3 Spent Fuel Pool.

At approximately 8:00 a.m. on September 20, the ISFSI storage cask was misaligned in the Unit 3 Spent Fuel Pool. The licensee was placing the empty cask on the cask pit stand located in the north east corner of the spent fuel pool when the cask was mispositioned on the stand, resulting in the cask leaning against the north end of the spent fuel pool. The maintenance personnel involved in moving the cask attempted to lift the storage cask to realign the cask to the stand, at which time the lifting hook on the cask trunion located opposite of the spent fuel pool wall shifted, the trunion end cap was knocked off and the lifting hook slipped partially off the trunion. The trunion end cap is not designed to withstand the lifting forces involved in moving the cask but provides guidance for the lifting hook until the hook is fully engaged and supporting the load. With the cask cocked on the stand the trunions were not horizontal and the one lifting hook engaged its respective trunion, lifting the cask and allowing the other lifting hook to shift and engage against the trunion end cap. The licensee stopped movement of the cask with one corner of the cask resting on the stand guide and the other corner approximately 3 inches above the stand with both lifting hooks partially supporting the load. The licensee secured the cask in its present position by opening the supply breaker to the crane and commenced to determine corrective actions to retrieve the cask from the spent fuel pool. The licensee initially decided to remove the spent fuel from the fuel racks adjacent to the cask to establish a safe radius and to ensure that fuel assemblies would not be damaged if the cask toppled over during recovery efforts. The licensee determined that 136 fuel assemblies had to be moved from the adjacent fuel racks and commenced fuel movement to relocate the assemblies in the spent fuel pool. Fuel movement was completed on September 22.

In conjunction with the fuel movement activities, the licensee developed a plan and procedure to retrieve the cask from the spent fuel pool. The licensee's retrieval plan involved securing the lifting hooks with a temporary collar, placing shims under the cask to prevent excessive tilting, lowering the cask to allow the temporary collar to be tightened to ensure full engagement of the lifting hook on the trunions, lifting the cask and placing it securely on the stand, removing the lifting rig for inspection, reattachment of the lifting rig to the cask, and removal of the cask from the spent fuel pool into the cask storage pit located adjacent to the spent fuel pool.

The licensee commenced cask retrieval efforts on September 25 and completed the transfer of the cask to the storage pit on September 27. The inspectors monitored the licensee;s activities in the spent fuel pool and witnessed cask retrieval evolutions in progress. The licensee's efforts were deliberate and accomplished in a controlled manner. Preliminary inspections of the cask did not identify any damage. The licensee does not plan to reintroduce the cask into the spent fuel pool until a root cause evaluation is completed and corrective actions implemented to prevent recurrence. The inspectors will follow the licensee's actions in this area.

h. Load Shed Channel 1

During the previous inspection period (NRC Inspection Report 269,270,287/93-22) the inspectors identified an Unresolved Item concerning the past operability of Unit 3 Load Shed Channel 1. The past operability concern resulted from the fact that the load shed channel 1 slave relay in switchgear 3TD had been incorrectly wired to a 120 VAC power supply in 1987, during implementation of a modification package. The item was identified as an unresolved item because the licensee had not completed the past operability evaluation but had stated that the preliminary review indicated that the channel had been operable.

The licensee completed the past operability evaluation during this inspection period and provided the evaluation to the inspectors for review. The licensee justification for operability was based on the operability of the other load shed channel and non-safety related undervoltage relays that would accomplish the load shed function independently of the load shed channels. Technical Specification 3.7.1.c requires that the emergency power switching logic circuitry be operable as specified by the conditions of Table 3.7-1. Table 3.7-1 requires that two circuits/channels of load shed and transfer to standby circuits (Channels A and B) be operable during normal operation. The undervoltage relays are not considered a portion of the emergency power switching logic circuitry, are not considered technical specification required components, are not safety related, and are not controlled as part of the licensee's quality assurance program.

The inspectors discussed the issue with Region II, NRR, and OE to review the licensee position with respect to the past operability of load shed channel 1 and the incorrect wiring of the switchgear 3TD channel 1 load shed slave relay. It was concluded that the post modification testing performed after implementation of modification TN/3/A/1426/00/0 had been inadequate and that the load shed channel had been inoperable since 1987 when the modification was implemented. The failure to establish an adequate post modification test program on the Unit 3 Load Shed Channel 1 circuity following the performance of Modification Package TN/3/A/1426/00/0, resulting in the incorrect wiring of the

load shed channel 1 slave relay in switchgear 3TD going undetected and the channel being inoperable from March 1987 to August 1993 is identified as Violation 287/93-24-01: Inadequate Post Modification Test Program.

Within the areas reviewed, one violation was 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 inspectors witnessed the tests, in whole or in part, to verify 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:

- TI/2/A/3001/12A, Functional Test for 2RC-4 Indication Lights. This special test procedure verified proper operation of the open and closed indicating lights for valve 2RC-4, Pressurizer PORV Block Valve, in the Safe Shutdown Facility (SSF) control room. The inspectors reviewed the special test procedure, witnessed the performance of the test from the SSF control room, and verified that the acceptance criteria was met.

- PT/0/A/0620/16, Keowee Hydro Emergency Start Test. The inspectors observed the performance of this technical specification required surveillance procedure on September 16 and September 20. On September 16 the Keowee Unit 1 generator breaker failed to close. On September 20, Keowee Unit 1 started but did not obtain expected voltage of 13.8 KV. The voltage regulator was adjusted and the test reperformed satisfactorily. This item is discussed in more detail in paragraph 5.

Within the areas reviewed, licensee activities were satisfactory.

No violations or deviations were identified.

4. Maintenance Activities (62703)

Maintenance activities were observed and/or reviewed during the reporting period to verify that work was performed by qualified personnel and that approved procedures adequately described work that was not within the skill of the trade. Activities, procedures, and work requests were examined to verify that proper authorization to begin work was given, provisions for fire were made, cleanliness was maintained,

exposure was controlled, equipment was properly returned to service, and limiting conditions for operation were met.

Maintenance activities reviewed and witnessed in whole or in part:

- WR 93030743, Install Wiring and Test 2RC-4. This maintenance activity installed a jumper in the control circuitry for valve 2RC-4, pressurizer PORV block valve, to provide power to the open indicating light in the SSF control room during an SSF event. This jumper had been inadvertently deleted during a previous modification package and was identified as Violation 270/93-21-01 in NRC Inspection Report No. 269,270,287/93-21. The inspectors reviewed the work package and observed the installation of the jumper.

Within the areas reviewed, licensee activities were satisfactory.

No violations or deviations were identified.

5. Keowee Issues

a. Both Keowee Units out of Service for Modification

At 7:34 a.m. on September 7, both Keowee units were removed from service to allow implementation of modification 52930, Replacement of Keowee Transfer Circuitry for Switchgear 1X and 2X. Technical Specification 3.7.6 allows both Keowee units to be removed from service for 72 hours provided the outage is scheduled and the 4160 volt standby busses are energized by a Lee Gas Turbine through a dedicated transmission line. The purpose of the modification package was to modify the Keowee auxiliary transfer logic scheme to allow the Keowee unit aligned to the underground path to be powered from the underground path and the Keowee unit aligned to the overhead path to be powered from the overhead path. The modification also modified the transfer to backup power supply scheme to allow power to be restored to the preferred power supply before transfer to the backup power supply occurred. The modification was implemented and the Keowee units were returned to service at 12:51 a.m. on September 8.

b. Keowee Unit 1 Failure to Start

On September 16, the inspectors witnessed the licensee's performance of surveillance PT/0/A/0620/16, Keowee Hydro Emergency Start Test. This test demonstrates the following: 1) operability of each Keowee Hydro units' emergency start circuitry from the Oconee Control Rooms; 2) the ability of the Keowee units to reach rated speed and voltage within 23 seconds; 3) the ability of the Keowee units to supply 25 MW or greater to the system grid; and 4) verification of the setpoints for time-delay relays 52-1TD and 52-2TD for the close permissive signal to the generator output breakers ACB-1 and ACB-2. Both of the Keowee units received a

start signal and Unit 2 reached rated speed and voltage satisfactorily. However, the Unit 1 generator supply breaker (Device No. 41-52) did not close and the unit did not develop an output voltage. The breaker closing coil energized but the breaker did not fully actuate and the closing coil overheated. This placed Keowee Unit 1 out of service and put the Oconee site in a 72 hour LCO per TS Section 3.7.2. The licensee promptly realigned Keowee Unit 2 from the overhead path to the underground path and verified that the unit was operable. Subsequent evaluation by the licensee determined that the breaker failure was internal to the breaker itself. The licensee initially indicated that the breaker failure was caused by high resistance in the closing coil contacts. The theory developed was that the high resistance value reduced the current to the closing coil to a value that would not close the breaker and that the closing coil remained energized and eventually overheated. The licensee replaced the generator breaker and performed the monthly performance test to verify operability of Keowee Unit 1. The monthly test starts the unit from the Oconee control room. The inspectors questioned the decision not to perform the emergency start test to verify operability. The licensee indicated that personnel considerations precluded the test from continuing in that personnel availability would be impacted since the test had been performed just prior to the end of the scheduled workweek. The licensee justified that performance of the monthly test would verify operability of the generator supply breaker. The licensee completed the Keowee emergency start test on Monday September 20.

Subsequent to replacing the generator supply breaker, the licensee performed testing on the failed breaker. The licensee determined that with 8 amps supplied to the closing coil, the breaker closed as designed. The normal current at full voltage is approximately 22 amps. The licensee also determined that current value too low to prevent the breaker from operating did not overheat the closing coil enough to cause damage. The licensee determined that full voltage and current were required to overheat the closing coil to the point of damage. The licensee also determined that the high resistance measured during the initial troubleshooting was most likely caused by the overheating of the closing coil. The coil resistance increases significantly as the coil temperature increases. The licensee believes that the resistance values measured initially were influenced by the elevated coil temperature. After further review the licensee identified that a missing cotter pin in the latching mechanism may have caused mechanical binding and prevented a previous trip signal from fully resetting. The inspectors will continue to follow the licensee's investigation.

c. Keowee Unit 1 Voltage Regulator Set Less Than Rated Voltage

During the performance of PT/0/A/0620/16, Keowee Hydro Emergency Start Test, on September 20, Keowee Unit 1 started and established

rated speed but did not established rated voltage of 13.8 KV. The machine developed 13.3 KV. The procedure acceptance criteria required that the machine develop approximately 13.8 KV. The performance technicians initially discussed signing the step off as complete based on the 13.3 KV value obtained. Subsequent discussions determined that the test would be continued and a test discrepancy initiated to resolve the low voltage concern. Design engineering was contacted and preliminary discussions determined that 13.3 KV was acceptable but that the voltage regulator should be adjusted to 13.8 KV. After completing PT/0/A/0620/16, the licensee removed Keowee Unit 1 from service to adjust the voltage regulator. The voltage regulator was adjusted and PT/0/A/0620/16 was reperformed to verify proper operation of the voltage regulator. The unit was returned to service at approximately 7:08 p.m. later that same day. The licensee determined that the voltage regulator had been set at 13.3 KV during previous maintenance activities based on information from design engineering that the minimum acceptable voltage was 13.2 KV. The licensee plans to revise the performance test to establish an acceptable voltage band based on the no-load value of 13.8 KV and is reviewing the program to ensure that the voltage regulator is required to be set at 13.8 KV for no-load conditions.

No violations or deviations were identified.

6. Review of Licensee Event Reports (92700)

The below listed Licensee Event Reports (LER) were reviewed to determine if the information provided met NRC requirements. The determination included: adequacy of description, compliance with Technical Specification and regulatory requirements, corrective actions taken, existence of potential generic problems, reporting requirements satisfied, and the relative safety significance of each event. The following LERs were reviewed:

a. (Closed) LER 269/92-11, Potential Single Failure During A LOCA/LOOP Event May Result in the Loss of Emergency Power Due to Design Deficiency.

During an engineering review, the licensee identified that a postulated failure of the Keowee Hydro underground feeder air circuit breaker could cause closure of the air circuit breaker to the overhead path on the unit aligned to the underground path. This could tie both Keowee units together through the main step up transformer, possibly out of phase, rendering both units inoperable.

To correct this problem, the control circuitry to the air circuit breakers were modified by the installation of normally closed contacts ("B" fingers) to prevent the two Keowee units from connecting to the overhead path at the same time. Also, Timer 52-1TD was replaced with a timer that has a longer range of

adjustment. The new timer is set at 6 seconds instead of 4 seconds. These modifications should prevent both units from connecting to the overhead line at the same time during emergency starts when there is a failure of the 13.8 KV underground path to Oconee. The inspector reviewed Work Request No. 9272588 01, ACB 1 and ACB 2 Interface Modification, and Procedure TN/2/A/OE4673/001, Install Interlock from ACB 1 to ACB 2 and from ACB 2 to ACB 1 - Replace Timer 52-1TD, and verified that this modification was complete.

In addition, the licensee conducted a single failure analysis of the Keowee power system. This analysis, Calculation OSC-5096, Keowee Single Failure Analysis, identified four postulated single failure problems. As of this inspection the potential single failures had either been corrected by station modifications or temporary measures had been implemented to eliminate any single failure that could render both units inoperable and prevent the Emergency Power System from performing its intended safety function. The inspectors reviewed this analysis. The licensee has completed the corrective actions for this LER.

b. (Open) LER 269/92-14, Equipment Failure Results in the Inoperability of Keowee Unit 2 Overhead Emergency Power Path and a Technical Specification Violation.

While performing post-modification testing, the licensee identified a failed relay which resulted in the inoperability of the Keowee Unit 2 overhead emergency power path. The failed relay was repaired by replacing a plastic stop nut, adjusting the contact gap according to the manufacturer's instructions and retesting the relay to ensure operability. To prevent recurrence, the licensee initiated the following corrective action:

- Inspect and repair other MG-6 type relays at Oconee and Keowee.

- Develop and implement an appropriate Preventive Maintenance program for the MG-6 type relays.

- Perform tests per the Keowee Design Basis Document.

The inspectors reviewed the licensee's corrective action and noted the following status:

MG-6 RELAYS

The MG-6 relay inspection program has been completed for Keowee (July 1993), Oconee Unit 1 (February 1993) and Oconee Unit 2 (June 1993). The inspection of the Oconee Unit 3 MG-6 relays is scheduled to be completed during the next scheduled refueling outage in early 1994. Presently only four MG-6 relays have been replaced. Four of the six MG-6 relays installed at Keowee have

been replaced with new ITE solid state type relays (Relay Nos. 27X/1X, 27X/2X, 27X/CX1 and 27X/CX2). The inspector reviewed Procedure TN/5/A/2930/00, Replacement of Keowee Transfer Circuitry for Switchgear 1X and 2X, which provided instruction and documentation for the replacement of these four relays. No discrepancies were noted. The annual performance of PT/0/A/0620/16, Keowee Hydro Emergency Start Test, verifies the operability of the new relays. An evaluation by the licensee is in progress on the remaining two MG-6 relays installed at Keowee (Relay Nos. 27T/1X and 27T/2X) to determine if these relays should also be replaced. These relays perform a safety related function during emergency start of Keowee by providing a time delay to assure that the Oconee switchyard is isolated prior to Keowee being aligned to the overhead path. The two remaining MG-6 relays are verified operable by performance of PT/0/A/0610/22, Degraded Grid Switchyard Isolation Functional Test, which is presently proposed to be performed every 18 months. The licensee had not identified any required modifications, repairs or replacements to any of the MG-6 relays installed at the Oconee facility. The NRC will continue to monitor the licensee's actions in this area.

PREVENTIVE MAINTENANCE PROGRAM FOR MG-6 RELAYS

An evaluation is in progress by the licensee to determine the appropriate items to be included in a preventive maintenance program for the MG-6 type relays. The results of this evaluation will be reviewed during a subsequent NRC inspection.

TESTING REQUIREMENT OF KEOWEE DESIGN BASIS DOCUMENT

The LER states that additional tests will be performed on the systems and components at Keowee as required by the Keowee Design Basis Document (DBD). The inspectors reviewed the DBD for Keowee, OSS-0254.00-00-1031, Design Basis Specification for the Keowee Systems and OSS-0254.00-00-2005, Keowee Emergency Power Design Basis Document. The DBD specifies the following tests be performed to verify that the system or component meet the DBD requirements. The inspectors verified that an appropriate procedure had been prepared and implemented to perform the required test.

TEST/MEASUREMENT	TEST PROCEDURE/(FREQUENCY)
Emergency start Keowee and accelerate to rated speed within 23 seconds.	PT/0/A/0620/16, Keowee Hydro Emergency Start Test. (Annually)

TEST/MEASUREMENT	TEST PROCEDURE/(FREQUENCY)
Verify emergency start signal to close permissive signal for ACB-1 and ACB-2 after a 4 second (+1 or -1 second).	PT/0/A/0620/16, Keowee Hydro Emergency Start Test. (Annually)
Verify operability of overhead electrical path from Keowee to Oconee.	PT/0/A/0610/22, Degraded Grid System Isolation Functional Test. (proposed for 18 months. First and only test performed since plant startup was conducted May 22, 1993.)
Verify operability of underground electrical path from Keowee to Oconee.	PT/0/A/0610/1J, Emergency Power Switching Logic Functional Test. (Annually)
Verify each Keowee unit transfers from normal power source to standby power source.	PT/0/A/0620/17, Keowee Manual Synchronization Test. (Annually)
Verify each Keowee unit ability to supply load equivalent to Oconee emergency load demand.	PT/0/A/0620/16, Keowee Hydro Emergency Start Test. (Annually)
Verify Keowee transformer fire protection system will discharge 1060 gpm at 54 psig.	MP/0/A/2000/032, Mulsifyre System Semi-Annual Check. (Annual functional test in summer and annual dry inspection test in winter)

Specification OSS-0254.00-00-1031, Design Basis Specification for the Keowee Systems, identifies the Keowee Hydro Station's mechanical systems and components that support the Keowee emergency power system. The following systems are identified as having a safety related function:

- Turbine Generator Cooling Water System
- Turbine Guide Bearing Oil System
- Turbine Sump Pump System
- Generator High Pressure Oil Lift System
- Governor Air System
- Governor Oil System

Although the DBD identifies the safety related systems at Keowee, no tests and measurement requirements were specified to verify the operability of these systems. There are a number of pumps, valves, and instrumentation and control devices which are not

periodically tested to verify operability. This issue was addressed by the NRC Electrical Distribution System Factional Inspection, NRC Inspection Report 50-269,270,287/93-02, which was conducted January 25 - March 5, 1993. The licensee, by letter dated July 6, 1993, committed to develop testing procedures for these components by December 31, 1993. The preparation of these procedures was in progress during this inspection period. First priority had been given to the preparation of test procedures for active components such as pumps and valves and for instrumentation and control devices which activate components such as pumps or valves. Procedures for testing and verification of instrumentation and control devices which provides a visual indication, or provides an audible alarm or activates an annunciator panel will be developed at a later date. The licensee has not provided a commitment date to the NRC as to when the operability of all of these components will be verified.

DBD Specification OSS-0254.00-00-2005, Keowee Emergency Power Design Basis Document, describes the operability requirements for the Keowee Main Transformer Fire Protection System. These requirements are verified by performance of surveillance procedure MP/0/A/2200/032, Mulsifyre System Semi-annual Check. This procedure requires two tests to be performed each year. One test is a "dry test" or visual inspection to be performed during the winter. The other test is a "wet test" or functional test to be performed during the summer. •The wet test verifies operability of all components of the fire protection system. The inspectors reviewed the most recent test performed on April 30, 1992, by procedure MP/0/A/2200/032 and noted that the Keowee fire pump had not been tested. Sections 9.5, 11.3.25 and 11.3.26 of the procedure specifically require the Keowee fire pump to be tested for operability and to verify that the pump will deliver at least 1060 gpm at a pressure of 54 psi which is adjusted if lake level is greater than 787.9 feet. Three test points are required to be obtained and plotted on the Keowee Fire Protection Pump Performance Curve, Enclosure 13.5 of the procedure. These procedure steps had been deleted from the 1992 test procedure by the "N/A" notation. The pump was not tested and verified operable by measuring discharge flow and pressure due to problems with a portable flow test meter.

Upon further investigation, the inspectors determined that the last operability test of the Keowee fire pump was performed on October 31, 1990. Using this date as the base for establishing the annual functional test schedule, the next test date would have been required October 31, 1991. However, a date of May 1, 1992, would fall within the six month grace period permitted by TS required surveillances. The 1991 annual test was performed on April 30, 1992, but this test did not perform an operability test and evaluation of the fire pump.

Selected Licensee Commitment Manual, Section 16.9.2, Sprinkler and Spray Systems, Surveillance Item a.i, requires that the Keowee Main Transformer Fire Protection System be functionally tested annually. The failure to perform an annual functional test of the fire pump, which is a component of the Main Transformer Fire Protection System, is identified as Violation 269,270,287/93-24-02: Failure to Perform Functional Test of Keowee Main Transformer Fire Protection System.

The pump was subsequently tested using a special test procedure. This test indicated that with a Keowee Lake level above 795.5 feet, the pump would deliver the required flow of 1060 gpm at a discharge pressure of 54 psi. However, the difference between the pump discharge pressure and suction pressure did not meet the past operability requirements for the pump with a lower lake level. Selected Licensee Commitment Manual Section 16.9.7, Keowee Lake Level, required lake level be maintained at a level of 787.9 feet or greater in order for the Keowee Main Transformer Fire Protection System to be operable. Presently, the pump will not meet the operability requirements with lake level below 795.5, therefore the licensee has revised Selected Licensee Commitment 16.9.7 to require lake level be maintained above 795.5 for Keowee Main Transformer Fire Protection System operability and is evaluating corrective actions to return the system to its original design capabilities. The licensee reviewed Keowee Lake levels to verify that lake level had not dropped below 795.5 since the last time the pump was verified operable.

Within the areas reviewed, one violation was identified.

7. Employee Concerns Program (TI 2500/028)

The inspectors reviewed the licensee's employee concerns program to determine if the the licensee had implemented a program to provide employees, who wish to raise safety issues, an alternate path from their normal line management to express these concerns and to encourage people to come forward with their concerns without fear of retribution. The results of this review are documented on the attached form.

8. Exit Interview

The inspection scope and findings were summarized on September 28, with those persons indicated in paragraph 1 above. The inspectors described the areas inspected and discussed in detail the inspection findings. No dissenting comments were received from the licensee. The licensee did not identify as proprietary any of the material provided to or reviewed by the inspectors during this inspection.

Item Number	Description/Reference Paragraph
VIO 50-287/93-24-01	Inadequate Post Modification Test Program (paragraph 2.h).
VIO 50-269,270,287/93-24-02	Failure to Perform Functional Test of Keowee Main Transformer Fire Protection System (paragraph 6)

Attachment

EMPLOYEE CONCERNS PROGRAMS

PLANT NAME: OCONEE **LICENSEE:** Duke Power **DOCKET #:** 50-269, 270, 287

NOTE: Please circle yes or no if applicable and add comments in the space provided.

A. PROGRAM:

1. Does the licensee have an employee concerns program? **(Yes or No/Comments)**

   Yes

2. Has NRC inspected the program? Report #_____

   No

B. SCOPE: (Circle all that apply)

1. Is it for:

   a. Technical? **(Yes, No/Comments)**

      Yes

   b. Administrative? **(Yes, No/Comments)**

      Yes

   c. Personnel issues? **(Yes, No/Comments)**

      Yes

2. Does it cover safety as well as non-safety issues? **(Yes or No/Comments)**

   Yes

3. Is it designed for:

   a. Nuclear safety? **(Yes, No/Comments)**

      Yes

   b. Personal safety? **(Yes, No/Comments)**

      Yes

   c. Personnel issues - including union grievances? **(Yes or No/Comments)**

      Yes

4. Does the program apply to all licensee employees?
(Yes or No/Comments)

Yes

5. Contractors?
(Yes or No/Comments)

Contractor employees may raise safety concerns by contracting the station's Safety Assurance Manager.

6. Does the licensee require its contractors and their subs to have a similar program?
(Yes or No/Comments)

No

7. Does the licensee conduct an exit interview upon terminating employees asking if they have any safety concerns?
(Yes or No/Comments)

Yes

C. INDEPENDENCE:

1. What is the title of the person in charge?

None

2. Who do they report to?

Corporate Management

3. Are they independent of line management?

Sometimes

4. Does the ECP use third party consultants?

No

5. How is a concern about a manager or vice president followed up?

By Human Resources and Executive Management

D. RESOURCES:

1. What is the size of staff devoted to this program?

Oconee Human Resources Staff - 8, but not devoted full time.

2. What are ECP staff qualifications (technical training, interviewing training, investigator training, other)?

Tyoically four years work experience in the Human Resource area.

E. REFERRALS:

1. Who has followup on concerns (ECP staff, line management, other)?

   Human Resources Staff
   Safety Assurance Management

F. CONFIDENTIALITY:

1. Are the reports confidential?
   (Yes or No/Comments)

   Yes

2. Who is the identity of the alleger made known to (senior management, ECP staff, line management, other)?
   (Circle, if other explain)

   Human Resources staff professional working on the investigation.

3. Can employees be:

   a. Anonymous? **(Yes, No/Comments)**

      Yes

   b. Report by phone? **(Yes, No/Comments)**

      Yes

G. FEEDBACK:

1. Is feedback given to the alleger upon completion of the followup?
   (Yes or No - If so, how?)

   Yes

2. Does program reward good ideas?

   No

3. Who, or at what level, makes the final decision of resolution?

   No level defined.

4. Are the resolutions of anonymous concerns disseminated?

   Changes are communicated.

5. Are resolutions of valid concerns publicized (newsletter, bulletin board, all hands meeting, other)?

   Changes are communicated.

H. EFFECTIVENESS:

1. How does the licensee measure the effectiveness of the program?

   Employee feedback, employee opinion survey.

2. Are concerns:

   a. Trended? **(Yes or No/Comments)**

      Yes

   b. Used? **(Yes or No/Comments)**

      Yes

3. In the last three years how many concerns were raised? _____ Closed? _____ What percentage were substantiated? _____

   No technical concerns were raised.

4. How are followup techniques used to measure effectiveness (random survey, interviews, other)?

   Employee opinion survey

5. How frequently are internal audits of the ECP conducted and by whom?

   No audits performed.

I. ADMINISTRATION/TRAINING:

1. Is ECP prescribed by a procedure? **(Yes or No/Comments)**

   Yes

2. How are employees, as well as contractors, made aware of this program (training, newsletter, bulletin board, other)?

   Employee Benefits material, Company Procedure Manual, notices GET Training and Orientation training for new employees.

ADDITIONAL COMMENTS: (Including characteristics which make the program especially effective or ineffective.)

The licensee's ECP program is primarily an administrative and personnel conerns program.

The person completing this form please provide the following information to the Regional Office Allegations Coordinator and fax it to Richard Rosano at 301-504-3431.

NAME: **TITLE:** **PHONE #:**
W. K. Poertner/ Resident Inspector/(803) 882-6927 **DATE COMPLETED:** 9/10/93