



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

Report Nos.: 50-269/92-18, 50-270/92-18 and 50-287/92-18

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: July 26 - August 22, 1992

Inspector: <u>W. Harmon</u>	9-14-92
for P. E. Harmon, Senior Resident Inspector	Date Signed
<u>W. Harmon</u>	9-14-92
for B. B. Desai, Resident Inspector	Date Signed
<u>W. Harmon</u>	9-14-92
for W. K. Poertner, Resident Inspector	Date Signed
Approved by: <u>G. A. Belisle</u>	9/15/92
G. A. Belisle, Section Chief	Date Signed
Division of Reactor Projects	

SUMMARY

Scope: This routine, resident inspection was conducted in the areas of plant operations, surveillance testing, maintenance activities, closure of open items, review of licensee event reports and both Keowee hydro units inoperable due to breaker coordination problems.

Results: One violation was identified concerning the failure of non-licensed operators to follow procedures (paragraph 2.e). In the instance cited, a procedure step requiring a nitrogen supply valve to be shut was not performed as required. Consequently, nitrogen was inadvertently supplied to the pressurizer and quench tank when an upstream valve was opened. Prompt, effective actions by the control room operators prevented overpressurization of the quench tank and failure of the tank's rupture disk.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

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

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

NRC Resident Inspectors:

- *P. Harmon
- *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 3 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.

Within the areas reviewed, licensee activities were satisfactory.

b. Plant Status

Unit 1 operated at power the entire reporting period.

Unit 2 operated at power the entire reporting period.

Unit 3 remained in a refueling outage the entire reporting period.

c. Unit 3 Midloop Operations (TI 2515/103)

The inspectors reviewed the licensee's actions with regard to reducing reactor coolant system (RCS) inventory for midloop operations. Unit 3 entered midloop operating conditions at approximately 2:35 p.m., on July 31, 1992. RCS level was increased above midloop operating conditions at approximately 12:40 p.m., on August 2, 1992. The licensee's requirements for midloop operations are contained in Operating Procedure OP/3/A/1103/11, Draining and Nitrogen Purging

of the Reactor Coolant System. The procedure requires that the following items be implemented prior to reducing RCS level below 50 inches as indicated on reactor vessel level indicator LT-5:

- A containment closure survey is performed to identify containment penetrations that would need to be closed in the event of a loss of decay heat removal capability and to ensure that containment closure can be achieved.
- Two independent RCS temperature indicators and alarms.
- LT-5 operable and calibrated.
- Ultrasonic level instrumentation operable.
- Two low pressure injection pumps operable.
- Both main feeder busses are required to be energized and two sources of electrical power are required to be available.
- Two means of adding inventory to the RCS are required.
- A review of maintenance and testing activities to ensure no adverse effects on systems and components required for decay heat removal.

The inspectors reviewed and witnessed the performance of portions of procedure OP/3/A/1103/11 and monitored activities in the control room during the vessel draindown from 50 inches on LT-5. During the review of OP/A/1103/11 prior to reducing RCS level below 50 inches, the inspectors determined that the procedure allowed one of the two low pressure service water (LPSW) pumps on Unit 3 to be inoperable if all three LPSW pumps in the shared Unit 1 and Unit 2 LPSW system were operable and the manual crossconnect valves between the systems were operable. The inspectors held discussions with the Unit 3 Manager and the Operations Superintendent and verified that both LPSW pumps on Unit 3 would be operable prior to reducing RCS inventory less than 50 inches. Subsequent to the discussions with operations management, the licensee agreed to change the procedure to require both LPSW pumps on Unit 3 to be operable prior to reducing RCS inventory to mid-loop conditions.

d. Unit 2 Control Batteries Less Than 80 Percent Capacity

During the inspection period, the licensee performed a battery capacity test to verify the test acceptance criteria contained in the 125 VDC Design Basis Document (DBD). The acceptance criteria requires that the battery capacity be greater than 80 percent. This test was performed by contractor personnel and was performed in accordance with guidance provided in ANSI/IEEE 450-1987, IEEE Recommended Practice for Maintenance, Testing, and Replacement of Large Lead Storage Batteries for Operating Stations and Substations. This test had never been previously performed. The test was performed on the 2CA battery on June 30, 1992, and the 2CB battery on July 14, 1992. Both of these are Unit 2 batteries. The test determined that battery 2CA had a capacity of 72 percent and that battery 2CB had a capacity of 76 percent. These capacities were below the acceptance criteria of 80 percent in the DBD.

The inspectors became aware that the batteries were degraded on July 30, 1992, during a review of licensee Problem Identification Reports (PIRs). The inspectors immediately contacted component engineering to question the operability of these Unit 2 batteries. The inspectors were told that the batteries were operable because; the testing requirements contained in the Technical Specifications (TS) did not require a capacity test to be performed, and the annual one hour discharge service test required by TS 4.6.10 would still have been met.

ANSI/IEEE 450 includes requirements for performing battery capacity test every five years and that annual capacity tests be performed on batteries that show signs of degradation or reach 85 percent capacity. The standard requires that the batteries be replaced if battery capacity is less than 80 percent. IEEE 450 is also referred to in the TS bases, Capacity of DC Systems.

On July 30, a meeting was conducted between the resident inspectors, component engineering, design engineering and compliance. The inspectors were told that the requirements of ANSI/IEEE 450 were not applicable to Oconee. The inspectors were told that the accountable engineer had initially reviewed the performance tests results and determined that the batteries could be returned to service based on the margin available and implementation of a battery replacement schedule for the following year. The inspectors were also told that Design Engineering (DE)

was performing an operability evaluation on the Unit 2 batteries to support continued operation and that the batteries would be brought above 80 percent capacity within six months and that the goal was to accomplish the upgrade within three months. The operability evaluation was completed on July 30, 1992, and concluded that the Unit 2 batteries were operable.

The inspectors identified concerns with regard to the licensee's actions in this area. The batteries were performance tested on June 30 and July 14, 1992, respectively and an upper tier problem investigation was not initiated until July 20, 1992, which was after the batteries were returned to service. Operations was not notified that the batteries had not met the acceptance criteria of the performance test prior to returning the batteries to service. An unofficial operability determination, documented in a memorandum to file, was performed by the accountable component engineer and was the only basis for operability of the batteries prior to DE performing an official operability review even though the capacity of the batteries did not meet the requirements of the DBD. The official operability review by design engineering was not accomplished until July 30, 1992, 30 days after battery 2CA failed to meet the requirements of the performance test acceptance criteria. The inspectors will verify the implementation of the licensee's corrective actions.

e. Mispositioned Nitrogen Supply Valve

On July 26, 1992, two non-licensed operators (NLOs) were sent to the Unit 3 Reactor Building (RB) to perform various valve lineups. At the time, the RCS was depressurized, and the water level in both RCS loops had been reduced (dropped). The pressurizer was open to the quench tank via an open pressurizer relief valve. During performance of procedure OP/0/A/1103/11, Dropping the Loops, the NLOs were directed by the procedure to shut valve 3N-161, the nitrogen supply valve to the pressurizer. Although the NLOs reported to the control room that the applicable step in the procedure had been performed, valve 3N-161 was not shut. As a result, nitrogen was inadvertently admitted to the pressurizer when an upstream nitrogen supply valve was later opened. With valve 3N-161 still open, pressurizer pressure and quench tank pressure began to increase. Control room operators immediately noticed the quench tank pressure increase, called the NLOs and directed them to close the nitrogen supply valve that they had just opened. Pressure stopped increasing when

the nitrogen supply valve was shut. Pressure in the quench tank increased to 40 psig during the event. The quench tank rupture disk is designed to actuate at 45 psig. Operators were able to avert rupture disk blowout by quick recognition of the problem and rapid venting of the quench tank to the waste gas header.

A check of several valves was performed, and valve 3N-161 was found to be open rather than closed. Valve 3N-161 was shut and the NLOs exited the RB. Licensee personnel initiated Problem Identification Report (PIR) 3-092-0294 to investigate the event.

The PIR concluded that the NLOs improperly performed Step 2.3 of Enclosure 3.1 to Procedure OP/3/A/1103/11, which directs the performer to shut valve 3N-161. At the time, the NLO performing the valve manipulation was aligning valves listed in Step 2.3 as read by the second NLO assigned the job inside the RB. The working copy read by the second NLO was not initialled by the performer. Instead, the steps were checked off by the reader after the performer replied that he had performed the steps. The reader then called the control room and reported that all valves listed in Step 2.3 had been aligned. The control room operator then signed the official copy of OP/3/A/1103/11, using the initials of the performing NLO. This is accepted practice at Ocone to minimize contaminating official copies of the valve lineup procedures. The working copy used by the two NLOs in the RB was not required to be initialled as each step was performed. As a result, the reader told the performer to align several valves listed in Step 2.3 as a group rather than one at a time.

Failure to perform the required activities in accordance with approved procedures in the instance described above is identified as Violation 50-287/92-18-01, Mispositioned Nitrogen Supply Valve.

One violation was identified in the Operations area.

3. Surveillance Testing (61726)

a. General

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:

PT/2/A/0150/22A	Operational Valve Stroke Test
PT/0/B/0610/04A	Oconee-Central Tie Supervisory Control Logic
TT/3/A/251/008	HPI full Flow Check Valve Test

Within the areas reviewed, licensee activities were satisfactory.

b. Valve Stroke Time Testing

During the inspection period the inspectors reviewed the performance test (PT) performed on valve 2LPSW-251 to verify operability in accordance with ASME Section XI. Valve 2LPSW-251 is the air operated flow control valve on the discharge of the LPSW line from the 2A low pressure injection cooler. When the valve was initially tested, the stroke time did not fall in the acceptable range as defined in the performance test. Also, the valve did not appear to fully close since flow was indicated through the LPI cooler. The stroke time of the valve fell in the alert range criteria of the procedure. When a valve falls in the alert range, the procedure requires that the testing frequency of the valve be increased to monthly as opposed to quarterly and that the accountable engineer be notified. Subsequent to the initial test, the valve was retested and it was determined that a mechanical binding problem existed in the valve operator and that the valve was not going fully closed during the stroke test. A work request was issued and the valve was repaired and subsequently retested. When the valve was retested the stroke time fell in the acceptable range as defined in the procedure.

The inspectors questioned the licensee about the adequacy of the acceptance criteria established in the procedures which control valve stroke time testing. The licensee's Inservice Testing program establishes acceptance criteria for valve testing but does not establish alert range bands for valve stroke time testing. The licensee stated that the acceptance

criteria is consistent with corporate guidance and identical to the requirements at the other Duke facilities. The inspectors are still reviewing this item. This item is identified as Inspector Followup Item 269, 270, 287/92-18-02, Review of Valve Testing Requirements.

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 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 92031237	Exempt Change Adds Groove on 3 PR-5
WR 92923483	Perform Mech/Elec PM on 3CCW-11
TN/5/A/OE4668/00	Defeat Discriminator on Keowee Circuit Breakers
MP/0/A/1400/2B	Equipment Hatch Emergency Closing
IP/A/203/C	LPI Instrument Calibration

Within the areas reviewed, licensee activities were satisfactory.

No violations or deviations were identified.

5. Closure of Open Items

a. Temporary Instruction (TI) 2515/115, Verification of Plant Records (Closed)

On April 23, 1992, the NRC staff issued Information Notice 92-30, "Falsification of Plant Records," to alert licensees to the NRC's concern that plant mechanics, technicians, and operators may have falsified plant logs at several nuclear power plants. All personnel involved in NRC regulated activities are responsible for complying with applicable NRC regulatory requirements and other Federal Laws.

The inspectors reviewed the licensee's action pertaining to the Information Notice. This included evaluation of routine surveillance requirements that

could potentially encourage falsification of records. The licensee plans to complete their evaluation in the near future.

The inspectors selected several operator rounds that required approximately forty entries into specific areas of the plant over a period of approximately one week. The rounds covered both day as well as night shifts. The completed surveillances were first reviewed and compared to the entries made as recorded by the security computer system. With the sample reviewed, no discrepancies were identified. The inspectors did note that specifically for the data selected, the time required to complete the SSF portion of Procedure OP/O/A/1102/20 ranged from twelve to thirty-nine minutes. This was brought to the attention of the licensee's management.

This TI is considered closed.

- b. NRC Bulletin 92-01, "Failure of Thermo-Lag 330 fire Barrier System" (Closed)

The licensee responded to NRC Bulletin 92-01 by letter dated July 22, 1992. The response stated that Oconee Nuclear Station does not have Thermo-Lag 330 installed as a fire barrier for small diameter conduit or wide trays which provide safe shutdown capability. Based on this information, Bulletin 92-01 is considered closed.

6. Review of Licensee Event Report (92700)

The following Licensee Event Report (LER) was reviewed to determine if the information provided met NRC requirements. The determination included; adequacy of description, verification of compliance with Technical Specifications and regulatory requirements, if corrective actions were taken, existence of potential generic problems, if reporting requirements were satisfied, and relative safety significance. The following LER was closed:

LER 269/91-03 Technical Inoperability of Oconee Backup Electrical Power Sources Results From Deficiently Designed Circuit Breaker Arrangement of Keowee Hydro Auxiliary Loads.

7. Both Keowee Hydro Units Inoperable Due to Breaker Coordination Problems

At 5:55 p.m., on August 19, 1992, the licensee declared both Keowee Hydro Units inoperable due to a potential breaker coordination problem associated with the 600 volt safety

related busses, 1XA and 2XA, that supply power to the Keowee hydro Unit 1 and 2 auxiliary equipment. The licensee determined that the potential existed for a fault on a non-safety related load powered from loadcenter 1XA or 2XA to trip the upstream loadcenter breaker from 1X or 2X respectively, if the fault occurred concurrent with a loss of power.

Technical Specification 3.7.7 allows continued operation of the Oconee units for 24 hours if both Keowee Hydro Units become unavailable due to unplanned reasons, provided the 4160 volt standby busses are energized within 1 hour by a Lee gas turbine through the 100KV transmission circuit. The licensee energized both standby busses from a Lee gas turbine at 6:28 p.m., approximately 33 minutes after declaring both Hydro units inoperable.

The breaker coordination problem was due to the fact that the breakers supplying power to loadcenters 1XA and 2XA are Westinghouse circuit breakers with Amptector solid state trip devices and include an instantaneous overcurrent trip device. The Amptector trip unit includes a discriminator function which determines, at the time of the fault, whether or not there was any current flow in the primary circuit prior to the fault. The trip unit would trip instantaneously if current flow was less than 3 percent of the sensor rating previous to the fault, indicating that the circuit had just been closed or that another switching device upstream of the breaker had been closed, and the current in the primary circuit exceeded approximately 12 times the sensor rating. The combination of zero current followed closely by high current would indicate the breaker had just closed in on a circuit with a fault. If the circuit senses such an event, an instantaneous trip of the breaker occurs, preempting both the slow trip and rapid trip features of the breaker. This feature was originally designed for personnel and equipment protection. Breaker coordination schemes did not consider the instantaneous nature of the discriminator circuit trip. The licensee determined that a loss of offsite power could arm the discriminator function of the supply breakers and that a concurrent fault on a non-safety load could result in the supply breaker tripping prior to the non-safety load breaker tripping due to the instantaneous overcurrent trip feature being enabled by the discriminator function.

The licensee generated a modification work package to jumper out the discriminator function on the supply breakers to loadcenters 1XA and 2XA. The modification was completed on Keowee Unit 1 at 12:26 p.m., on August 20, 1992 and, the unit was declared operable. The modification was completed on Unit 2 at 6:15 p.m., on August 20, 1992.

The inspectors followed the licensee's corrective actions and reviewed the modification work package implemented to delete to discriminator function. The inspectors will follow the licensee's long term corrective actions via review of the LER.

8. Exit Interview (30703)

The inspection scope and findings were summarized on August 26, 1992, 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.

<u>Item Number</u>	<u>Description/Reference Paragraph</u>
Violation 50-287/92-18-01	Mispositioned Nitrogen Supply Valve, paragraph 2.e.
IFI 50-269,270,287/92-18-02	Review of Valve Testing Requirements, paragraph 3.b.3.