

APPENDIX

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Inspection Report: 50-313/92-14
50-368/92-14

Operating Licenses: DPR-51
NPF-6

Licensee: Entergy Operations, Inc.
Route 3, Box 137G
Russellville, Arkansas 72801

Facility Name: Arkansas Nuclear One, Units 1 and 2

Inspection At: Russellville, Arkansas

Inspection Conducted: December 6, 1992, through January 23, 1993

Inspectors: L. Smith, Senior Resident Inspector
S. Campbell, Resident Inspector

Accompanying personnel: K. Kennedy, Project Engineer
T. Alexion, Project Manager
K. Weaver, Engineering Aide

Approved: W.D. Johnson
W. Johnson, Chief, Project Section A

2/4/93
Date

Inspection Summary

Areas Inspected (Units 1 and 2): This routine resident inspection addressed operational safety verification, monthly maintenance observation, bimonthly surveillance observation, followup on corrective actions for violations, other followup, and onsite followup of licensee event reports.

Results (Units 1 and 2):

- The operability determinations for degraded equipment were conservatively performed on both units. Operator response to alarms was appropriate. Housekeeping and plant material condition were good (Section 2).
- All maintenance activities observed on both units were conducted properly. The licensee very effectively maintained dosage as low as reasonably achievable during maintenance on Unit 2 Charging Pump 2P-36B (Section 3).

- Surveillance activities for both units were performed properly. A strength was identified in the licensee's efforts in assessing a governor valve anomaly that did not impact the operability of Emergency Feedwater Pump P-7A. A condition report was initiated when a button on the Unit 2 remote shutdown panel did not reduce steam generator low pressure setpoint when depressed (Section 4).
- The licensee's decision to enhance their capabilities to detect, quantify, and trend primary-to-secondary steam generator leakage was timely, considering the tube repairs performed as a result of recent steam generator inspections. The licensee's conservative decision was a strength (Section 6.3).
- The effort to improve maintenance performance by using multiple debriefs to develop improvement plans was a strength (Section 6.4.2).
- The licensee's corrective actions, both completed and planned, appropriately addressed the weaknesses described in NRC Inspection Report 50-313/92-13; 50-368/92-13 related to the Unit 2 freeze protection program (Section 6.2).
- The meteorological tower instrumentation heat tape circuitry was not included in a program to periodically confirm its functionality. However, procedurally controlled alternative methods were available to obtain the same information. Further, the licensee committed to develop an appropriate method for periodically confirming the functionality of the heater circuitry used to protect meteorological tower instrumentation from freezing (Section 2.3).

Summary of Inspection Findings:

- Violation 368/9224-01 was closed (Section 5.1).
- Unresolved Item 313/9211-06 was closed (Section 6.1).
- Inspection Followup Item 368/9213-01 was closed (Section 6.2).
- Licensee Event Reports 368/90-004, 313/90-011, 313/91-002, 313/91-004, 313/92-003, 368/92-005, 313/92-006, and 368/92-007 were closed (Section 7).

Attachment:

Persons Contacted and Exit Meeting

DETAILS

1 PLANT STATUS

1.1 Unit 1

The unit operated at or near full power throughout this inspection period.

1.2 Unit 2

The unit operated at or near full power throughout this inspection period.

2 OPERATIONAL SAFETY VERIFICATION (71707)

The inspectors routinely toured the facility during normal and backshift hours to assess general plant and equipment conditions, housekeeping, and adherence to fire protection, security, and radiological control measures. Ongoing work activities were monitored to verify that they were being conducted in accordance with approved administrative and technical procedures and that proper communications with the control room staff had been established.

During tours of the control room, the inspectors verified proper staffing, access control, and operator attentiveness. Technical Specification limiting conditions for operation were evaluated. The inspectors examined the status of control room annunciators, various control room logs, and other available licensee documentation.

2.1 Units 1 and 2 - Routine Tours

The general plant condition was good. Good housekeeping practices were implemented. No inappropriate fire protection, security, or radiological control measures were identified. Staffing in the control room was always consistent with the requirements. Technical Specification limiting conditions for operation were appropriately evaluated. The control room operators were appropriately attentive to annunciators and responded well, referring to the alarm response procedures when appropriate. Operators demonstrated awareness of the distinction between control room wall sockets reserved for vital loads, such as the radiological dose assessment computer, and wall sockets available for general use, such as microwaves.

2.2 Unit 1 - Operability Determination for Degraded Service Water Pump P-4B

On December 16, 1992, Service Water Pump P-4B was declared inoperable based on pump performance data. The pump performance was degraded below the limiting range of operability as specified by Procedure 1104.029, Revision 40, Supplement 2, "Service Water and Auxiliary Cooling System." Service Water Pump P-4C was immediately started to maintain operability of Loop 2 service water.

During troubleshooting activities, part of a hard hat was discovered inside Service Water Strainer F-6B. Service Water Bay B was pumped down and the impeller portion of the pump was inspected for possible damage and additional parts of the hard hat. A security officer was posted at Security Door 171, which was opened for the routing of hoses during pumping of the service water bay. Additional parts of the hard hat were discovered in the suction piping. The discharge piping between the pump and the strainer was inspected. Most of the remaining pieces of the hard hat were found in that location. The licensee stated that approximately 80 percent of the hard hat, by weight, was retrieved during the inspection. The licensee evaluated the impact of leaving the remaining 20 percent of the hard hat in the system and found it to be acceptable.

The licensee stated that, based upon the results of the inspection, no damage had occurred to Pump P-4B. After the inspections were completed, a surveillance test was performed on Service Water Pump P-4B. The pump performed acceptably per Procedure 1104.029 and was declared operable on December 18.

2.3 Unit 2 - High Pressure Safety Injection Valve Operability Determination

On January 6, while performing Procedure 2104.39, Supplement 4, "Quarterly HPSI Valve Stroke Test," the licensee discovered that the valve stem position indicator on Valve 2-CV-5015-1 did not match the shoulder mark on the valve stem when the valve was in the full open position. The mark on the valve stem was found to be approximately 1/2 inch above the indicator, suggesting that the valve was greater than full open. The licensee declared the valve inoperable in accordance with Procedure 2104.39, Supplement 4, "Quarterly HPSI Valve Stroke Test," and declared the associated high pressure safety injection header inoperable. Technical Specification Action Statement 3.5.2.a required that the injection header be restored to operable status within 72 hours or be in hot shutdown within the next 12 hours. Of the eight injection valves that were tested during the surveillance, Valve 2-CV-5015-1 was the only one identified with this condition.

The valve stem stroke distance for Valve 2-CV-5015-1 was measured from the closed position to the full open position, and this measurement was compared to previous data. The licensee determined that the stroke distance was correct and concluded that the valve stem position indicator was not in the correct position. The valve stem position indicator was repositioned and the valve declared operable on January 7.

2.4 Unit 2 - Failure of Meteorological Tower Instrumentation Due to Freezing Precipitation

On January 18, at 4:53 p.m., Unit 2 entered the 7-day action statement of Technical Specification 3.3.3.4 because the 10 meter and 57 meter wind speed indicators at the meteorological tower froze as a result of freezing precipitation and a malfunctioning heater circuit. The neutral wire to the heater circuit was discovered disconnected. Condition Report C-93-0003 was

initiated, the wire was reconnected, and wind speed indication was promptly restored. The Technical Specification Action Statement was exited on January 19, at 4:22 p.m., within the allowed outage time.

Operators declared the radiological dose assessment computer system (RDACS) inoperable as a result of the wind speed sensors being inoperable. The wind speed data provided to the RDACS is used in calculating radiological dose projections in the event of an offsite release. After further review, the licensee determined that the emergency procedures contained compensatory measures for manually inputting wind speed information obtained from the National Weather Bureau, the local airport, or the local radio station, into the RDACS. The licensee determined that the RDACS was actually operable and stated that the condition report would be revised to document this change.

Similar problems with meteorological tower wind speed indication were documented between 1988 and 1990. Condition Report 2-90-0566 was initiated on December 21, 1990. After identifying an equipment failure trend, the licensee upgraded the 20 watt heater to 80 watts and completed postmodification testing on January 2, 1992. The current freezing of the wind speed sensors was the first event since the installation of the higher wattage heater on January 2, 1992, and was determined to have a separate cause from the original failures.

The licensee committed to develop an appropriate method for periodically confirming the functionality of the heat tape circuitry used to protect meteorological tower instrumentation from freezing. See Section 6.2 for further discussion of the Unit 2 freeze protection program.

2.5 Summary of Findings

The operability determinations for degraded equipment were conservatively performed. Operator response to alarms was appropriate. Housekeeping and plant material condition were good.

3 MONTHLY MAINTENANCE OBSERVATION (62703)

Station maintenance activities for the safety-related systems and components listed below were observed to ascertain that they were conducted in accordance with approved procedures, regulatory guides, and industry codes or standards, and in conformance with the Technical Specifications.

3.1 Unit 2 - Packing and Plunger Replacement on Charging Pump 2P-36B (Job Order (JO) 00886662)

On December 29, the oil, packing, and plungers for Charging Pump 2P-36B were replaced. The maintenance activity was performed in accordance with Procedure 2402.032, Revision 16, "ANO-2 Mechanical Charging Pump." The oil was sampled and both the oil and the packing were replaced. The oil sample was analyzed and determined to be satisfactory. Since the plunger replacement part was not "like for like," a temporary modification was drafted.

Temporary Modification 2-92-0050 evaluated the replacement of existing stainless steel plungers with stainless steel plungers coated with 3 to 5 microns of titanium nitride. The plunger replacement was performed in an effort to increase the life of the plungers and the packing, thereby reducing pump outage time, plunger maintenance activities, and radiation exposure associated with the activity. There was no environmental qualification issue pertaining to the plunger replacement, and the temporary modification was determined to be acceptable.

Quality control personnel verified cleanliness and proper installation of the parts. Measuring equipment at the work site was calibrated. Workers were cognizant of radiation hot spots and demonstrated exceptional "as low as reasonably achievable" practices. Radiation Work Permit (RWP) 921313, prescribed for this job, estimated that the exposure would be 300 millirem. The actual received exposure was 412 millirem. The RWP, which was drafted in August 1992, only addressed repacking the pump. Five additional jobs associated with the pump overhaul were not considered during initial RWP exposure estimates.

Following this maintenance evolution, the licensee conducted a lessons learned debriefing to enable them to continually improve their performance. See Section 6.4.2 for a discussion of the debriefing.

3.2 Unit 1 - Troubleshooting of Radiation Detector RE-3815 (JO 00897203)

On January 20, the inspector observed troubleshooting activities associated with the radiation detector located in the service water discharge from the containment cooling coils on Cooler VCC2C. The job request was initiated on January 2, 1993, when the spurious high alarms were noticed in the control room.

The maintenance crew appropriately signed in with operations prior to starting the troubleshooting. All measuring and test equipment used was within its calibration interval. The drawings used by maintenance personnel met the drawing control requirements. All of the calibration calculations were checked twice.

Portions of Procedure 304.026, Revision 9, "Unit 1 Process Radiation Monitor System Test," were used to confirm that voltage from the power supply had not drifted and that the detector was still calibrated. No malfunctions were identified. The maintenance personnel indicated that the spurious alarms could be related to electrical noise which was not currently present. The job order remained open to repair the alarm circuit in the event that spurious alarms recurred.

The maintenance activities were conducted properly using approved instructions and drawings.

3.3 Summary of Findings

All maintenance activities observed were conducted properly. The licensee very effectively maintained dosage as low as reasonably achievable during maintenance on Charging Pump 2P-36B.

4 BIMONTHLY SURVEILLANCE OBSERVATION (61726)

The inspectors observed the Technical Specification required surveillance testing on the systems and components listed below and verified that testing was performed in accordance with Technical Specifications and the licensee's implementing procedures.

4.1 Unit 1 - P-7A Surveillance Test (JO 00886347)

On December 30, a surveillance test on Emergency Feedwater Pump P-7A was performed per Procedure 1106.06, Revision 47, "Emergency Feedwater Pump Operations," Supplement 2, "Steam Driven Emergency Feedwater Pump (P-7A) Test (Monthly)." The licensee had noted that Governor Valve CV-6601B had been slow in returning to the open position after completion of runs during previous surveillance tests. Condition Reports 1-92-0570 and 1-92-0598 had documented these findings.

A root cause analysis was performed. The possibility of binding due to thermal expansion and metal to metal contact was eliminated using temperature and acoustic monitoring data of the stem and bonnet. The governor valve control circuit output to the actuator was measured using a voltmeter and the demand versus speed data collected indicated normal operation during two consecutive pump runs.

The governor valve closed in the presence of a demand signal to prevent overspeeding the turbine upon steam admission. The valve appropriately modulated open which enabled the turbine to ramp to full speed. Thus, the licensee determined that the slow opening of the governor valve after the pump was operated did not impact the operability of the pump. The licensee speculated that the reason for the slow opening of the governor valve was associated with the actuator oil hydraulic system. The licensee was proactive in addressing the slow opening of the valve rather than just accepting a successful surveillance test for an operable pump. The licensee's efforts to ensure pump operability were a strength.

4.2 Unit 2 - Control Element Assembly Test (JO 00886587)

On January 8, a monthly control element assembly (CEA) test was performed per Procedure 2105.009, Revision 13, Appendix A, "CEA Exercise Test." This test was performed to verify the operability of each CEA as required by Technical Specification 4.1.3.1.2.

Prior to actual CEA movement, two instrument and control technicians transferred individual CEAs from the shim bus to the hold bus and recorded

control element drive mechanism control system (CEDMCS) logic circuit voltage traces. The control room operator entered Technical Specification 3.1.3.1, Action C, prior to conducting the test as required by the test procedure. The technician's supervisor observed the performance of the test and analyzed the voltage traces for each CEDMCS to verify proper operation of the logic circuits. The test was well coordinated and the technicians were in continuous communication with the control room.

Later that day, control room operators continued the test by inserting each CEA seven steps and returning it to its original position. The operator followed the correct sequence for moving the CEAs and recorded the results in the appropriate table. CEAs were properly and satisfactorily exercised during the portion of the test observed by the inspector. No concerns were identified during the observation of this test.

4.3 Unit 2 - Plant Protection System Channel A Test (JO 00886904)

On January 12, the inspector observed portions of the performance of Procedure 2304.037, Revision 22, "Plant Protection System Channel A Test." The calibration of the test equipment used for the surveillance was current. Control room operators placed magnetic labels next to annunciators that were expected to alarm during this test.

During the performance of the test, the technicians found the setpoint for Annunciator 2K04C4, "A S/G PRESS SETPOINT '0," out of tolerance and made adjustments to return it to the desired value. Later, the technicians discovered that Pushbutton 2HS-9112-1, located on the remote shutdown panel, did not reduce the steam generator low pressure trip setpoint when depressed. The technicians secured the test, restored the system to its normal configuration, and briefed the shift superintendent on the status of the test.

Condition Report 2-93-0009 was issued later that day in response to this failure. In addition, operators entered Technical Specification 3.3.3.5, "Remote Shutdown Monitoring Instrumentation," Action Statement a., which required the inoperable channel be restored to operable status within 30 days or place the plant in hot shutdown within the next 12 hours.

On January 13, technicians discovered that the Steam Generator A variable setpoint bistable card had failed, resulting in the inability to lower the Steam Generator A pressure trip setpoint. The card was replaced and Technical Specification 3.3.3.5 was exited following satisfactory completion of the postmaintenance test.

4.4 Summary of Findings

Surveillance activities for both units were performed properly. A strength was identified in the licensee's efforts in assessing a governor valve anomaly that did not impact the operability of Emergency Feedwater Pump P-7A. A

condition report was initiated when a low pressure setpoint button on the Unit 2 remote shutdown panel did not reduce the steam generator low pressure setpoint when depressed.

5 FOLLOWUP ON CORRECTIVE ACTIONS FOR VIOLATIONS (92702)

5.1 (Closed) Violation 368/9224-01: Maintenance Activities Which Caused a Bent Valve Stem and Cracked Disk on High Pressure Safety Injection Valve 2CV-5015-1

This item involved the failure to take sufficient care to keep the stem disk assembly for Valve 2CV-5015-1 from dropping back onto the seat as required by written instructions. The maintenance activities caused the valve stem to bend and the disk to crack. Condition Report 2-92-0374 was issued to address the valve cracking problems. The damaged stem/disk assembly was immediately replaced and Valve 2CV-5015-1 was verified to be operable. The maintenance personnel involved were counseled regarding failure to exercise appropriate precautions to prevent damage to the valve. Based on a review of the action items associated with Condition Report 2-92-0374 and Entergy Operations' response to the violation contained in Letter OCAN119207, this item is closed.

6 FOLLOWUP (92701)

6.1 (Closed) Unresolved Item 313/9211-06: Falsification of Plant Records

On April 23, 1992, the NRC staff issued Information Notice 92-30, "Falsification of Plant Records," to alert licensees to the NRC's concern that personnel may have falsified logs at several nuclear power plants.

Following receipt of NRC Information Notice 92-30, Arkansas Nuclear One management initiated an inspection of all routine operator logs taken from January 24 to February 1, 1992. The Unit 1 inspection identified three nonlicensed operators who had documented log readings or door checks inconsistent with the security door data. The security door data did not show that all required door entries were made. However, required door entries were made for all Technical Specification required readings on Unit 1. Based on further evaluation by the NRC staff, the licensee's actions in response to the NRC Information Notice were determined to be appropriate. As part of the implementation of the computerized log keeping system, the waste control operator and the auxiliary operator logs were streamlined to focus on important attributes. Control room logs are currently being streamlined. The licensee has also established a repetitive task to ensure that performance in this area is periodically evaluated. These actions should prevent recurrence of the problem.

6.2 (Closed) Inspection Followup Item 368/9213-01: Unit 2 Freeze Protection Program

The following paragraphs provide updated information on the observations identified during the previous freeze protection inspection:

- All heater strip circuits in the refueling water tank (RWT) level transmitter protective boxes were electrically checked and verified as operational. The failed heater strip, previously identified by the inspector, was repaired using JO 00886468. A minor maintenance activity was performed to correct the degraded insulation inside the RWT level transmitter boxes. Additionally, a job request was initiated to replace degraded insulation in all of the sodium hydroxide tank level transmitter boxes. A procedure improvement form (PIF) for Procedure 2306.011, "Unit 2 - Insulation Inspection for Freeze Protection Assurance," was initiated to include an inspection of the internals of the level transmitter boxes. The program previously included a daily external inspection of the RWT level transmitters and temperature verification which was logged by the waste control operators. The licensee reviewed waste control operator logs taken on January 19, 1993, and confirmed that the temperatures inside all the RWT level transmitter boxes were above the low temperature tolerances.
- The licensee stated that protective covering on the condensate storage tank (CST) level transmitter boxes was not required because the heater strips were sized to maintain acceptable temperature levels without the extra insulation. The licensee verified that the CST level transmitter boxes were between 68°F and 78°F inside the boxes on January 19.
- A revision to Procedure 2106.032, "Unit 2 - Operations Freeze Protection Guide," was incorporated to allow more flexibility for the position of the CST pit hatch.
- The burned out light bulbs on Boric Acid Annunciator Panels 2C-330A and 2C-330B were replaced. A PIF was submitted to change the monthly lamp check in "Non-engineered Safety Features Switchgear and Annunciator Surveillance," Supplement 7 to Procedure 2107.001, "Electrical System Operations," Revision 32, to include verification of the annunciator panel lights.
- JO 00832612, which was initiated on December 25, 1990, to correct sulfuric acid tank heat trace deficiencies, was not completed. However, the essential maintenance activities associated with that JO were completed. It was not necessary to prioritize the repair of the sulfuric acid tank heat tracing because the temperatures needed to freeze sulfuric acid in the concentrations present, -28°F, are unlikely to occur in Arkansas. The prioritization of the repair of these heat tape circuits was therefore justified.

The licensee submitted a PIF to ensure that Procedure 2106.032 was placed on the weekly surveillance schedule and reviewed on a weekly basis during the months of October through March. Additionally, a planned maintenance sheet was submitted to planning and scheduling to begin performing the freeze protection guide in September of each year.

A PIF was submitted to include daily logging of the CST level transmitter box temperatures on the RWT/Sodium Hydroxide waste control operator log during the months of October through March.

The licensee corrective actions, both completed and planned, appropriately addressed the weaknesses described in NRC Inspection Report 50-313/92-13; 50-368/92-13 related to the Unit 2 freeze protection program.

6.3 Headquarters or Regional Requests Followup

6.3.1 Unit 2 - Installation of Nitrogen 16 (N16) Monitoring System

During Refueling Outage 2R9, N16 monitoring equipment was installed to enhance the licensee's capabilities to detect, quantify, and trend primary-to-secondary steam generator leakage. The addition of this equipment did not replace the existing equipment and methods. The system was designed to monitor the steam lines for the presence of N16 and then utilize the reactor power level to quantify the level of primary-to-secondary leakage.

The equipment included two N16 detectors (one for each steam line), a signal analyzer (to put the signal in a form useable by other equipment), a processing unit (which combines the N16 count rate with a reactor power level signal to generate a leakage rate), and a recorder. The N16 monitoring system interfaced with the plant computer to provide indication, trending, and alarms. The setpoints for the alarms were variable and controlled by operators through the plant computer terminal. The alarms driven by the new equipment were "Trouble/Lkrt Hi," "Secondary Sys Radiation Hi," and "Rate of Change Hi," and were located on Annunciator Panel 2K11 in the control room. Computer readouts from the N16 monitoring system were available in the control room.

The licensee set the "Lkrt Hi" alarm at .01 gpm or 14.4 gpd. This was the lowest leak rate that chemists would be able to detect using a grab sample. Since N16 has a short half-life, comparison of the N16 leak rate with the grab sample leak rate would enable determination of the location of the leak within the steam generator. If a leak occurred, the setpoint would then be increased to less than or equal to twice the new leak rate. The "Trouble" portion of the same alarm would actuate based on failures within the monitoring system.

The licensee set the "Secondary Sys Radiation Hi" alarm setpoint at 0.1 gpm or 144 gpd. This setpoint was based on administrative limits to ensure that the Technical Specification limit of 0.5 gpm was never challenged. The "Rate of Change Hi" alarm setpoint was set to alarm if the calculated leak rate was expected to double within 1 hour.

The system only calculated valid leak rates above 20 percent power. The accuracy of the N16 monitors was plus or minus 10 percent after monitor adjustment to agree with grab sample data. Without this adjustment, the N16 leakage rate could be in error by 50 percent. All of the signals between the plant computer and the N16 monitoring system were routed through a multiplexer

in the secondary sampling room. The power for the new equipment was from an existing lighting panel, and the power source was not backed up by an emergency power source.

The licensee's decision to enhance their capabilities to detect, quantify, and trend primary-to-secondary leakage was timely, considering the tube repairs performed as a result of recent steam generator inspections. The licensee's conservative decision was viewed as a strength.

6.4 Other Followup

6.4.1 Unit 2 - Followup of Condition Report 2-92-0459, Radial Peaking Factor Calculational Error

On December 15, the Corrective Action Review Board met to evaluate the root cause and proposed corrective action plan for Condition Report 2-92-0459. This condition report identified a calculational error made during the performance of Procedure 2302.034, "Power Ascension Testing Controlling Procedure," which resulted in less conservative radial peaking factor adjustments in the core protection calculator and the core operating limit supervisory system. Condition Report 2-92-0459 was determined to be significant based on the fact that the apparent personnel error was a recurrence of a similar type calculation error documented in Condition Report 2-91-0453. The actual safety impact of the calculation error on plant operations was minimal and no Technical Specification limits were exceeded.

Based on a human performance evaluation of reactor engineering, it was determined that the root cause of the calculation error was that reactor engineering test procedures lacked human factors considerations and had inadequate independent verification requirements. Corrective actions were planned to establish and incorporate standards for human performance factors in reactor engineering procedures and to prepare new guidance for independent verification requirements in reactor engineering procedures.

6.4.2 Unit 2 - Mechanical Maintenance Debrief Session on Charging Pump 2P-36B

A maintenance debrief was held to assess the implementation of work activities performed on Charging Pump 2P-36B and to identify strengths and areas for improvement. The licensee stated that the debrief was a prototype session which would be used to establish a maintenance project debrief program. The objective of the debrief was to identify ways to improve performance based on an open and honest exchange of information between personnel involved in the multi-disciplined safety-related activity. The employees were encouraged to describe any performance strengths and obstacles that they encountered. A meeting summary was written to document the strengths, weaknesses, and individuals responsible for planned improvement actions.

6.4.3 Unit 2 - Corrective Action Review Board for Failure of Charging Pump 2P-36C to Develop Adequate Lubrication Oil Pressure

On January 12, the Corrective Action Review Board met to evaluate three condition reports related to charging pumps.

Condition Reports 2-92-0414-01 and 2-92-0434-00 involved the failure of Charging Pump 2P-36C to develop adequate lubrication oil pressure following a pump start on two separate occasions. The root cause evaluation determined that the probable cause was a worn relief valve, used to control the oil system pressure. It was determined that maintenance had never been performed on this relief valve. Debris in the lubrication oil tubing was identified as a potential cause. The corrective actions developed were to replace the oil relief valves on all three charging pumps and to perform a reliability centered maintenance review of the chemical and volume control system.

Condition Report 2-92-0449-00 was written as a result of the failure of Charging Pump 2P-36A to develop normal flow following a start. The root cause was determined to be accelerated wear of the charging pump internal check valves, resulting in premature failure. Corrective actions identified included installing run time meters on the charging pumps to establish an average part life for check valves and the formation of a multi-discipline group to review previous charging pump problems and develop a formal plan to address them.

6.4.4 Unit 2 - Plant Safety Committee Review of Changes to Biocide Addition Program

A Plant Safety Committee meeting was conducted on January 8 to review the 10 CFR 50.59 safety evaluation regarding the temporary isolation of the biocide addition system used to add bromine to the Units 1 and 2 service water systems and to the Unit 1 circulating water system. Temporary isolation of the biocide addition system, anticipated to last approximately 3 weeks, was necessary to allow completion of a system modification which installed a new biocide addition system. This system modification was scheduled to be performed in January because lake temperatures below 50°F are not conducive to the growth of Asian clams and Ectoprocta, the major contributors to biofouling of the service water system. The safety evaluation addressed compensatory measures for biocide addition in the event that the temperature of the lake increased to 50°F or higher. The evaluation determined that relevant Technical Specification requirements could be satisfied during this period and that the temporary isolation of the biocide addition system maintained licensee commitments in this area. The Plant Safety Committee discussed the items in the safety evaluation and concluded that the temporary isolation of the biocide addition system did not involve an unreviewed safety question.

7 ONSITE FOLLOWUP OF LICENSEE EVENT REPORTS (92700)

7.1 (Closed) Licensee Event Report 368/90-004: "Missing Backwater Valve in Floor Drain Created a Condition Which Could Have Prevented the Fulfillment of the Safety Function of the Emergency Feedwater System"

This event involved a missing backwater valve in the floor drain piping of the Emergency Feedwater Pump 2P-7A room. In addition, subsequent inspection of the Emergency Feedwater Pump 2P-7B room backwater drain valve identified the presence of trash and debris. The backwater valves were designed to prevent cross-flooding between the emergency feedwater pump rooms.

The NRC's review of this event was documented in NRC Inspection Report 50-313/90-05; 50-368/90-05. The licensee documented the event in Condition Report 2-90-0085. The root cause of the event was unknown, however, the ultimate contributing causes were a configuration control weakness and the failure to include the backwater drain valves in the preventive maintenance program. Repairs to the backwater drain valves in Emergency Feedwater Pump 2P-7A and 2P-7B rooms were documented on JO 00807640. The backwater valves were given component identification labels and included in the piping and instrument drawings for the turbine building sumps. The valves were also incorporated into the preventive maintenance program with inspection intervals of every 18 months.

Based on the review of Condition Report 2-90-0085, NRC Inspection Report 50-313/90-05; 50-368/90-05, piping and instrument drawings for the turbine building sumps, and JO 00807640 this licensee event report is closed.

7.2 (Closed) Licensee Event Report 313/90-011: "Inadvertent Actuation of the Control Room Emergency Ventilation System Initiated by a Trip of a Chlorine Monitor Most Likely Caused by Radio Frequency Interference"

This event involved an unexpected actuation of the control room emergency ventilation system following the trip of a chlorine monitor. The immediate cause of the monitor trip could not be determined, however, the most likely cause was determined to be radio frequency interference caused by a hand held radio in the vicinity of Chlorine Monitor 2CLS-8762-2. The area in the vicinity of the chlorine monitors was subsequently posted to prohibit use of radios. A memorandum was issued to inform plant personnel of the effect of radio frequency interference on the chlorine monitors and to ensure that personnel were aware of the restriction on the use of radios in the area. Also, bold stripes were painted on floors to improve personnel awareness of areas where radio usage is prohibited.

Based on a review of Condition Report C-90-0093, this licensee event report is closed.

7.3 (Closed) Licensee Event Report 313/91-002: "Inadvertent Actuation of the Combined Control Room Emergency Ventilation System Due to an Invalid Unit Two Radiation Monitor Trip Which Was Initiated by a Transient Noise Spike"

This event involved an automatic actuation of the control room emergency ventilation system which occurred as a result of the tripping of Radiation Monitor 2RE-8750-1. The cause of the event was a transient noise spike. Radiation Monitor 2RE-8750-1 was reset after the actuation and the control room emergency ventilation system was returned to its normal configuration. A new method for determining the trip setpoint for Radiation Monitor 2RE-8750-1 was developed. This method determined the background radiation level by averaging the previous 90 readings. This process resulted in a setpoint which was less susceptible to trips induced by random noise.

Based on a review of Condition Reports 2-91-0359 and C-91-0045, this licensee event report is closed.

7.4 (Closed) Licensee Event Report 313/91-004: "Inadvertent Actuation of the Control Room Emergency Ventilation System due to a Chlorine Monitor Trip Which was Caused by Personnel Error"

This event involved an automatic actuation of the control room emergency ventilation system which occurred as a result of the inadvertent tripping of a chlorine monitor. The cause of the chlorine monitor tripping was a technician working from a ladder near the monitor inadvertently contacting the reset pushbutton of the chlorine monitor. The control room emergency ventilation system was reset and returned to its normal configuration. The technician was counseled regarding the importance of using caution when working around sensitive plant equipment. Protective covers were placed over the reset buttons of the chlorine monitors to prevent them from being inadvertently depressed.

Based on review of JO 00843501 and Condition Report 91-0049, this licensee event report is closed.

7.5 (Closed) Licensee Event Report 313/92-003: "Automatic Initiation of the Emergency Feedwater System During Plant Heatup as a Result of Securing the Running Reactor Coolant Pumps Due to Reverse Rotation of an Idle Pump"

This event involved an automatic initiation of the emergency feedwater system which occurred when operations personnel secured the reactor coolant pumps in response to indications that an idle reactor coolant pump was rotating in the reverse direction. The event was documented in NRC Inspection Report 50-313/92-08; 50-368/92-08 and tracked as Inspection Followup Item 313/9208-02, which was subsequently closed in NRC Inspection Report 50-313/92-13; 50-368/92-13. Condition Report 1-92-0341 was initiated and it was determined that the antirotation device was installed cocked and off center to the motor shaft coupling and that the upper bearing support

bolts were not adequately torqued due to the loss of work control, incomplete planning and scheduling, and circumventing established procedures. Condition Report 1-92-0341 addressed 10 corrective action items, of which 5 had been closed. The completed and planned action items appeared sufficient to correct the problems. A review of the plant startup and shutdown procedures with respect to the emergency feedwater initiation controls' design basis requirements was performed and documented in Condition Report 1-92-0340. It was determined that the emergency feedwater initiation controls initiated at the safest and most appropriate time.

Based on review of NRC Inspection Report 50-313/92-08; 50-368/92-08, NRC Inspection Report 50-313/92-13; 50-368/92-13, and Condition Reports 1-92-0340 and 1-92-341, this licensee event report is closed.

7.6 (Closed) Licensee Event Report 368/92-005: "Personnel Error Results in Failure to Monitor Fuel Handling Area Ventilation Exhaust for Radioactivity as Required by Technical Specifications"

This item involved the failure to monitor the fuel handling area ventilation exhaust for approximately 54 hours. The root cause was personnel error on the part of the chemist who obtained a weekly grab sample from the ventilation pathway and did not realign the radiation monitor valves for Super Particulate Iodine and Noble Gas Monitor (SPING) 7 to their normal configuration. No significant release of radioactivity occurred during the 54 hours, based upon results of the weekly grab samples. The chemists who found the SPING 7 valves misaligned immediately realigned them after sampling the vent. The chemists also verified valve alignment on the other SPINGs. The individual who failed to return the radiation monitor valves for SPING 7 to their normal configuration was counseled concerning the importance of procedural compliance. The event was reviewed with chemists who perform vent sampling duties. Procedure 1607.010, Revision 6, "Sampling of the ANO Unit 1 Vent," and Procedure 2607.010, Revision 5, "Sampling The Unit 2 Vents," were revised to include independent verification for restoring the sample valve line up.

Based on the review of Condition Report 2-92-0211 and Procedures 2607.010 and 1607.010, this licensee event report is closed.

7.7 (Closed) Licensee Event Report 313/92-006: "Inadvertent Actuation of the Control Room Emergency Ventilation System Due to an Invalid Unit Two Radiation Monitor Trip Which was Initiated by Electronic Component Failure"

This item involved an inadvertent actuation of the control room emergency ventilation system that occurred as a result of a spurious trip signal initiated by Radiation Monitor 2RE-8750-1.

During the event, the control room emergency ventilation system actuated as designed, even though no actual high radiation condition existed. JO 00878688

was initiated and Circuit Card A2 was replaced on Radiation Monitor 2RE-8750-1. The control room ventilation system was returned to its normal configuration.

Based on the review of JO 00878688, this licensee event report is closed.

7.8 (Closed) Licensee Event Report 368/92-007: "High Pressure Safety Injection Flow Rates Below Safety Analysis And Technical Specification Requirements Due to Incorrect Size of Valve Discs Caused by Vendor Error"

This item involved unbalanced flow rates through the high pressure safety injection system legs, which were also below the minimum value specified in Technical Specifications and the Safety Analysis Report.

This event was documented in NRC Inspection Report 50-313/92-24; 50-368/92-24. The cause of the event was replacement of the valve disc assemblies in five of the high pressure safety injection valves. The new disc assemblies were not identical to those replaced and inadvertently modified the flow characteristics of the valves, rendering the high pressure safety injection system inoperable. Subsequently, spare valve disc assemblies were returned to the vendor and refurbished to have the correct flow characteristics and were then installed in all five safety injection valves. A successful flow balance test of the high pressure safety injection system was completed following installation.

Based on review of NRC Inspection Report 50-313/92-24; 50-368/92-24 and an NRC Enforcement Discretion letter dated November 25, 1992, from Mr. James L. Milhoan to Entergy Operations, this licensee event report is closed.

ATTACHMENT

1 PERSONS CONTACTED

1.1 Licensee Personnel

C. Anderson, Unit 2 Operations Manager
D. Boyd, Licensing Specialist
S. Boncheff, Licensing Specialist
S. Cotton, Radiation Protection/Radwaste Manager
R. Espolt, Acting Unit 2 Plant Manager
M. Frala, Supervisor Chemistry
J. Fisicaro, Licensing Director
R. King, Licensing Supervisor
W. McKelvy, Chemistry Superintendent
J. Taylor-Brown, Acting Quality Director
J. Vandergrift, Unit 1 Plant Manager

1.2 NRC Personnel

L. Smith, Senior Resident Inspector
S. Campbell, Resident Inspector

The personnel listed above 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 January 22, 1993. During this meeting, the inspectors reviewed the scope and findings of the report. The licensee did not identify as proprietary any information provided to, or reviewed by, the inspectors.