

ENCLOSURE 2

U.S. NUCLEAR REGULATORY COMMISSION

REGION IV

Docket No.: 50-458  
License No.: NPF-47  
Report No.: 50-458/96-015  
Licensee: Entergy Operations, Inc. (EOI)  
Facility: River Bend Station  
Location: P.O. Box 220  
St. Francisville, Louisiana 70775  
Dates: September 22 through November 2, 1996  
Inspectors: W. F. Smith, Senior Resident Inspector  
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Division of Reactor Projects

Attachment: Supplemental Information

## EXECUTIVE SUMMARY

### River Bend Station NRC Inspection Report 50-458/96-015

This inspection included aspects of licensee operations, maintenance, engineering, and plant support. The report covers a 6-week period of resident inspection.

#### Operations

- The conduct of plant operations was professional and reflected a focus on safety (Section O1.1).
- Housekeeping continued to be excellent throughout the plant (Section O1.1).
- Operators responded well to an inadvertent isolation of the Reactor Core Isolation Cooling (RCIC) system. A thorough investigation of the root causes was completed (Section O1.2).
- A violation with four examples was identified for failures to control the configuration of safety-related systems. Licensee management recognized the adverse trend in configuration control problems and initiated a work team to develop comprehensive corrective actions (Section O2.1).
- During review of Licensee Event Report (LER) 50-458/94-029, a noncited violation (NCV) was identified for the failure to meet a Technical Specification (TS) surveillance requirement. Upon testing, the equipment met the acceptance criteria (Section O8.1).

#### Maintenance

- The licensee's actions in response to the Division II Emergency Diesel Generator (EDG) jacket water cooling piping support failure were appropriate to the circumstances (Section M1.1).
- A violation was identified for failure to implement an inservice testing (IST) procedure and the IST program for two standby service water (SSW) pumps. Examples of licensee personnel not adequately implementing IST requirements were previously identified, which indicated that corrective actions for IST issues were not fully effective (Section M1.3).
- During closure review of LER 50-458/95-013, the inspectors identified an NCV for failure to comply with maintenance instructions when installing a gasket seal in the Division II EDG lubricating oil cooler (Section M8.6).

#### Engineering

- The licensee's actions in response to concerns with motor operated valve (MOV) fastener problems were appropriate to the circumstances (Section E2.1).

- The engineers demonstrated good, proactive performance in reviewing the plant design for susceptibility to a lubricating oil fire similar to the Arkansas Nuclear One (ANO) event. The engineers adequately demonstrated that the recirculation pump design and installation was adequate (Section E2.3).

#### Plant Support

- Failure of an employee to stop and question the alarming portal radiation monitors prior to exiting the primary access point demonstrated the use of poor judgment. An NCV was identified for failure to follow contamination control procedures (Section R1.1).

## Report Details

### Summary of Plant Status

The plant operated at essentially 100 percent power for the duration of this inspection period.

## I. Operations

### **O1    Conduct of Operations**

#### **O1.1   General Comments (71707)**

The inspectors conducted frequent reviews of ongoing plant operations including control room observations, attendance of the licensee's plan-of-the-day meetings, and plant tours. In general, the conduct of plant operations was professional and reflected a focus on safety. The control room was operated in a formal manner with good communications among the operators and between operators and supporting organizations. Operator responses to alarms were observed to be prompt and appropriate to the circumstances. During plant tours, the inspectors noted that housekeeping continued to be excellent throughout the plant.

#### **O1.2   Inadvertent Engineered Safety Feature Actuation**

##### **a.    Inspection Scope (93702)**

The inspectors reviewed the licensee's response to Condition Report (CR) 96-1876, which discussed an inadvertent isolation of the RCIC system.

##### **b.    Observations and Findings**

On October 30, 1996, while an instrumentation and controls technician was performing a TS surveillance test on RCIC system instrumentation, the technician bumped his knee into the fuse holder located in power supply Cabinet E21-APS1. This action apparently caused a momentary loss of power to several trip units on Panel H13-P629, which resulted in isolation of the RCIC system. The plant responded as expected for the isolation signal. The isolation signal closed Valve E51-FO64, the outboard steam supply isolation valve, which rendered the RCIC system inoperable. The operators entered Abnormal Operating Procedure AOP-0003, "Automatic Isolations," Revision 8, in response to the event and restored RCIC system operability.

During the root cause investigation, the licensee repeated the initiating event in the shop and determined that the RCIC system isolation would occur if the spring loaded fuse holder was bumped. The licensee noted that although the fuse holder that was bumped was in a high activity area with no protection from bumping, the technician was not sufficiently careful when working near sensitive equipment. The licensee was developing corrective actions at the end of the inspection period. The inspectors will evaluate the licensee's corrective actions during the closure review of the LER that will be issued by the licensee to address this issue.

c. Conclusions

A technician was not sufficiently careful when working near a safety-related cabinet and inadvertently bumped a fuse holder, which resulted in isolation of the RCIC system. Operators responded well to the event and the licensee performed a thorough investigation of the root causes.

**O2 Operational Status of Facilities and Equipment**

**O2.1 Configuration Control Deficiencies**

a. Inspection Scope (71707)

The inspectors reviewed system configuration controls to determine if the licensee was adequately aligning and maintaining selected safety systems in the standby lineups prescribed by procedures. The inspectors toured the facility and reviewed licensee responses to CRs 96-1449, -1477, -1554, -1563, and -1751.

b. Observations and Findings

On September 30, 1996, the inspectors found a removed lock seal under Valve 1SWP-V912, which is the throttle valve in the service water system that supplies cooling for penetration valve leakage control system Compressor 1LSV-C3B. The inspectors reviewed System Operating Procedure SOP-0018, "Normal Service Water," Revision 17, and the inspectors noted that Procedure SOP-0018, Attachment 2, required Valve 1SWP-V912 to be throttled open two turns and lock sealed in place. Valve 1SWP-V912 was not lock sealed; therefore, the valve was not in the configuration prescribed by Procedure SOP-0018. The inspectors notified the control room supervisor, who wrote CR 96-1718.

The inspectors noted that during the previous week, the licensee had performed maintenance on Compressor 1LSV-C3B. The inspectors reviewed the Clearance 96-1160 for this maintenance and noted that the clearance had been released on September 26. The restoration valve lineup for the clearance listed the position of Valve 1SWP-V912 as "throttled open two turns" and did not require the lock seal.

Procedure ADM-0027, "Protective Tagging," Revision 16, Section 7.10.3.3 required that following the removal of danger tags the clearance official shall consult the applicable system operating procedure to obtain the proper component positions. During restoration of Clearance 96-1160, the clearance official consulted Procedure SOP-0018 for the position of Valve 1SWP-V912 but inadequately reviewed Procedure SOP-0018 to ensure proper restoration. The failure to lock seal Valve 1SWP-V912 in accordance with Procedure SOP-0018 is the first example of a violation of TS 5.4.1.a (50-458/96015-01).

The inspectors performed a review of previous activities to determine if programmatic problems with configuration control existed. NRC Inspection Reports 50-458/96-012 and 50-458/96-005 cited violations for valves that were out of position. In addition, several recent licensee identified CRs discussed configuration control problems as follows:

- On August 6, the licensee initiated CR 96-1449, which documented that keylock test Switch S1-HVKB03 for safety-related chilled water Pump HVK-P1B was in the "TEST" position rather than the "NORMAL" position as required by Procedure SOP-0066, "Plant and Control Building Chilled Water," Revision 18. Craftsmen had changed out the refrigerant in control building emergency Chiller HVK-CH1B, but operations did not restore the system properly following maintenance. The operability of the CRAC system with Switch S1-HVKB03 in the "TEST" position is discussed further in Section E2.2 of this inspection report. The failure to align Switch S1-HVKB03 in accordance with Procedure SOP-0066 is the second example of a violation of TS 5.4.1.a (50-458/96015-01).
- On August 12, the licensee initiated CR 96-1477, which indicated that operators found the "STOP" button for the pushbutton switch of control building emergency Chiller HVK-CH1A depressed, when the "RESET" button was required to be depressed per Procedure SOP-0066. Operators did not properly ensure that Chiller HVK-CH1A was aligned for standby operation. This problem existed since August 8, before an operator discovered the discrepancy during a control board walkdown. The licensee identified that they had performed a partial surveillance of the Division I CRAC system but did not perform the steps in the surveillance procedure that returned the system to its normal standby alignment and independently verified the lineup. This resulted in the Division I CRAC being inadvertently inoperable for four days. The TS allow this system to be inoperable for 30 days. The failure to properly align Chiller HVK-CH1A for standby operation in accordance with Procedure SOP-0066 is a third example of a violation of TS 5.4.1.a (50-458/96015-01).
- On August 27, the licensee initiated CR 95-1554, which documented that Breaker 2FD on Panel NHS-MCC103B was "OFF" when it was required to be "ON." This breaker feeds nonsafety-related motor-operated Valve SWC-V7D. The licensee used a human danger tag for work on Valve SWC-V7D but did not formally control the breaker position following the work to ensure that the system was restored properly, as was required by Procedure ADM-0027.
- On August 28, the licensee initiated CR 96-1554, which documented that the reactor building operator discovered control switch for Pump DFR-P3M in the "OFF" position rather than in the "AUTO" position as required by Procedure SOP-0104, "Floor and Equipment Drains," Revision 15. Although

Pump DFR-P3M was not a TS-required item, this pump removed water from the high pressure core spray pump room in the event of flooding. The licensee did not formally restore the system following maintenance. The failure to place the control switch for Pump DFR-P3M in the position prescribed by Procedure SOP-0104, is the fourth example of a violation of TS 5.4.1.a (50-458/96015-01).

- On October 6, the licensee discovered that Valves WTL-V3058 and -V3059 were incorrectly positioned. These valves were in the nonsafety-related clarifier system. Valves WTL-V3058 and -V3059 were open with gauges installed on the end pipes, while licensee procedures required them to be shut with the end caps installed. This system was also not properly restored following maintenance activities.

The inspectors noted that the above configuration control problems together indicated an adverse trend in operations human performance. In addition, these issues indicated that the corrective actions for violations in NRC Inspection Reports 50-458/96-005 and -012, which discussed valves out of position, were apparently not fully effective.

Licensee management recognized the adverse trend in configuration controls and initiated a work team to establish comprehensive corrective actions to improve performance. The work team's efforts were still in progress at the end of this inspection period, but the following corrective actions were already initiated: (1) changing the format of valve lineups to improve the human factors, (2) upgrading the clearance procedure to an Entergy-wide standard, (3) benchmarking other plants on configuration control practices, (4) providing training in all maintenance shops, (5) developing a training video for incoming contractors and for general employee training, and (6) writing a configuration control manual.

c. Conclusions

A violation with four examples was identified for failures to control the configuration of safety-related systems. These examples indicated that corrective actions for previous violations were not fully effective in correcting configuration control problems. Licensee management recognized the adverse trend in configuration control problems and initiated a work team to develop comprehensive corrective actions.

02.2 Engineered Safety Feature System Walkdown (71707)

During routine tours, using Inspection Procedure 71707, the inspectors walked down accessible portions of the Standby Gas Treatment System over the 6-week inspection period. There were no operability concerns identified on this system, and the material condition was very good. Housekeeping in the vicinity of the system



was excellent. Selected valves, dampers, and switches were verified to be in the correct position. The inspectors identified no concerns as a result of the walkdown.

**07 Quality Assurance in Operations**

**07.1 Review of Institute of Nuclear Power Operations (INPO) Evaluation Report (71707)**

During this inspection period, the inspectors reviewed the final results of the April 1996 evaluation of River Bend Station performed by INPO. The report was consistent with recent NRC perceptions of the licensee's performance; therefore, no additional followup is planned.

**08 Miscellaneous Operations Issues (92700, 92901)**

**08.1 (Closed) LER 50-458/94-029: Missed surveillance because of inadequate review of TS amendment.** Upon implementing Amendment 74 to the TS, the licensee failed to perform the quarterly surveillance of the anticipated transient without scram recirculation pump trip. Personnel failed to recognize the increase in frequency from 18 months to 92 days because Amendment 74 reduced most of the other surveillance frequencies. The licensee altered the change process for implementing TS changes.

The inspectors verified that, as corrective action, the licensee changed Nuclear Licensing Procedure NLP-10-009, "Processing a Request for Change to the Operating License," Revision 4, to require that the procedure and/or system owner will be provided an information copy of the proposed change, and that actions would be taken to ensure that similar or more restrictive requirements would be implemented promptly.

Failure to properly implement Amendment 74 to the TS resulted in a violation of TS Surveillance Requirement 4.3.4.1.1, in that the trip unit setpoint calibration on one of the four channels was completed approximately 3 weeks late. This was an isolated case of improper implementation of a TS amendment and the surveillance was successfully performed, thus indicating that the channel would have performed its design basis function. Therefore, this licensee-identified and corrected violation is being treated as an NCV consistent with Section VII.B.1 of the NRC Enforcement Policy. Specifically, the violation was identified by the licensee, was not willful, actions taken as a result of a previous violation should not have corrected this problem, and appropriate corrective actions were completed by the licensee (50-458/96015-02).

**08.2 (Closed) Violation 50-458/95004-01: Low pressure core spray (LPCS) system vented without a procedure.** The inspectors identified that the operators determined that the procedure for venting the LPCS system was inadequate; however, operators vented the LPCS system by documenting repositioned valves in the manipulated device log, rather than obtaining a procedure revision. For corrective



actions, the licensee: (1) revised Procedure SOP-0032, "Low Pressure Core Spray," to include proper venting instructions, (2) reviewed and revised the fill and venting instructions for each of the other emergency core cooling systems, and (3) briefed all of the operating crews on when use of the manipulated device log was appropriate. In addition, the inspectors noted that, for a separate action, the licensee changed the procedure revision process to make procedure revisions less burdensome to obtain. The inspectors reviewed the licensee's completed corrective actions and determined that the corrective actions were satisfactorily completed.

## II. Maintenance

### **M1 Conduct of Maintenance**

#### **M1.1 Repair of Failed Pipe Support on EDG**

##### **a. Inspection Scope (62707)**

The inspectors observed portions of repair activities on the Division II EDG covered by Maintenance Action Item (MAI) 308769.

##### **b. Observations and Findings**

On October 23, 1996, while the Division II EDG was in operation for surveillance testing, the licensee's engineer identified cracks in the weld attaching a 6-inch jacket water cooling system pipe support to the diesel engine baseplate. Further investigation revealed that the pipe support had completely separated from the baseplate, and the support was cracked. The operators declared the EDG inoperable and implemented the actions required by the applicable TS limiting condition for operation.

The inspectors reviewed MAI 308769 and found it to be a good quality product. The MAI work package contained all the information necessary to remove the damaged support and weld remnants, fabricate a new support, and install the new support. The appropriate welding instructions were provided along with the certification documentation on the weld filler metal to be used. The inspectors noted that effective quality assurance oversight was provided. The workmanship on the new support was superior to the original support supplied by the EDG vendor.

The inspectors questioned the licensee as to the cause of failure, and the licensee responded that they were evaluating the causes and actions to be taken to prevent future failures. Preliminary indications were that the pipe may have been too rigidly restrained to allow for thermal growth, which may have placed the support in a stressed condition subject to fatigue failure. The licensee inspected other pipe

supports on all three EDGs and found no other failures. The inspectors independently performed a similar inspection and found no evidence of failures.

c. Conclusions

The licensee's actions in response to the Division II EDG jacket water cooling piping support failure were appropriate to the circumstances. The maintenance activities involved in the replacement of the failed support were well controlled, and the workmanship was of high quality.

M1.2 MOV Maintenance

a. Inspection Scope (62707)

On October 30, 1996, the inspectors witnessed portions of the work and testing associated with MAI 308078, "Troubleshoot and Repair Valve E51-MOV59." MOV-59, "Service Water Containment Isolation Valve," failed to stroke during testing.

b. Observations and Findings

The inspectors reviewed the work instructions and found them to be sufficiently detailed for performance of the work. This MAI required disassembly of the valve actuator, the lifting of several leads, and the installation of jumpers. The licensee performed these tasks in accordance with the general maintenance procedure and independently verified proper restoration. The electricians demonstrated a good questioning attitude, and the system engineer was present and provided effective guidance. The electricians performed the jumper installation with a human danger tag and met all requirements of Procedure ADM-0027. Following removal of the human danger tag, the licensee performed independent verification of the breaker position.

c. Conclusions

The electricians demonstrated good performance as they implemented maintenance on Valve E51-MOV59. The system engineer provided effective oversight of this task to ensure proper completion.

M1.3 Surveillance Testing of SSW Pumps and Valves

a. Inspection Scope (61726)

The inspectors observed IST of the SSW system conducted in accordance with Surveillance Test Procedure STP-256-6303, "Standby Service Water A Loop Quarterly Pump and Valve Operability Test," Revision 8.

b. Observations and Findings

On October 10, 1996, during performance of Procedure STP-256-6303, the inspectors noted that Steps 7.2.6 and 7.3.6 required the user to obtain pump vibration readings at the locations indicated on Attachment 4 for SSW Pumps 1SWP-P2A and -P2C, respectively. Attachment 4 to Procedure STP-256-6303 provided a drawing that required the vibration readings to be taken axially on top of the upper pump motor cover, upper motor cover parallel to the pump discharge flow, and upper motor cover orthogonal to the pump discharge flow. However, the engineers took the vibration data in three orthogonal directions on lifting lugs that were welded to the lower sides of the motor cover.

The inspectors questioned why the engineers did not take the pump vibration data at the locations shown in Attachment 4 of Procedure STP-256-6303. The operators directing the procedure stated that the vibration data was taken on the motor lifting lugs for approximately 1 year, and the pump vibration data had been baselined at these new locations. However, the procedure had not yet been revised to reflect the current practice.

The inspectors reviewed the licensee's locations of recording vibration data actually used by the engineers during performance of Procedure STP-256-6303. The inspectors compared these locations for recording vibration to the requirements of the licensee's IST program. The inspectors noted that the licensee requested and received relief from the IWP sections of ASME Section XI but were approved to use ASME/ANSI OMa-1988, Part 6, "Inservice Testing of Pumps in Light-Water Reactor Power Plants," for IST of safety-related pumps. Section 4.6.4 of ASME/ANSI OMa-1988 requires, for vertical line shaft pumps (including Pumps 1SWP-P2A and -P2C), that the vibration velocity be taken on the upper motor bearing housings in three orthogonal directions with one in the axial direction. Because the licensee was not taking vibration velocity readings on the upper motor bearing housings, the inspectors noted that the licensee was not in compliance with the IST program. The failure to comply with Procedure STP-256-6303 and to properly implement the IST program is a violation of TS 5.5.6 (50-458/96015-03).

The inspectors informed the IST engineers, who initiated CR 96-1862 to enter this issue into the licensee's corrective action program. The licensee's investigation noted that vibration velocity readings were taken in unapproved locations for Pumps 1SWP-P2A, -P2B, -P2C, and -P2D (SSW pumps), and EGF-P1A, -P1B, and -P1C (fuel oil transfer pumps for the EDGs). The licensee's response to CR 96-1862 will determine if a relief request will be submitted or if a modification to the pumps will be performed to allow the vibration velocity readings to be taken in the proper location.

The inspectors noted that previous examples existed in which the licensee's procedures for IST were unclear or incorrect for performance. This was discussed in NRC Inspection Report 50-458/96-13. In addition, NRC Inspection Reports

50-458/95-025 and 50-458/96-005 each described problems with drawings for taking pump vibration data. Therefore, the inspectors concluded that the licensee has not effectively corrected problems with IST procedures.

c. Conclusions

A violation was identified for failure to implement an IST procedure and the IST program for two SSW pumps. The licensee did not take vibration velocity readings for the SSW pumps in the locations prescribed by the procedure or the ASME Code. Previous examples existed in that licensee personnel did not adequately implement IST requirements, which indicated that corrective actions for IST issues were not fully effective.

M1.4 Dynamic Testing of Containment Isolation Valve

a. Inspection Scope (61726)

On October 24, 1996, while performing inservice stroke testing of SSW valves, manual containment isolation Valve SWP-MOV81B failed to indicate fully closed. The inspectors reviewed the licensee's actions in response to this problem.

b. Observations and Findings

The inspectors reviewed CR 96-1861, which identified a problem on October 24, where Valve SWP-MOV081B failed to indicate fully closed during the inservice stroke timing test, after 90 seconds had elapsed. The reference closing time was 53.7 seconds. When the operator signalled the valve to open, it indicated fully open in about 50 seconds. On the second and third attempts the valve fully closed. Valve SWP-MOV081B was a normally open Velan 12-inch, 150-psi class, flex-wedge gate valve, powered by a Limitorque operator. The valve permitted return service water flow from the drywell unit coolers and one safety-related containment unit cooler. Valve SWP-MOV081B did not have any interlocks or permissives nor did it receive any automatic signals to open or close.

The inspectors reviewed the operability assessment provided by engineering. The engineers stated that, in accordance with the surveillance test procedure, the valve was tested under the dynamic conditions of service water flow from the drywell unit coolers. The evaluation also stated that subsequent as-found testing under static flow conditions did not identify any degradation of the valve or its torque switch setting of 5993 pounds. However, the engineers calculated that under the specified dynamic conditions with flow from the drywell unit coolers, the torque switch would have to be set high enough to allow a thrust of 6660 pounds, which was why the valve did not fully close on the initial attempt on October 24.

The evaluation identified that design basis Calculation G13.18.2.3\*290 specified a differential pressure of 0.0 psid across the valve for operation. The licensee stated

that no design basis scenario existed that would require this valve to close against a differential pressure. The inspectors questioned this on the basis that although the drywell unit coolers would be automatically isolated during a loss of coolant accident, the containment unit coolers would be cooled by SSW, and the return flow would be through Valves SWP-MOV81A and -B. The inspectors asked the licensee if plant operating procedures required the operators to secure flow prior to attempting to close the valves so that there will be no differential pressure. The response was that none of the applicable system, abnormal, or emergency operating procedures required Valves SWP-MOV81A or -B to be closed; however, the abnormal operating procedure for loss of offsite power provided for the securing of flow prior to closing the valves. There was an exception that stated not to close Valves SWP-MOV81A or -B, as well as the inlet Valves SWP-MOV507A or -B, if a loss of coolant accident existed.

The licensee was in the process of determining what other valves in the plant were set up to function at a differential pressure that was less than the maximum differential pressure that can be expected during normal, abnormal, or accident conditions, and why this was acceptable. This information was not available as of the end of this inspection period and, therefore, will be tracked for future review as an Inspection Followup Item (50-458/96015-04).

c. Conclusions

Failure of Valve SWP-MOV081B to fully close under system dynamic conditions demonstrated the possibility that there were valves in the plant that were set up to function at a differential pressure that was less than could be anticipated during dynamic conditions. Additional review of this issue will be performed pending completion of an evaluation by the licensee.

**M8 Miscellaneous Maintenance Issues (92700, 92902)**

- M8.1 (Closed) Violation 50-458/95003-01: TS 3.6.5.1 violated because a secondary containment door was unlatched. The licensee documented the corrective actions for this violation in LER 50-458/95-004 below. The latching mechanism ensured that the closed door maintained secondary containment. The immediate corrective actions included securing and subsequent repair of the door.

The inspectors reviewed the long-term corrective actions listed in the LER and in Root Cause Analysis 95-0410. Long-term corrective actions included issuing a reminder for plant personnel to ensure doors were properly secured, placing signs that required notifying the control room of discrepant doors, and training/reviewing this event with plant personnel. The inspectors verified that the licensee implemented the corrective actions.

- M8.2 (Closed) LER 50-458/95-004: Auxiliary Building door found inoperable because of latching mechanism failure. This issue was discussed in NRC inspection



Report 50-458/95-003, Section 2.3. A violation was identified for operating the plant in a condition prohibited by TS.

- M8.3 (Closed) LER 50-458/95-005: High pressure core spray (HPCS) pump breaker trip during surveillance testing. This issue was discussed in NRC Inspection Report 50-458/95-005, Section 2.2. The inspectors identified no new information or enforcement issues.
- M8.4 (Closed) LER 50-458/95-007: Failure of HPCS Unit Cooler 1HVR-UC5 fan hub. This issue was discussed in NRC Inspection Report 50-458/95-23, Section 2.1. The inspectors identified no additional concerns or enforcement issues related to this LER.
- M8.5 (Closed) LER 50-458/95-011: RCIC Division I isolation because of a failed transmitter. On December 15, 1995, the RCIC steam supply outboard isolation valve and the RCIC trip and throttle valve closed when the Division I primary containment isolation instrument high steam flow function failed downscale. Immediate corrective actions included troubleshooting the problem and installing replacement components. The failure analysis attributed the failure to a combination of process noise, electrically conductive particles in the fill oil, and high vibration. Further, the vendor identified that the failure only occurred in 0.1 percent of the installed transmitters and depended on the application of the transmitter. The licensee concluded that because the deficiency was application-specific for the transmitters, this event was isolated. The inspectors identified no safety concerns or enforcement issues related to this event.
- M8.6 (Closed) LER 50-458/95-013: Operation outside of TS limits because of trip, maintenance, and repair of Division II EDG. On December 28, 1995, the Division II EDG tripped because of a problem with the wattmeter. The licensee initiated a maintenance outage to correct the instrument problem and perform several other maintenance activities. During postmaintenance testing, operators secured the EDG because of abnormal noise and vibration. The licensee determined that a previously identified minor jacket water leak to the lubricating oil system had significantly increased.

The licensee requested and the NRC granted a Notice of Enforcement Discretion to complete troubleshooting and repairs because the 72-hour limiting condition for operation allowed outage time would have expired and forced a plant shutdown (refer to NRC Inspection Report 50-458/95-26, Section 4.1). The licensee attributed the root cause of the water leak into the lubricating oil to inappropriate application of silicone sealant and improper assembly of the lube oil cooler packing ring on the low pressure waterbox-to-shell interface. The inspectors determined that this work was completed in 1992 by the EDG vendor representatives, which utilized mechanics from the contractor labor pool. The licensee stated that plant personnel did not supervise the work.



To prevent recurrence of substandard work by unsupervised contractors, the licensee adopted a policy that strengthened controls over contractors. The use of contractors was significantly reduced by resource sharing with other EOI sites. When contractors were used, Quality Assurance surveillance, System Engineering oversight, and Maintenance Department supervision were provided at all times on critical components such as the EDGs. The inspectors observed implementation of this policy as the licensee repaired the lube oil cooler and at other times during the 1996 refueling outage. The policy was implemented successfully.

The failure to properly implement work instructions is a violation of TS 5.4.1.a. However, this licensee-identified and corrected violation is being treated as an NCV consistent with Section VII.B.1 of the NRC Enforcement Policy. Specifically, the violation was identified by the licensee, was not willful, actions taken as a result of a previous violation should not have corrected this problem, and appropriate corrective actions were completed by the licensee (50-458/96015-05).

### **III. Engineering**

#### **E2 Engineering Support of Facilities and Equipment**

##### **E2.1 Incorrect Bolting Material Application for MOVs**

###### **a. Inspection Scope (37551)**

The inspectors evaluated the licensee's response to information received on an MOV fastener problem that occurred at another EOI facility.

###### **b. Observations and Findings**

On October 3, 1996, the inspectors became aware that the licensee was evaluating bolting issues on MOVs in response to a problem identified at Waterford 3. The licensee found some fastener problems (i.e., the use of fasteners made of an incorrect material) that had been previously identified at River Bend and noted that a Significant Event Review Team report, dated November 17, 1994, on missing fasteners had initiated extensive corrective actions. The licensee determined that there were no problems with controls over MOV bolting at River Bend.

The inspectors questioned the licensee's disposition of this issue based on the fact that under the licensee's resource sharing program, Waterford 3 personnel participated in the January 1996 refueling outage.

The inspectors conducted an inspection of accessible MOVs in the auxiliary building and found six safety-related MOVs with an assortment of stainless steel, carbon steel, marked and unmarked fasteners on the MOV limit switch covers. No problems were found on other fasteners on the MOVs including bonnet flange

bolting and actuator top housing bolts. The inspectors also found assorted bolts on the LPCS pump motor terminal cover, a missing nut on the LPCS keep-filled pump coupling cover, and a round head screw was substituted for a pan head screw on the back of Motor Control Center 1ENB-MCC1.

The licensee replaced the missing nut and determined that the other fasteners, based on previous evaluations, were acceptable. On October 4, the licensee inspected 10 spare MOVs located in the warehouse and 11 MOVs installed in the plant for limit switch cover fastener deficiencies. The licensee did not identify any fastener problems that had not been previously evaluated as acceptable. The inspectors considered this to be appropriate because the limit switch cover fasteners were not subject to operational loading.

On October 9, the licensee became aware that other EOI sites had found some bolts in MOV upper bearing housing covers that were not Grade 5, as specified by the vendor. However, the bolts appeared to have been supplied with the MOVs by the vendor. Some of the bolts still had the Limitorque vendor's green paint on them. The licensee reinspected the 10 spare MOVs in the warehouse and found two bolts on one MOV upper bearing housing cover that were unmarked. Subsequent testing revealed that the unmarked bolts, supplied by the vendor, only met the material properties of Grade 2 or better.

By October 10, the licensee provided the inspectors with an evaluation of all MOVs in the NRC Generic Letter 89-10 program. The licensee demonstrated that if the load bearing bolts on the MOVs were Grade 2 in lieu of the specified Grade 5, the margin between the Grade 2 bolt proof load and the stress caused by the maximum thrust set into the MOVs would be no less than 19.03 percent. Most MOVs had thrust margins between 50 and 70 percent. The licensee then inspected 22 MOVs in the plant that had the lowest margin and found that all Grade 5 fasteners were installed on the load-bearing parts. The licensee concluded that this issue did not present an operability problem at River Bend.

c. Conclusions

The inspectors concluded that the licensee's actions in response to questions about MOV fastener problems were appropriate to the circumstances, and there were no operability concerns. Engineering efforts to address operability concerns were good in that they were able to demonstrate that all MOVs in the NRC Generic Letter 89-10 Program had sufficient margin to prevent overstressing of Grade 2 fasteners at the maximum thrust.

## E2.2 Operability Evaluation Review

### a. Inspection Scope (37551)

The inspectors reviewed the licensee's initial operability evaluation for CR 96-1449, which discussed the operability of the CRAC system with key lock test Switch S1-HVKB03 in the "TEST" rather than the required "NORMAL" position.

### b. Observations and Findings

The inspectors questioned the statements in the operability evaluation, which stated that Switch S1-HVKB03 being mispositioned only affected the automatic divisional swap of CRAC and did not prevent manual initiation of the system, so the system remained operable. The inspector questioned if the licensee had thoroughly researched the logic train to determine if the automatic start of the CRAC system on a loss of offsite power was affected.

In response to the inspectors' concern, the licensee evaluated the automatic start logic of the CRAC system. The licensee noted that when Switch S1-HVKB03 was in the "TEST" position, the automatic start of Division 1 CRAC was defeated if control room emergency Chiller HVK-CH1B was in service. Therefore, when Switch S1-HVKB03 was mispositioned, Division 1 of the CRAC may have been inoperable from July 15 to August 6. The licensee started up from a forced outage on July 20. To address this issue, the licensee must perform additional evaluations to determine when control building emergency Chiller HVK-CH1B was in service because the licensee may have changed operational modes with one Division of CRAC inoperable, in violation of TS 3.0.4. This item is considered an unresolved item (URI) pending further NRC review of the licensee's evaluations (50-458/96015-06).

The operability evaluation also stated that the issue discussed in CR 96-1449 was not significant in that continued plant operation with all CRAC inoperable was allowed as long as control room temperature was less than 104°F. However, the inspectors noted that TS 3.7.3 requires the plant to be shut down after 30 days if one division of CRAC is inoperable and after 7 days if all CRAC is inoperable, regardless of the temperature in the control room. The licensee agreed that this statement was incorrect and deleted this reference to the TS in the CR.

### c. Conclusions

An unresolved item was identified for additional evaluation to determine if a violation of TS 3.0.4 occurred when the licensee changed modes with a test switch on the CRAC system mispositioned. The licensee's initial operability assessment was weak in that the licensee improperly applied the TS and did not perform sufficient research of the CRAC system actuation logic.

### E2.3 Engineering Applicability Review of Oil Fire at ANO Unit 1

#### a. Inspection Scope (37551)

The inspectors reviewed the licensee's evaluation of the potential applicability of circumstances that caused the October 17, 1996, oil fire in the ANO Unit 1 containment.

#### b. Observations and Findings

On October 17, 1996, the licensee at ANO declared a Notification of Unusual Event because of a fire in the Unit 1 containment. The plant was in a startup from a refueling outage, and the reactor coolant system temperature was about 450°F. Residual lubricating oil that had sprayed on the fibrous insulation on Steam Generator B spontaneously ignited. The oil came from a previously leaking weld on the reactor coolant pump lift oil pump system.

The engineers at River Bend initiated an evaluation of the conditions and possible sources of an oil fire hazard in the drywell. Then the engineers briefed the inspectors on the results of the evaluation.

The inspectors found that Updated Final Safety Analysis Report (UFSAR) Section 9B.4.15 addressed the requirement of 10 CFR 50, Appendix R requirement for reactor coolant pumps to be equipped with an oil collection system such that a failure will not cause a fire during normal or design basis accident conditions. The UFSAR stated, however, that an oil collection system was not provided for the recirculation pumps because they do not have the external oil lift pump systems found on pressurized water reactor coolant pumps. In addition, the recirculation pump motors had internal, nonpressurized motor bearing lubrication reservoirs, with low oil level monitors. In Section 9.5.1.6 of the Safety Evaluation Report, the NRC staff concurred that an engineered oil leak collection system or additional fire protection for the recirculation pumps was not required.

#### c. Conclusions

The inspectors concluded that the engineers demonstrated good, proactive performance in reviewing the plant design for susceptibility to a lubricating oil fire similar to the ANO event. The engineers adequately demonstrated that the recirculation pump design and installation was adequate.

### E2.4 Review of Facility Conformance to UFSAR Descriptions

A recent discovery of a licensee operating a facility in a manner contrary to the UFSAR description highlighted the need for a special focused review that compares plant practices, procedures, and/or parameters to the UFSAR descriptions. While performing the inspections discussed in this report, the inspectors reviewed the

applicable portions of the UFSAR that related to the areas inspected. The inspectors verified that the UFSAR wording was consistent with the observed plant practices, procedures, and/or parameters.

#### IV. Plant Support

##### **R1 Radiological Protection and Chemistry Controls**

##### **R1.1 Radiological Controls for Personnel Exiting the Protected Area**

###### **a. Inspection Scope (71750)**

The inspectors reviewed the licensee's actions in response to CR 96-1829, where an employee exited the primary access point with the portal radiation monitors in an alarm state.

###### **b. Observations and Findings**

On October 17, 1996, the licensee identified an incident where an employee exited the primary access point and proceeded to his office outside of the protected area with the portal radiation monitors in an alarm state. Personnel inside the security building enclosure recognized the problem; however, the employee left the building before they could get his attention. Security personnel promptly identified the employee from the badge he turned in and notified Radiation Protection. Radiation Protection contacted the employee and found that he had been administered radiopharmaceuticals.

The inspectors were concerned that any individual, trained and authorized unescorted access to the protected area, would walk away from an alarming portal monitor without at least questioning the security officers in attendance. Radiation Protection Procedure RPP-0043, "Personnel Contamination Monitoring," Revision 9, Section 6.3, required an individual to reset an alarming portal monitor and then reenter. If the portal monitor alarmed again, qualified personnel must respond to the area to take the appropriate actions to prevent the spread of contamination or determine other causes of the alarm, such as a portal monitor failure or the presence of radiopharmaceuticals.

The inspectors interviewed the individual and Radiation Protection management personnel and noted that the individual was not qualified to enter the radiologically controlled areas and, thus, he had not been in these areas. The individual was qualified to enter the protected area unescorted, and General Employee Training discussed the proper way to exit through the portal monitors. The individual stated that when he was administered the radiopharmaceuticals, he was told by his doctor that the radiopharmaceuticals would be gone by the time he went to work, so he assumed the portal monitors were not alarming because of him.

The licensee counseled the individual. In addition, Radiation Protection technicians monitored personnel exiting the protected area for a full working day to determine if there were enough spurious alarms to cause employees to be less responsive to the alarms. There were less than 0.5 percent spurious alarms and, thus, there were no concerns about employees being desensitized to the portal monitor alarms.

Failure to comply with Procedure RPP-0043 is a violation of TS 5.4.1. This licensee-identified and corrected violation is being treated as an NCV consistent with Section VII.B.1 of the NRC Enforcement Policy. Specifically, the violation was identified by the licensee, was not willful, actions taken as a result of a previous violation should not have corrected this problem, and appropriate corrective actions were completed by the licensee (50-458/96015-07).

c. Conclusions

The inspectors concluded that failure of an employee to stop and question the alarming portal radiation monitors prior to exiting the primary access point demonstrated the use of poor judgment; however, this was an isolated incident, and the licensee identified the issue and took appropriate corrective action. An NCV was identified for failure to follow contamination control procedures.

**S1 Conduct of Security and Safeguards Activities**

**S1.1 General Comments (71750)**

Throughout the inspection period, the inspectors observed security officers as they performed their duties. The security officers were alert at their posts, security boundaries were being maintained properly, and entry screening processes were performed well at the primary access point. During night tours, the inspectors noted that lighting was properly maintained as required by the Security Plan.

**V. Management Meeting**

**X1 Exit Meeting Summary**

The inspectors presented the inspection results to members of licensee management at the conclusion of the inspection on November 7, 1996. The licensee acknowledged the findings presented.

The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.



ATTACHMENT  
SUPPLEMENTAL INFORMATION  
PARTIAL LIST OF PERSONS CONTACTED

PARTIAL LIST OF PERSONS CONTACTED

Licensee

J. P. Dimmette, General Manager, Plant Operations  
D. T. Dormady, Manager, System Engineering  
J. R. Douet, Manager, Maintenance  
J. Holmes, Superintendent, Chemistry  
H. B. Hutchens, Superintendent, Plant Security  
W. H. Odell, Superintendent, Radiation Control  
W. P. O'Malley, Acting Manager, Operations  
T. R. Leonard, Director, Engineering  
D. N. Lorfing, Supervisor, Licensing  
C. R. Maxson, Senior Lead Licensing Engineer  
J. R. McGaha, Vice President-Operations  
W. H. Odell, Superintendent, Radiation Control

INSPECTION PROCEDURES (IP) USED

IP 37551	Onsite Engineering
IP 61726	Surveillance Observations
IP 62707	Maintenance Observation
IP 71707	Plant Operations
IP 71750	Plant Support Activities
IP 92700	Onsite Followup of Written Reports of Nonroutine Events at Power Reactor Facilities
IP 92901	Followup - Operations
IP 92902	Followup - Maintenance
IP 93702	Prompt Onsite Response to Events at Operating Power Reactors

ITEMS OPENED AND CLOSED

Opened

50-458/96015-01	VIO	Failure to maintain plant configuration control (Section O2.1)
50-458/96015-03	VIO	Failure to comply with IST vibration requirements (Section M1.3)
50-458/96015-04	IFI	Review of MOV differential operating pressures (Section M1.4)
50-458/96015-06	URI	Further review of potential violation of TS 3.0.4 while changing modes (Section E2.2)

Closed

50-458/95003-01	VIO	Secondary containment door left unlatched and unattended (Section M8.1)
50-458/95004-01	VIO	LPCS system vented without a procedure (Section O8.2)
50-458/94-029	LER	Missed surveillance due to TS Amendment implementation error (Section O8.1)
50-458/95-004	LER	Secondary containment door left unlatched and unattended (Section M8.2)
50-458/95-005	LER	HPCS pump breaker trip (Section M8.3)
50-458/95-007	LER	Failure of HPCS pump room fan (Section M8.4)
50-458/95-011	LER	Division I RCIC isolation (Section M8.5)
50-458/95-013	LER	Division II EDG failure report (Section M8.6)

Opened and Closed

50-458/96015-02	NCV	Missed surveillance due to TS Amendment implementation error (Section O8.1)
50-458/96015-05	NCV	Failure to follow maintenance instructions while installing cooler gasket (Section M8.6)
50-458/96015-07	NCV	Failure to regard portal monitor alarm (Section R1.1)

LIST OF ACRONYMS USED

ANO	Arkansas Nuclear One
CFR	Code of Federal Regulations
CR	Condition Report
CRAC	Control Room Air Conditioning
EDG	Emergency Diesel Generator
HPCS	High Pressure Core Spray
IP	Inspection Procedure
INPO	Institute for Nuclear Power Operations
IST	Inservice Testing
LER	Licensee Event Report
LPCS	Low Pressure Core Spray
MAI	Maintenance Action Item
MOV	Motor Operated Valve
NCV	Noncited Violation
PDR	Public Document Room
RCIC	Reactor Core Isolation Cooling
SSW	Standby Service Water
TS	Technical Specification
UFSAR	Updated Final Safety Analysis Report
URI	Unresolved Item
VIO	Violation