



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

Report Nos.: 50-269/88-20, 50-270/88-20, 50-287/88-20

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

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

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

Facility Name: Oconee 1, 2, and 3

Inspection Conducted: July 18 - August 15, 1988

Inspectors:

P. H. Skinner, Senior Resident Inspector

8/23/88
 Date Signed

L. D. Went, Resident Inspector

8/23/88
 Date Signed

Approved by:

T. A. Peebles, Section Chief
 Division of Reactor Projects

8/23/88
 Date Signed

SUMMARY

Scope: This routine, announced inspection involved resident inspection on-site in the areas of operations, surveillance testing, maintenance activities, safeguards and radiation protection, and inspection of open items.

Results: Of the six areas inspected, no violations were identified. Weaknesses were noted with respect to communications between some onsite or offsite support groups and the on-shift operators and between operators and technicians during performance of tasks. This observation was expressed to the licensee during the exit interview.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

- *M. Tuckman, Station Manager
- *C. Boyd, Site Design Engineer Representative
- J. Davis, Technical Services Superintendent
- W. Foster, Maintenance Superintendent
- T. Glenn, Instrument and Electrical Support Engineer
- *C. Harlin, Compliance Engineer
- D. Hubbard, Performance Engineer
- *H. Lowery, Chairman, Oconee Safety Review Group
- *T. Matthews, Production Specialist
- J. McIntosh, Administrative Services Superintendent
- F. Owens, Assistant Engineer, Compliance
- 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. Licensee Action on Previous Enforcement Matters

(Closed) Violation 269,270,287/88-08-05: Failure to Provide An Adequate Procedure to Identify Components Requiring Maintenance. The inspectors reviewed the licensees corrective actions both completed and planned. A revision to Station Directive 3.2.1 clearly provides better guidance for correct component verification. Additionally the licensee is in the process of labeling all instrumentation root valves, beginning with those root valves judged most important to safe operation of the facility. This program, while extensive and time consuming should help minimize wrong train or wrong unit type incidents in the future. Based on this corrective actions, this item is closed.

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 and 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. 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
- Units 1, 2, and 3 Electrical Equipment Rooms
- Units 1, 2, and 3 Cable Spreading Rooms
- Station Yard Zone within the Protected Area
- Standby Shutdown Facility
- Units 1, 3 Penetration Rooms
- Component Cooling Water Intake Structure
- Switchyard

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

Unit 1 - Unit 1 began the period operating at 100% power and remained at that level except for a few hours on August 4 when power was reduced to approximately 93% due to Main Turbine Alterex coupling problem.

Unit 2 - Unit 2 operated at 100% power for the entire report period with the exception of several hours at 96% on July 22 for feedwater heater problems.

Unit 3 - Unit 3 operated at 100% power until August 10 when the unit was shutdown for a scheduled 44 day refueling outage.

- b. Standby Shutdown Facility (SSF) Heating, Ventilation and Air Conditioning (HVAC) System Low Condenser Flow.

Primarily as a result of a licensee letter to the NRC dated July 15, 1988, describing test results indicating low service water flow through the SSF HVAC condensers the resident inspector visited Duke Power Company's general office and met with the involved design

engineering personnel. The purpose of the visit was to review design engineerings (DE) analysis of the HVAC issue and to discuss how DE interfaced with onsite personnel in resolving this problem.

The Oconee SSF is designed to provide an alternate and independent means to achieve and maintain hot shutdown conditions for one or more of the Oconee units. Among the support systems within the SSF is the SSF HVAC Service Water system consisting primarily of two service water pumps which circulate Condenser Circulating Water (CCW) through the two HVAC condensers. This system was designed to be capable of providing the required SSF cooling using only one service water pump with CCW (lake water) temperatures at 80 degrees F. The remaining pump was for backup purposes.

In the summer of 1987, as a result of the Reactor Building Cooling Units and Low Pressure Injection Coolers fouling issue in conjunction with elevated lakewater temperatures, a 10 CFR 50.59 evaluation was completed to allow operation of station service water systems at lakewater temperatures up to 85 degrees F. The only adverse effect of this elevated lakewater temperature on the SSF concerned the SSF HVAC system. Compensatory actions were taken which included procedural revisions to require the operation of both SSF HVAC service water pumps during SSF operations and securing the security computer (an SSF HVAC load) when required. At that time design engineering calculations determined that a total condenser service water flow of 41 gpm would be required with 85 degrees F lakewater temperature to allow the SSF HVAC system to maintain required SSF Control Room temperatures during an SSF event. Although service water flowrates through the condensers had not been measured (during performance testing) with both pumps running simultaneously, all available design information indicated that the flow would be at least 41 gpm.

In early March of this year test personnel identified that only 34.5 gpm total service water flow was going through the HVAC condensers with both service water pumps running. The exact cause of this unexpectedly low flow is still being investigated. When the 34.5 gpm flowrate was used in design engineering calculations to predict the flowrate during an SSF event, the resultant flowrate was only 25.9 gpm. (The measured flowrate is modified primarily by the lower suction pressure and higher water temperatures that would exist during an SSF event under certain conditions.) Further evaluation concluded that under the existing condenser flowrates and operating procedures the SSF HVAC system was operable to 67 degrees F lakewater temperature. (Lake Keowee had not yet exceeded 67 degrees F in 1988). A procedural change requiring diversion of the SSF diesel service water discharge to the station yard drain system instead of recirculating it back to the SSF Service water suction enabled the SSF to be operable to 85 degrees F lakewater temperature with the measured 34.5 gpm condenser flowrate.

The inspector reviewed and discussed several design engineering calculations concerning the SSF HVAC System with the engineers involved. The inspector noted that design engineers efforts to "benchmark" the SSF HVAC System model to the measured parameters in order to predict system performance under SSF event conditions were particularly strong overall. Although the root cause of the less than expected condenser flowrate is yet to be determined, the engineers have taken the observed performance and applied numerous conservatisms to predict the performance under the most limiting SSF conditions. The inspector did not find any significant deficiencies in the calculations but several concerns were expressed during the reviews:

- Some portions of the calculations utilized data which was obtained with the condenser inlet 3-way control valves positioned to allow full service water flow through the condenser and a manual globe valve in the condenser bypass line shut (All service water flow going through the condenser, none through the bypass line). Under normal operating conditions the manual bypass valves are not shut and some flow could bypass the condensers if the 3-way control valve does not fully position or leaks by.
- When calculations were made of the resistance to service water flow of the two condensers in parallel a nonconservative value may have been utilized due to the method by which the condenser differential pressure was measured and applied in the calculation.
- Communications to onshift operators did not sufficiently emphasize the operational configuration of the SSF HVAC Service Water system assumed by design engineering and thus required for the system to fulfill its intended safety function. Both Service Water pumps are required to be operable vice one with the other as a backup. The bypass line isolation valves are not addressed in the SSF operating procedure but their operation would play an important role under the present system limitations.

These concerns will be identified as Inspector Followup Item 269,270,287/88-20-01: SSF HVAC Condenser Low Service Water Flow.

In addition, the licensee states that there is a higher than expected differential pressure between the service water pumps discharge and the flow measuring orifice with the cause unknown. Excessive soft deposits of silt, mud, and/or corrosion products were found in the piping near the flow detector but two check valves which appear to be easily inspectable have not yet been examined for fouling. Along with the ongoing analysis (to 90 degrees F lakewater temperature) of all Oconee plant systems effected by higher lakewater temperatures,

(see Inspection Report 269,270,287/88-15) the addition of a third SSF HVAC service water pump is being designed. Analysis indicates that the SSF HVAC Service Water system will not be operable without more flow through the HVAC condensers if Lake Keowee temperature exceeds 85 degrees F. While current information projects that the lake will probably peak at approximately 83 degrees F, plans are being made to install the pump if necessary. Overall the inspector was impressed by the efforts of an apparently very busy design engineering group towards solving these issues. The resident inspectors will continue to closely follow licensee actions to fully resolve this issue.

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/or witnessed in whole or in part:

DP/0/A/310/14C Engineered Safeguard Analog Channel 'C'
 Functional Test (Unit 1)
 PT/3/A/0600/12 TDEFWP Surveillance Test
 PT/1/A/0600/12 TDEFWP Performance Test (Unit 1)
 OP/0/A/1600/10 Operation of the SSF Diesel - Generator
 PT/0/A/600/21 SSF Diesel Generator Operation
 PT/3/A/0261/07 Emergency CCW System Flow Test

No violations or deviations were identified.

5. 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/or witnessed in whole or in part:

WR 92538C Repairs to 3LPSW-16
 WR 92511C Repairs to PR-5 (Reactor Building Purge Isolation Valve)

WR 050827H Replacement of Card 104 in ICCM '1A'
WR 92519C Repair Pump Outboard Bearing on TDEFWP Unit 1
WR 92458C Repair FDW-369 Failure to Open During PT

No violations or deviations were identified.

6. Safeguards and Radiological Controls Activities (71709, 71881)

a. In the course of the monthly activities, the Resident Inspectors included review of portions of the licensee's physical security activities. The performance of various shifts of the security force was observed in the conduct of daily activities which included; protected and vital areas access controls, searching of personnel, packages and vehicles, badge issuance and retrieval, escorting of visitors, patrols and compensatory posts. The inspectors observed protected area lighting and protected and vital areas barrier integrity, and verified interfaces between the security organization and operations or maintenance. In addition, the inspectors toured the new Radwaste Facility during this inspection period.

b. New Radwaste Facility

The inspectors toured the Radwaste Facility (RWF) which is approaching completion of construction. While most of the facility is not yet operable, during the last week of July, control and monitoring of liquid radiological effluent was shifted to this facility. The liquid radwaste control valves and effluent monitors are located in the new radwaste facility and controlled from the new facility's control room as discussed in section II of the Oconee Nuclear Station Final Safety Analysis Report (1986 update). Personnel in the Unit 1/2 control room will no longer be able to directly control or monitor a liquid release. During a short tour of the new facility the inspectors noted several areas in which operation of the radwaste facility could impact on station operation;

- Instrument air provides a backup source of control air to the radwaste facility. The supply valve to the new facility is interlocked shut at low air pressure.
- The new facility is powered from station main feeder busses 2TE and 3TE.
- Equipment cooling water utilized throughout the RWF is supplied by the Condenser Circulating Water System.
- Liquid waste releases will be controlled from the RWF control room, not the Unit 1/2 control room as before.
- Liquid waste releases will be monitored by 1RIA-33 and 1RIA-34 located in the RWF. These monitors are controlled by TS and addressed in the FSAR.

- The RWF adds additional responsibility to onsite firefighting and medical assistance personnel.

The residents will continue to follow the completion of the RWF with emphasis on the control and monitoring of radiological releases as well as the other items noted above.

Also included in the routine monthly activities were observations of radiological protection practices. These activities included reviews of radiological work permits, control of internal and external radiation exposures, posting of radiation requirements, observation of high radiation areas, and personnel entries into those areas.

No violations or deviations were identified.

7. Inspection of Open Items (92701)

The following open items are being closed based on review of licensee reports, inspection, record review, and discussions with licensee personnel, as appropriate:

(Closed) Inspector Followup Item 50-269,270,287/85-21-02: Review of Purchase Orders for Undervoltage Devices. This item was opened pending the licensee obtaining vendor information on the undervoltage device part numbers at the site. MP/O/A/2001/4, CRD Breaker Inspection and Maintenance procedure was reviewed and the vendor information for UV devices has been incorporated into this procedure. Based on this review, this item is closed.

8. Exit Interview (30703)

The inspection scope and findings were summarized on August 16, 1988, with those persons indicated in paragraph 1 above. The following items were discussed in detail:

<u>Item Number</u>	<u>Status</u>	<u>Description/Reference Paragraph</u>
269,270,287/88-08-05	Closed	Failure to Provide An Adequate Procedure to Identify Components Requiring Maintenance. (See Paragraph 2a)
269,270,287/88-20-01	Open	SSF HVAC Condenser Low Service Water Flow (See Paragraph 3b)
287/85-21-02	Closed	Review of Purchase Orders for Undervoltage Devices (See paragraph 7)

The licensee representatives present offered no dissenting comments, nor did they identify as proprietary any of the information reviewed by the inspectors during the course of their inspection.