U.S. NUCLEAR REGULATORY COMMISSION

REGION II

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Licensee:	Duke Energy Corporation
Facility:	Oconee Nuclear Station, Units 1, 2, and 3
Location:	7800 Rochester Highway Seneca, SC 29672
Dates:	May 23 - July 3, 1999
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Approved by:	C. Ogle, Chief, Projects Branch 1 Division of Reactor Projects

Enclosure

EXECUTIVE SUMMARY

Oconee Nuclear Station, Units 1, 2, and 3
NRC Inspection Report 50-269/99-04,
50-270/99-04, and 50-287/99-04

This integrated inspection included aspects of licensee operations, maintenance, engineering, and plant support. The report covers a six-week period of resident inspection, as well as the results of announced regional-based inspections. [Applicable template codes and the assessment for items inspected are provided below.]

Operations

- Unit 1 reduced inventory operations were completed properly with appropriate operator action, good supervisory oversight, and good procedure adherence. (Section O1.2; [POS - 1A, 3A, 3C])

- Following a Unit 2 reactor trip, operations personnel exhibited good command and control during the trip recovery. (Section O1.3; [POS- 1B, 3A])

- Following a Unit 2 reactor trip, engineering identified the cause of the trip in a timely, thorough, and professional manner. (Section O1.3; [POS - 5B, 5C])

- Operations responded appropriately when a leak occurred while performing high pressure injection system testing. (Section O1.4; [POS - 1B, 3B])

- The licensee identified a potential design issue associated with potential pressurization of the low pressure injection system suction piping. The licensee implemented immediate corrective action to address the issue. The licensee was continuing its evaluation process of this issue at the conclusion of the inspection period. (Section O1.4; [POS - 5B, 5C])

- Fuel movement activities on Unit 1 were conducted in a professional manner with adequate procedures and good adherence to procedures. (Section O4.1; [POS - 1A, 3A, 3C])

- During the occurrence of a raw cooling water low header pressure condition, the operators did not use three-way communication, the annunciator response guide was not referenced, and the unit supervisor did not remain in a position of oversight. (Section O5.1; [NEG - 1B, 3C])

- The licensee's development and administration of the annual operating tests and biennial written examinations were satisfactory. The written examinations and simulator scenarios provided very good evaluation tools to measure operator knowledge, skills, and abilities for various plant conditions. The facility evaluators adequately noted and documented individual operator performance discrepancies. (Section O5.2; [POS - 3B])

- The routine participation of operations management, and occasionally senior plant management in the simulator evaluation process was noted as a strength. This level of management support reinforced the importance of the requalification program to the operators. (Section O5.2; [STREN - 3B, 3C])

- The evaluated portion of the licensed operator requalification program met the requirements of 10 CFR 55.59, Requalification. (Section O5.2; [POS - 3B])

- The licensee implemented new configuration controls and clearance procedures this outage with positive results. (Section O6.1; [POS - 2B, 3A])

- A non-cited violation was identified for inadequate implementation of the work control clearance process which resulted in a Unit 2 reactor trip. (Section O8.1; [NCV - 2B, 3A])

Maintenance

- Routine and outage maintenance activities were completed thoroughly and professionally. (Section M1.1; [POS - 3A])

- The licensee's inservice inspection and once through steam generator eddy current examinations were conducted in a conservative manner. Results of inspections and resolutions to identified problems were given appropriate reviews. (Section M1.2; [POS - 2B])

- In general, problem identification reports reviewed were clear and appropriately completed. (Section M7.1; [POS - 5B, 5C])

- Maintenance personnel did not fully understand the design and operation of the data acquisition computer for Radiation Indicating Alarm 31 and as a result went to the wrong computer to troubleshoot it. (Section M7.1; [NEG - 3B])

- The problem investigation process report on the data acquisition computer for Radiation Indicating Alarm 31 did not fully document all corrective actions taken to improve troubleshooting of the computer. (Section M7.1; [NEG - 5B, 5C])

Engineering

- Problems identified during the testing of the emergency power system were examples of poor pretest reviews and walkdowns of a new procedure. (Section E1.1; [NEG - 1A, 3A])

- During the emergency power system tests, the operators exhibited a good awareness of plant system configurations and the effect of testing on systems in operating alignments. (Section E1.1; [POS - 1A, 3A])

- The licensee's walkdown inspections for coatings were adequate to plan and prioritize coating repair activities to be completed during the current Unit 1 refueling outage. (Section E2.1; [POS - 4B])

- A non-cited violation was identified for failure of the licensee to maintain quality records documenting repairs to the Units 1 and 3 containment vessel liner repairs. (Section E2.1; [NCV - 4C])

- The licensee's program for evaluation of the presence of water in the Unit 1 vertical tendons was comprehensive. (Section E2.2; [POS - 4C])

- The licensee's resolution of the Unit 1 problems and repairs to the Unit 1 tendons were completed in a timely manner. (Section E2.2; [POS - 5C])

- A non-cited violation was identified for failure to document, evaluate, and initiate corrective actions to resolve the presence of water in the Units 2 and 3 vertical tendons. (Section E2.2; [NCV - 5B, 4C])

- A weakness was identified in the licensee's program for control of parts and consumables. (Section E8.1; [WEAK - 2B, 4C])

- A non-cited violation was identified for failure to inspect and document inspection of the Unit 3 reactor building Service Level I coatings. (Section E8.2; [NCV - 2B])

- The Year 2000 checklist, per Temporary Instruction 2515/141, was completed. Overall the Year 2000 project is 100 percent complete and the contingency plan is nearly 100 percent completed. (Section E8.3; [MISC - 4B, 4C])

Plant Support

- The licensee's normal and outage health physics activities were implemented in a controlled and informative manner. Enhancements employed during the Unit 1 outage were positive in the control of human performance and in reducing overall contamination levels. (Section R1.1; [POS - 1C])

Report Details

Summary of Plant Status

Unit 1 began and ended the period in a scheduled refueling outage. Major work included replacement of Reactor Coolant Pump (RCP) 1A2, replacement of 34 control rod drive mechanisms, low pressure service water (LPSW) modifications, 7 kilovolt (kV) switchgear modifications, and the addition of an automatic interlock on the high pressure injection suction valves from the borated water storage tank.

Unit 2 began the period at 100 percent power. Operators reduced power to 68 percent power on June 19, 1999, in response to low level in the lower oil reservoir for the RCP 2A1 motor. The unit tripped from 68 percent power later on June 19, 1999, due to a false high level signal in a moisture separator reheater. Following repairs, the unit went critical on June 23, 1999, and returned to 100 percent power on June 24, 1999. The unit remained at 100 percent power for the remainder of the inspection period.

Unit 3 operated at 100 percent power throughout the inspection period.

I. Operations

O1 Conduct of Operations

O1.1 General Comments (71707)

Using Inspection Procedure (IP) 71707, the inspectors conducted frequent reviews of ongoing plant operations. In general, the conduct of operations was professional and safety-conscious; specific events and noteworthy observations are detailed in the sections below.

O1.2 Unit 1 Reduced Inventory Activities

a. Inspection Scope (71707)

On May 25, 1999, the licensee drained the Unit 1 reactor coolant system (RCS) to reduced inventory conditions in order to install nozzle dams for maintenance work on the once through steam generators (OTSG). On June 20, 1999, following maintenance, the licensee again drained the Unit 1 RCS to reduced inventory conditions to remove nozzle dams. The inspectors observed the reduced inventory activities.

b. Observations and Findings

The licensee entered reduced inventory operations when the operators reduced the RCS level to less than 50 inches above the centerline of the hot legs. The inspectors attended the prejob brief and were present in the control room during draining operations until the RCS level stabilized at 14 inches above the centerline of the hot legs. The inspectors observed that licensee controls of electrical power, containment closure, RCS level indication, core cooling, exit thermocouples, RCS makeup capability, and RCS vent paths met licensee procedural and regulatory requirements during the performance of reduced inventory activities.

The inspectors also observed the operators routinely referring to their procedure and careful oversight by both senior reactor operators and licensee management.

c. Conclusions

Unit 1 reduced inventory operations were completed properly with appropriate operator action, good supervisory oversight, and good procedure adherence.

O1.3 Unit 2 Reactor Trip

a. Inspection Scope (93702)

On June 19, 1999, at 10:15 a.m., Unit 2 experienced a reactor trip from 68 percent power. The inspectors responded to the site and performed post-trip observations and reviews.

b. Observations and Findings

When the inspectors responded to the site, Unit 2 was in a stable condition and in Mode 3. The observed plant parameters were as expected for the plant conditions. The licensee determined that the cause of the trip was simultaneous ground faults on the positive direct current (DC) control battery buss and a relay in the electro-hydraulic control (EHC) system. The faults were due to wear on a wire and loosening of a switch mounting clip in the main turbine trip circuit in the 2A2 moisture separator reheater main steam reheater level switch. The ground faults caused the trip relay in the EHC system to energize resulting in a main turbine trip. A main turbine trip at 68 percent power resulted in an automatic reactor trip per design. The material deficiencies were corrected and the unit was returned to full power. Unit 1 level switches were tagged out, evaluated, and repaired. Unit 3 switch inspection was being planned at the end of the period. Operations personnel exhibited good command and control during the trip recovery, through the subsequent trip investigation, and repairs. The licensee issued problem investigation process (PIP) report 2-O99-2540 to document events associated with the reactor trip. The inspectors observed that the post-trip review and cause determination were performed in a timely, thorough, and professional manner. The licensee initiated Licensee Event Report (LER) 50-270/99-002, Reactor Trip Due to Secondary System DC Grounds, in response to the event.

c. Conclusions

Operations personnel exhibited good command and control during the trip recovery.

Following a Unit 2 reactor trip, engineering identified the cause of the trip in a timely, thorough, and professional manner.

O1.4 Low Pressure Injection (LPI) Suction Piping Pressurization

a. Inspection Scope (71707, 37551)

During the performance of a Unit 1 high pressure injection (HPI) full flow test, the licensee identified a potential pressurization concern involving the HPI system, LPI suction piping, and the building spray (BS) system. The residents independently inspected the issue, verified problem resolution, and observed subsequent testing.

b. Observations and Findings

On June 26, 1999, while performing a Unit 1 HPI full flow test, the licensee identified a 35 gallon per minute (gpm) leak. The licensee determined that the leak was due to improper seating of the suction side valve 1BS-10 (BS pump suction valve for 1B LPI cooler). The licensee also determined that approximately 1100 gallons of RCS water

leaked into the high activity waste tank during actual performance of the test and troubleshooting activities. In response to the leakage, the licensee evaluated the emergency action level (EAL) description guidelines and concluded that no conditions requiring the performance of EAL actions existed. The inspectors independently evaluated the EALs and identified no necessary actions.

The licensee initiated PIP 1-O99-2689 to address the leakage identified during the HPI full flow test. Upon further investigation, the licensee initiated PIP 1-O99-2755 to address LPI suction side overpressure concerns. The inspectors reviewed the PIPs and associated operator actions and determined that the licensee responded appropriately to the event.

The licensee determined from reviews associated with PIP 1-O99-2755 that the B Train emergency sump suction valve, LP-20, on all three units may be susceptible to differential pressure locking that could lead to sump valve inoperability if the suction piping became overpressurized. The corresponding A Train sump suction valve was not affected. With the LPI system supplying suction to the HPI pumps, the B Train suction piping would be pressurized through the B LPI pump minimum flow recirculation line (Units 2 and 3) or through any pump discharge check valve back-leakage. This would pressurize one side of the LP-20 valve which could result in it being unable to open against the higher differential pressure. If the A Train of the BS and LPI systems experienced a single failure this could prevent operation of the LPI system. The pump discharge check valves were not known leakage paths when this concern was identified.

Because the potential inoperability only affected the LPI piggy back Train B flow path, the operating units entered Improved Technical Specifications (ITS) 3.5.2.C, a 72-hour action statement. Unit 1 was in an outage and was not subject to the ITS requirements at that time. The licensee notified the NRC of the one-hour, non-emergency event consisting of a condition existing outside of the design basis of the plant. The licensee implemented a system alignment change that created a vent path to the reactor building (RB) using the BS Train B piping. The inspectors verified that procedure changes were made to support the alignment changes prior to the expiration of the ITS time limit. The inspectors also verified that required operations' training was completed.

The inspectors observed portions of the completion of the Unit 1 HPI full flow test. The licensee identified leakage past the 1LP-10 valve. The inspectors were informed that the 1LP-9 valve, which was also a LPI train cross-connect, also may have leakage past its seat. The licensee initiated PIP 1-O99-2817 to track the identified leakage paths. A test was written and performed to quantify the leakage on both valves. The inspectors observed that the valves' leakage was minimal. The licensee's testing demonstrated system functionality with the identified leakage. At the conclusion of this inspection period, the licensee was continuing to evaluate the potential design issues associated with LPI suction piping pressurization. The NRC will review this issue under Inspector Followup Item (IFI) 50-269/99-04-01, Potential Over Pressurization of LPI Suction Piping.

c. Conclusions

Operations responded to the leakage during the HPI full flow test with timely, conservative actions.

The licensee identified a design issue associated with potential pressurization of the LPI suction piping. The licensee implemented immediate corrective action to address the issue. The licensee was continuing its evaluation process of this issue at the conclusion of the inspection period.

O2 Operational Status of Facilities and Equipment

O2.1 Operations Clearances (71707)

The inspectors reviewed the following clearances during the inspection period:

- O-1-9-1412 Isolation of Reactor Coolant Pump Power for NSM-12983
- O-1-9-1364 Replacement and Maintenance of Reactor Coolant Pumps
- O-1-9-1883 CCW Pump Motors

The inspectors observed that the associated clearances were properly prepared and authorized, and that tagged components were in the required positions with the appropriate tags in place.

O2.2 Engineered Safety Feature (ESF) System Walkdown (71707)

The inspectors walked down accessible portions of the following ESF system:

- Unit 1 Siphon Seal Water to Circulating Cooling Water Pumps
- Unit 2 4160/600 Volt Emergency Power Distribution System
- Unit 1 Essential Siphon Vacuum System

The inspectors verified that the above systems were operable, and that the material condition of the equipment and the housekeeping in the area of the equipment were acceptable. During the walkdowns, the inspectors identified minor discrepancies which were brought to the licensee's attention. The licensee corrected each discrepancy identified by the inspectors.

O4 Operator Knowledge and Performance

O4.1 Unit 1 Refueling Activities

a. Inspection Scope (71707)

Between May 30, 1999, and June 1, 1999, the licensee removed all fuel from Unit 1. Between June 13, 1999, and June 16, 1999, the licensee refueled Unit 1. The inspectors observed portions of these fuel movements.

b. Observations and Findings

The inspectors observed fuel movement activities in the control room, spent fuel pool, and RB. Procedures were available at each location and were adequate to meet all requirements of ITS and the Oconee Shutdown Protection Plan. Fuel movement personnel referred to the procedures frequently. Constant communication was maintained among the various locations such that operators in the control room were aware of the movement of each fuel assembly by number. Control room operators and fuel movement personnel also monitored nuclear instrumentation as each assembly was installed. Newly installed refueling equipment upgrades in the spent fuel pool and the RB operated properly. The inspectors also reviewed tapes of the debris scan and core verification scan.

c. Conclusions

Fuel movement activities on Unit 1 were conducted in a professional manner with adequate procedures and good adherence to procedures.

O5 Licensed Operator Requalification Program Evaluation

The inspector conducted a routine, announced inspection of the licensed operator requalification program during the period June 1-4, 1999. Specific areas of review included requalification annual operating examinations, biennial written examinations, and control room observation.

O5.1 Control Room Observation

a. Inspection Scope (71001)

The inspector observed licensed operator activities in the main control room (MCR) on Units 1 and 2 for two crews over portions of two shifts the afternoon and evening of June 2, 1999. Operator performance was measured against the licensee's administrative procedures, conduct of operations procedure, and compliance with Technical Specifications. The consistency of operator performance with requalification training and operations management expectations was also evaluated.

b. Observations and Findings

The inspector found that MCR activities were performed in a formal and professional manner. The Unit Supervisor (US) (the Unit 1 Senior Reactor Operator (SRO)) properly controlled access to the MCR to minimize disruptions and distractions. The ROs were generally attentive to their panels and promptly responded to MCR alarms. On several occasions, MCR alarms were received and communicated to the crew as expected alarms. As permitted by administrative procedures in this circumstance, the appropriate annunciator response guides (ARGs) were not referenced.

During the evening shift turnover process, Unit 1 received a raw cooling water (RCW) header pressure low alarm (1SA-9, A2) which was silenced and reported by the Unit 2 Balance of Plant (BOP) Reactor Operator (RO) to the US. The inspector noted that the US did not repeat back the BOP's report as prescribed by the site communications standard for three-way communications and as expected by operations management. Additionally, the inspector did not see either the BOP or the US reference the appropriate ARG for this alarm any time during the event. The Unit 2 BOP returned to his duties on Unit 2 following his initial announcement of the alarm.

The inspector then observed the US and the Unit 2 SRO jointly respond to the low RCW header pressure condition. The US checked RCW pump status and discharge pressures on the control panel and then contacted the outside non-licensed operator (NLO) to investigate the problem locally. Neither of the Unit 1 ROs were directed to perform any actions during the immediate or follow-up response to this event by the SRO. The NLO vented the operating RCW pumps over the next half an hour which corrected the problem.

The inspector noted that the actual corrective action taken by the operating crew was prompt, appropriate and adequate to restore the RCW system to nominal operating conditions with no negative consequences to any of the three units. However, the approach taken by the US was contrary to that taught during simulator training and it also differed from that observed by the inspector for similar events during the annual requalification simulator examinations. The inspector discussed the above observations

with operations supervision and the plant manager. They agreed that operator performance in this instance did not meet their expectations. They stated the US was expected to remain in a position of oversight and supervise the unit operators in their response to the event (e.g., monitor communications, ensure the ARG was referenced, ensure appropriate corrective action was initiated and provide guidance, if needed). The plant manager informed the inspector that operator feedback would be initiated and management expectations would be reinforced. The area of three-way communication and ARG usage was documented as an area needing improvement during the last requalification inspection (Inspection Report (IR) 50-269,270,287/97-05, Section O5.4).

c. Conclusions

During the occurrence of a RCW low header pressure condition, the inspector observed that three-way communication was not used, the annunciator response guide was not referenced, and the US did not remain in a position of oversight. Based on the above observations, the inspector concluded that this area has continued need for improvement and management attention.

O5.2 Requalification Annual Operating and Biennial Written Examinations

a. Inspection Scope (71001)

The inspector observed the licensee's conduct of two active simulator examination (ASE) scenarios and eight job performance measures (JPMs) during administration of the annual operating examinations to four crews of licensed operators. The inspector also observed portions of the administration of the biennial written examination to these same four crews and the back-up crews. Additionally, the inspector reviewed the quality and level of difficulty of all examination materials administered during the week of the site visit. The inspector reviewed recent operational events to determine if lessons learned had been incorporated into the requalification examination process. The inspection served to measure the licensee's compliance and effectiveness in conducting operator requalification training and testing in accordance with 10 CFR 55.59, Requalification.

b. Observations and Findings

1. **Review of Requalification Examinations.** The inspector reviewed Oconee's operating history to determine the effectiveness of the operator requalification training program. The inspector found one recent LER, (LER 50-287/98-002 RCS Pressure Limit For Containment Integrity Exceeded Due to Improper Actions) where operator performance resulted in a plant transient. This review revealed that the training department did not develop any specific training in response to this issue. However, remedial training was accomplished by the Operations Shift Manager (OSM) for each shift. The OSM conducted real-time training with the crew to reinforce use of temporary alarm set points on the operator aid computer (OAC) and to reinforce the need to report to crew members when plant manipulations occur.

The inspector noted that the annual requalification operating examination was an opportunity for measuring the effectiveness of the above described OSM training. Such a measurement would have been consistent with the Systems Approach to Training (SAT) process, as well. The inspector asked if the licensee's evaluator's had been advised to search for examples where operators applied the above corrective action and whether the examinations themselves had been developed to include malfunctions or other opportunities to observe operator behavior in this area. The inspector was informed that neither aspect had been considered or applied in the conduct of present annual examinations.

The inspector reviewed six ASE scenarios, 14 JPMs and the RO and SRO written examinations that were administered during the site visit. Except as discussed above, the inspector found the examination materials met the guidelines of the licensee's examination development procedures as well as the guidelines of Appendix A of IP 71001.

The inspector found that the written examination questions were well written and discriminating test items. Almost all questions were application, calculation or synthesis in nature. While these types of questions were necessitated by the open-reference format of the test, they also provided an excellent tool for measuring each operator's knowledge and ability of plant procedures and expected plant responses to a variety of operational conditions. Consequently, confidence in the test results (discussed in paragraph 2. below) is greater.

The inspector also found that the ASEs were very good tools for evaluating operator performance on a real-time basis. The scenario malfunctions were presented in a logical sequence and consisted of a series of related events that led to a major plant transient. The ASEs measured operator skills and abilities in safely manipulating and controlling the plant during routine, abnormal, and emergency plant operations as well as examining operator familiarity with administrative procedures and Technical Specifications.

While the inspector found the area of JPM development to be adequate, a few areas for improvement were noted. The inspector identified that the evaluators were using copies of JPMs that had not been signed as approved by the Operations Training Supervisor. While investigation revealed otherwise, the potential for using erroneous or outdated JPM guides existed. In another area, the inspector identified that some operators were inappropriately cued during the conduct of time-critical JPMs. The licensee's JPM administration guidelines directed the evaluator to inform the operator when the clock started and stopped during time-critical tasks. A competent operator would be aware which tasks are time-critical, the basis for being designated as such, and how quickly the task must be completed. During the JPM testing process, the operator demonstrates he/she has learned that a specified task was time sensitive by adjusting his/her rate of performance commensurate with the time-critical nature of the task. Clock start/stop time was a tool for measuring the success of the operator's performance. Providing that information to the operator during the JPM was not necessary for success. Consequently, informing an operator when the time-critical clock started and stopped was inappropriate cuing. Finally, the inspector noted that the initial conditions and initiating cues for many JPMs were overly descriptive and not representative of how the task would be directed in the plant. In one example, part of the JPM task was for the operator to properly diagnose a component failure and then respond appropriately to the resulting plant transient. However, the initial conditions of the JPM told the operator which component would fail thus invalidating the diagnosis part of the evaluation.

2. **Review of Licensee Administration of Requalification Examinations.** The inspector observed the administration of the RO/SRO written examinations, two simulator examination scenarios and eight JPMs to the operators of "A" shift. The administration of these examinations to each licensed operator fulfilled the NRC requirements for an annual operating test and biennial written examination of the licensed operators.

The inspector observed that each part of the examinations was administered per a pre-established schedule. The licensee utilized operator sequestering during the operating tests to maintain examination security. The inspector noted that the

use of sequestering during these tests was minimized, and well coordinated when used. The impact on operator stress appeared to be minimal. The written examination was administered in the requalification training room with proctors and other appropriate security measures implemented to preclude examination compromise. The written examination was graded immediately following an operator completing the test. This allowed prompt feedback to the operator on his/her performance plus allowed feedback to the training department on the quality of the test items. The test appeared to be challenging. Test scores during the week of the site visit ranged from 80.0 to 100 percent.

The inspector reviewed test results from the previous examination weeks and noted that nine of the 92 operators tested had failed the examination with scores ranging from 70.0 to 78.8 percent. However, over 66 percent (61/92) of the operators taking the tests had scores above 85.0 percent. Based on the above results, the inspector determined that the Oconee written examinations could detect those operators requiring additional management attention and training.

The inspector observed operator performance during the simulator examinations and generally found it to be good. Some weaknesses such as communications errors and improper procedure usage were noted. The inspector observed the facility evaluator debrief sessions and reviewed the evaluator documentation of the operators' performance. The inspector noted that past errors or mistakes that operators repeated during the present examination were given added emphasis in their evaluation. The evaluators comments and findings were objective and appropriate to the operators' performance. Two of 16 operators tested were evaluated as unsatisfactory. They were removed from shift pending remedial training and retesting. These results were in line with the inspector's observations.

The inspector noted the strong support the simulator evaluations received from both operations and senior plant management. Each simulator examination was evaluated by an operations management representative. The licensee indicated that the plant manager periodically observed the examination process as well. The inspector noted that the plant manager observed one ASE scenario during the site visit. The operations management representative was in charge of the post-examination critique with each crew. Specific individual and crew strengths and weaknesses were discussed during the critique. The inspector noted that the operators appeared to accept the validity of performance comments more readily when presented by the operations representative, and particularly in the presence of the plant manager, than by the training department evaluators alone.

The inspector observed three facility evaluators administer JPMs to six operators both on the simulator and in the plant. Operator and evaluator performance was acceptable.

Two simulator fidelity issues were identified during the examinations. The licensee added them to their simulator deficiency tracking system for evaluation and correction. A simulator facility report which discusses the issues is included as Attachment A.

c. Conclusion

The inspector determined that the development and administration of the annual operating tests and biennial written examinations were satisfactory. The inspector found the written examinations and simulator scenarios provided very good evaluation tools to measure operator knowledge, skills and abilities for various plant conditions.

Incorporation of facility operational events, such as LER 50-287/98-002, into the simulator scenarios would have enhanced the evaluation process. JPM development was identified as being acceptable but was an area where improvement could enhance test effectiveness to a level comparable with the written and simulator examinations. The facility evaluators adequately noted and documented individual operator performance discrepancies.

The routine participation of operations management and occasionally senior plant management in the simulator evaluation process was noted as a strength. This level of management support reinforced the importance of the requalification program to the operators. The inspector concluded that the evaluated portion of the licensed operator requalification program met the requirements of 10 CFR 55.59, Requalification.

O6 Operations Organization and Administration

O6.1 Outage Work and Configuration Control

a. Inspection Scope (71707)

During the current Unit 1 outage, the licensee implemented additional controls in their outage control room (CR), work control center (WCC), and tagging/clearance process. The inspectors observed the configuration control effort throughout the refueling outage.

b. Observations and Findings

The licensee reduced the number of operating crews from five crews to three crews to provide improved control of outage activities. The reduction in the number of crews, resulted in an increased number of operators in each crew. The increased number of operators per crew resulted in better communications, a more efficient implementation of the clearance and tagging process, and fewer mispositionings and near misses during the outage. The inspectors observed the WCC SROs having shiftily direction meetings with outage team leaders and outage operation's coordinator prior to commencing work. The WCC SROs stayed in formal contact with the CR staff to coordinate work that may have changed plant configuration. The level of communications was superior to previous outages. Clearances on equipment were fully explained by the WCC to personnel hanging the clearances. At the end of this period, with just a few outage days remaining, there have been two mispositionings with eight misposition near misses. For the last Unit 3 outage, there were four mispositionings and 14 near misses. The inspectors validated the mispositioning numbers against previous PIPs and IRs. The inspectors determined that the reduction in mispositionings and near misses were attributed to the implementation of a new clearance system.

c. Conclusions

The licensee implemented new configuration controls and clearance procedures this outage with positive results.

O8 Miscellaneous Operations Issues (92901, 90712)

O8.1 (Closed) LER 50-270/98-003: Low Condenser Vacuum Results in a Reactor Trip Due to an Inadequate Work Clearance Process, Revisions 0 and 1

This event was discussed in IR 50-269,270,287/98-06 (Sections O1.6 and O2.2). The licensee issued PIP 2-O98-2947 to identify root cause and corrective actions. The LER stated that the root cause of the event was inadequate implementation of the work clearance process. The LER also stated that a contributing cause was an improper

action. The improper action was the operations' coordinator not realizing that the work on the de-superheater was outside the auxiliary steam (AS) tagout isolation boundary and not using an independent review of the tagout as required. Key corrective actions were: the issuance of Operations Management Procedure (OMP) 2-18, Tagout, Removal and Restoration Procedure, Revision 0; revising the operating procedure for the AS system; counseling the coordinator on the improper action; and training personnel on OMP 2-18.

Technical Specifications (TS) 6.4, Station Operating Procedures, Section 6.4.1 required that procedures be written to control work activities. Nuclear Site Directive (NSD) 500, Red Tags/Configuration Control, Revision 9, required that tagouts be appropriate for the work and be reviewed independently. This Severity Level IV violation is being treated as an NCV, consistent with Appendix C of the NRC Enforcement Policy and is identified as NCV 50-270/99-04-02, Failure to Implement an Adequate Work Clearance Process. This violation is in the licensee's corrective action program as PIP 2-O98-2847. The licensee has returned to compliance by completion of the corrective actions identified above.

O8.2 (Closed) Violation EA 97-298-01012: Failure to Adhere to TS Requirements for the HPI System

The licensee issued LER 50-287/97-003, High Pressure Injection System Inoperable Due to Design Deficiency, on June 2, 1997, and a response letter to the violation on September 25, 1997. The LER was closed in IR 50-269, 270,287/98-08, Section O8.7. In the response letter Section 3, steps to avoid future violations, the licensee identified four steps to be completed. Several IRs and licensees' PIP reports addressed the response letter Section 3 steps as identified below:

Response Section	IR/PIP	IR Section	Topic
3.a	IR 98-07	E8.6	Reliability Study
3.b	IR 98-06	E7.2	Technical Audit
	IR 98-10	E2.5	System Review
	IR 98-11	E2.5	Technical Audit
3.c	IR 98-01	E7.3	Operating Experience
	IR 98-09	E7.1	Operating Experience
	PIP 0-O97-1507	Action 14	Operating Experience
3.d	PIP 3-O97-1428	Actions 7, 19, 30, 33, and 34	Equipment Monitoring

The inspectors reviewed and verified that the steps had been completed as described. Under Step 3.d, the root valve position verification (Actions 19 and 33) remained scheduled, partially completed, and open under the control of the PIP action items. This violation is closed.

O8.3 (Closed) Inspector Followup Item (IFI) 50-269,287/98-05-03: Unit 1 and 3 LPSW Testing

This IFI addressed the post-modification testing of the siphon seal water (SSW), essential siphon vacuum (ESV), LPSW, and related interactive testing. The inspectors reviewed documentation which indicated that LPSW test had been satisfactorily completed on Units 1 and 3. The inspectors also observed portions of the Unit 1 testing. The test results were discussed with test and system engineers who provided consistent coverage during the testing process. This item is closed.

Although testing has been satisfactorily completed there are several issues that the licensee has in their PIP program to resolve. These are: occasional high differential pressures on the SSW system discharge strainers, PIP 2-O98-4990; ESV float valve closure problems, PIP 2-O98-2415; and LPSW supplied cooling to the Unit 2 HPI motor coolers low flow, PIP 2-O96-2280. These are longer term problems requiring piping replacements or modifications.

II. Maintenance

M1 Conduct of Maintenance

M1.1 General Comments

a. Inspection Scope (62707, 61726, 37551)

The inspectors observed all or portions of the following maintenance activities:

- NSM 13043 — Containment Penetration Modification
- NSM 12885 — BWST Valve Interlock Modification
- PT/1/A/251/023 — LPSW System Flow Test, Revision 12
- IP/0/A/3003/11 — I and C Battery Quarterly Surveillance, Revision 16
- PT/1/A/0610/01L — Load Shed Channel Verification, Revisions 1 and 2
- WO 98161750 — Implement Minor Modification OE-13350, Replace Stem and Wedge on 1FWD-313
- TN/1/A/2983/AL1 — Installation Procedure for 7kV Modification, Revision 1
- MP/0/A/1200/02 — Valve-Gate Disassembly, Repair, Reassembly, Revision 38
- WO 98080026 — Implement 7kV Modification, NSM-12983
- TN/0/B/3000/CL4 — Test of ESS Alarms and Indication, Revision 0
- WO 98161818 — Implement Minor Modification OE-13351, Replace Stem and Wedge on 1 FWD-314
- PT/1/A/0610/01J — Emergency Power Switching Logic Functional Test, Revision 31
- TT/1/A/0251/80 — Valves 1LPSW-251 and 252 Diagnostic Tests, Revision 2
- IP/0/A/0305/014-1 — RPS Control Rod Drive Breaker Trip and Events Recorder Timing Test, Revision 12
- TT/1/A/0261/010 — ECCW/ESV Integrated Post Modification Test, Revision 1
- TT/1/A/0261/009 — ESV System Post Modification Test, Revision 0

- PT/1/A/0150/045 1CF-11, 1CF-12, 1 CF-13, and 1CF-14 Operability Test, Revision 5
- TT/1/A/0251/070 Siphon Seal Water Test, Revision 2

b. Observations and Findings

In general, the inspectors found the work performed under these activities to be professional and thorough. All work observed was performed with the work package present and in use. Technicians were experienced and knowledgeable of their assigned tasks. Quality control (QC) personnel were present when required by procedure. When applicable, radiation control measures were in place.

c. Conclusions

The inspectors concluded that the outage and maintenance activities listed above were generally completed thoroughly and professionally.

M1.2 Inservice Inspection (ISI) and OTSG Eddy Current Inspection (Unit 1)

a. Inspection Scope (73753,50002)

The inspectors reviewed selected results of ISI and OTSG eddy current examinations conducted during the Unit 1 refueling outage. The focus of the ISI review was on augmented examinations of HPI connections to the RCS, and the focus of the OTSG review was the licensee's commitments to examine for intergranular stress corrosion cracking (IGSCC) and intergranular attack (IGA).

b. Observations and Findings

The inspectors reviewed the scope and results of eddy current inspections of the Unit 1 OTSGs and compared the results with degradation projections listed in the licensee's program manual, SGMEP 105, OTSG Specific Assessment of Potential Degradation Mechanisms. SGMEP 105 provided an estimate that OTSG 1A would have 69 pluggable tubes, and OTSG 1B would have 216 pluggable tubes. The total number of plugged tubes was slightly less than projected, 66 in OTSG 1A and 189 in OTSG 1B, bringing the total number and percentage of plugged tubes to 557 (3.6 percent) in OTSG 1A and 1642 (10.6 percent) in OTSG 1B. The inspectors participated in a conference call between the licensee and the NRC Office of Nuclear Reactor Regulation where the results of the eddy current examinations were discussed.

The inspectors observed tube plugging operations in OTSG 1B. The operations observed included QC verification of the locations of tubes to be plugged, insertion and seating of the plugs, and final rolling of the plugs. The inspectors witnessed the operations being conducted by two crews working on each of the 1B tubesheets. During these operations, the inspectors noted that there appeared to be good communications between personnel inside containment and the operators at the remote work stations. Although the computer program for the manipulators provided consistent indexing to the selected tube location, the inspectors noted that the operators constantly checked tube locations with the video camera through reference to landmarks on tubesheet maps. The tube plugging operations appeared to be well controlled in accordance with the licensee's procedures.

The inspectors reviewed eddy current problem reports to determine if problems were identified during the performance of the examinations. The inspectors noted that

problems were identified and had been appropriately reviewed, screened, and were addressed through the generation of PIP reports.

In the area of ISI, the inspectors reviewed activities involved with the resolution of PIP 1-O99-2157 which addressed the inability to perform ultrasonic test (UT) of welds between HPI boundary check and stop valves to nozzles A1, A2, B1, and B2. The UT examination of these welds were augmented ISI examinations because the HPI connections to the RCS can be subject to thermal fatigue. These welds were placed in this category due to licensee commitments to NRC Bulletin 88-08, Thermal Stresses in Piping Connected to Reactor Cooling Systems.

The HPI welds could not be fully examined by UT because the physical configuration of valve-to-valve welds limits the UT scans to circumferential scans which can only detect axial cracking. The licensee plans to examine these welds through a combination of radiography (RT) and UT during the next Unit 1 refueling outage. The inspectors agreed that this appeared to be an appropriate solution to the identified problem, in that the type of thermal cracking discussed in NRC Bulletin 88-08 was circumferential cracking which was discernable with carefully planned RT. The decision to delay the inspection until the next refueling outage was acceptable because the next outage would be within the same 40-month inspection period.

c. Conclusions

The licensee's ISI and OTSG eddy current examinations were conducted in a conservative manner. Results of inspections and resolutions to identified problems were given appropriate reviews.

M7 Quality Assurance in Maintenance Activities

M7.1 PIP Review

a. Inspection Scope (71707, 62707, 37551)

The inspectors reviewed nine PIPs picked from a search of recent PIPs on the LPSW, LPI, and radiation monitoring systems. While these PIPs generally documented and corrected problems adequately, PIP 0-O99-1299 raised concerns over the processing of prior PIP 7-O98-5782, which was written to document a wrong unit event. The inspectors reviewed the circumstances surrounding these two PIPs.

b. Observations and Findings

On December 3, 1998, maintenance personnel were notified of suspect indication on Unit 3 Radiation Indicating Alarm (RIA) 31. Maintenance personnel attempted to solve the problem by restarting the Unit 3 System Control and Data Acquisition Computer (SCADA) A. This did not correct the problem. Maintenance referred the work to information technology (IT) personnel who corrected the problem and initiated PIP 7-O98-5782. The PIP identified that restarting of the Unit 3 SCADA A was the wrong component to correct the problem. After discussions between maintenance and IT management about the intent of the actions to restart the Unit 3 SCADA A, PIP 7-O98-5782 was closed with no corrective actions. Information technology personnel then initiated PIP 0-O99-1299 to further document concerns over the handling of troubleshooting on RIA-31.

The inspectors reviewed both PIPs and interviewed personnel involved to determine whether or not Unit 3 SCADA A was the wrong component. RIA-31 had a unique design

in that it sampled each unit and processed the data through Unit 1 SCADA B. Unit 1 SCADA B then processed the data through the local area network sending data to the CR for each unit. Maintenance personnel agreed they went to the wrong component (Unit 3 SCADA A) to correct the problem but stated that the RIA-31 documentation was not clear to maintenance personnel. The inspectors determined that the consequences of restarting any of the SCADA computers were negligible in that no RIA operability would be affected nor would any data be lost. Maintenance personnel were aware of this negligible impact before restarting the Unit 3 SCADA A on December 3, 1998. Following a meeting of interested parties on April 12, 1999, the licensee decided that future work involving the SCADA computers would be done only by IT personnel.

One of the concerns mentioned in PIP 0-O99-1299 was that one procedure used to plan the troubleshooting of RIA-31 was incorrect and another procedure could not be performed as written. The licensee agreed this was the case and included a corrective action in PIP 0-O99-1299 to change the procedures. The inspectors verified that the procedure changes were in the process of development.

The inspectors also reviewed PIP 0-O99-1299 for completeness. The PIP raised concerns about using plant procedures as design documents and about closing PIP 7-O98-5782 without consulting the subject matter expert and without proper corrective actions. The inspectors learned that these concerns were resolved and corrective actions put in place during the meeting on April 12, 1999. However, the corrective action section neither for PIP 0-O99-1299, nor for PIP 7-O98-5782 mentioned the resolution. Upon questioning by the inspectors, the licensee added comments to the problem resolution section of PIP 0-O99-1299 to state that procedures are not design documents but can be used as references and reopened PIP 7-O98-5782 to add a corrective action for maintenance to contact IT personnel before working on radiation monitors. The inspectors verified that these changes had been made to the PIP.

c. Conclusions

In general, problem identification reports reviewed were clear and appropriately completed.

Maintenance personnel did not fully understand the design and operation of the data acquisition computer for Radiation Indicating Alarm 31 and as a result went to the wrong computer to troubleshoot it.

The problem investigation process report on the data acquisition computer for Radiation Indicating Alarm 31 did not fully document all corrective actions taken to improve troubleshooting of the computer.

III. Engineering

E1 Conduct of Engineering

E1.1 Outage Electrical Testing Observations and Reviews

a. Inspection Scope (37551)

The inspectors observed and reviewed emergency power testing activities during the Unit 1 refueling outage.

b. Observations and Findings

PT/1/A/0610/01L, Load Shed Channel Verification and PT/1/A/0610/01J, Emergency Power Switching Logic Functional Test were issued and revised for the ITS. While performing the tests, the licensee identified and corrected several problems. The licensee initiated PIPs 1-O99-2482 and 5-O99-2478 to document the problems identified.

These problems indicated poor pretest reviews and walkdowns of a new procedure. The identification of a LPSW interaction between operating and non-operating units by the operators demonstrated good operational awareness of the plant. This awareness included system configurations and the effect of testing on systems in operating alignments. This operator action kept the test from causing a potential transient.

c. Conclusions

Problems identified during the testing of the emergency power system were examples of poor pretest reviews and walkdowns of a new procedure.

During the emergency power system tests the operators exhibited a good awareness of plant system configurations and the effect of testing on systems in operating alignments.

E2 Engineering Support of Facilities and Equipment

E2.1 Followup on Repairs to RB Protective Coatings - Unit 1

a. Inspection Scope (37550)

The inspectors examined the protective coatings in the Unit 1 RB and repairs to the protective coatings which have been completed during the current refueling outage.

b. Findings and Observations

The licensee initiated several PIPs to document and disposition deteriorated protective coatings in the Units 1, 2, and 3 RBs. During the current Unit 1 refueling outage, the licensee performed an inspection of the Unit 1 RB protective coatings. This inspection was performed in accordance with procedure MP/0/B/3005/013, RB Coating Inspection Procedure, Revision 1. The inspectors reviewed the results of the coatings inspection which were documented on the procedure coatings inspection form, Attachment A. Attachment A documented areas inspected, described the coating deficiencies, and recommended resolution to correct the deficiencies. Licensee engineers identified several problems with coatings applied during the last refueling outage. These included blisters in many areas, delamination of the new coatings, and a few areas where the new coating material was rough and powdery and could easily be removed by scrapping. The licensee initiated PIP 1-O99-2008 to document and correct these problems.

Based on the results of the coatings inspection, the licensee determined the scope of work for coatings repairs which would be completed during the current outage. The work included repairs to the damaged coatings applied during the last refueling outage, removal of delaminated coatings from the grid support steel for the containment spray and portions of the polar crane, and repairs to other localized areas identified during the licensee's inspection. Since only a few localized areas of defective coatings were identified during inspection of the dome liner plate, the licensee concluded that repairs to these areas could be deferred until a future outage.

The inspectors performed an independent inspection of the coatings to assess the adequacy of the licensee's coatings inspection. During the walkdown, the coatings were examined for any visible defects such as blistering, cracking, flaking/peeling, delimination, rusting, pitting and physical (mechanical) damage. The following conditions were observed by the inspectors which had not been identified by the licensee during their inspection:

- The topcoat was deliminated and flaking/peeling on Column C-25 on the third floor level.

- The topcoat was flaking/peeling on the liner plate in the vicinity of Azimuth 30 at approximately Elevation 864.

- The sealant covering the expansion joint material at the intersection of basement slab/liner plate interface was degraded and the liner plate appeared to be rusted between column C-25 and C-2. A portion of the sealant was missing at Column C-18 and the liner plate was rusted.

The inspectors concluded that, with the exception of those areas discussed above, the licensee's inspection of the RB building coatings was adequate. The licensee noted the above deficiencies identified by the inspectors in their scope of work for the current outage.

The inspectors examined the coating repairs which were in progress. This work primarily involved removal of the delaminated coatings from the grid support steel for the containment spray steel. This work involved removal of the topcoat only. The inorganic zinc oxide primer basecoat was in good condition and will provide corrosion protection for the steel. The inspectors also examined the dome liner plate and noted that the damaged coatings were confined to a few small localized areas. The inspectors concurred with the licensee's conclusions that repairs to the dome coatings could be deferred until a future outage.

The licensee completed repairs to the coating at the liner/concrete floor intersection in the expansion joint area in both Unit 1 and Unit 3 during previous outages. The repairs included removal of a small portion of the concrete floor, measurement of the thickness of the liner plate using UT methods, and application of new coatings. This work was completed under minor modification numbers 9688 and 9729 in 1996 and 1997. The inspectors requested copies of the modification records for review on June 4, 1999. The licensee was unable to locate the records documenting the extent and locations of the completed liner repairs. The failure of the licensee to maintain these quality records is a violation of 10 CFR 50, Appendix B, Criterion XVII. This Severity Level IV violation is being treated as an NCV, consistent with Appendix C of the NRC Enforcement Policy. This violation is in the licensee's corrective action program as PIP 1-O99-2423. It is identified as NCV 50-269,287/99-04-03, Failure to Maintain Records Documenting Repairs to Containment Vessel Liner.

c. Conclusions

The licensee's walkdown inspections for coatings were adequate to plan and prioritize coating repair activities to be completed during the current Unit 1 refueling outage. A non-cited violation was identified for failure of the licensee to maintain quality records documenting repairs to the Units 1 and 3 containment vessel liners.

E2.2 Reactor Building Tendon Surveillance Program

a. Inspection Scope (37550)

The inspectors reviewed the results of the licensee's RB tendon surveillance program.

b. Observations and Findings

The inspectors reviewed the results of Tendon Surveillance Number 7 performed on the Unit 1 post-tensioning system in 1997. The licensee performed the tendon surveillance in accordance with Technical Specification 4.4.2. During the surveillance inspection, conditions were observed which were considered under TS 4.4.2.2 and 4.4.2.4 as indications of potential abnormal degradation of the post-tensioning system. The licensee submitted a special report dated December 31, 1997, to the NRC as required by TS 3.6.7.2.c describing the results of the tendon surveillance. The report summarized the engineering evaluation which concluded that the problems identified during the tendon inspections did not result in loss of pre-stress forces or affect containment integrity. The problems identified included lower than expected tendon elongation during tendon retensioning, leakage of the tendon corrosion preventing filler material (grease) from the tendon ducts, presence of water in the tendon ducts, and high water content and/or low reserve alkalinity in the grease. The licensee's evaluation showed that the lower than expected tendon elongation was acceptable and no additional surveillance inspections were required to address this issue. However additional remedial actions were undertaken to examine the remaining vertical tendons for corrosion, presence of free water, and lack of corrosion protection (grease coverage) on the vertical tendons. The actions included inspection of all remaining Unit 1 vertical tendons, draining of water from the tendon ducts, and replacement of missing or degraded grease.

Free water was identified in a total of 26 of the Unit 1 vertical tendons during the initial and expanded surveillance inspections. The inspectors reviewed Duke procedure MP/0/A/1400/034, Tendon-Inspection-Corrosion, which provide instructions for performance of inspections of the tendons for loss or degradation of the corrosion prevention filler material. The inspector examined records documenting inspection of the tendon hardware, the condition of the grease, sampling and testing of the grease, and replacement of the grease. The presence of free water was identified in the inspection records.

Based on the results of the Unit 1 tendon surveillance inspections, the licensee committed to inspect the Units 2 and 3 vertical tendon lower caps for the presence of free water by February 1998. The licensee stated in the December 31, 1997, Special Report that additional remedial actions would be taken on Units 2 and 3 based on the results of these inspections. These actions were to be completed during the Spring 1998 Unit 2 refueling outage, and the Fall 1998 Unit 3 refueling outage. The inspectors requested that the licensee provide the records documenting the inspection of the Units 2 and 3 vertical tendons. Discussions with licensee personnel disclosed that the only records available were completed work requests numbers 98004497 for Unit 2 and 98004495 for Unit 3. These documents describe that the tendons were inspected by loosening one of four nuts on the lower tendon grease cap to determine the presence of water. If only grease was seen when the nut was loosened, then it was assumed no water was present in the tendon duct. The work requests stated that water was detected in 75 locations in Unit 2 and 96 locations in Unit 3. The specific tendon locations were not recorded. The licensee was not able to provide the specific locations (tendon numbers) to the inspectors during the inspection. The inspectors performed a walkdown inspection in the Unit 3 tendon gallery and examined the tendon caps. The inspectors noted that although a minimal amount of grease had leaked from a few tendon caps, the

overall condition of the grease caps was good and the caps were retaining the grease per design requirements. A small amount of moisture/dampness was observed on the tendon gallery floor but this would not impact the tendons. Automatic sump pumps were installed in the tendon galleries to remove excessive water.

The inspectors questioned licensee personnel whether a PIP was initiated to document the results of the inspections performed on the Units 2 and 3 vertical tendons. These discussions disclosed that a PIP had not been initiated. On June 4, 1999, the licensee initiated PIP 6-O99-2215 to document the failure of engineers to document the results of the inspections of the Units 2 and 3 vertical tendons in the corrective action program, and failure to perform any remedial actions to correct the water problems as committed to in the December 31, 1997, Special Report.

Section 208.3 of Duke Power Nuclear Station Directive 208, Problem Investigation Process, Revisions 16 through 20, requires that a PIP be initiated to identify problems, document the problems, and respond to (correct) the problems with a level of effort and timeliness commensurate with their significance. The failure of the licensee to initiate a PIP to further evaluate and correct the presence of water in the Units 2 and 3 vertical tendons is a violation of 10 CFR 50, Appendix B Criterion V, Failure to Follow Procedure (Nuclear Station Directive 208, Problem Investigation Process). This Severity Level IV violation is being treated as an NCV, consistent with Appendix C of the NRC Enforcement Policy. This violation is in the licensee's corrective action program as PIP number 6-O99-2215. It is identified as NCV 50-270, 287/99-04-04, Failure to Initiate Corrective Actions to Remove Water from the Units 2 and 3 Vertical Tendons.

c. Conclusions

The licensee's program for evaluation of the presence of water in the Unit 1 vertical tendons was comprehensive. The licensee's resolution of the Unit 1 problems and repairs to the Unit 1 tendons were completed in a timely manner. A non-cited violation was identified for failure to document, evaluate, and initiate corrective actions to resolve the presence of water in the Units 2 and 3 vertical tendons.

E8 **Miscellaneous Engineering Issues** (37551)

E8.1 (Closed) Unresolved Item (URI) 50-269/99-03-04: Storage Requirements for QA1 Material Following Issue

This URI was opened to allow the inspectors to further review the amount and types of quality assurance (QA) materials stored in unauthorized locations after issue. The inspectors' review and investigation found no examples of consumable materials being used beyond the expiration date. Weaknesses were identified in the program for tracking and tracing issued QA1 consumable material. The licensee documented these weaknesses and the proposed corrective actions in PIP 0-O99-1408 and PIP 4-O99-1994. This URI is closed.

E8.2 (Closed) Apparent Violation (EEI) 50-287/98-10-08: Failure to Inspect and Document Inspections of RB Service Level 1 Safety Related Coatings

Apparent Violation 50-287/98-10-08, addressed the failure of the licensee to inspect and adequately document inspections of the RB Service Level 1 safety related coatings. Specifically, records disclosed that QC inspections of the coatings were being documented on work orders in accordance with instructions listed on Form QAF-1FA, dated December 5, 1994. The specific instructions on this form were to perform Categories 1 through 6 of the inspection requirements addressed in procedure QAC-3.

These requirements included mixing and thinning of the coatings, surface preparation, prime coat application, intermediate and finish coat applications, and touch up (repair) of existing coatings. The inspectors reviewed the documentation associated with coating activities performed on October 24, 26, and 27, and November 1, 6, 11, and 15, 1998. However, records showed that the following information was either not documented or was incomplete: coating thickness, environmental conditions (dew point, surface temperature, humidity, and ambient temperature), batch numbers/lot numbers of coating materials, identification of measuring and test equipment, and identification of the inspection personnel. The licensee initiated PIP 3-O98-5918 to document and disposition this issue. Immediate corrective actions included documentation of the ongoing QC inspections for the Unit 3 coatings on Form QAC-3A, Field Applied Coatings Inspection. Additional corrective actions included implementation of procedure MP/O/A/1000/006, Service Level I through IV Coating which was approved on May 27, 1999. This procedure provided detailed requirements for surface preparation, application and inspection for coatings. This procedure was implemented for coatings work and inspection performed in the Unit 1 RB during the current refueling outage. This EEI is closed.

The failure to inspect and document inspection of the Unit 3 RB Service Level I coatings is a violation of 10 CFR 50, Appendix B, Criterion V for Failure to Follow Procedures. This Severity Level IV violation is being treated as an NCV, consistent with Appendix C of the NRC Enforcement Policy. This violation is in the licensee's corrective action program as PIP 3-O98-5918. It is identified as NCV 50-287/99-04-05, Failure to Perform Inspection of Unit 3 Safety Related Coatings.

E8.3 Year 2000 (Y2K) Readiness Program Review (Temporary Instruction (TI) 2515/141)

The staff conducted an abbreviated review of Y2K activities and documentation using TI 2515/141, Review of Year 2000 (Y2K) Readiness of Computer Systems at Nuclear Power Plants. The review addressed aspects of Y2K management planning, documentation, implementation planning, initial assessment, detailed assessment, remediation activities, Y2K testing and validation, notification activities, and contingency planning. The reviewers used Nuclear Energy Institute/ Nuclear Utilities Software Management Group (NEI/NUSMG) 97-07, Nuclear Utility Year 2000 Readiness, and 98-07, Nuclear Utility Year 2000 Readiness Contingency Planning, as the primary references for this review.

During the review, the licensee stated that the Y2K Readiness Project activities were 100 percent completed with contingency planning nearly 100 percent complete, and that both programs were on target to be completed by their scheduled due dates.

Conclusions regarding the Y2K readiness of the facility are not included in this report. The results of this review will be combined with the results of reviews of other licensees in a summary report to be issued by July 31, 1999.

E8.4 (Withdrawn) Violation (VIO) 50-269,270,287/98-03-01: Untimely Reporting of Design Issues

In a letter to the licensee dated June 2, 1999, the NRC withdrew this violation. The NRC noted that the licensee's timeliness in reviewing and reporting design basis issues involving past operability differed from the NRC guidance in NUREG-1022. However, the NRC concluded that the licensee's actions to determine past operability and reportability were reasonable and in compliance with the applicable regulations for the six examples described in the Notice of Violation.

IV. Plant Support Areas

R1 Radiological Protection and Chemistry Controls

R1.1 Radiological Protection

a. Inspection Scope (71750)

The licensee implemented enhanced health physics (HP) controls for the Unit 1 outage. The inspectors observed the licensee's implementation of the controls and assessed the effectiveness of the controls.

b. Observations and Findings

The inspectors periodically toured the radiological control area (RCA) during the inspection period. Radiological control practices were observed and discussed with radiological control personnel, including RCA entry and exit, survey postings, locked high radiation areas, and radiological area material conditions.

During the outage, the licensee implemented changes to their normal programs for outage work. Additional personnel staffed control points around the RB entry and in the interior of the RB. The staff assisted personnel concerning health physics controls in their work area and patrolled the RB with a greater frequency. At the RB entry point, the staff questioned personnel as to details of their work and expected work conditions. The licensee employed new, automatic equipment to ensure that personnel entries into the RB building had appropriate personal dosimetry.

The inspectors reviewed documentation which compared the level of radiation received during the current outage with those of previous outages. Following the review of documentation, the inspectors determined that the newly implemented controls had resulted in lower levels of personnel exposure. From the inspections performed, the inspectors also determined that radiation controls were implemented as required by procedure, and procedural requirements were adhered to by plant personnel.

c. Conclusions

The licensee's normal and outage health physics activities were implemented in a controlled and informative manner. Enhancements employed during the Unit 1 outage were positive in the control of human performance and maintaining dose at reasonable levels during a high work load outage.

S1 Conduct of Security and Safeguards Activities

S1.1 General Comments (71750)

During the period, the inspectors toured the protected area and noted that the perimeter fence was intact and not compromised by erosion or disrepair. Isolation zones were maintained on both sides of the barrier and were free of objects which could shield or conceal an individual. The inspectors periodically observed personnel, packages, and vehicles entering the protected area and verified that necessary searches, visitor escorting, and special purpose detectors were used as applicable prior to entry. Lighting of the perimeter and of the protected area was acceptable and met illumination requirements.

V. Management Meetings

X1 Exit Meeting Summary

The inspectors presented the inspection results to members of licensee management at the conclusion of the inspection on July 7, 1999. The licensee acknowledged the findings presented. No proprietary information was identified to the inspectors

Partial List of Persons Contacted

Licensee

L. Azzarello, Design Basis Engineering Manager
E. Burchfield, Regulatory Compliance Manager
T. Coutu, Superintendent of Operations
T. Curtis, Mechanical System/Equipment Engineering Manager
G. Davenport, Operations Support Manager
B. Dobson, Engineering Work Control Manager
J. Forbes, Station Manager
W. Foster, Safety Assurance Manager
T. Hartis, Recovery Plan Coordinator
D. Hubbard, Modifications Manager
C. Little, Civil, Electrical & Nuclear Systems Engineering Manager
W. McCollum, Site Vice President, Oconee Nuclear Station
B. Medlin, Superintendent of Maintenance
M. Nazar, Manager of Engineering
J. Smith, Regulatory Compliance
J. Twiggs, Manager, Radiation Protection

Other licensee employees contacted during the inspection included technicians, maintenance personnel, and administrative personnel.

NRC

D. LaBarge, Project Manager

Inspection Procedures Used

IP37551	Onsite Engineering
IP61726	Surveillance Observations
IP62707	Maintenance Observations
IP71001	Licensed Operator Requalification Program Evaluation
IP71707	Plant Operations
IP71750	Plant Support Activities
IP90712	In-Office Review of Written Reports of Nonroutine Events at Power Reactor Facilities
IP92901	Followup - Plant Operations
IP93702	Prompt Onsite Response to Events
TI2515/141	Review of Year 2000 Readiness of Computer Systems at Nuclear Power Plants

Items Opened, Closed, and Discussed

Opened

50-269/99-04-01	IFI	Potential Over Pressurization of LPI Suction Piping (Section O1.4)
50-270/99-04-02	NCV	Failure to Implement an Adequate Work Clearance Process (Section O8.1)
50-269,287/99-04-03	NCV	Failure to Maintain Records Documenting Repairs to Containment Vessel Liner (Section E2.1)
50-270,287/99-04-04	NCV	Failure to Initiate Corrective Actions to Remove Water from the Units 2 and 3 Vertical Tendons (Section E2.2)
50-287/99-04-05	NCV	Failure to Perform Inspection of Unit 3 Safety Related Coatings (Section E8.2)

Closed

50-270/98-003	LER	Low Condenser Vacuum Results in a Reactor Trip Due to an Inadequate Work Clearance Process, Revisions 0 and 1 (Section O8.1)
EA 97-298-01012	VIO	Failure to Adhere to TS Requirements for the HPI System (Section O8.2)
50-269,287/98-05-03	IFI	Unit 1 and 3 LPSW Testing (Section O8.3)
50-269/99-03-04	URI	Storage Requirements for QA1 Material Following Issue (Section E8.1)
50-287/98-10-08	EEI	Failure to Inspect and Document Inspections of RB Service Level 1 Safety Related Coatings (Section E8.2)

Withdrawn

50-269,270,287/98-03-01	VIO	Untimely Reporting of Design Issues (Section E8.4)

Discussed

50-270/99-002	LER	Reactor Trip Due to Secondary System DC Grounds (Section O1.3)
50-269/99-005	LER	LPI-HPI Pressurization Problem (Section O1.4)
50-287/98-002	LER	RCS Pressure Limit For Containment Integrity Exceeded Due to Improper Actions (Section O5.2)
50-287/97-003	LER	High Pressure Injection System Inoperable Due to Design Deficiency (Section O8.2)

List of Acronyms

ARG	Annunciator Response Guides
AS	Auxiliary Steam
ASE	Active Simulator Examination
BS	Building Spray
BOP	Balance Of Plant
CFR	Code of Federal Regulations
CR	Control Room
DC	Direct Current
EAL	Emergency Action Level
EEI	Escalated Enforcement Item
EHC	Electro-Hydraulic Control
ESF	Engineered Safety Feature
ESV	Essential Siphon Vacuum
GPM	Gallons Per Minute
HP	Health Physics
HPI	High Pressure Injection
IFI	Inspector Followup Item
IGA	Intergranual Attack
IGSCC	Intergranual Stress Corrosion Cracking
IP	Inspection Procedure
IR	Inspection Report
ISI	Inservice Inspection
IT	Information Technology
ITS	Improved Technical Specification
JPM	Job Performance Measures
kV	Kilovolt
LER	Licensee Event Report
LPI	Low Pressure Injection
LPSW	Low Pressure Service Water
LTOP	Low Temperature Overpressure Protection
MCR	Main Control Room
NCV	Non-Cited Violation
NLO	Non-Licensed Operator
NRC	Nuclear Regulatory Commission
NSD	Nuclear Site Directive
OAC	Operator at the Controls
OMP	Operations Management Procedure
OSM	Operations Shift Manager
OTSG	Once Through Steam Generator
PIP	Problem Investigation Process
PORV	Power Operated Relief Valve
QA	Quality Assurance
QC	Quality Control
RB	Reactor Building
RCA	Radiological Control Area
RCP	Reactor Coolant Pump
RCS	Reactor Coolant System
RCW	Raw Cooling Water
RIA	Radiation Indicating Alarm
RO	Reactor Operator
RT	Radiography
SCADA	System Control and Data Acquisition Computer
SRO	Senior Reactor Operator

SSW	Siphon Seal Water
TI	Temporary Instruction
TS	Technical Specification
URI	Unresolved Item
US	Unit Supervisor
UT	Ultrasonic Test
WCC	Work Control Center
WO	Work Order
Y2K	Year 2000

Simulation Facility Report

Facility Licensee: Oconee Nuclear Station

Facility Docket No.: 50-269, 50-270, and 50-287

Operating Tests Administered on: June 3-4, 1999

This form is to be used only to report observations. These observations do not constitute audit or inspection findings and, without further verification and review, are not indicative of noncompliance with 10 CFR 55.45(b). These observations do not affect NRC certification or approval of the simulation facility other than to provide information that may be used in future evaluations. No licensee action is required in response to these observations.

While conducting the simulator portion of the operating tests, examiners observed the following items:

ITEM	DESCRIPTION
Pressurizer Heater Control	During a loss of ICS AUTO power event, the operators noted that pressurizer heaters would not operate when selected to AUTO. The associated abnormal procedure, AP/1/A/1700/23, Section 502, Step 1.3, indicated the heaters would operate in either HAND or AUTO. The licensee is investigating to determine whether the simulator is improperly modeled or the abnormal procedure is in error.
1A Main Feedwater Pump Recirc Flow 1FDW-53	During one scenario, the operator attempted to establish about 2300 gpm recirc flow on 1A MFDWP using 1FDW-53. The operator reported that the valve was slow in responding (compared to the plant). The licensee is investigating the simulator response time of the valve.

Simulation Facility Report

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While conducting the simulator portion of the operating tests, examiners observed the following items:

ITEM	DESCRIPTION
Pressurizer Heater Control	During a loss of ICS "AUTO" power event, the operators noted that pressurizer heaters would not operate when selected to "AUTO." The associated abnormal procedure, AP/1/A/1700/23, Section 502, Step 1.3, indicated the heaters would operate in either "HAND" or "AUTO." The licensee is investigating to determine whether the simulator is improperly modeled or the abnormal procedure is in error.
1A Main Feedwater Pump Recirc Flow 1FDW-53	During one scenario, the operator attempted to establish about 2300 gpm recirc flow on 1A MFDWP using 1FDW-53. The operator reported that the valve was slow in responding (compared to the plant). The licensee is investigating the simulator response time of the valve.