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

Report Nos: 50-269/89-25, 50-270/89-25, 50-287/89-25

Licensee: Duke Power Company
422 South Church Street
Charlotte, N.C. 28242

Docket Nos.: 50-269, 50-270, 50-287 License Nos. DPR-38, DPR-47, DPR-55

Facility Name: Oconee Nuclear Station

Inspection Conducted: July 17 - August 19, 1989

Inspectors: _____ 9-7-89
P. H. Skinner, Senior Resident Inspector Date Signed

_____ 9-7-89
L. D. Wert, Resident Inspector Date Signed

Approved by: _____ 9-7-89
M. B. Shymlock, Section Chief Date Signed
Division of Reactor Projects

SUMMARY

Scope: This routine, announced inspection involved resident inspection on-site in the areas of operations, surveillance testing, maintenance activities, facility modifications, loss of decay heat removal (GL 88-17) actions, electrical power system self initiated technical audit and design basis documentation analysis, and inspection of open items.

Results: During this period the inspectors noted a weakness in the licensees program to take appropriate action to assure problems of a similar nature do not recur and also a weakness in the maintenance of physical examinations for licensed operators. A strength was noted in the area of control of activities during the period of the time a unit is in mid-loop operation as addressed by Generic Letter 88-17.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

*M. Tuckman, Station Manager
*S. Baldwin, Compliance
C. Boyd, Site Design Engineer Representative
*T. Curtis, Compliance Manager
*J. Davis, Technical Services Superintendent
D. Deatherage, Operations Support Manager
W. Dukes, Medical Doctor
W. Foster, Maintenance Superintendent
T. Glenn, Instrument and Electrical Support Engineer
*D. Havice, Instrument & Electrical Engineer
D. Hubbard, Performance Engineer
E. Legette, Assistant Engineer Compliance
*H. Lowery, Chairman, Oconee Safety Review Group
*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.H. Skinner
*L.D. Wert

*Attended exit interview.

2. An Unresolved Item is a matter about which more information is required to determine whether it is acceptable or may involve a violation. There was one unresolved item identified in this report (paragraph 3.b).

3. Plant Operations (71707)

a. The inspectors reviewed plant operations throughout the reporting period to verify conformance with regulatory requirements, technical specifications (TS), and administrative controls. Control room logs, shift turnover records, and equipment removal and restoration records were reviewed routinely. 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 week days and on weekends. Some inspections were made during shift change in order to evaluate shift turnover performance.

told that this was covered by Corporate Medical Guidelines. The station up until 1984, had Station Directives to address this process but at that time the medical groups at all sites were shifted to the direction of the corporate office. At that time the Station Directive was deleted. The medical exams were not a problem prior to 1984 since at that time it was a part of the application for a license renewal every two years, but when this was changed provisions for assuring this was done appear to have been inadequate.

A system had been established by corporate to list all Duke required physicals (crane operators, fire brigade members, licensed operators, asbestos handlers, etc.) on a computer system, but it appears that this system was incorrect and inefficient in that many operators were getting as many as three physicals a year (license, fire brigade, and respirator). As a result the licensee was in the process of correcting this inefficiency when the problem of missed medical examinations was identified. Medical personnel responsible for maintaining operator records would send notification to the operations supervision for supervisors to schedule examinations for their personnel. Since these notifications did not contain dates the supervisors did not know that the operators had exceeded their required dates. Review of the information provided to the operations department indicated that the operators did obtain their physicals upon notification by the medical department.

A computer program has now been established on site in the medical facility that has a list of all operators and the dates that their physicals are due. This list has also been provided to the supervision of each of the groups that has licensed operator personnel that maintain their license. Another factor affecting this process was that supervision normally scheduled the medical examinations for the operators without notification to the operator concerned until three days prior to the exam. This was due to the company policy associated with drug testing.

Although the operators did not get the required medical examinations during the prescribed period, each did have a physical conducted by a nurse. This 'nurse physical' is comprehensive and includes most checks provided in the physical given by the doctor except for X-ray, EKG, blood work, and drug screening. In addition, if problems are identified during the 'nurse physical' the individual is required to see a doctor. Discussions were held with the doctor that provides these examinations concerning the individuals that had exceeded their time intervals. None of these persons had any problems that would have prevented them from fulfilling their watchstanding duties. 10 CFR 50.54(k) requires an operator or senior operator licensed pursuant to Part 55 to be present at the controls at all times during operation of the facility. 10 CFR 55.21 requires a licensed operator to have a medical examination by a physician every two years to determine that the operator meets the requirements of 10 CFR 55.33(a)(1). Pending further review of these requirements

by NRR this will be identified as an Unresolved Item 50-269,270,287/89-25-01: Apparent Failure to Provide Personnel Licensed Pursuant to 10 CFR 55 at the Controls at All Times During Operation of the Facility.

c. Unit 1 Reactor Trip From 40% Power

On August 10, 1989, Unit 1 tripped from 40% full power at 3:41 p.m. The plant responded as expected. Two main steam relief valves did not reseat as expected and header pressure was reduced to approximately 970 psig to allow the valves to reseat. Upon evaluation, the licensee determined that the valves reseated within the prescribed operating tolerance of the valves. The unit was returned to critical operation at 9:10 p.m. on August 10 and was restored to 100% power operation on August 11. This trip was caused by an Instrument and Electrical (I&E) technician placing two Reactor Protective System (RPS) channels in a tripped condition at the same time. The inspectors reviewed this occurrence in detail. The sequence of events was the following: At approximately 7:00 a.m. on August 10, a low oil level alarm was received on the 1A2 reactor coolant pump (RCP) motor. The licensee commenced a power reduction at 7:45 a.m. in order to remove the pump from service. At approximately 10:00 a.m. the pump was secured and the unit was in operation in a three pump configuration. At noon the plant exceeded the steady state quadrant power tilt (QPT) limit specified in TS 3.5.2. Corrective actions were commenced by operations at that time to try to reduce the QPT to the limits allowed by TS. At 2:05 p.m. maintenance personnel had entered containment, added oil to the RCP motor and the pump was restarted. Also at approximately 2:00 p.m., the operators had not been successful in restoring the QPT, so I&E was contacted to reduce the RPS Nuclear Overpower Trip Setpoints according to the requirements of TS 3.5.2b.2. I&E personnel performed procedure IP/0/A/0301/003U, Procedure To Reset The Flux/Imbalance/Flow and High Flux Trips For Operation With Excessive Power Tilt Or Other Conditions, to adjust the RPS for this condition. Discussions with various operating and IE personnel identified the following points:

- The procedure used for this activity is a very complex procedure - several time consuming calculations prior to actual manipulations of the RPS controls.

- It has been used infrequently and a minimum number of I&E personnel are qualified to perform this activity.

- Sign offs in the procedure for step tracking are infrequent.
- Several steps have multiple action steps within the step.

In addition to the problems described above with the procedure and personnel qualifications, the individual performing the procedure

EHC trip circuitry and shorted out some components causing the loss of EHC signal. The plant responded normally to the trip although one main steam relief valve (3MS-6) did not reseat properly and operations personnel had to reduce main steam header pressure to approximately 970 psig to reseat the valve. The licensee dried out the panel, replaced the faulted components in the EHC system and restarted the unit. The unit was taken critical at 5:47 p.m. and returned to 100% at 6:15 p.m. on August 19. The relief valve has been identified as a work item for the upcoming outage presently scheduled to start on November 15, 1989.

One violation was identified.

4. 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:

WR 57855A	Perform Test on Keowee Line Relays (Annual Testing) (21L1,50P,51,50,51G,67G,87L,74PW)
PT/O/A/0610/02	Electrical Grid Trouble Protection System Logic and Switchyard Isolation Testing
MP/1/A/2200/06	Inspection and Maintenance of Keowee Unit 1 Permanent Magnetic Generator
IP/3/A/305/9	RPS 'A' Main Feedwater to Main Turbine Trip Calibration
PT/1/A/0202/11	High Pressure Injection System Performance Test
IP/O/A/0310/013C	Engineered Safeguards System Logic Subsystem 2 RB Isolation and Cooling Channel 6 On Line Test (Unit 3)
IP/1/A/0305/001E	Reactor Protective System Channel 'A' RC Temperature Instrument Calibration

No violations or deviations were identified.

5. 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 55162B	PM Control Rod Drive Breaker for Units 2 & 3 AC-3
WR 55406B	PM Control Rod Drive Breaker for Units 2 & 3 AC-6
WR 22434C	Investigate 1B LPSW Pump Abnormal Start
WR 22405C	Repack Outboard Rearing LPSW Pump 2B

b. Inadequate Retesting of Valve 3LWD-1 (62703)

On August 11, 1989, the licensee discovered that valve 3LWD-1 (Normal Reactor Building Sump Suction, Unit 3) had been returned to service following maintenance without all required retests having been performed. The torque switch on the valve's operator had been adjusted and no leak rate test was performed before this Engineered Safeguards Containment Isolation valve was returned to service. The leak rate test is required by TS 4.0.4 which requires testing in accordance with Section XI of the ASME Code. The leak test was subsequently performed with satisfactory results. Since this incident is similar to a previous issue (LER 269/88-01: TS Violations Due to Missed ASME Section XI Testing Resulting From Management Deficiency), involving valve 1RC-7, the inspectors examined the circumstances in detail. At Oconee, the control and planning of maintenance including retesting requirements is accomplished through the Work Request (WR) process. SD 3.2.1: Work Request, and Maintenance Directives (MD) 7.5.1 through 7.5.5 contain most of the applicable guidance concerning WRs. The root cause of the 1RC-7 incident as stated in the LER was a management deficiency due to the failure of management to insure the proper implementation of the station WR program used to control the work on 1RC-7. Several problems including inadequate training, failure to follow WR procedures, problems with the directives, and inadequate communications caused that incident. The LER states that programmatic problems associated with the directives and individual groups methods of implementing these directives caused the majority of the mistakes. Numerous corrective actions were identified and implemented.

After investigation, the inspectors concluded that the 3LWD-1 incident occurred primarily due to a miscommunication between the job supervisor and the Performance (PE) representative concerning the scope of the maintenance actually performed on the valve. Although the fact that adjustment had been made to the torque switch is clearly documented in the "action taken" section of the WR, a phone conversation between the job supervisor and PE failed to communicate to PE that the torque switch had been adjusted. This PE representative was well aware of the 1RC-7 incident and its causes.

NSM 2458 AL Replace Valves 2FDW-107 and 2RC-7
NSM 2458 AM Replace Valves 2FDW-107 and 2RC-7
NSM 2759 AK1 PORV Low Range Pressure Control Instrumentation
NSM 2755 AL1 Replace Pneumatic Control Loop For PORV (RC 66) With Electrical Current Control Loop and Add Time Delay

Two areas of concern were identified associated with returning a system to operation following a modification. These were training provided to operations personnel and interim drawings potentially needed by operations upon restart of the system. These problems were recently identified by the Quality Assurance group on-site following a surveillance (O-S8853) of the startup following the Unit 1 outage and a surveillance (O-S89/ST-5) conducted during the Unit 2 outage. Problem Investigation Report (PIR) 2-089-0114 has been issued with the response to be provided by the operations and projects groups management. Licensee management has indicated that these problems will be corrected prior to the upcoming refueling outage for Unit 3 which is scheduled to begin in mid - November. Pending satisfactory resolution of this PIR, the inspector is identifying this concern as an Inspector Followup Item 269,270,287/89-25-04: Resolution of PIR 2-089-0114.

No violations or deviations were identified.

7. TI 2515/101 Loss of Decay Heat Removal (GL88-17) (71707)

Inspection Report 50-269,270,287/89-17 discussed the review of two of the six applicable expeditious action items required by Generic Letter(GL) 88-17. During this report period the inspectors completed the remaining requirements of TI 2515/101.

The third applicable expeditious action item requires at least two independent, continuous temperature indications whenever the Reactor Coolant System (RCS) is in a mid-loop condition and the reactor vessel (RV) head is on the vessel. The GL requires that these temperature indications be periodically checked and recorded by an operator or automatically and continuously monitored and alarmed, depending on the location of the monitoring. The licensee committed to monitoring of the temperature indications by control room operators and formally logging those indications every two hours. Enclosure 4.7 of Operating Procedure(OP)/2/A/1103/11: Requirements for Reducing RV level Less Than 50 Inches On LT-5 (LT-5 is Oconee's RV level instrument: 50 inches on LT-5 corresponds to about 32 inches above the top of the hot leg flow area), contains independence criteria for temperature indications and monitoring requirements if the RV head is in place. Core exit thermocouple (CETC) indications from each train of the Inadequate Core Cooling Monitor (ICCM) are normally selected. If both trains of ICCM are not available, an operable CETC output is selected from the Operator Aid Computer (OAC) to be utilized along with an operable ICCM train CETC. The alarm setpoints of the selected CETC's are reduced to 140 degrees F. Performance Test (PT)/2/A/600/01: Periodic Instrument Surveillance, requires recording of the selected two primary CETC indications every two hours. During the

last Unit 2 refueling outage the inspectors observed operator compliance with these procedures and noted no problems.

The fourth expeditious action item requires at least two independent, continuous RCS water level indications whenever the RCS is in a reduced inventory condition (below about 48 inches on LT-5 at Oconee). These indications should also be either periodically checked and recorded by an operator or automatically and continuously monitored and alarmed. In the response to the GL, the licensee stated that only one permanent RCS water level indication is available per unit in the control room, with other alternatives being evaluated. The installed RV level instrumentation (LT-5) operable during draindown is a differential pressure transmitter which is connected to a water filled reference leg (which is open to containment atmosphere) and to the RCS cold leg piping. The connection tap is on the elevation center line of the cold leg piping. These characteristics make LT-5 very sensitive to variations in containment pressure or RCS pressure. In discussions with the inspectors, operators indicate that they are well aware of the limitations of LT-5. The inspectors have observed some problems with the LT-5 indication system during past outages. It was noted that although normally a temporary level indication system (tygon tubing) is installed before level is reduced below 28 inches, during the most recent outage due to a high radiation area near the connection point, this installation was not performed. The tygon tubing level indicator system, due to its RCS connection location and complications involved with running tubing over such a large elevation, has not been a reliable level indication system. During an inspection visit to McGuire Nuclear Station the inspector observed an ultrasonic detector (temporary installation) in operation. This system, based on control room operator comments, works very well. Oconee management has indicated similar options (as well as other alternatives) are being considered for Oconee. Enclosure 4.7 of OP/2/A/1103/11: Requirements for Reducing RV Level Less Than 50 Inches On LT-5, requires that LT-5 (and any other redundant level indication, excluding tygon tubing) be verified operable. PT/2/A/600/01: Periodic Instrument Surveillance, requires recording of this level indication every two hours whenever level is less than 50 inches.

The fifth applicable expeditious action requires the implementation of procedures and administrative controls to generally avoid operations

which knowingly lead to perturbations to the RCS or to systems necessary to keep the RCS stable while in a reduced inventory condition. Enclosure 4.7 of OP/2/A/1103/11 requires that the Operating Engineer or designee sign a step which states that testing or maintenance which may adversely affect the performance of systems or components required for decay heat removal is not scheduled for the period of operation less than 50 inches. While this step appears very broadly worded and requires significant judgement and coordination effort on the part of the Operating Engineer's staff, no problems have been noted in this area to date. During the last outage the inspectors followed several maintenance activities which could have affected decay heat removal capability. In all cases work was either

particularly rely on extensive coordination and involvement on the part of the operating staff, no significant problems have been noted by the inspectors. During the inspection the observations included in the NRR letter dated May 17, 1989, in response to the licensees' submittal that were considered. While the licensee's formal response appeared to contain insufficient detailed information in several areas, a closer onsite review into each of the applicable actions resulted in most of the comments being fully resolved. The licensee is continuing to evaluate installation of an additional, more reliable water level indication system in order to fully comply with the GL recommendation on water level indications.

No violations or deviations were identified.

8. Electrical Power System Self Initiated Technical Audit (SITA) and Design Basis Documentation (DBD) Analysis Programs

During this report period the licensee continued both of these programs. A meeting with NRR was held on June 22, 1989 in Washington, D.C. to discuss Oconee's Electrical Power System and related Licensee Events Reports. Followup meetings were held onsite on July 13, 1989 with AEOD personnel and July 19-21, 1989 to discuss the SITA process in more detail. Inspection Report 269,270,287/89-17 contains details of several additional electrical system problems identified by these efforts.

On August 4, 1989, as a result of the DBD effort on the 4 KV System, the licensee identified that the '2B' Reactor Building Spray (RBS) pump motor had been replaced with another motor which had different starting characteristics from the original motor. A DBD review of the calculation disclosed that under a Loss of Coolant Accident coincident with a Loss of Offsite Power event (LOCA/LOOP), the motor may have tripped while starting. The licensee immediately declared the spray pump inoperable and entered a 7 day Limiting Condition for Operation in accordance with TS 3.3.6.c.(2). The overcurrent relays were reset to the new calculated settings and the pump was declared operable at 1155 on August 5, 1989. Because incorrect or inappropriate motor overcurrent settings have been a problem in the recent past at Oconee (LER 269/87-05: High Pressure Injection (HPI) Pumps Potential Tripping, LER 269/88-13: Lee Gas Turbines Unacceptable as Backup Emergency Power), the inspectors examined closely this latest issue in regards to the corrective actions of the earlier issues. The licensee informed the inspectors that after the HPI pump motor overcurrent issue had been identified, all safety equipment that would be actuated on a LOOP or a LOCA was reviewed to ensure that the overcurrent relays were set correctly. During those reviews the Design Engineering (DE) personnel involved utilized the starting characteristics of the original spray pump motors. Review of the spray pump motor calculations as part of the DBD analysis revealed that the motors had been replaced with motors of different starting characteristics. Although several spray pump motors had been replaced, analysis revealed that only the '2B' motor had this incorrect overcurrent setting problem. The motor had been replaced in 1980 which was prior to the licensee's initiation of The Overall Plan for Organizational Review of Modifications (TOPFORM)

program which contains requirements specifically designed to prevent such occurrences during modifications. The licensee informed the inspectors that all other safety related motors have been examined to ensure that their overcurrent settings are correct. The '2B' RBS pump motor appears to have been a unique problem caused by an error during the analysis (after the HPI motor incident) of LOCA loads fed via the underground emergency power path. The licensee's present modification process ensures that this problem would not occur on a pump motor replaced or added in the future. This item will be identified as a Noncited Violation; NCV 270/89-25-03: Reactor Building Spray Pump Motor Incorrect Overcurrent Relay Settings. This licens identified violation is not being cited because criteria specified in Section V.G.1 of the NRC Enforcement Policy were satisfied.

Another potential problem was identified by the SITA team on July 20, 1989 during the onsite portion of their 4160V system audit. During a tour of the Keowee Hydro Station battery room, the team identified that cable trays and HVAC duct work above the batteries appeared to not be seismically qualified. A Problem Identification Report (PIR) was initiated. A subsequent DE review found that the cable trays and ductwork are not seismically designed. Although the FSAR does not specifically require review of interactions between QA Condition I components and non-seismic components, DE looked into this issue and concluded that seismic interaction between the trays or ducts and the Keowee batteries are not a safety concern. A memorandum to file documents this conclusion and supporting information. This memo notes that the overall issue of seismic interaction for equipment necessary for safe shutdown will be addressed when Unresolved Safety Issue (USI) A-46 is resolved by walkdowns in accordance with Seismic Qualification Utilities Group (SQUG) guidelines.

In response to observations stated during the July 19-21 meeting between NRR representatives and the licensee and the inspectors concerns (see Inspection Report 269,270,287/89-17 and LER 269/89-09), the licensee established a task force to revise TS 3.7, Auxiliary Electrical Systems. The inspectors were concerned that significant problems with the TS which had recently been discovered would not be corrected in a timely matter. While it would be premature to submit a complete detailed revision to TS 3.7 before the DBD and SITA efforts are complete, the significant concerns recently discovered should be addressed promptly such that operation in an unanalyzed or not permitted configuration is prevented. The task force met on July 19, 1989 and decided that the recent TS 3.7 submittal will be revised and resubmitted by about September 1, 1989. The licensee discussed these changes with the inspectors and ensured that their immediate concerns would be satisfied. A complete rewrite of the TS is expected to be submitted about June 1991. This revision is intended to improve the format of the TS, make it less confusing and improve its ease of use for the operators, in addition to incorporating the results of the SITA/DBD programs and other concerns of the operators. The inspectors will continue to closely follow the SITA and DBD efforts and results.

be complete by June 1, 1989. The inspectors conducted a review to determine if this LER could be closed. The chemistry department had initiated action to have the degraded valves replaced. Five valves had been identified but only two had been replaced. The second action had also been accomplished, in that, the chemistry department had performed an evaluation and determined that the facility was understaffed, but no action has been taken by management to address this problem. Since the LER implies, although not stated, that the actions taken will preclude a similar occurrence from happening, the inspectors considers that insufficient actions have been taken to prevent this problem from recurring although the specific action was taken. The inspectors discussed this with upper management and a review of this issue is being performed. This item will remain open pending further review and action taken by management.

10. Exit Interview (30703)

The inspection scope and findings were summarized on August 19, 1989, with those persons indicated in paragraph 1 above. The inspectors described the areas inspected and discussed in detail the inspection findings listed below. The licensee did not identify as proprietary any of the material provided to or reviewed by the inspectors during this inspection. Dissenting comments were not received from the licensee.

Item Number	Description/Reference Paragraph
UNR 269,270,287/89-25-01	Apparent Failure to Provide Personnel Licensed Pursuant to 10 CFR 55 At The Controls At All Times During Operations Of The Facility, paragraph 3.b.
VIO 269,270,287/89-25-02	Inadequate Corrective Action to Preclude Recurrence of Events (two examples) paragraphs 3.c and 5.b.
NCV 270/89-25-03	Reactor Building Pump Motor Incorrect Overcurrent Relay Settings, paragraph 8.
IFI 269,270,287/89-25-04	Resolution of PIR 2-089-0114, paragraph 6.