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

Report Nos.: 50-269/85-21, 50-270/85-21, and 50-287/85-21

Licensee: Duke Power Company
422 South Church Street
Charlotte, NC 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 29 - August 2, 1985

Inspectors: L. E. Foster 9/3/85
L. E. Foster, Team Leader Date Signed

J E Gordon for 9-4-85
N. Merriweather Date Signed

L. E. Foster for 9/3/85
M. J. Davis Date Signed

Consultant: P. M. Chan, Lawrence Livermore National Laboratory

Approved by J E Gordon 9-4-85
T. E. Conlon, Section Chief Date Signed
Division of Reactor Safety

SUMMARY

Scope: This special, announced inspection entailed 124 inspector-hours on site concerning licensee response to Generic Letter 83-28, Required Actions Based on Generic Implications of Salem Anticipated Transient Without Scram (ATWS) Events. Areas inspected included: post-trip review; equipment classification; vendor interface and manual control; post-maintenance testing; and reactor trip system reliability.

Results: Two violations were identified: Failure to Follow Procedure During Classification of Work Request, paragraph 7 and Inadequacies in Development and Implementation of Procedure MP/0/A/2001/4, CRD Breaker Inspection and Maintenance, paragraph 9.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

*J. Pope, Superintendent of Operations
*T. Owen, Superintendent of Maintenance
*W. McAlister, Instrumentation and Electrical (I&E) Engineer
*T. Glenn, I&E Support Engineer
*T. Matthew, Compliance Technical Specialist
D. Clardy, Planning and Scheduling Supervisor
*R. Bond, Compliance Engineer
D. Phillips, Electrical Foreman
D. Gibson, Vendor Manual Group Clerk
*G. Edens, Support Engineer
G. Davenport, Performance Engineer
B. McKinney, Electrician
L. Evans, Electrician
T. Graham, I&E Specialist
S. Henderson, Document Control
R. Murrell, I&E Specialist
M. Roach, Administrative Supervisor
B. Loftis, I&E Engineer
D. Larson, Planning & Scheduling
C. Phouletter, Planner and Scheduler
A. Green, Planner and Scheduler
*P. Waltman, Quality Assurance
*F. Siurua, I&E Associate Engineer
C. Parsons, Performance Engineer
L. Staggers, Document Control Clerk

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

NRC Resident Inspectors

*J. C. Bryant, Senior Resident Inspector
*L. King, Resident Inspector

*Attended exit interview

2. Exit Interview

The inspection scope and findings were summarized on August 2, 1985, with those persons indicated in paragraph 1 above. The inspector described the areas inspected and discussed in detail the inspection findings. No dissenting comments were received from the licensee.

Violation 50-269/85-21-01, Failure to Follow Procedure During Classification of Work Requests, paragraph 7.

Inspector Followup Item 50-269,270,287/85-21-02, Review of Purchase Orders for Undervoltage Devices, paragraph 3.

Violation 50-269,270,287/85-21-03, Inadequacies in Development and Implementation of Procedure MP/O/A/2001/4, CRD Breaker Inspection and Maintenance, paragraph 9.

The licensee did not identify as proprietary any of the materials provided to or reviewed by the inspectors during this inspection.

3. Licensee Action on Previous Enforcement Matters

This subject was not addressed in the inspection.

4. Unresolved Items

No unresolved items were identified during this inspection.

5. Background

In February 1983, the Salem Nuclear Power Station experienced two failures of the reactor trip system upon the receipt of trip signals. These failures were attributed to Westinghouse - Type DB-50 reactor trip system (RTS) circuit breakers. The failures at Salem on February 22 and 25, 1983, were believed to have been caused by a binding action within the undervoltage trip attachment (UVTA) located inside the breaker cubicle. Due to problems of the circuit breakers at Salem and at other plants, NRC issued Generic Letter 83-28, Required Actions Based on Generic Implications of Salem ATWS Events, dated July 8, 1983. This letter required the licensees to respond on immediate-term actions to ensure reliability of the RTS. Actions to be performed included development of programs to provide for post-trip review, classification of equipment, vendor interface, post-maintenance testing, and RTS reliability improvement. The licensee responded to Generic Letter 83-28 by correspondence with the following dates: November 4, 1983; December 30, 1983, January 17, 1984; February 2, 1984; July 5, 1984; August 10, 1984; March 20, 1985; March 29, 1985; and April 25, 1985. This inspection was performed to review the licensee's current program, planned program improvements, and implementation of present procedures associated with post-trip review, equipment classification, vendor interface, post-maintenance testing, and reactor trip system reliability for Oconee Unit Nos. 1, 2, and 3.

6. Post-Trip Review

The licensee was requested in GL 83-28 to describe their program, procedures, and data collection capability to assure that the causes for unscheduled reactor shutdowns, as well as the response of safety-related equipment, are fully understood prior to plant restart. The licensee's

response to GL 83-28 gives a description of the program and procedures pertinent to performing post-trip reviews. The inspector reviewed their response, appropriate procedures, and interviewed responsible licensee personnel to assess the adequacy of the licensee's program for post-trip reviews.

The licensee has prepared and revised procedures to define responsibilities, authorities, methods of assessment, training, and equipment needed to perform a timely technical post trip review. Their program and implementation observed are discussed below:

The Oconee post-trip review program is addressed and implemented by Performance Manual Chapter 4.7, "Support of Reactor Trips - Performance" and by Operations Management Procedure 1-8, "Investigation of Reactor Trips".

The Shift Supervisor, Operations Unit Engineer, and Operations Duty Engineer are responsible for determining the cause of any reactor trip.

The Performance Duty Engineer is responsible for conducting an independent evaluation of the reactor trip event. These activities are documented by the completion of the "Post-Trip Review Report", which is an attachment to Performance Manual Chapter 4.7.

Any unplanned manual or automatic trip will require a full post trip review report and the assembly of plant data which may include events recorder printout, alarm typer printout, Transient Monitor Computer output in graph or table form, strip charts, operator interviews, and logbooks.

Prior to restart of the unit, operations personnel must ensure that:

The immediate cause of the reactor trip is known or has been investigated to the fullest extent possible while remaining in the shutdown condition.

Plant transient behavior did not identify unresolved problems that could impact the ability of the unit to be safely restarted and operated.

Any malfunction or failures in equipment or components subject to Technical Specifications requirements are evaluated and corrected prior to restart.

Operations shall ensure that the Reactor Engineer's recommendations are resolved prior to restart and shall obtain his/her concurrence with restart as indicated by the Reactor Engineer's signature on the trip recovery operating procedure or documented in the SRO log. The Station Manager, or his designee, is required to resolve disagreements between Operations and the Reactor Engineer regarding necessary corrective action.

If the immediate cause of the reactor trip cannot be determined, or if any unresolved safety issues exist, or if compliance with licensing requirements is in question, then an independent review is performed by a group of knowledgeable individuals identified by the Station Manager. This group makes a recommendation on restart to the Station Manager, or his designee, who then resolves the restart decision.

Each reactor trip is subsequently evaluated by the Compliance Section in accordance with Compliance Manual Section 5.1, "Non-Routine Events Reporting". An incident investigation report is prepared that includes the following:

Information and data collected during the Post-Trip Review.

A Sequence of Events describing all action taken and system/equipment performance during the event that materially affected the course of the event.

An assessment of the plant transient behavior that identifies any deviations from expected plant performance and that documents the behavior of key plant parameters.

An assessment of the performance of protection and Engineered Safety systems during the transient, identifying any malfunctions or failure to perform as expected.

An assessment of other equipment failures that contributed to the event.

An assessment of personnel performance and procedure adequacy relevant to the event.

A description of corrective actions taken or planned as a result of the event.

Post-Trip Review packages are maintained in fire-resistant file cabinets in the Performance Engineering Office.

The inspector reviewed post-trip data review packages generated for eight reactor trips that occurred in 1985 and and seven reactor trips that occurred in 1984. The packages were thorough and adequately documented the events.

The inspector conducted a review of licensee procedures to verify that they were consistent with licensee responses to GL 83-28. The following procedures were reviewed:

Compliance Manual Section 5.1, Non-Routine Events Reporting, 11/9/84

Operations Management Procedure 2-1, Duties of the Reactor Operators on the Control Board, the SRO in the Control Room, and the STA, 4/17/85

Operations Management Procedure 1-8, Investigation of Reactor Trips, 11/1/84

Performance Manual Section 4-7, Support of Reactor Trips - Performance, 9/21/84

Operations Management Procedure 1-3, Operations Duty Engineer, 3/13/85

Operations Management Procedure 1-1, Administration of Operations Management Procedures, 12/3/84

Performance Manual Section 3.1, Procedures - Performance, 3/26/85

Operations Management Procedure 3-1, Operations Training, 11/1/84

Station Directive 4.5.1, Non-Routine Events Reporting, 12/1/84

The licensee is preparing to replace the General Electric (GE) PAC 4020 plant computer systems with the Honeywell 45000 computer systems over the next three years. The alarm typer output device is associated with the plant computer. Digital alarms and change of status indications of safety-related pumps, valves, and motors are printed on the typer to the nearest second. This device is powered by a non-class IE, non-interruptible AC source.

The Transient Monitor System is a dedicated computer system. Data is received via hardwired inputs one per second and stored on a hard disk. Data output can be in either graph or table form. The parameters recorded by the transient monitor document the pre-trip and post-trip behavior of the primary system, secondary system, important Balance of Plant (BOP) systems, and safety systems. The transient monitor is powered by a non-class IE AC source which is interruptible but will automatically transfer to the onsite AC backup on loss of power.

The Events Recorder is a dedicated computer system which monitors equipment and components pertinent to reactor trip investigations. Output is on a paper tape and the time of each event is recorded, with discrimination down to one millisecond, along with the parameter number. This device is powered by a non-class IE AC source which is interruptible but will automatically transfer to the onsite AC backup on loss of power. Additionally, a safety-related non-interruptible DC backup power supply is provided.

The licensee is in the process of installing the Safety Parameter Display System (SPDS) data collection and processing system associated with the NUREG 0737 upgrade of Emergency Response facilities. Although, the current data and information collection systems are adequate for the evaluation of unplanned reactor trips, the new system should enhance the plants' data collection capabilities.

Interviews revealed that plant personnel preparing and/or reviewing the post-trip documentation were familiar with plant systems, equipment, and plant operation.

Within the areas examined, no violations or deviations were identified.

7. Equipment Classification

The licensee was requested in Sections 2.1 and 2.2 of GL 83-28 to confirm that all components of the reactor trip system whose function is required to trip the reactor are identified as safety-related. This identification was to be on documents, procedures, and information handling systems used in the plant to control safety-related activities including maintenance, work orders, and parts replacement. In addition, the licensee was requested to describe their program for ensuring that all components of other safety-related systems necessary for accomplishing required safety functions are also identified as safety-related on information handling systems used at the plant. The licensee's response to Sections 2.1 and 2.2 of GL 83-28 gives a detailed description of the program and procedures for safety-related equipment classification. The licensee makes the following statements in their response dated November 4, 1983:

> "Station specific documents provide the mechanism for the determination of whether or not a given station structure, system, or component is safety-related. This document is provided to appropriate station and general office personnel and is entitled, "Oconee Nuclear Station Safety-Related Structures, Systems, and Components Manual".

The inspector reviewed their response, appropriate procedures, and interviewed responsible licensee personnel to verify if the licensee's program for equipment classification was adequate and consistent with the above response. During this inspection, the inspector reviewed the following procedures and documents listed below:

> Oconee Nuclear Station Maintenance Directive III.B, Work Request Planning, Revision dated April 16, 1984
>
> Oconee Nuclear Station Directive 3.2.1, Work Request, Revision dated July 8, 1985
>
> Quality Standards for Structures, Systems, and Components
>
> Oconee Nuclear Station Directive 4.5.4, QA Condition Determinations, Revision dated December 1, 1984
>
> Technical Specification 6.4, Station Operating Procedures
>
> Duke Power Company Steam Production Department Administrative Policy Manual for Nuclear Stations

As stated above, the licensee has developed the Quality Standards Manual for Structures, Systems, and Components which identifies safety-related components. The intent of this procedure is to identify both mechanical and electrical safety-related components. The inspector reviewed the procedure and found it to be somewhat general in identifying safety-related components. Interviews with planning department personnel pointed out a weakness with the piping drawings in identifying safety-related instruments. The licensee acknowledged that the Q-Lists are to general and that they are considering improving the Q-Lists with more detail. Section 4 of this procedure also includes an instruction for making component classifications. The inspector reviewed four equipment classification evaluations for the following plant components:

- Inlet and Outlet Thermometers on SSF AC Unit
- Valve 2SD-325
- 3MS - 140
- Filters on SSF HVAC Equipment

No concerns were identified with the equipment classification evaluations reviewed.

The inspector randomly selected several work requests (WRs) for examination to verify that work activities were being properly classified as safety-related or non-safety-related as required by the above procedures. The work requests reviewed and associated classifications assigned are identified below:

Work Request No.	Classification
22518B	Nonsafety
56263	Safety-Related
56890	Safety-Related
56888	Safety-Related
22840B	Nonsafety
83761B	Nonsafety
22790B	Nonsafety
22549B	Nonsafety
51724D	Nonsafety
23178B	Safety-Related
23030B	Safety-Related
22827B	Nonsafety
22843B	Nonsafety
50197C	Nonsafety
50196C	Nonsafety
23070B	Nonsafety
22838B	Nonsafety
23071B	Nonsafety
23069B	Nonsafety
23068B	Nonsafety
54666C	Safety-Related
23108C	Nonsafety

In reviewing the above WRs, the inspector identified a discrepancy in the way the licensee was classifying the calibration of the power range instrumentation channels 5, 6, 7 and 8 (channels A, B, C, and D respectively of Reactor Protection) on WR 22790B, dated July 17, 1985. The licensee identified this WR as non-safety-related. Subsequent to this WR on July 20, 1985, the licensee identified WR 23020B as safety-related QA condition 1. The inspector reviewed the Quality Standards Manual for Structures, Systems, and Components and determined that the power range nuclear instrumentation is classified as safety-related. The work required by the work sequence on both work requests required the calibration of the NIs using Instrument Procedure IP/O/A/301/3T, Reactor Protective System Power Range Calibration at Power. This procedure is considered to be safety-related; however, the reviews required prior to performing a non-safety WR are not the same reviews required for a safety-related work request. QA condition WRs are required by Station Maintenance Directive III.E to be reviewed by the Station QA Section. The licensee was informed of the above discrepancy with the safety classification of WR 22790B. The licensee considered this to be an isolated case of failing to properly classify a safety-related WR for nuclear instrument (NI) calibrations. At the request of the inspector, the licensee ran a computer sort of the work history for power range nuclear instruments for calendar years 84 and 85 to determine if this was an isolated case. The results of this computer sort indicated that the licensee had misclassified five (5) work requests as non-safety. The five WRs which were misclassified are identified below:

WR No.	Date	Work Description
020835B	04/28/85	Perform NI Calibration
018401B	01/19/85	Please Calibrate NIs
022790B	07/17/85	Calibrate NIs as Required on Power Escalation
016545B	10/30/84	Perform NI Calibration
020141B	03/29/85	Reset RPS Channels #A, B, C, D to Hi Pwr Trip

10 CFR 50, Appendix B, Criterion V requires activities affecting quality to be performed in accordance with instructions, procedures, or drawings. Station Directive 2.2.1 implements the requirements of 10 CFR 50, Appendix B, Criterion V as it requires activities to be conducted in accordance with the provisions of the applicable procedure.

Station Directive 5.4.5 defines how to use the Quality Standards Manual for Structures, Systems, and Components (QSMSSC) in the determination of QA condition classifications on Maintenance Work Requests (MWRs), material requisitions, and procedures. This directive states that "the Quality Standards Manual for Structures, Systems, and Components shall be used to determine QA condition level." The QSMSSC identifies power range nuclear instruments as safety-related.

Contrary to the above, WR 22790B was improperly classified as non-safety-related. Consequently, the WR had not been reviewed by the station QA section. This constitutes Violation 50-269/85-21-01, Failure to Follow Procedure on Classification of Work Requests. This problem may be generic to safety-related components at Oconee since the Q-List is very general. Therefore, the licensee should consider auditing other WRs to verify that they have been properly classified. In addition, the licensee should review the training provided plant personnel responsible for classifying safety-related work activities to ensure that personnel perform correct classifications.

8. Vendor Interface and Manual Control

The inspector reviewed the licensee's response to GL 83-28 which described their program for vendor interface and control of vendor technical information. Their response described the following program:

> Licensee response dated November 4, 1983, stated that the Reactor Trip System components were originally supplied by Babcock and Wilcox (B&W) and that current updates to this equipment were being supplied by the B&W Owners Group. The licensee acknowledges receipt of the information by written confirmation. All technical information received which has an impact on plant design, maintenance, and safe operation is distributed to appropriate licensee organizations for review, approval, and incorporation into plant procedures as applicable. The licensee has procedures to assure that vendor information is controlled.

Procedure OEMA/IM-1, Receipt and Distribution of Operating Experience Information, describes how technical information will be properly received, screened, and distributed to licensee personnel. Review of this procedure confirmed that the licensee has a method to receive and use operating experience information and, if properly implemented, will be an asset to plant operation and maintenance activities.

The licensee's procedure, Nuclear Steam Supply System (NSSS) Vendor Information Letters, identifies responsibilities, describes the activities, and summarizes the process used for attaining resolution to vendor information letters. The procedure also states that revisions to station procedures and vendor manuals will be implemented through the station procedure change process and through the vendor manual change process. The Nuclear Technical Services Group is responsible for assessing the applicability of the vendor information letters and implementing necessary corrective actions. The inspector could not find, nor did the licensee identify, a list, log, or status report of vendor information letters received and resultant review and implementation actions being performed by the different Duke departments as described in the procedure. The reactor trip breaker maintenance procedure did not contain all recommendations specified in GE Advisory Letters TAB 175-9.3 and 175-9.3S, nor did the licensee provide justification why the recommendations were not included in the licensee's procedure. The failure to include vendor recommendations in procedures or justification for not including is discussed further in paragraph 9 of this report. The

licensee has completed some modifications and is in the process of completing the modifications concerning the shunt trip, undervoltage device, and replacement of bearings with ones that contain Mobil 28 lubricant.

Licensee's response dated March 29, 1985, specified that their preventative maintenance program had been structured to be in accordance with GE Maintenance Instruction GEI-50299EI; however, Revision E was not referenced in the procedure and was not in document control. Licensee referenced GEI-50299A and the Master Copy was 50299A instead of 50299EI. The inspector loaned the technical support group his copy of GEI-50299E so they could compare it with 50299A.

Information obtained during reactor trip breaker performance is being transmitted by the licensee to the B&W Owners Group for trending purposes. The B&W Owners Group will provide recommendations resulting from evaluation of performance data received from other plants.

The licensee has started a program to review all vendor manuals associated with safety-related equipment. The licensee has a special Vendor Manual Group assigned full time to review onsite vendor manuals and to prepare a Master Copy of each manual. The Master Copy will include all up-to-date technical information. After completion of the update, controlled copies of the manuals are being redistributed to approved satellite files per inter-station memo which require recipients to transmit an acknowledgement receipt. The licensee also utilizes a formal form (18527) for transmittal of documents to the Master File. A Record of Verification Form (02665 of 3-83) is being used by the Vendor Manual Group to verify that the manuals have been proofread and corrections have been included. The use of this form was discussed with the Administrative Supervisor. Other forms such as Insertion Control Form (01045) and Design Engineering Transmittal Form (01190) are also being used to control vendor information. The Vendor Manual Group maintains a "Station Backfit Log" which lists the documents reviewed, corrective action needed, and date of final review. A monthly audit (status) report is being continually updated to show the number of manuals updated and discrepancies resolved. The inspector discussed the program with licensee personnel, observed the verification in process and examined manuals in the Document Control Area. The licensee has several procedures to help assure that technical information is properly received, reviewed, and controlled. The licensee appears to be extending an all out effort on updating and controlling vendor manuals.

The inspector reviewed the licensee's Procedure MP/O/A/2001/4 dated June 6, 1985, CRD Breaker Inspection and Maintenance. The procedure review revealed the following concerns: GE Technical Manuals were incorrectly referenced; GE Advisory Letters were not referenced; approved cleaning solvents were not specified; repair as necessary statement does not provide for control of work or require maintenance personnel to document findings; engineering was not required to evaluate damage and evaluate causative factors; item 11.4 does not specify the trip method (electrical or mechanical); item 11.5 does not reference where the 50 and 80 msec. c[illegible]om; cautions on using cleaning agents are not specified; pressur[illegible] compressed air is not

specified; how to replace or repair arc chutes was not specified or referenced; paragraph 11.8 allows equivalent lube to be used, although the type of lubricant previously used was partly the cause of poor operation; the latest tests by the vendor requires Mobil 28 lubricant for the bearing, therefore, it is presumed the breakers are qualified if Mobil 28 is used, yet the procedure allows an equilivant lube to be used; paragraph 11.15 does not specify that a special tool is required to manually trip the breaker; paragraph 11.16 does not follow GE recommendations as GE recommends that the pickup voltage be checked three quick times, however, the procedure only specifies one time; QA/QC personnel have minimal involvement throughout the repair and maintenance activity, except for verifying certain hold points; the caution note on Mobil 28 should be located prior to paragraph 11.14; the text of the procedure does not require the recording of as-found information, however, Enclosures 13.3a and 3b (Reliability Data Sheets) have spaces for as-found and as-left data; paragraph 11.16 requires the UV device be near room temperature prior to testing, however, the procedure does not specify a minimum or maximum room temperature; the procedure does not specify disassembly of UV devices, however, the licensee was disassembling the UV devices, inspecting, and reassembling; GE Service Advice Letters Nos. 175-9.20, 175-9.3, and 9.3S were not referenced, although some information from these was used. The above comments on the procedure were discussed with licensee personnel. Some of the above comments are further discussed in paragraph 9 and contribute to the violation.

Discussions with personnel and observation of maintenance activities revealed that during the preventative maintenance (PM) on a reactor trip breaker, the licensee has been disassembling the undervoltage trip device and examining the parts for damage as previously reported. The licensee informed the inspector that the following discrepancies were found: sharp burrs existed on the edges of the armature (where measurements are made) that contact the rivet; indentation of the area of the armature that contacts with the rivet; sharp edges where the armature pivoted against the magnet; rubbing between the armature trip paddle and the heads of the two screws that attach the trip device to the mechanism frame; plus some wearing of the paint coatings around the bearing area of the armature. The licensee has issued several letters to the NRC (February 14, 1985, April 22, 1985, August 17, 1984, and August 27, 1984) concerning problems found with Oconee breaker front frame assemblies. These problems were also reported to the vendor. The basic problem appeared to be with the trip shaft bearing lubrication which is being corrected by installing bearings which have been lubricated with Mobil 28 lubricant. The licensee is in the process of replacing all the front frames of Oconee RTS breakers.

The licensee reported on July 22, 1985 that during on-line testing of a reactor trip breaker (CB-1 on Channel C), the breaker took 1738 milliseconds to open instead of the 80 milliseconds allowed. The licensee replaced the breaker with a spare and examined the faulty breaker. They suspected interference between the heads of the UV mounting screws and the armature trip paddle.

The inspector examined a UV trip device to determine if the armature trip paddle could interfere with the heads of the two attachment screws. A minimum clearance of approximately 0.025 inches was obtained with the armature in its worst position. The licensee stated that this UV device was an "old" one and that one of the two "new" ones (replacement for old UV devices) actually had a rubbing condition and they had filed approximately 1/32 inch off the side of the screw heads to eliminate the rubbing condition. The licensee stated that the breaker passed its test prior to his filing the screw heads. No detail drawings were available for review; therefore, it could not be determined if the rubbing could be the result of design deficiencies.

The inspector examined another UV device which the licensee stated was an "old" device. The inspector noted that the location of the armature trip paddle in relation to the attaching screw heads was different (had more clearance) than the UV device previously examined.

The licensee stated that they had recently installed two new undervoltage devices. Upon questioning whether these two new devices were the same part number as the old UV devices, the licensee was unsure and could not confirm as the purchase order and receiving information was not readily available. The licensee stated that they would contact GE and resolve the part number discrepancy and the possible rubbing problem. The purchase order and receiving information for 18 reactor trip breaker front frames were not readily available for the inspectors' review; however, this information on the front frames was reviewed by the NRC Resident Inspector on August 5, 1985 and was satisfactory. Until the licensee obtains information on the UV device part numbers at the site, this is considered Inspector Followup Item 50-269, 270, 287/85-21-02, Review of Purchase Orders for Undervoltage Devices.

Within the area examined, no violations or deviations were identified; however, some of the findings contribute to the violation discussed in paragraph 9.

9. Post Maintenance Testing (Reactor Trip System Components)

The Oconee Nuclear Station (ONS), Units 1, 2, and 3, have a total of 18 GE AK-2 low voltage power circuit breakers (and four spares) in the Reactor Trip System (RTS). There are two AC breakers and four DC breakers in each Oconee unit. Since Units 2 and 3 were wired differently from Unit 1, two of the spare breakers (one AC and one DC) are for Units 2 and 3, and the other two spare breakers (one AC and one DC) are for Unit 1.

The inspector reviewed Maintenance Procedure MP/O/A/2001/4, CRD Breaker Inspection and Maintenance and observed the performance of this procedure on breaker Nos. U2 & 3-DC-9 and U2 & 3-AC-1. The maintenance being performed on the breakers was a regularly scheduled preventive maintenance activity. It involved checking out the two spare breakers for Units 2 and 3 and preparing them for replacing two Control Rod Drive (CRD) breakers that were scheduled to be removed from service for preventive maintenance.

The work was performed by electricians trained on the job. Duke Power Company (DPC), the licensee, maintains and renovates circuit breakers, including CRD breakers, with the licensee's own staff. There is no formal training program for electricians assigned to CRD breaker maintenance. The electrical foreman leading the maintenance work on the CRD breakers stated that "new" electricians with less than three years' experience are not allowed to do CRD breaker maintenance work on their own. They work alongside electricians with more experience while receiving on-the-job training. Duke Power Company, the licensee, responded in their letter, dated April 25, 1985, stating that the requirement of GL 83-28, Section 3.1.2, had been completely met by March 31, 1985. The inspector reviewed the licensee's effort in meeting this GL 83-28 requirement and noted that the licensee had issued a revision to their maintenance procedure MP/O/A/2001/4 for the maintenance of RTS circuit breakers. The inspector checked to see if the vendor's recommendation (in this case, GE's) were properly incorporated into the licensee's maintenance procedure. GE had previously issued Service Advice Tab 175, No. 9.3, and also a supplement No. 9.3S, dated April 15, 1983, which augmented and clarified some of the areas in the maintenance check of the RTS breakers. The inspector noted that there were differences in the licensee's maintenance manual when compared with the GE Service Advisories. These items were discussed with the licensee's personnel and are enumerated below:

a. The inspector observed that the licensee personnel were performing the maintenance and calibration work on the RTS circuit breakers in a room adjacent to the hot and humid turbine generator high bay area. The electrician's room was small and crowded, and the room temperature was not being monitored. This is contrary to the licensee's procedure where Section 11.16 required some assurance be made that the UV device was near room temperature. It is contrary to the GE service advisory which stated that, "Calibration should be done at room temperature (approximately 20-25°C) after the device has been de-energized for about one (1) hour."

b. GE Service Advisory 9.3S stated that after the electricians administer the three quick test trips, they should wait one hour for the UV device to stabilize back to room temperature prior to recording additional pick-up and drop-out voltages. The GE advisory also states that care should be taken on calibration checks to ensure that the coil temperature remains close to room temperature. Contrary to this, Section 11.17 of the licensee's procedure does not require this wait period or a check of coil temperature. Further, the writer of the licensee's procedure stated that he intended the trip tests be done electrically, whereas the electricians performing the work stated that they had performed the trip both ways: electrically, as well as mechanically. Misinterpretation of requirements could result in misadjustments and other malfunctions.

c. Another incidence of misinterpretation between the intention of the procedure writer and the practice of the electricians occurred during performance of Section 11.17a. The procedure writer intended that the UV pick-up voltage be measured again in that section. However, the inspector noted that the electricians did not re-perform the pick-up voltage measurement. Instead, the electrician recorded the pick-up voltage that was set in the calibration process in previous Section No. 11.16. Misinterpretations of this nature are exemplary of the looseness allowed during the implementation of this procedure. It also indicates a possible lack of communication between the different departments in the licensee's organization. The inspector discussed the importance of resolving misinterpretations prior to performing maintenance activities and why QA/QC personnel should be more involved.

d. The inspector noted that Section 9.0, Acceptance Requirements, contains the limits and criteria for acceptance of all the parameters except the UV coil drop-out voltage. A review of the GE service advisory showed that the manufacturer's recommendation for drop-out voltage is 30-60% of nominal voltage. Inasmuch as the UV drop-out voltage was measured and recorded as per procedure, there was no specified acceptance criteria listed in the procedure. This is contrary to Criterion V of 10 CFR 50, Appendix B, which requires that procedures contain acceptance criteria. However, examination of previous tests revealed that the drop-out voltage was within the vendors recommendation of 30-60% of nominal voltage.

e. The inspector noted that in the performance of Section No. 11.12 of the procedure, the electricians removed the UV device and completely disassembled it, thoroughly examined it, and carefully reassembled it. However, Section No. 11.12 of the procedure does not direct the electricians to disassemble the UV device in the first place. The licensee responded that the practice of disassembling the UV device was undertaken in the current cycle of RTS circuit breaker maintenance and that they intended to stop the practice once all 22 RTS circuit breakers in the licensee's possession have received this one-time scrutiny on their UV devices. The inspector pointed out that procedures were developed to control activities and any deviation from procedure be documented in the form of a temporary procedure change with all the additional steps included in the proper sequence and that inspection results be recorded. Station Directive 2.2.1 (TS) dated December 1, 1984, describes the licensee's methods to prepare, change, reissue, and delete procedures. The directive also provides guidance in the areas of procedural adherence and use.

f. Section 11.5 of the procedure referenced the FSAR for selection of the 80 msec. limit specified; however, the inspectors could not find the specified 80 msec. limit in the FSAR. Upon discussion with the licensee and further inspection, the 80 msec. limit was found in the Technical Specifications.

The above findings, plus the additional items discussed in paragraph 8 constitute Violation 50-269,270,287/85-21-03, Inadequacies in Development and Implementation of Procedure MP/0/A/2001/4, CRD Breaker Inspection and Maintenance. In summary, the inspectors concluded the following:

The procedure did not include vendor recommendations as specified in advisory letters, and all were not referenced.

The technical review of this procedure appeared to be lacking due to the number of discrepancies found by the inspectors.

The importance of having clear understandable procedures without misinterpretation and the importance of strictly adhering to procedures appeared to be lacking.

Auditing of RTS maintenance activities, including observation of work, to assure that all activities are performed in a quality manner and according to procedure was not apparent.

The requirement to perform post-maintenance testing and on-line surveillance testing will help assure that equipment will function when and required; however, procedures properly prepared, technically reviewed, approved, and properly implemented further assures that equipment will function when needed.

g. To further evaluate the licensee's program, the inspector reviewed the latest complete set of MWRs associated with work on the 22 RTS circuit breakers. The WR numbers reviewed were: 54318C, 54315C, 56776, 56774, 56597, 56598, 56771, 56772, and 56773. The inspector examined the documents for consistency in the data taken, completeness in the records, the type of preventive or corrective measures required, and evidence of post-maintenance testing. No problems were identified during review of these WRs.

h. The following licensee procedures and documents were reviewed:

- Station Directive 3.2.1, Work Request, dated July 8, 1985
- Instrument Procedure IP/2/A/305/3D, Instrument Procedure Data Package for RPS Channel "D" Calibration and Functional Test, dated May 22, 1985
- Maintenance Directive III.D, Work Request Completion, dated May 14, 1984
- Maintenance Directive III.B, Work Request Planning, dated April 16, 1985
- Maintenance Procedure MP/0/A/2001/4, CRD Breaker Inspection and Maintenance, dated May 31, 1985

- Instrument Procedure IP/O/B/330/9, CRD System Check of CRD System Before Test Tripping of CRD Breakers

- Instrument Procedure IP/2/A/305/3, Nuclear Instrument and Reactor Protection System RP Channel Calibration and Functional Test

i. The inspector also reviewed completed WRs on other safety-related components to determine if post-maintenance testing was being implemented. Seven WRs were selected for inspection and are listed below:

Work Request No.	Work Description
23178B	Relay Repair
23030B	Power Range Calibration
55052A	E/S System Test
05794B	Repair Pump Leak
90153C	Valve Repair
50277C	Valve Repair
29055A1	Valve Repair

Except for the findings discussed in items a thru f, no other violations or deviations were identified in this area.

10. Reactor Trip System Reliability

The licensee stated in their responses to GL 83-28 that on-line functional surveillance testing of individual Reactor Protection System Channels will be performed once per month. The licensee also stated that diverse trip features, including the breaker undervoltage and shunt trip features will be tested on a regular basis and that vendor recommendations would be evaluated and used where deemed applicable. The licensee had ordered and had installed some new reactor trip breaker front frames which contained bearings lubricated with Mobil 28 lubricant. Shunt trip and undervoltage devices were being installed and tested, plus preventive maintenance and testing of the reactor trip breakers was being implemented as discussed in paragraphs 8 and 9. Data taken during surveillance testing and maintenance inspection are being transmitted to B&W Owners Group for trending purposes. The inspector observed the on-line testing of a reactor trip breaker. Licensee personnel performed the operations as required by procedure. The inspector verified that the periodic maintenance program to ensure reliability described in their March 29, 1985 response was being implemented. Based on review of procedures and observation of work, the licensee is implementing a program to help ensure reactor trip system reliability.

The following documents were reviewed:

PT/O/A/305/01, Reactor Manual Trip Test, approved October 11, 1984

Documentation Package for WR 97210B, Addition of Shunt Trip Feature on CRD AC and DC breakers dated February 14, 1985.

Procedure TN/2/A/2288, Addition of Shunt Trip Feature, Revision 0

Document Package for Purchase Order No. K13589-76 for 22 Front Frames for GE breakers dated March 6, 1984 (included receipt inspection reports and certificates of conformance). Reviewed by Resident Inspector on August 5, 1985 and in Region II office on August 16, 1985.

Purchase Order J20388-70 for Coil, Shunt Trip Devices dated April 26, 1983

Various Purchase Orders to B&W for Reactor Trip System Equipment and Parts

Within the areas inspected, no violations or deviations were identified.