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

Report Nos.: 50-269/88-13, 50-270/88-13, and 50-287/88-13

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: May 9-13 and 19-27, 1988

Inspectors: _____ 7/25/88
M. Shannon, Team Leader — Date Signed

Team Members

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Approved by: _____ 7/25/88
G. A. Belisle, Chief — Date Signed
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Operations Branch
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SUMMARY

Scope: This routine, announced inspection of quality assurance effectiveness was conducted in the areas of operations and surveillance testing, maintenance, and design control.

Results: Although a number of violations were identified, the licensee's various work practice and procedural controls in the areas inspected were generally acceptable. Licensee personnel were knowledgeable of their work activities.

Within the areas inspected, the following violations were identified.

- Failure to provide accurate IST and firewatch records, paragraphs 3.b and 3.c.

- Failure to measure the full stroke time of ASME Section XI valves, paragraph 3.d.

- Failure to identify valves required to be tested pursuant to ASME Section XI requirements, paragraph 3.g.(3).

- Failure to follow procedural requirements of Station Directives relating to maintenance work requests and cleanliness controls, paragraphs 4.d and 4.e.

- Failure to document the bases for 10 CFR 50.59 determinations, paragraph 5.b.

- One unresolved item was identified involving configuration control inadequacies in the ES and RPS cabinets, paragraphs 4.b and 4.e.

- A weakness (IFI) relative to acceptance criteria for valves moving freely, paragraph 3.g.(1).

- A weakness (IFI) relative to corrective actions for valve 1LP-21 multiple failures, paragraph 3.e.

Within the areas inspected, the following observations were noted:

- The number of value stroke time failures was very small.

- Maintenance history records did not indicate repetitive failures.

- Based on the low component failure rate and few repetitive failures the licensee's corrective and preventive maintenance programs appeared to be better than average.

- The licensee's maintenance engineering program, with emphasis towards component engineers, appeared to be a effective method of resolving component failures.

- The requirements of ASME 45.2.11 Design Control appeared to be adequately implemented for most engineering activities.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

J. Bowers, Production Specialist I
*R. Brackett, Station QA Manager
*M. Clardy, Maintenance/P&S Engineer
B. Davis, Nuclear Production Engineer
D. Denard, Performance Supervisor
T. Dwyer, Nuclear Production Engineer
P. Forrester, Nuclear Production Engineer
B. Foster, Superintendent of Maintenance
E. Frampton, Design Engineer
*A. German, Design Engineering/Site Office
R. Harris, Design Engineer
D. King, Design Engineer
R. Knoerr, Project Services Engineer
R. Ledford, QA Surveillance Supervisor
*T. Mathews, Production Specialist II (Licensing)
W. McAlister, Support Engineer
B. Millsaps, Maintenance Services Engineer
*F. Owens, Regulatory Compliance
K. Rhode, Nuclear Production Engineer
N. Riddle, Project Support Engineer
*D. Sweigart, Operations Superintendent
D. Taylor, Project Support Engineer
R. Todd, Project Support Engineer
*M. Tuckman, Station Manager

Other licensee employees contacted included engineers, operators, technicians, maintenance personnel, and office personnel.

NRC Resident Inspectors

*P. Skinner, Senior Resident Inspector
L. Wert, Resident Inspector

*Attended exit interview

Acronyms and initialisms used throughout this report are listed in the last paragraph.

2. Quality Assurance Effectiveness (TI 2515/78)

The objective of this inspection was to assess quality assurance effectiveness. For this report, quality assurance effectiveness is defined as the ability of the licensee to identify, correct, and prevent

recurrence of similar problems. The term quality assurance effectiveness used in this application was not limited to the licensee's QA Department; it was the total of all efforts needed to achieve quality results.

This was a performance-based rather than a compliance-based inspection. Instead of verifying compliance with programmatic requirements, the principal effort was to determine whether results were actually achieved that the quality assurance program was designed to accomplish. However, when problems were identified, appropriate regulatory requirements were enforced.

The inspection effort was divided into the following areas, each of which is addressed in separate report details.

Operations and Surveillance Testing
Design Control
Maintenance

3. Operations And Surveillance Testing

The licensee's quality assurance effectiveness in the area of operations and surveillance testing was assessed by observing plant operating personnel, observing surveillance testing, reviewing surveillance results, reviewing normal and emergency procedures, reviewing component equipment histories, and conducting personnel interviews.

a. Surveillance Testing

The inspectors witnessed Performance Test PT/2/A/0150/22A, Operational Valve Functional Test. This consisted of stroke time testing IST categorized valves for Unit 2, while at power. The test was conducted satisfactorily; however, valve 2-LP-16 failed to stroke open as required and valve 2-LWD-1 had a stroke time increase. These and other discrepancies noted during the course of the inspection will be discussed later in this report.

After witnessing valve stroke time testing, reviewing valve stroke time histories, and reviewing maintenance histories, the inspectors concluded that the licensee's program for ASME Section XI valve testing was above average. There were no indications of repetitive failures or of common component failures. The preventive maintenance program and MOVATS testing program appear to have created high operational reliability for plant power operated valves.

b. Documentation Falsification

While witnessing PT/2/A/0150/22A on May 11, 1988, the inspectors noted that on the Reactor Building Normal Sump Isolation valve, 2LWD-1, stroked closed in eight seconds; its previous stroke time was five seconds. Acceptance criteria 11.3.3 of the performance test states that in order to meet the acceptance criteria, valves with

previous stroke times equal to or greater than five seconds and less than or equal to ten seconds must not increase 50 percent from the previous test. The inspectors then witnessed the recording of the stroke time into the test data as eight seconds and verified this time via the control room printer. The performance technician was unaware that the as-found stroke time did not meet acceptance criteria 11.3.3, and initialed procedure step 12.16.5 which verified acceptance. The inspectors were aware that the stroke time did not meet the applicable acceptance criteria; however, the inspectors wanted to ensure this test discrepancy would be identified during the procedure review and approval cycle. On May 25, 1988, the inspectors reviewed the completed test procedure for verification that the stroke time discrepancy had, in fact, been identified by the licensee during the review cycle. The inspectors identified that the stroke time of eight seconds (previously entered in the completed procedure) had been changed to five seconds, which now met the acceptance criteria. Upon verification of the original recorded stroke time, the inspectors asked for documentation of any retest that may have been performed. Unaware of any retest performance, the licensee then verified the computer recorded stroke time of eight seconds and retested the valve on May 25, 1988; the retested stroke time was also eight seconds. Upon examination by the inspectors, it appeared that initials on the procedure page in question were not consistent with the same initials on other test pages. The licensee stated that they would investigate and determine the cause of the discrepancies and take appropriate corrective actions.

The licensee contacted the responsible performance technician, who admitted to replacing the completed page in question and to changing the measured stroke time from eight seconds to five seconds. The licensee also identified that the previous (prior to May 11) stroke time for valve 2LWD-1 had been recorded as five seconds and the computer had shown the actual stroke time to be eight seconds. This surveillance test was also performed by the same individual.

The actions of the performance technician in changing the TS surveillance data violate NRC requirements. 10 CFR 50.9(a), Completeness and Accuracy of Information, states that information required by the Commission's regulations, orders, or license conditions to be maintained by the licensee shall be complete and accurate in all material respects.

Failure to meet the 10 CFR 50.9(a) requirements is collectively combined with an additional example as discussed in paragraph 3.c and is identified as Violation 269, 270, 287/88-13-01.

c. Falsification Of Records Associated With Fire Barrier Penetration Patrols

On May 18, 1988, the DE group identified that some fire barriers between the control room, cable room, equipment room, and turbine

buildings were inoperable. The fire barriers consisted of 10 inches of a foaming agent with metal plates on each side which was determined by test results to be inadequate. The test results identified that a 12 inch thickness of foam was required. As a result of the notification by DE, the penetrations were declared inoperable and the actions of TS 3.17.6.1 were entered. The TS LCO requires a fire watch patrol to inspect the affected areas hourly. On May 19, the resident inspector reviewed the security print-out of the cable room card-key doors and identified several periods that exceeded the specified time interval required by TS. Since the NEOs were responsible for this surveillance, the inspector also reviewed the logs maintained by the assigned personnel. The logs for all three units indicated the required hourly watches were performed, even though the computer listing indicated the individuals had not entered the prescribed areas in the required time. This conflicting information was provided to Operations management. Subsequent licensee investigations identified 5 times in a continuous 28 hour period that the fire patrols were not performed in the prescribed TS time requirements, where as the logs indicated that the patrols were performed. The licensee concluded that three personnel were involved in this occurrence. The failure to perform these required activities resulted in violating TS 3.17.6.1. This falsification of documentation is collectively combined with an additional example as discussed in paragraph 3.b and is identified as Violation 269, 270, 287/88-13-01.

d. Valve Stroke Time Testing

While witnessing valve stroke time testing, the inspectors noted that valves were being tested utilizing the time between actuations of the limit switches, i.e. the "light to light" method. It was also noted that for certain valves the time delay between valve actuation and first limit switch actuation was as much as eight seconds. The "light to light" method does not measure the full stroke time of the valve.

The 1980 ASME Boiler and Pressure Vessel Code, Section XI, Rules for Inservice Inspection of Nuclear Power Plant Components, Article IWV 3412, Exercising Procedure, requires that valves tested under this section shall be full-stroke exercised. Article IWV-3413, Power Operated Valves, defines full-stroke time as that time interval from initiation of the actuating signal to the end of the actuating cycle; however, the licensee measures the time between actuations of the limit switches. The licensee's failure to meet the 1980 ASME Section XI valve stroke testing requirements is identified as Violation 269, 270, 287/88-13-02.

e. Valve 1LP-21 Discrepancies

During the equipment maintenance history review, the inspectors noted that multiple maintenance work request had been completed for valve

1LP-21 because it was unable to meet its acceptance criteria. 1LP-21 is the "A" train LPI system suction valve from the BWST. The following is a failure and repair history for 1LP-21 for the last two years:

> On April 4, 1986, 1LP-21 failed to meet its acceptance criteria of a maximum stroke time of 15 seconds, in that, it stroked in 16 seconds. The licensee apparently did not recognize that the valve did not meet its acceptance criteria, consequently, a discrepancy was not written.
>
> Unit 1 started up on May 6, 1986, and again on May 27, 1986, without knowledge of the valve not meeting its acceptance criteria. On June 3, 1986, 1LP-21 again failed to meet its acceptance criteria when it was found to stroke in 16 seconds. At this time the licensee recognized that the previous test did not meet its acceptance criteria and took corrective actions by counseling the personnel involved. Corrective action was to reset the limit switch and the valve actuated in 15 seconds.
>
> On November 17, 1986, 1LP-21 failed to meet its acceptance criteria and stroked in 16 seconds. The valve stem threads were lubricated and the valve stroked in 15 seconds.
>
> On May 20, 1987, 1LP-21 failed to meet is acceptance criteria and Work Request 91757C was written and stated that the valve had a bent stem, a packing leak, and failed to meet the stroke time acceptance. A deficiency written on PT/1/A/0150/22A stated that the stroke time was inconsequential and that 1LP-21 would be repaired during the next Unit 1 outage. The unit was shut down on September 2, 1987, and repairs were completed on October 8, 1987. These repairs reset the limit switch.
>
> On October 31, 1987, 1LP-21 failed to meet its acceptance criteria and the threads were lubricated without issuing a work request. Work Request 50209F was written to perform MOVATS testing and called for replacing the torque switch; however, the torque switch was not replaced.

These identified discrepancies with the 1LP-21 stroke times did not present an operability concern but they do raise a concern with the licensee's adherence to acceptance criteria. The licensee's IST program acceptance criteria lists the acceptable stroke time as 15 seconds; however, on May 20, 1987, a work request stated that the valve failed to meet its stroke time acceptance and repairs were not performed on the valve for over three months. The licensee's statement that the stroke time was inconsequential, presented an attitude that the acceptance criteria is only a guideline and not a requirement. It was also noted that the limit switch was reset on two occasions as corrective action for obtaining proper valve stroke time.

The resetting of limit switches as corrective action for stroke failures, for 1LP-21 is considered to be a weakness and is identified as Inspector Followup Item 269/88-13-08. This item is applicable to Unit 1 only.

f. Valve 2LP-16

While witnessing PT/2/A/0150/22A, Valve 2LP-16 failed to stroke. Valve 2LP-16 is the Train "B" LPI System supply valve for HPI pump suction and RBS system cooling. This valve is opened during various emergency procedures by the RO. It is commonly known as the piggyback valve and is opened after the BWST has been drained during a loss of coolant accident. After the valve failure, the supply breaker was verified closed and a work request was written. No other licensee initiated reviews or evaluations were performed at this time.

The control room operators were questioned by the inspectors concerning HPI and RBS system operability with 2LP-16 being out of service. An informal discussion determined that the HPI and RBS systems were not inoperable and the reasoning used was that: (1) the valve could be manually opened if required, and (2) the RCS could be depressurized for the accident condition when this valve is required. The next shift was also questioned concerning HPI and RBS system operability with 2LP-16 out of service. They also stated that the valve could be manually opened and the RCS could be depressurized. It was noted that licensee personnel had not verified that the valve could be manually operated after its initial failure. There were also discussions concerning possible area radiation levels during the accident scenario for which the valve would be required and it was determined by the operators that area radiation levels would be prohibitive for manual operation of this valve. At this point the Operating Engineer was contacted in order to determine if any further action was required.

The following day, the day shift operators were also questioned concerning system operability. They also stated that the valve could be manually operated and the RCS could be depressurized. A shift RO walked through the emergency procedures with the inspector and determined that under conditions when 2LP-16 required opening, the RCS would be saturated and could not be depressurized as previously thought.

The licensee was again questioned about HPI and RBS system operability and it was stated that the HPI suction could be manually cross-tied to supply Train "A" LPI to both trains of HPI and RBS. Again the licensee did not account for accident radiation levels for entry to manipulate various valves.

Three different shifts made assumptions that were not valid. The valve was not checked for manual operation, area radiation levels

during accident scenarios were not considered, and it was assumed that the RCS could be depressurized.

The IST Engineer was contacted concerning the valve failure. He, in turn, contacted the Maintenance Department and personnel were assigned to perform the work request. An electrician physically lifted the motor starting relay and the valve cycled. The valve was then cycled from the control room, the performance group timed the valve, and the work request was closed. The root cause for the failure was not determined, in that, the failure mechanism was not identified. At this time the licensee stated that ASME Section XI allows 24 hours before they were required to declare a non-operating valve inoperable and thus the HPI and RBS systems were not inoperable. The licensee further stated that the HPI pump suctions were cross-tied and suction flow to all three pumps could be supplied from the "A" Train LPI pump and therefore the HPI trains were both operable.

During the inspection, the licensee communicated to the NRC a preliminary LER concerning LPI supply to HPI and RBS. The LER stated an analysis indicated that under certain conditions during the recirculation phase, both trains of LPI may not be able to provide adequate HPI pump suction pressure and this could result in the loss of HPI system capability. It is apparent that if both LPI trains are unable to supply adequate suction pressure, that only one LPI train available would be even more restrictive.

The licensee did not take a conservative approach in addressing the issue of system operability when 2LP-16 failed to open; however, the valve was repaired, satisfactorily tested, and returned to service within 24 hours. A more desirable action would have been to declare the HPI and RBS Train "B" systems inoperable, enter the appropriate TS action statements, make the necessary repairs, and perform the appropriate retesting for operability.

g. Miscellaneous Items

(1) PT/1,2,&3/A/0150/22A, Section 11.0, Acceptance Criteria, Step 11. 1, states that all valves move freely and without restriction or binding over a complete cycle. This acceptance criteria was not verified during the course of the surveillance test even though the steps verifying acceptance were signed as acceptable. This item was considered to be a weakness in the IST program and needs further management attention. It will be identified as Inspector Followup Item 269,270, 287/88-13-07.

(2) The inspectors observed the following actions by control room personnel; horseplay (jostling, joking, bumping, etc.) whistling, backs to panels, feet on desk, crowded conditions, and the burning of an insect. Most items occurred on one shift. The licensee was notified by the inspectors that all of these items conveyed a less than professional appearance. The Station

Manager discussed this situation with cognizant operation's personnel and corrective actions were taken. During subsequent observations, this situation did not recur. This was also discussed during the management meeting on June 7, 1988.

(3) During a review of various system flow diagrams it was noted that certain power operated valves were not included in the IST program. ASME Section XI, Article IWV 100, Scope, requires that Class 1, 2, and 3 valves required to perform a specific function in mitigating the consequences of an accident, are to be tested to verify operational readiness. Valves exempted from this requirement are valves used for operating convenience, system control, or for maintenance.

The following valves: LPSW-772, LPSW-773, and LPSW-774, which are power operated and are the first isolation valves outside containment, were not included in the IST program. They would be used as containment isolation valves for mitigating radioactive release.

HP-98 is a power operated valve in the HPI suction header. This valve would be used to provide ECCS HPI train separation on a suction header fault.

ASME Section XI, IWV-1400, requires that each valve to be tested in accordance with ASME requirements shall be categorized by the owner and listed in plant records.

10 CFR 50 Appendix B, Section XI, Test Control, states that a test program shall be established to assure that all testing required to demonstrate that structures, systems and components will perform satisfactorily in service is identified and performed in accordance with written test procedures.

Contrary to the above requirements, the IST program failed to assure that components required to be tested were identified. Valves HP-98, LPSW-772, LPSW-773 and LPSW-774 were not included in the ASME Section XI valve testing program. The licensee's failure to identify valves required to be tested pursuant to the 1980 ASME Section XI requirements is identified as Violation 269, 270, 287/88-13-03.

4. Maintenance

The inspectors reviewed predictive, preventive, and corrective maintenance to determine the licensee's ability to identify and correct adverse trends. This review included field verifying maintenance activities in progress and reviewing previously completed maintenance activity records. The maintenance activity review focused primarily on EFW, FDW, RPS, ES Logic, HPI, RVLIS, LPI, and RC system, although other systems were included to a lesser extent.

a. Predictive Maintenance

The inspector reviewed plant procedures and station directives to identify any mechanism used for identifying potential problems that could lead to equipment failure. The inspector also interviewed responsible personnel and reviewed history files on equipment identified in the predictive maintenance program.

Engineers in the Maintenance Service section were responsible for identifying potential problems and for specifying corrective actions. They reviewed work requests and Nuclear Plant Reliability Data System information on a periodic basis to identify potential problems. Maintenance directives were used to provide special instructions for monitoring specific equipment. Maintenance Directive 5.3.4, Predictive Maintenance and Monitoring Program (PM-2), was used as a mechanism for identifying problems with rotating and reciprocating equipment. Maintenance service engineers utilize statistical failure analysis, oil analysis, and vibration analysis to identify potential problems per PM-2. Maintenance Directive 5.3.5, Valve and Valve Operation Program, provided information on the valve program established at Oconee. A review of the items identified under the PM-2 and the valve operation program indicated that adequate monitoring and corrective actions were taken to prevent recurring problems. The inspector also noted that those persons responsible for the vibration and valve program were very knowledgeable of the subject matter.

b. Preventive Maintenance

The inspector witnessed the performance of IP/0/A/310/12A, Engineered Safeguards System Logic Sub System 1, High Pressure Injection and Reactor Building Isolation, Channel 1, on Line Instrument Calibration for Channels 1 and 2. The technician performing the maintenance activity was knowledgeable of the procedure and the effects of performing the procedure on associated plants systems. The procedure was technically correct, however, it was necessary to perform several steps out of sequence which made its use somewhat cumbersome.

While witnessing IP/0/A/310/12A, the inspector observed that a jumper was installed across a power transformer in the cabinet which housed some of the Channel 1 Engineered Safeguards Instrumentation on Unit 3 (ES Analog Cabinet). The jumper was not shown on any of the system drawings.

The jumper was removed by the system engineer when the determination was made that the jumper served no apparent function. The system engineer did not document removing this jumper on a work request or a modification request, i.e. the jumper was removed without proper authorization. Several days later, after being questioned by the inspector, the system engineer documented an evaluation to remove the

jumper which included taking meter readings and inspecting similar cabinets. The licensee believed that the jumper may have been left in the cabinet after a surveillance, or stored in the cabinet by an instrument technician rather than returning the jumper to the appropriate storage location. The jumper had no effect on system operability; however, this is considered an example of inadequate configuration control and is combined with additional examples in paragraph 4.e. to constitute Unresolved Item 269, 270, 287/88-13-06.

c. Corrective Maintenance

The inspector witnessed licensee personnel performing work requests 55365B, 55366B, and 55367B, performance of PM on the Magnex Valves in the RVLIS on May 19, 1988. The purpose of the Magnex valves in the RVLIS is to provide a means of calibrating or replacing a faulty transmitter with the reactor at elevated pressure. While performing the maintenance test, the inspector witnessed the technicians striking the Magnex valves with a nylon hammer and heating the valves with a portable heater when two valves on Unit 3 could not be operated manually. This action was in accordance with a hand written procedure change that was appropriately documented and approved.

The inspector questioned the technicians involved in this activity to determine how this type of corrective action had been approved. The inspector was informed that the vendor had recommended this method of corrective action; the inspector then contacted the vendor. Vendor personnel stated that the original request to heat the valves came from the licensee without mentioning striking or mechanically disturbing the valves. The vendor concurred with heating the valves; however, the licensee did not evaluate the effects of heating or striking the valves. As a result of the inspector's observations and discussions with the vendor and licensee, the inspector contacted the valve manufacturer, Autoclave, and spoke with one of the valve's designers. He stated that these valves had sensitive internal components and a light coating of a vacuum grease and were not designed for the methods of corrective actions taken by the licensee.

The valve manufacturer also stated the preferred orientation of the valves was in the vertical direction with the operator directly above the valve body. This allows the ball of the valve to rotate in the valve cup assembly. The orientation of the valves observed by the inspector is in the horizontal direction which causes the valve to rotate against the valve seat. Both valves in question have failed to close during the last three surveillances. The first two valve failures were not identified on the Component Malfunction/Maximum Tolerance Limit Exceeded sheet as required by the PM procedure and as such did not receive an appropriate engineering review. The licensee could not find an evaluation or any objective evidence to justify their method of corrective action. There are additional examples of similar failures and similar corrective actions on Units 1 and 2. The current method of corrective actions will not ensure the valves

will remain open after the valves that bind are cycled. Other than magnetic valve actuator position, there are no direct ways to determine the valves' position. The valves are not essential to system operability. The only requirement for the Magnex valves is to remain open when the RVLIS is required.

Until a satisfactory method of correcting the valve binding problem can be determined, the licensee agreed to suspend the practice of striking and heating the valves and pursue a course of corrective action that will not have the potential of damaging the valves or the valves' internals.

d. Work Requests

The inspector reviewed selected samples of the approximately 2900 (1080 open and 1725 closed) QA Condition 1 work requests issued since January 1, 1987. The review was focused primarily in the area of retest and functional test requirements, environmental qualification determinations, clearances, QA condition determinations, and adherence to the procedural requirements during the performance of the maintenance tasks. Additionally, the inspector reviewed Station Directive 3.2.1, Work Request, dated February 18, 1988. Minor problems were found in the majority of the Work Request packages reviewed. Selected examples of the discrepancies are as follows:

Work Request No. 12514, Repack 2LP-76. On sheet 1 of the Post Maintenance Testing section, the inspection for packing leakage and inspection for general leakage were identified as required but were not performed. The work request also required Red Tags to be installed but procedure MP/0/A/1200/01, Valves - Adjusting and Packing, step 12.1, was marked N/A for the applicability of clearing the Red Tags.

Work Request No. 14665, Loop B Feedwater Valve Delta Pressure Instrument Repair. The QA condition, retest requirements, and functional verification were not correctly identified in accordance with Oconee Nuclear Station Directive 3.2.1, Sections 6.1, 6.2 and 6.3 respectively.

Work Request No. 03535, 2LP-63. The clearance to begin work was not given. Sheet 1 of the Post Maintenance Testing section, the inspection for packing leakage, and inspection for general leakage were identified as required but were not performed.

The work requests listed below were for performing PMs on Control Rod Drive Breakers:

Not considered EQ related	EQ determination not made	
55161B	55154B	55163B
55162B	55155B	55165B
55013A	55156B	55170B
55171B	55157B	55159B
55449A	55158B	55173B

The work requests without EQ determinations were not consistent with the requirements of Station Directive 3.2.1, Work Requests, Section 6.13, Environmentally Qualified Equipment.

Work Request 92265C, Repair 1LPSW-566. The retest requirements were changed without appropriate initials and date, making it impossible to determine when or by whom the change was made or who reviewed the change.

The following work requests for refurbishing limitorque operators did not include either determining or documenting that required retests were performed:

51638G		51659G	
51689G		51644G	
51687G		51652G	
51688G	Note 1	51608G	Note 1

Note 1: In addition, the appropriate electrical functional verification test was not specified.

The following work requests involved performance of the Doble test on 4160 volt breakers and transformers:

57791B	Note 2	58035C	
57046C	Note 2	57048C	
57044C	Note 2	57045C	
57762B	Note 2	57042C	
57435D	Note 2	57033C	Note 3
57043C		52005G	Note 4
57035C		52006G	Note 5

Note 2: The computer generated retest requirements were incorrect, however the work planner corrected the work request prior to commencing work.

Note 3: The clearance for the breaker was not completed and the systems were returned to service without documentation.

Note 4: The functional verification test was incorrectly specified.
Note 5: The work request specified a retest which could not physically be performed. As a result, no retest was performed.

The following work orders had either incorrectly specified retest requirements or retest requirements were not specified:

96178C	Drain in 2FW-130
53030G	Replace limit switch on 2RC-3
53033G	2FDW-16
52922G	2PT-17P

Work Request 12514C, Repack 2LP-76, and Work Request 03535C, Repack 2LP-63. On the Post Maintenance Testing sheet, the inspection for packing leakage and inspection for general leakage were identified but were not performed.

The examples noted above were not considered all inclusive and were considered a programmatic lack of attention to detail in completing work requests. These examples are collectively combined with another example of a failure to follow procedures, paragraph 4.e, and constitute Violation 269, 270, 287/88-13-04.

The following work orders were reviewed with no discrepancies noted:

55451A
55449A
52308G

At the licensee's request, the inspector reviewed a sample of work requests that were not microfilmed or were not completed. Some of the same type of problems existed in the additional sample reviewed. The review results were inconclusive. It was generally not possible to determine if the work had been completed correctly since all the associated paper work had not been finished. Some of the preplanning work; however, appeared to demonstrate improvement.

The inspector witnessed maintenance activities in progress and interviewed selected maintenance personnel to determine the effect of the maintenance work order discrepancies on actual maintenance work performed. The consensus of the maintenance personnel interviewed and the conclusions of the inspector, based upon maintenance activities witnessed, are that the actual work activities were performed in accordance with applicable station directives and applicable procedures. Based on this conclusion, Violation 269, 270, 287/88-13-03 is directed only to the completion of required documentation and does not indicate a lack of quality in the maintenance work performed.

e. Reactor Protection System and Engineered Safeguards Logic

The inspectors verified the terminated wiring, installed configuration, and logic wiring of selected portions of the RPS and ES. A number of discrepancies were identified; the licensee subsequently reviewed these discrepancies. The following are the specific discrepancies and the licensee's evaluations.

(1) Debris was found primarily in the ES cabinets which included numerous unattached plastic wiring tags, metal strips, a bag of termination screws, a box of light bulbs, paper, and a styrofoam tobacco expectorant receptacle which contained a soiled paper towel and an apple core. The expectorant receptacle and the associated contents were wedged in the rear portion of the ES wiring harness.

(2) Unit 3 ES Analog Cabinet #1, Terminal Block 2, Row 9. A landed lead from terminal 12 was attached to terminal 9 instead of terminal 8 as shown on approved drawings or as connected on the other units. Licensee evaluation: terminal 8 is the common ground for the -15 VDC power supply for ES Analog Cabinets 1 and 4. Although the ground was not connected in accordance with the drawing, the power supply for cabinets 1 and 4 are operable based on monthly surveillance results. The licensee stated that a PIR will be initiated to evaluate the landed lead not attached in accordance with the termination drawing. This item was specifically discussed on June 14 and June 28, 1988, with licensee personnel. The licensee verified that the existing ground connection to the ES Cabinet would perform the function of the instrument ground.

(3) Unit 1 ES Analog Cabinet #1, Terminal Block 3, Row 9. Terminals 1 and 2 have landed leads which are not designated on controlled drawings. Licensee evaluation: although the connections are not on controlled drawings, they go to the test panel control point.

(4) Unit 2 ES Analog Cabinet #1, Terminal Block 3, Row 9. Terminals 6 and 7 have landed leads which are not on the terminal drawings. Licensee evaluation: although the terminations are not shown on the appropriate termination drawings, they are shown on the test panel control board drawings.

(5) Unit 2 ES Analog Cabinet #1, Terminal Block 3, Row 9. Terminals 1 and 2 have landed leads which are not designated on controlled drawings. Licensee evaluation: although the connections are not on controlled drawings, they go to the test panel control point.

(6) Unit 1 ES Analog Cabinet #1, Terminal Block 3, Row 9. Terminals 6 and 7 have landed leads which are not on the terminal drawings. Licensee evaluation: although the terminations are not shown on the appropriate termination drawings, they are shown on the test panel control board drawings.

(7) Unit 3 ES Analog Cabinet #1, Terminal Block 3, Row 9. Terminals 6 and 7 have landed leads which are not on the terminal drawings. Licensee evaluation: although the terminations are not shown on the appropriate termination drawings, they are shown on the test panel control board drawings.

(8) Unit 3 RPS Channel D-2 cabinet contains a jumper from Terminal Block 6, Row 8, terminal 2 to Terminal Block 6, Row 9, terminal 3, which is not designated on controlled drawings. The licensee was in the process of evaluating this discrepancy.

(9) Unit 3 RPS Channel A-1 cabinet, Terminal Block 3, Row 8, terminal 12 has a landed lead which is not designated on controlled drawings. Licensee evaluation: the function of these

wires has not been determined and will require tracing the circuit in the RPS cabinet.

(10) Unit 3 RPS Channel A-2 cabinet, jumper shown on drawing going from Terminal Block 6, Row 8, terminal 1 to Terminal Block 6, Row 9, terminal 3 actually goes from Terminal Block 6, Row 8, terminal 2. Licensee evaluation: this supplies the ground for the manual bypass switch, and is the result of rolled wires on the back plane of the terminal strip.

(11) Unit 3 RPS Channel A-2 cabinet, terminals 9 and 10 have parallel connections not shown on the termination drawings. Licensee evaluation: these wires go to the B&W test panel and are reflected on drawing 0-2715 H1.

(12) Unit 3 RPS Channel B-1 cabinet, Terminal Block 5, Row 9, terminals 4, 5, 9, and 10 and Terminal Block 6, Row 9, terminals 1, 2, 4, and 5 have parallel connections which are not on the termination drawing. Licensee evaluation: these wires to the B&W test panel and are reflected on drawing 0-2715 H1.

(13) Unit 3 RPS Channel C-2, cabinet jumper shown on drawing going from Terminal Block 6, Row 8, terminal 3 to Terminal Block 6, Row 9, terminal 3 actually goes from Terminal Block 6, Row 8, terminal 2. Licensee evaluation: this supplies the ground for the manual bypass switch, and is the result of rolled wires on the back plane of the terminal strip.

(14) Unit 2 RPS Channel C-2 cabinet has a jumper between terminals 10 and 12 that does not appear on the termination drawing. Licensee evaluation: this supplies the ground for the manual bypass switch, and is the result of rolled wires on the back plane of the terminal strip.

(15) On all three units in the A-1, B-1, C-1 and D-1 RPS cabinets, a metal test jack assembly and the associated test leads were not considered in the seismic design of the RPS cabinets and were not shown on the system drawings. The test jacks are used to measure RC flow transmitter signals.

(16) Numerous test connections are in the ES and RPS cabinets that are not shown on the wiring drawings.

Items 2-14 and 16 are examples of configuration control inadequacies in the ES and RPS cabinets. Until these configuration control inadequacies are resolved by the licensee, this is combined with an additional example of a configuration control inadequacy as discussed in paragraph 4.b to constitute Unresolved Item 269, 270, 287/88-13-06.

Item 1 contains examples of failure to maintain adequate housekeeping controls in the ES cabinets. The failure to maintain adequate

housekeeping is contrary to the requirements of Maintenance Directive 3.2.5, Maintenance Housekeeping Program, and is collectively combined with other examples of failure to follow procedures, paragraph 4.d., and constitutes Violation 269, 270, 287/88-13-04.

Item 15 resulted in portions of the RPS being in a seismic configuration which was previously unanalyzed. After the identification of the concern by the inspector, the licensee performed a seismic analysis of the cabinets which demonstrated the cabinets were seismically qualified in their current configuration. This is considered as an additional example of Unresolved Item 269, 270, 287/88-13-06. Another example is discussed in paragraph 4.b.

f. Quality Assurance Involvement In Maintenance

To determine the extent that QA was involved in the work request process the inspector interviewed the QA Work Request Controller. The Work Request Controller delineated the work request flow path through the QA organization. The inspector then interviewed selected QA personnel and reviewed selected QA audits and surveillances. The inspector concluded that while QA only reviewed portions of the work requests, the work request discrepancies should have been detected by QA. This area needs additional attention by the QA audit and surveillance programs.
To determine the extent that QA was involved in the configuration control of the ES and RPS, the inspector interviewed selected QA personnel. The results of the interviews indicated that QA was not directly involved in modifications that were considered to be non-safety related and were not part of the decision process to determine if the modifications were safety related. Since documentation did not exist to indicate how the specific discrepancies noted in paragraph 4.e occurred, QA was not aware of the activities that may have caused the specific discrepant conditions. Additionally, QA does not have a specific audit or surveillance program which required the field verification of RPS or ES terminations or system logic. The lack of QA involvement in the determination of whether a modification is safety related or not and the lack of a program to verify ES and RPS terminations and logic, were considered contributing factors which led to the findings noted in paragraph 4.e. The licensee has agreed to include inspections of this type in future QA surveillances or audits.

5. Design Control

The inspector reviewed the station modification program and examples of SPRs, DSs, ECs, TMs, Alarm and Setpoint Changes, and NSMs. Interviews were conducted with personnel in Project Services, Maintenance Services, Instrument and Electrical, Training, and Compliance.

a. Modification Controls

The inspector reviewed a sample of open and closed NSMs, for the period since January 1987 and identified that documentation required by the Nuclear Station Modification Manual, Station Directive 2.3.4, Nuclear Station Modification Program, revised October 8, 1987, and Project Services Manual, Section 4.6, Nuclear Station Modification, revised April 8, 1988, was present. The station has identified the open NSM backlog as a problem and established goals to reduce that backlog. Between April 1986 and April 1988, the number of open NSMs decreased from approximately 1150 to approximately 450. The goal of 450 was expressed to the inspector as approximately two years worth of work.

The inspector reviewed approximately 120 ECs to assure that modifications were not being handled as ECs, which receive a lesser level of approval, review, schedule, and documentation. The inspector reviewed OE-1239 which performed steam generator tube sleeving and modified the primary system boundary, and OE-1227 which installed nozzle dams and nozzle dam hold down rings in the steam generators. The review of OE-1227 and OE-1228 by the individual NSRB members resulted in the following concern:

> "These exempt change VNs were to install nozzle dam hold down rings in the "A" & "B" OTSGs for Unit 1. Why was this done using an exempt change VN instead of issuing an NSM? What's the basis for this meeting the exempt change VN criteria?"

The response to this concern stated the following:

> "It was the Superintendent of Maintenance's decision to handle this modification as a VN rather than an NSM. The Superintendent is no longer at Oconee, but it is speculated that his decision was based on the fact that the modification could be done quicker."

These examples received what appeared to be complete and technically accurate reviews and evaluations, but the potential to mistreat the modification control program appears to exist.

The inspector reviewed approximately 25 TMs from January 1987 to the present, and identified that all requirements for evaluation, review, and approval were present. The three month re-evaluations were present for TMs open greater than this period.

b. 10 CFR 50.59 Evaluations

10 CFR 50.59(b)(1) states that the licensee shall maintain records of changes in the facility, including a written safety evaluation which provides the bases for the determination that the change does not involve an unreviewed safety question.

The safety evaluation is only required for changes to the facility which alter the design, function, or method of performing the

function of a structure, system, or component described in the Safety Analysis Report either by text or drawing. Since structures, systems, or components which are not explicitly described in the Safety Analysis Report clearly have the potential for affecting those systems which are explicitly described, this affect must be considered in the performance of either safety evaluations or the screening process utilized in determining if an unreviewed safety question is required.

The NSMM, Appendix E, Guidance for 10 CFR 50.59 Evaluations, Section 7.1, provides the criteria for determining if a 10 CFR 50.59 evaluation is required. Among the criteria listed are requirements for a review of the possibility of degradation of equipment important to safety during events such as seismic, fire, tornadoes, missiles, flood, security, etc., and for changes which actually result in a different physical appearance. Section 7.1 also provides guidance for the written justification which must be provided whenever a 10 CFR 50.59 evaluation has been determined to not be required.
The inspector reviewed Nuclear Station Modifications, Exempt Changes, Temporary Changes, and Alarm and Setpoint Changes to determine the adequacy of the attached 10 CFR 50.59 evaluations. The following exempt changes pertaining to valve replacements were determined by site personnel to not involve an unreviewed safety question; however, they did not have a 10 CFR 50.59 evaluation performed, nor a documented basis other than a generic statement that the replacement component met or exceeded original design specifications and that the component had been approved by DE (this is not an inclusive list):

OE No.	OE No.	OE No.	OE No.
1341	1347	1190	1355
1359	1360	1312	1313
1606	1607	1608	1609
1620	1621	1622	1609
1658	1344	1200	

The licensee determined that the following exempt changes required a 10 CFR 50.59 evaluation and determined that an unreviewed safety question was not involved, but did not include the bases for the determination that an unreviewed safety question was not involved.

This list is not intended to be all inclusive.

OE No.	OE No.	OE No.	OE No.
1349	1339	1188	1192
1218	1179		

The licensee informed the inspector that since the DE group had approved the replacement valves, this was justification for not providing a complete 10 CFR 50.59 evaluation, as the DE group did a

complete analysis prior to approving the replacement valves. The engineer who approved the replacement valves stated that acceptability of the new valves was based on pressure, temperature, and application of the valves. He also stated that the failure mechanisms of the old valves were reviewed to select a valve less susceptible to the failure. The engineer was asked to supply the records of the evaluations for the valve replacements but he stated that no records were available and that he had not been told to maintain them.

The inspector reviewed the NSRB review sheets for NSRB meetings dated September 21, 1987, November 20, 1987, and February 5, 1988. The NSRB members continually expressed concern as to the adequacy of the 10 CFR 50.59 evaluations for the ECs used for valve replacements.

The NSMM, Section 9.0, Subsection 9.2.1.3, Exempt Changes for Electrical and Instrumentation Systems and Components, included instrumentation setpoints as an item to be handled under the EC process. The site Project Services Manual, revised June 26, 1987, Section 4.4, Exempt Changes, referenced the NSMM as the source to be used in determining when a change requires an EC.

Oconee Nuclear Station Directive 2.1.3, revised April 14, 1987, Alarm and Setpoint Control, stated that setpoint changes were made utilizing the Procedure Major Change Process Record form. This directive did not include the DE group in the development and review of proposed changes. The Station Directive did not require that a 10 CFR 50.59 evaluation be performed, even though the change form has a section titled, Safety Evaluation; it required only that four questions be answered yes or no. These questions include:

Involves an unreviewed safety question?
Requires completion of a Nuclear Safety Evaluation Check List?

The Nuclear Evaluation Check List is a detailed 10 CFR 50.59 evaluation, but none of the changes since January 1987, required that one be completed. This included two changes that required TS revisions. The revisions to the TS themselves had 10 CFR 50.59 evaluations attached, but the setpoint change documents did not.

The inspector reviewed the change packages for instrumentation setpoints generated since January 1987. Changes to the Alarm and Setpoint document do not include 10 CFR 50.59 evaluations other than a statement that an unreviewed safety question is not involved. The determination of the existence of an unreviewed safety question, as described in both the NSMM and 10 CFR 50.59, was performed; however, the bases for the determination that an unreviewed safety question was not involved was not documented.

The inspector reviewed procedure changes that implemented the setpoint changes to determine if the 10 CFR 50.59 procedure

evaluations would satisfy the requirements for the actual setpoint changes. The evaluations addressed the impact of revising the procedures, not the impact in changing the actual setpoint. The inspector was informed that the Station Directive governing Alarm and Setpoint Control would supposedly be revised by June 1, 1988, to include instructions to complete 10 CFR 50.59 evaluations.

Since early 1987, the licensee has been working to upgrade their 10 CFR 50.59 program. The program for procedure revisions is scheduled to be implemented June 1, 1988; however, the program for the modification program was implemented in early 1987, with the latest revision being implemented December 1, 1987. The valve replacement program discrepancies identified by the inspector occurred after the implementation of the new program. The alarm and setpoint changes were handled as procedure revisions; however, even the old program would have required a 10 CFR 50.59 evaluation.

While the inspector noted an increase in the quality of the 10 CFR 50.59 evaluations performed for NSMs and TMs, the evaluations performed for the valve replacement ECs and the Alarm and Setpoint Changes do not satisfy the requirements of 10 CFR 50.59(b)(1). The failure to adequately document the bases for the determination that changes did not involve an unreviewed safety question is contrary to 10 CFR 50.59 requirements and is identified as Violation 269, 270, 287/88-13-05.

6. Exit Interview

The inspection scope and findings were summarized on May 27, 1988, with those persons indicated in paragraph 1. 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 and Reference
269,270,287/88-13-01	Violation - Failure to provide accurate IST and fire watch records, paragraphs 3.b and 3.c.
269,270,287/88-13-02	Violation - Failure to measure the full stroke time of ASME Section XI valves paragraphs 3.d.
269,279,287/88-13-03	Violation - Failure to identify valves to be tested pursuant to ASME Section XI requirements, paragraph 3.g.(3).

269,270,287/88-13-04	Violation - Failure to follow procedural requirements of Station Directives relating to maintenance work requests and cleanliness controls, paragraphs 4.d and 4.e.
269,270,287/88-13-05	Violation - Failure to document the basis for 10 CFR 50.59 determinations, paragraph 5.b.
269,270,287/88-13-06	URI - Configuration control inadequacies in the ES and RPS cabinets, paragraphs 4.b and 4.e.
269,270,287/88-13-07	IFI - Acceptance criteria for valves moving freely, paragraph 3.g.(1).
269/88-13-08	IFI - Corrective actions for valve 1LP-21 multiple failures, paragraph 3.e.

7. Acronyms and Initialisms

ASME	-	American Society of Mechanical Engineers
B&W	-	Babcock and Wilcox
BWST	-	Borated Water Storage Tank
CFR	-	Code of Federal Regulations
DE	-	Design Engineering
DS	-	Design Studies
EC	-	Exempt Changes
EFW	-	Emergency Feedwater
EQ	-	Environmentally Qualified
ES	-	Engineered Safeguard
FDW	-	Feedwater
HP/HPI	-	High Pressure Injection
IFI	-	Inspector Followup Item
ISI	-	Inservice Inspection
IST	-	Inservice Testing
LCO	-	Limiting Condition for Operation
LER	-	Licensee Event Report
LP/LPI	-	Low Pressure Injection
LPSW	-	Low Pressure Service Water
LWD	-	Liquid Waste Disposal
MOVATS	-	Motor Operator Valve Testing
N/A	-	Not Applicable
NEO	-	Nuclear Equipment Operator
NRC	-	Nuclear Regulatory Commission
NSM	-	Nuclear Station Modification
NSMM	-	Nuclear Station Modification Manual
NSRB	-	Nuclear Safety Review Board
OE	-	Oconee Exempt Change
OTSG	-	Once Through Steam Generator
P&S	-	Planning and Scheduling
PIR	-	Problem Investigation Report
PM	-	Preventative Maintenance
PT	-	Periodic Test

QA	-	Quality Assurance
RBS	-	Reactor Building Spray
RC/RCS	-	Reactor Coolant System
RO	-	Reactor Operator
RPS	-	Reactor Protection System
RVLIS	-	Reactor Vessel Level Indicating System
SPR	-	Station Problem Report
SRO	-	Senior Reactor Operator
TB	-	Terminal Block
TI	-	Temporary Instruction
TM	-	Temporary Modification
TS	-	Technical Specification
VN	-	Variation Notice