APPENDIX B

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Inspection Report: 50-458/94-08

Operating License: NPF-47

Licensee: Entergy Operations, Inc.
P.O. Box 220
St. Francisville, Louisiana 70775-0220

Facility Name: River Bend Station

Inspection At: St. Francisville, Louisiana

Inspection Conducted: March 13 through April 23, 1994

Inspectors: W. F. Smith, Senior Resident Inspector
C. E. Skinner, Resident Inspector

Approved: _____ 5/12/94
P. H. Harrell, Chief, Project Branch C Date

Inspection Summary

Areas Inspected: Routine, unannounced inspection of plant status, onsite response to events, operational safety verification, maintenance and surveillance observations, and refueling activities.

Results:

- Plant Operations

The operators generally demonstrated professionalism in the control room and good management oversight of plant operations was apparent. The plant shutdown conducted in preparation for the refueling outage was event free. Operator response to a transient on the power grid was good. A weakness was identified in that a reactor operator was not attentive to core operating limits while the reactor was stabilizing from a control rod withdrawal (Sections 2.2, 2.3, and 3.1).

A nuclear equipment operator exhibited a good questioning attitude in identifying a potential secondary containment breach; however, it took 19 days for the breach to be identified, which was an indication of a lack of attention to details by other operations personnel. A weakness was identified during performance of personnel in the work management center in that the personnel did not recognize that the work specified on a maintenance work order would result in a loss of secondary containment. A noncited violation

was identified for not maintaining secondary containment integrity in accordance with the Technical Specification (TS) requirements (Section 2.1).

A violation was identified for the failure to comply with the protective tagging procedure. A red danger-hold tag was posted on a station battery breaker without racking out the breaker, as was required by the clearance. The tag verifier failed to identify the error. This incident demonstrated inattention to detail by two operations personnel. A recent procedure change was made to delete the requirement for independent verification of the installation of danger-hold tags, which was a contributor to this problem (Section 3.2).

An operator failed to initiate the appropriate corrective actions when he identified a valve that was not properly labeled. This is an indication of the operator's willingness to work around a deficient condition (Section 3.2).

- Maintenance

The licensee's actions to resolve a degraded cell on Station Battery B demonstrated good teamwork between the maintenance and engineering disciplines (Section 4.1).

Efforts to correct a malfunctioning breaker for Annulus Mixing Fan A were hampered by a defective electronic control system trip device coupled with a deficient procedure that could not fully test the device, as written. Maintenance personnel stopped the troubleshooting activities to revise the work plan, which was a good indication of the willingness of maintenance personnel, in this case, to ensure that proper work instructions are available to perform a maintenance task (Section 4.2).

The overall performance of surveillance activities observed was generally good, except that the instructions provided in procedures problems continued to cause a disruption of work activities. Technicians demonstrated strengths as they corrected procedure errors instead of working around them (Sections 5.1, 5.2, and 5.3).

A surveillance procedure required independent verification of the return of a portion of the electrical system to service, and an untrained individual was sent by the maintenance supervisor to perform the verification. The electrician displayed good attention to details in questioning the individual's training; however, the maintenance supervisor displayed poor judgement in sending an untrained individual to perform the task (Section 5.3).

A violation was identified for failure to comply with a surveillance test prerequisite to properly warm up a current source before using it. The cause of the violation was the technician's failure to follow the specific instructions provided in a procedure (Section 5.4).

- Engineering

Good engineering support was demonstrated with the resolution of a degraded cell in Station Battery B and with the timely restoration of a secondary containment penetration (Section 4.1).

- Plant Support

Housekeeping and equipment condition was maintained at a satisfactory level as the plant proceeded with the refueling outage. Management attention in this area was generally evident (Section 3.2).

A radiation technician was inside a contaminated area without his wrist and ankle openings of his anticontamination clothing taped shut. Although not required by procedure, it is expected that radiological protection personnel would set the standard for other plant personnel to follow by complying with published radiological control good practices (Section 3.3).

- Management Overview

Based on the types of findings and concerns identified above, it was not apparent that management was providing sufficient oversight of routine, day-to-day activities. Many of the items identified during this inspection had previously been identified during previous NRC inspections. Examples include such items as: the failure of a technician to follow a surveillance procedure, a radiological protection technician inside a contaminated area not following good radiological protection practices, an operator identifying a valve without a label and not entering the deficiency in the corrective action program, and a lack of attention to details by operations personnel performing their plant tours resulting in the loss of secondary containment for 19 days. Management's decision to remove a requirement for independent verification of the installation of danger-hold tags resulted in a tag not being installed in accordance with the instructions provided on the tag.

Summary of Inspection Find ngs:

- A noncited violation was identified (Section 2.1)
- Violation 458/9408-01 was opened (Section 3.2)
- Violation 458/9408-02 was opened (Section 5.4)

Attachment:

Persons Contacted and Exit Meeting

DETAILS

1 PLANT STATUS

At the beginning of this inspection period, the plant was operating at 100 percent power.

On March 29, 1994, power began to slowly coast down to approximately 95 percent, as the end of the fuel cycle approached. On April 16, the reactor was shut down to commence the scheduled, 53-day Refueling Outage 5. On April 17, the plant entered Operational Condition 4 (i.e., reactor coolant temperature was less than 200°F).

At the end f this inspection period, the plant was shut down and in Day 8 of the refueling outage.

2 ONSITE RESPONSE TO EVENTS (93702)

2.1 Breach of Secondary Containment Integrity

On March 4, 1994, while the plant was operating at full power, a contractor removed a 4-inch exterior auxiliary building penetration seal from Sleeve 1WS899N06 to facilitate the temporary routing of a 1-inch water supply hose, which was to be used for the application of fire-proofing material. After the hose was pulled through the sleeve, alumina silica ceramic fiber was used to fill the annular space between the hose and the sleeve. The 4-inch sleeve penetrating the exterior wall of the auxiliary building at the 98-foot elevation is considered a secondary containment boundary by TS 3.6.5.1, as defined in TS 1.40.f.

The inappropriate seal configuration existed until March 22, when a nuclear equipment operator noticed the hose and questioned whether secondary containment integrity was being maintained. The shift superintendent declared secondary containment inoperable and entered the applicable TS 3.6.5.1 action statement, which allowed 4 hours to restore secondary containment integrity before commencing a plant shutdown. The shift superintendent also directed the restoration of the seal, initiated Condition Report 94-0311, and verified that a zero or negative pressure was being maintained in the auxiliary building, as required by TS 4.6.5.1.

Within the TS-allowed, 4-hour period, the hose was removed and the seal was restored to its original design configuration in accordance with Penetration Seal Detail EL-1 and Specification 229.180, except that the 24-hour cure time for the seal was waived by engineering. The waiver was based on a Stone & Webster Engineering Corporation letter (C-RBS-04444), which stated that the standby gas treatment system was capable of maintaining a negative pressure in the auxiliary building with the penetration open. Promatec Differential Pressure Test CTP-1033 provided qualifications for a 4-inch deep seal for up to 554 inches of water. With the new seal being 6 inches deep, coupled with

the large pressure margin, the seal was considered operable after vulcanization, which occurred prior to the expiration of the allowed outage time of 4 hours. The inspectors considered the basis and subsequent analysis performed by engineering to be acceptable.

The inspectors reviewed the applicable TS surveillance requirements that required verification of secondary containment. The inspectors noted that surveillance requirements specified in TS 4.6.5.1.a and 4.6.5.1.b were completed during the 19-day period while the auxiliary building penetration was improperly sealed. The inspectors verified that TS 4.6.5.1.a was being met by reviewing Surveillance Test Procedure (STP) 000-0001, "Daily Operating Logs," Revision 13. All measurements, taken from March 4-22, were found to be within the specified maximum pressure limit. TS 4.6.5.1.b, performed on March 11, states, in part, that secondary containment integrity shall be demonstrated by verifying, at least once per 31 days, that all secondary containment penetrations required to be closed during accident conditions are closed by valves, blind flanges, or deactivated automatic dampers/valves secured in position. Permanently sealed penetrations were not within the scope of the licensee's verification; however, TS 1.40.f, "Secondary Containment Integrity-Operating," requires, in part, that the sealing mechanism associated with each auxiliary building penetration shall be operable. By failing to meet this requirement on Sleeve 1WS899N06 during the period of March 4-22, the licensee did not fully maintain secondary containment integrity. This is a violation of TS 3.6.5.1. This violation will not be cited because the licensee's efforts in identifying and correcting the violation meet the criteria specified in Section VII.B.2 of Appendix C to 10 CFR Part 2.

Although the safety significance of the above technical issue was mitigated by the small size of the penetration in question, this incident demonstrated two weaknesses in the conduct of plant operations. The work management center failed to recognize that a secondary containment penetration would be breached when Maintenance Work Order (MWO) R202757 was released for implementation. The inspectors were told that the work center was only concerned about the penetration fire seal and made sure that the appropriate fire watches were established, but the personnel did not recognize that a loss of secondary containment would occur.

On January 11, 1994, a near miss to breaching primary containment occurred during work on a containment airlock door because of poor communications between maintenance personnel and the operators controlling work. This was documented in NRC Inspection Report 50-458/93-31. Plant management's efforts to improve communications to strengthen the work control process was not fully effective. Maintenance management accepted responsibility for not specifically identifying the work as a secondary containment breach and stated that future MWOs would properly identify primary or secondary containment penetrations requiring work. The inspectors subsequently found that a blue flag was being provided in MWO packages involving penetrations.

Operations management performed an accountability review of this problem and implemented a checklist item for work management center personnel as a reminder to be sensitive to penetration work. The inspectors later interviewed operators in the work management center, and found them to be aware of the penetration breach issue, and were satisfied with the corrective actions taken to preclude an inadvertent breach of containment or control room integrity.

The inspectors concluded that the auxiliary building operator demonstrated good performance in observing and questioning the penetration breach; however, the inspectors considered it a weakness that the anomaly was not challenged by the operators for a period of 19 days. This is a violation of TS 3.6.5.1. Operations management acknowledged the violation and took action by discussing the incident with all on-shift personnel and by initiating plans to include this incident of management's expectations of a questioning attitude during future operator training. Based on the fact that this issue was identified by the licensee, prompt corrective actions were taken to restore the deficient condition, and extensive actions were taken to prevent recurrence, this violation is not being cited.

2.2 Erroneous Indication of Core Thermal Limit Violation

On March 26, 1994, at 6:21 a.m., the reactor operator noticed that the value for the fraction representing core maximum average planar linear heat generation rate (CMAPR) had exceeded the TS 3.2.1 limit of 1.0. The P-1 plant computer hourly printout indicated a value of 1.005. The shift superintendent contacted the on-call reactor engineer as TS Action Statement 3.2.1 was entered, which requires restoration to the TS limits within 15 minutes. The reactor operators inserted Control Rods 28-13 and 28-45 from Positions 48 to 40. By 6:34 a.m., the indicated CMAPR was 0.986 and the TS action statement was exited.

The reactor engineer came on site and performed a local power range monitor substitute value and base distribution calculation (OD-2). This adjusted the P-1 printout calculation conservatism and resulted in a CMAPR step improvement from 0.986 to 0.946, which revealed that the TS limits had not been exceeded. By applying the 0.04 difference to the indicated CMAPR of 1.005, the corrected CMAPR was 0.965.

The inspectors reviewed the previous hourly P-1 printouts and discussed the issue with the reactor engineer and the reactor engineering supervisor. The reactor engineer had been in the control room during the previous evening to supervise the withdrawal of the last two control rods to the fully withdrawn position, which was completed at 1:15 a.m. The P-1 printout indicated that the CMAPR was 0.974 at 2 a.m. The reactor engineer left site after he determined, from the 3 a.m. printout, that the CMAPR was 0.976 and there was sufficient margin for xenon to reestablish equilibrium. A P-1 printout indicated that the CMAPR reached the TS limit of 1.000 at 5 a.m. The operators did not notice that the TS limit was exceeded until the 6 a.m. printout indicated a value of 1.005. Having just increased power from

90 percent (power was reduced the night before to conduct weekly turbine valve testing) and changing control rod configuration, management stated that the operators should have monitored the hourly P-1 printouts until all values stabilized, even though the TS surveillance requirement was to verify that the power distribution values were within the TS limits at least once every 24 hours. Condition Report 94-0340 was initiated to enter the issue into the licensee's corrective action program.

Plant management stated that the operators' failure to be sensitive to thermal limit indications provided by the plant computer via the P-1 printouts was less than what would have been expected during a transient from the control rod withdrawals. The licensee informed the inspectors that, as a plant enhancement, a core thermal limit annunciator would be added during the refueling outage. This annunciator would alarm when the fractions representing thermal limits approached 1.0 by a margin of approximately 2 percent.

2.3 Electrical Transient on the Power Grid

On April 6, 1994, a broken shield wire fell on a 230-kV line North of Baton Rouge, Louisiana. The cause of the broken shield wire was fatigue failure. The line relays adequately cleared the initial fault and the line was reclosed. When the line was reclosed, both sets of high-speed, primary relays failed to re-isolate the fault. The cause for the high-speed, primary relay failure was indeterminate at the time of this inspection, but relay testing and fault analyses were in progress.

The second fault resulted in an extreme voltage drop on the power grid, which lasted for approximately 1 second. The fault interrupted service to over 30 major industrial customers and tripped off four fossil-fueled generating units and two industrial cogenerators. The total generation tripped off line was over 850 MW, which resulted in an industrial load loss of approximately 1500 MW. At the River Bend Station, the voltage dropped by approximately 33 percent and resulted in an electrical transient. The transient caused the following:

- A half main steam isolation valve isolation
- The main generator voltage regulator transferred from automatic to manual
- The standby gas treatment system started
- The annulus mixing fans started
- The Division II fuel building filter train started
- Control room air conditioning system Chiller HVK*CH1C (Division I) tripped and the Division II unit automatically started, as expected

- All turbine building chillers tripped
- Standby closed cooling water system pumps started
- Undervoltage alarms were received on the preferred transformers
- Momentary failure of the digital radiation monitoring system
- Both reactor water cleanup pumps tripped
- Feedwater Heater Pump HDL-P1C tripped
- Main generator emergency seal oil pump started
- Feedwater Lube Oil Pump FWL-P1A tripped and Pump FWL-P2A started
- Drain isolation valves isolated

The operators restored the plant to normal conditions following the transient without incident. A 4-hour, nonemergency notification was made to the NRC as a conservative measure, pending results of a licensee investigation. Condition Report 94-0366 was written and assigned to system engineering, who developed an Electrical Transient Event Team. The Team was created to identify and evaluate any safety concerns resulting from the transient. For every event that occurred, an investigation was conducted and an explanation was provided on why each system was effected by the transient.

The inspectors' assessment agreed with the team's conclusions that no significant safety concerns existed and that each system performed as designed.

2.4 Reactor Building Contaminated

On April 20, 1994, maintenance personnel were attempting to loosen a stuck reactor vessel head holddown bolt using a portable pneumatic impact wrench. An unrestrained, 1 1/2-inch air hose came apart at the quick disconnect, which caused the whipping action of the hose to fall into the bellows region of the upper pool cavity. The air flowing from the hose agitated the dry debris in the bottom and on the sides of the cavity, causing contaminated dust to enter the reactor building atmosphere. The air supply to the hose was quickly isolated.

The containment purge system was in service at the time of the event and the containment equipment hatch was open. In response, the licensee secured reactor building ventilation and maintained containment purge flow to the standby gas treatment system to establish a negative pressure inside the reactor building and prevent the release of contaminated material. Personnel evacuated the reactor building. Surveys identified that 15 workers were contaminated; 10 with skin contamination and 5 with clothing contamination.

Of the ten with skin contamination, 1 had nasal contamination. Whole body counts of the worker with the highest level of skin contamination and the worker with the nasal contamination were performed. The results indicated that no significant uptake occurred, with the levels estimated at 0.2 percent of the annual limit on intake.

The licensee performed swipe surveys of the refueling floor, upper pool area, equipment hatch area, and outside the reactor building. Swipes inside the reactor building indicated that the general area contamination was 100 to 5000 disintegrations per minute (dpm). Swipes near the equipment hatch indicated an average of 10,000 dpm, with the highest swipe reading 30,000 dpm at a location in a vertical shaft above the equipment hatch. The licensee stated they believed that these higher levels of contamination were the result of other activities in the reactor building and not this event. Swipes outside of the reactor building revealed no contamination.

Most areas of the reactor building have been decontaminated. To prevent recurrence, the licensee stated they would use whip restraints when working with pressurized lines that are temporary and were working on a procedure to implement this policy. The following week, radiation protection specialist inspectors examined the radiation protection aspects of this event, which is documented in NRC Inspection Report 50-458/94-09.

2.5 Conclusions

A noncited violation for poor work controls was identified because secondary containment integrity was not being maintained as required by the TS. Secondary containment integrity was breached for 19 days before a nuclear equipment operator questioned the temporary seal configuration. A weakness was identified with the work management control center for releasing an MWO without fully understanding the scope of the work being performed.

During the electrical grid transient, the operators performed well in restoring the plant to its original configuration. Also, the review of the effects on plant equipment from the transient was performed well by the system engineers and was completed in a timely manner.

The licensee's corrective action to prevent temporary hoses from coming loose by the installation of whip restraints was adequate.

3 OPERATIONAL SAFETY VERIFICATION (71707)

The objectives of this inspection was to ensure that the facility was being operated safely and in conformance with regulatory requirements and to ensure that the licensee's management controls were effectively discharging the licensee's responsibilities for continued safe operation.

3.1 Control Room Observations

The inspectors observed control room activities on a sampling basis throughout this inspection period. The operators demonstrated a professional attitude and communications were clear, with good repeat-backs.

On April 16 and 17, 1994, the inspectors observed portions of the plant shutdown for Refueling Outage 5. The process was executed in an orderly manner without incident.

The inspectors noted that, during the refueling outage, a majority of the distractions imposed on the control room in the past by the work control process were relieved by the remote work management center. This allowed the operators to concentrate more fully on the maintenance of plant conditions required to support outage activities.

3.2 Plant Tours

The inspectors conducted inspection tours of accessible areas in the plant and found housekeeping and equipment condition to be generally good, with the following exceptions: (1) a torque switch cover bolt was missing on safety-related Valve E22*MOVF010; (2) Service Water Valve 1SWP*MOV171 was showing signs of leaking grease/oil; (3) a ladder was improperly stored by the Division II diesel generator motor control center electrical breakers; (4) a torque switch cover bolt was missing on a service water motor operated valve, which was not labeled; (5) a scaffold erected in the reactor building around safety-related Valve 1E12*MOVF037B remained in place nearly 2 weeks after the work was completed; (6) a pushcart was left unattended in the auxiliary building, 114-foot elevation; and (7) Breaker ENB*BAT01B for the Division II station battery was not placed out of service in accordance with the danger-hold tag. The shift supervisor was informed of the items listed above and took appropriate corrective actions. The inspectors also noted a good management awareness of housekeeping issues brought forward by licensee-conducted tours.

Regarding Item (4) above, the valve had a danger-hold tag attached. The inspectors questioned the operator, who installed the danger-hold tag, as to how he verified that the valve was the correct one. The operator stated that he could not find the plant identification label, but he knew which valve it was from his plant knowledge and the valve operator having a manufacturing label that identified the valve by the proper number. He further explained that he should have requested a temporary equipment identification tag, as required by Administrative Procedure ADM-0037, "Equipment Identification and Labeling," Revision 6. The inspectors reexamined the valve and verified that the manufacturer's label could be used to identify the valve. However, Operations management stated that the manufacturer's label should not be used to identify a valve and the operator should have requested a temporary equipment identification tag. Further investigation revealed that the valve had a plant identification label, but the label was under the insulation and

not visible without removing the insulation. The identification label was moved to a different part of the valve where it could be easily seen.

Regarding Item (7) above, procedural controls are required for ensuring that protective tagging of safety-related equipment is properly accomplished. Administrative Procedure ADM-0027, "Protective Tagging," Revision 12, Section 7.2.1.4, states that positioning of breakers shall be according to the positioning action specified and placed on the clearance. The designated operator, who was responsible for placing Breaker ENB*BAT01B out of service, failed to follow Clearance RB-94-1573, which required the breaker to be opened and racked out. He opened the breaker but did not rack it out. The second designated operator, who was responsible to verify proper tag placement, failed to notice that the breaker was not racked out.

When the inspectors notified the shift superintendent, the condition was corrected by immediately notifying the maintenance department clearance holder and then installing a new danger-hold tag. The breaker was racked out as required by the clearance. Condition Report 94-0438 was initiated to enter the problem into the licensee's corrective action program. Failure to place Breaker ENB*BAT01B in the position specified by the clearance is a violation (458/9408-01).

The inspectors discussed this issue with Operations management and found that the second designated operator had verified the tag concurrent with the first operator installing it. Independent verification of the installation of the danger-hold tag was not required by Procedure ADM-0027. On April 14, 1994, the licensee changed Procedure ADM-0027 to delete the requirement for independent verification. Prior to April 10 this verification was required to be performed by the clearance holder (i.e., the craftpersons requesting the clearance), but was changed based on radiological exposure considerations and the impact on maintenance resources due to the unfamiliarity of the plant by craftpersons. In lieu of an independent verification by the clearance holder, the revised procedure required independent verification by operations personnel. On April 14 the procedure was revised to permit concurrent verification, which allows both persons to be present when the danger-hold tag is initially installed. Independent verification requires one person to install the tag and another person to verify correct installation at a later time. It appeared that the procedure change, made on April 14, was a contributor to the cause of this incident. On May 2 the inspectors verified that the procedure was revised to require independent verification by a second operator, with exceptions for radiological exposure considerations. The exceptions require approval by the Operations Superintendent.

3.3 Radiation Protection Activities

On April 23, 1994, while the inspectors were observing work on the main steam isolation valves, a radiation protection technician was noticed not to have his wrist and ankle opening sealed while he was in a contaminated area. When the inspector questioned the technician, he responded by stating that he was not performing any work; therefore, he did not need the openings sealed.

The inspector discussed this event with Radiation Protection management, who stated that everyone is required to follow the dress out rules when wearing protective clothing and that management would reinforce their expectations to the radiation protection technicians. The inspectors noted, during review of this item, that a procedural requirement for specifying the actions to be taken when donning anticontamination clothing did not exist. Instead, the accepted method for donning anticontamination clothing was considered to be a radiological good practice. The inspectors viewed this event as a weakness since the technicians set the standards for radiological control practices that are followed by other plant personnel.

3.4 Conclusions

Control room operators demonstrated professionalism and good communications. Conduct of the plant shutdown evolution in support of the start of Refueling Outage 5 was performed without incident. However, two examples of poor operator performance were identified. In the first example, an operator demonstrated a work-around approach to a valve identification tag deficiency. The second example involved a procedure violation of improper installation of a danger-hold tag by one operator followed by an inappropriate verification by another operator.

Plant equipment condition and housekeeping practices were generally good, in view of the many outage activities.

A radiation protection technician failed to set a proper example by inappropriately donning anticontamination clothing in a contamination zone.

4 MAINTENANCE OBSERVATIONS (62703)

The maintenance activities addressed below were observed and documentation reviewed to ascertain that the activities were conducted in accordance with the licensee's approved maintenance programs.

4.1 Failure of Battery B to Meet Surveillance Acceptance Criteria

On March 27, 1994, Cell 17 of safety-related station Battery 1ENB*BAT01B failed to meet the TS surveillance requirements for specific gravity. Cell 17 was the pilot cell and was at a specific gravity of 1.199 versus the minimum TS requirement of 1.200. The inspectors monitored the actions taken by electrical maintenance and engineering to resolve this issue. Because all of the cells met the TS Category B criteria, the battery was considered to be operable for 6 more days as permitted by TS Table 4.8.2.1-1. During the 6 days, the licensee placed the battery on an equalizing charge and added approximately 1/8 inch of electrolyte to the cell, as recommended by the vendor. In the event Cell 17 failed to return to a specific gravity of greater than 1.200, the licensee developed a contingency plan to jumper out the cell if it was required. This proposed action was supported by an analysis that calculated a satisfactory end-of-duty voltage with one cell removed from service. Maintenance was prepared to install the jumper within

the 2 hours permitted by the TS; however, by the end of the 6 days, the specific gravity met the TS Category A criteria and the battery was declared fully operable. As of the end of this inspection period, the Cell 17 specific gravity was satisfactory. The licensee scheduled the cell to be replaced during the current refueling outage. The licensee's engineering and maintenance personnel supporting this problem demonstrated good teamwork and technical decisions appeared to have a sound bases.

4.2 Troubleshooting of Annulus Mixing Fan HVR*FN11A

On April 8, 1994, Annulus Mixing Fan HVR*FN11A was given a start signal and its associated breaker tripped open. As a result of the fan failing to start, the licensee entered TS 3.6.5.5, which allowed 7 days to return the fan to operable status or be shutdown within the next 12 hours. The inspectors observed portions of the maintenance activities that the licensee initiated to correct this problem.

The electricians obtained an appropriate clearance from the work management center to allow the troubleshooting, which was performed in accordance with MWO R204814. The inspectors verified that the hold points for quality control were being met and that all measuring and test equipment (M&TE) was currently calibrated.

The electricians tested the breaker and could not identify the problem. The breaker was replaced with a new one from the warehouse, but the new breaker continued to trip when the fan was given a start signal. Further troubleshooting revealed that the breaker rack-in position switch was malfunctioning. After the position switch was replaced, the breaker continued to trip prematurely. The electricians then measured the motor winding resistance and the starting and running currents for the fan motor. All measurements taken on the fan motor were found to be satisfactory. The work plan was revised to obtain and test a new electronic control system (ECS) trip device and install the ECS on the breaker in the field. Replacing the ECS solved the problem with the breaker tripping prematurely. After five start signals with no failures and a successful operability test on the fan, the fan was declared operable within the TS allowed outage time.

The root cause for the original breaker tripping open was not determined. The replacement breaker had a defective ECS trip device, thus complicating the troubleshooting process. Troubleshooting did not reveal the defective ECS because the licensee only had procedures that tested ECS devices that fail high, while this particular ECS failed low. The MWO was changed to provide a temporary procedure to test the ECS for a low failure. The licensee planned to send the original breaker to General Electric for failure analysis and to make a permanent change to the ECS testing procedures to specify a method for testing an ECS with a low failure.

4.3 Conclusions

The licensee's actions to resolve and correct the degraded specific gravity of Cell 17 were adequate and demonstrated good teamwork between engineering and maintenance personnel.

Troubleshooting activities for the annulus mixing fan breaker were complicated by less than adequate ECS testing instructions that failed to identify that a new ECS was defective. However, maintenance personnel did stop the troubleshooting efforts in order to revise the work plan.

5 SURVEILLANCE OBSERVATIONS (61726)

The inspectors observed the surveillance testing of safety-related systems and components addressed below to verify that the activities were being performed in accordance with the licensee's approved programs and the TS.

5.1 Control Rod Scram Testing

On March 11, 1994, while the plant was operating at 70 percent power, the inspectors observed portions of individual control rod scram testing, which was performed in accordance with STP 052-3701, "Control Rod Scram Testing," Revision 7. This was a 10 percent sampling of control rods, as required by TS 4.1.3.2.c.

The test performers received a good briefing and signed the procedure as having read and understood the test. Direct communications were set up between the hydraulic control units and the reactor operator in the control room. A reactor engineer directed the test from a command position in the control room. Clear communications were demonstrated between the test performers. Particular care was taken to ensure that the directions given were understood. The test procedure was followed and signed off in a step-by-step manner as each control rod was tested.

The test went smoothly, with one minor problem. The Position 13 reed switch for Control Rod 04-25 failed. TS 3.2.3.2 has an acceptance criteria for scram time for Positions 13, 29, and 43. The reactor engineer measured the scram time from Position 11 instead of Position 13. The scram time was 1.165 seconds, which was well within the acceptance criterion of 1.474 seconds for Position 13. MWO 203748 was issued to repair the reed switch during the refueling outage.

During the test, the inspectors independently verified a sampling of data taken from the recorder charts and identified no discrepancies. On March 17, the inspectors reviewed the completed data package. All data met the acceptance criteria and were clearly recorded. The inspectors noted that, for Control Rod 04-25, there was no annotation on the data sheet that the time was read to Position 11 (i.e., the Attachment 3 data sheet indicated Position 13). However, there was a comment at the end of the procedure that indicated that

the reactor engineer corrected the data sheet to make reference to the note. This was satisfactory.

5.2 Intermediate Range Monitor (IRM) Channel B Calibration

On March 15, 1994, the inspectors observed portions of IRM Channel B calibration in accordance with STP 504-4202, "Reactor Protection System/Control Rod Block Instrumentation - IRM Channel B Semiannual Channel Calibration," Revision 7A. This testing was required by TS 4.3.1.1 and 4.3.6.

After verifying that the shift supervisor had granted permission to begin the test, the inspectors observed two technicians preparing to install the M&TE. A page from the surveillance procedure was identified as missing. A new surveillance procedure was obtained and checked to verify that all pages were present. The inspectors verified that all M&TE in use was in calibration.

The technicians noticed that, when the procedure instructed them to verify a shorting link in place, the procedure listed the wrong terminal points. The procedure directed the technicians to Panel H13-P694 to verify, on Terminal Board TB0021, that a shorting link existed from Terminal 02 to Terminal 02. The technicians actually observed that the shorting link went from Terminal 01 to Terminal 02. The technicians verified that the procedure was incorrect by checking the associated electrical drawing. After a procedure change notice was completed, the technicians resumed the test.

When the technicians reached Step 7.1.55 of the procedure, they realized that not all of the M&TE was present at the job location. After rechecking Section 4.1 of the procedure, which listed all the required M&TE, the technicians determined that a step was missing. The technicians checked the surveillance procedures for other IRMs and found the missing step that listed the required M&TE. They also determined that the step was missing in two other similar STPs. Another change notice was incorporated into the procedure to include the M&TE. The other two procedures that were identified as deficient were also corrected.

The procedure was started again on March 17, with the technicians continuing from Step 7.1.55, which stated, in part, to connect the test equipment as illustrated in Figure 3 of Attachment 5. In Figure 3, the connection points were listed as J1 and J2; however, the correct connection points should have been TP1 and TP2. A third change notice was implemented to correct the labeling discrepancy. The test was subsequently completed.

During each delay, the technicians kept their supervisor and the shift superintendent informed of the problems. The technicians displayed a good questioning attitude, which enabled them to identify and correct procedural problems.

5.3 Functional Test of Division II 4.16-kV Standby Electrical Bus

On April 14, 1994, the inspectors observed portions of the Division II 4.16-kV standby bus sustained undervoltage and degraded voltage tests, as required by TS 3.3.3. The functional test for the sustained undervoltage was performed in accordance with STP 302-1201, "4.16-kV Emergency Bus Sustained Undervoltage Monthly Functional Test," Revision 5. The functional test performed for the degraded voltage was in accordance with STP 302-1202, "4.16-kV Emergency Bus Degraded Voltage Monthly Functional Test," Revision 4.

The electricians obtained permission from the work management center prior to starting the surveillance, established communications with the control room, and kept the control room informed of expected alarms. The inspectors verified that all M&TE used for this surveillance was currently calibrated.

Each surveillance required the emergency electrical bus to be returned to service within 1 hour or perform the actions specified in the TS. The inspectors verified that the operators logged in the beginning and ending times of both procedures and that each time span was within the 1-hour time limit.

The procedure stated that an independent verification shall be performed during the restoration of the system. The electrician informed his supervisor of this requirement. When the verifier arrived, the electrician performing the surveillance questioned the verifier on whether or not he had the required training. It was determined that he did not. The inspectors considered this a strength on the part of the electrician, but a weakness on the part of the supervisor who sent a person to perform the verification without checking his qualifications.

5.4 Functional Test of Primary Containment Purge Isolation Radiation Monitor

On April 14, 1994, the inspectors witnessed portions of the primary containment purge isolation Radiation Monitor 1RMS*RE21B channel functional test, as required by TS 4.3.2.1. The functional test was performed in accordance with STP 257-4502, "Radiation Monitor System-Primary Containment Purge Isolation Radiation-High Activity Monitor Monthly Channel Functional," Revision 6.

The technicians obtained the work management center's permission prior to starting the surveillance, notified the control room operators of all expected alarms that would be received during the surveillance, and established proper communications with the control room. All M&TE used for this surveillance was verified by the inspectors to be currently calibrated.

While observing the test in progress, the inspectors questioned why the technician was not in compliance with Prerequisite Section 6.10, which stated that the current source should be energized to allow it to warm up. The current source was not energized. Precautions and Limitations Section 5.12 stated that the current source required 1-hour warm up time to achieve its

required accuracy. The technician responded by stating that he had previously energized the current source for 1 hour in the shop and, thus, had satisfied the Section 6.10 requirement. He then energized the current source, after it had been cooling off for more than 1 hour, and proceeded to use it after a 30- to 40-minute warmup. The licensee initiated Condition Report 94-0499 to enter this concern in the corrective action program. The performance of this surveillance activity was contrary to Sections 5.12 and 7.1.6.1 of the procedure. Failure to comply with STP 257-4502 is a violation (458/9408-02).

The TS allows the primary containment purge isolation system to be placed in an inoperable status for up to 2 hours for a required surveillance without taking action. Because of unexpected delays, the surveillance went beyond the 2-hour time allowance and the inspectors verified that the licensee took the required actions as described in the TS.

During subsequent discussions with licensee management, the inspectors questioned the validity of the test since the current source was not operated with the required warmup time. The licensee ran a preliminary test and determined that the accuracy of the current source, with or without a warmup time, was well within the requirements for this surveillance test. They indicated that this would be formally addressed in the corrective action to be taken in response to the violation.

5.5 Conclusions

Though numerous surveillance procedural errors existed, the technicians' questioning attitudes enabled them to locate and correct the errors without violating any requirements.

A violation was identified for failure to comply with a prerequisite paragraph requiring a current source to be properly warmed up before use. This demonstrated a lack of understanding of procedure requirements on the part of the technician.

ATTACHMENT 1

1 PERSONS CONTACTED

1.1 Licensee Personnel

*J. B. Blakely, Director, Predictive Programs
*O. P. Bulich, Manager, Nuclear Licensing
*R. E. Cole, Supervisor, Process System-System Engineering
*W. L. Curran, Cajun Site Representative
*J. R. Douet, Director, Plant Projects and Support
*E. C. Ewing, Manager, Maintenance
C. L. Fantacci, Supervisor, Radiological Engineering
J. J. Fisicaro, Director, Nuclear Safety
A. O. Fredieu, Supervisor, Maintenance Services
*P. E. Freehill, Manager, Plant Modification and Construction
*K. J. Giadrosich, Manager, Quality Assurance
*J. R. Hamilton, Project Manager
W. C. Hardy, Superintendent, Radiation Protection
T. O. Hildebrandt, Manager, Outage Management
J. Holmes, Superintendent, Chemistry/Environmental
*H. B. Hutchens, Superintendent, Nuclear Security
*R. T. Kelly, Superintendent, Instrument and Controls Maintenance
G. R. Kimmell, Superintendent, Electrical Maintenance
*M. A. Krupa, Manager, System Engineering
*J. W. Leavines, Supervisor, NSAG
*T. R. Leonard, Director, Engineering
*L. G. Lewis, Manager, Nuclear Training
*D. N. Lorfing, Supervisor, Nuclear Licensing
*I. M. Malik, Supervisor, Corrective Action & Reviews
J. R. McGaha, Vice President-Operations
J. F. Mead, Supervisor, Control Systems (ELEC)
*W. H. Odell, Superintendent, Radiological Programs
*M. B. Sellman, General Manager, Plant Operations
B. R. Smith, Superintendent, Mechanical Maintenance
W. J. Trudell, Superintendent, Operations
*J. E. Venable, Manager, Operations
*D. H. Williamson, Senior Nuclear Engineering Technologist
G. S. Young, Supervisor, Reactor Engineering

* Denotes personnel that attended the exit meeting. In addition to the personnel listed above, the inspectors contacted other personnel during this inspection period.

2 EXIT MEETING

An exit meeting was conducted on May 4, 1994. During this meeting, the inspectors reviewed the scope and findings of the inspection report. The licensee acknowledged the inspection findings documented in this report. The licensee did not identify as proprietary any information provided to, or reviewed by, the inspectors.