

APPENDIX B

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Inspection Report: 50-313/89-18
50-368/89-18

Licenses: DPR-51
NPF-6

Dockets: 50-313
50-368

Licensee: Arkansas Power & Light Company (AP&L)
P.O. Box 551
Little Rock, Arkansas 72203

Facility Name: Arkansas Nuclear One (ANO), Units 1 and 2

Inspection At: ANO Site, Russellville, Arkansas

Inspection Conducted: April 16 through May 31, 1989

Inspectors:

Wright D. Chamberlain for
W. D. Johnson, Senior Resident Inspector
Project Section A, Division of Reactor
Projects

6-15-89
Date

Wright D. Chamberlain for
R. P. Haag, Resident Inspector, Project
Section A, Division of Reactor Projects

6-15-89
Date

Approved:

Wright D. Chamberlain
D. D. Chamberlain, Chief, Project Section A
Division of Reactor Projects

6-15-89
Date

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Inspection Summary

Inspection Conducted April 16 through May 31, 1989 (Report 50-313/89-18;
50-368/89-18)

Areas Inspected: Routine, unannounced inspection including plant status, followup on previously identified items, followup of events, operational safety verification, surveillance, maintenance, and installation and testing of modifications.

Results: During followup review of a previous violation on pump coupling lubrication, the NRC inspector identified a violation involving the application of the wrong grease for a high pressure injection pump coupling. The licensee has been developing an improved lubrication control program, but this recent violation indicates that additional licensee review of this area is needed.

The NRC inspector identified weaknesses in the program for scheduling and tracking visual inspections of snubbers and in the process for reviewing technical manual revisions to determine whether any plant procedure changes are required.

DETAILS1. Persons Contacted

- *N. Carns, Director Nuclear Operations
- C. Anderson, In-House Events Analysis Supervisor
- B. Baker, Plant Modifications Manager
- T. Baker, Technical Support Manager
- B. Bell, Nuclear Safety Analysis Engineer
- D. Bennett, Mechanical Engineer
- S. Capehart, I&C Engineer
- *K. Coates, Maintenance Technical Assistant
- B. Converse, Operations Assessment Supervisor
- A. Cox, Unit 1 Operations Superintendent
- M. Durst, Project Engineering Superintendent
- J. Gobell, Mechanical Engineer
- B. Greeson, Design Engineering Supervisor
- L. Gulick, Unit 2 Operations Superintendent
- *L. Humphrey, General Manager, Nuclear Quality
- G. Jones, Engineering General Manager
- G. Kendrick, I&C Maintenance Superintendent
- *R. Lane, Engineering Manager
- D. Lomax, Plant Licensing Supervisor
- R. Lovett, Electrical Engineer
- W. McCord, Planning and Scheduling Supervisor
- R. McKelvey, Field Engineer
- J. McWilliams, Maintenance Manager
- B. Michalk, Mechanical Engineer
- *P. Michalk, Nuclear Safety and Licensing Specialist
- V. Pettus, Mechanical Maintenance Superintendent
- F. Philpot, Nuclear Engineering Superintendent
- S. Quennoz, General Manager Plant Support (acting)
- *J. Remer, Engineering Support Supervisor
- C. Shively, Plant Engineering Superintendent
- M. Stroud, Project Engineering Supervisor
- L. Taylor, Nuclear Safety and Licensing Specialist
- R. Tucker, Electrical Maintenance Superintendent
- J. Vandergrift, Operations Manager
- D. Williams, Nuclear Safety Analysis Supervisor
- M. Wood, Engineering Support Technical Specialist
- C. Zimmerman, Unit 1 Operations Technical Support Supervisor

*Present at exit interview.

The NRC inspectors also contacted other plant personnel, including operators, technicians, and administrative personnel.

2. Plant Status (Units 1 and 2)

Unit 1 operated at 50 percent power until a reactor trip occurred on May 1, 1989, when maintenance personnel inadvertently jarred a turbine control panel. The unit returned to 50 percent power operations on May 3, 1989. Then on May 16, 1989, the unit was shut down to investigate an increase in the unidentified RCS leakage and remained shut down through the end of the inspection period to repair RCS leaks.

Unit 2 operated at 100 percent power until April 18, 1989, when a ruptured extraction steam line initiated a turbine trip and a reactor trip. On May 7, 1989, the unit was returned to critical operation. The unit reached 100 percent power operation on May 10, 1989, and remained at that power through the end of the inspection period.

3. Followup on Previously Identified Items (Units 1 and 2) (92702)

- ° (Closed) Open Item 313/8418-01; 368/8418-01: The site evacuation alarm and the public address system were not audible in all areas of the plant.

Following extensive testing to locate the areas where audibility of these systems was deficient, the licensee installed three design change packages to expand and upgrade the systems (DCPs 84-2001, 85-2116, and 86-2132). The last of these DCPs was completed in early 1989. This item is closed.

- ° (Closed) Unresolved Item 368/8504-02: Service water differential pressure alarms on high pressure safety injection, low pressure safety injection, and containment spray pump coolers.

The licensee has revised annunciator response procedures to specify proper operator actions in response to these alarms when performing surveillance tests or when an engineered safeguards actuation has occurred. The licensee was performing an engineering evaluation to determine whether these alarms may be eliminated or have their setpoints modified (Engineering Action Request 87-909, Design Change Package 88-2110). This item is closed.

- ° (Closed) Deviation 313/8527-02; 368/8528-05: Control room isolation.

The licensee has maintained the doors from the control rooms to the shift supervisors' offices closed. This has been verified by the resident inspectors on numerous occasions. The licensee established a review group to study control room habitability. At the time of this inspection, this group had completed its review and was preparing a report to management, recommending various improvements. This item is closed.

- (Closed) Open Item 368/8528-03: Radiation Monitoring Panel 2C25 operability.

The licensee has made steady progress in improving the operability status of the process and area radiation monitoring instruments on this panel. This item is closed.

- (Closed) Open Item 368/8528-04: Containment purge control.

The licensee has issued Procedure 1104.21 to provide instructions to operators for operation of the Eberline radiation monitoring system. Recorder 2RR-0645 has been replaced, and its recorder charts have improved legibility. The licensee plans to obtain a Xenon-133 source to use for calibration of Radiation Detector 2RE-8233. This item is closed.

- (Closed) Violation 368/8627-03. Seismic support discrepancies.

The licensee completed Calculations 86E-00062-01 and 86E-00064-01 and concluded that the seismic supports were operable in the "as-found" condition. The NRC inspectors have not recently identified any similar discrepancies. The licensee's room inspection effort and isometric walkdown project have identified seismic support discrepancies. These have been evaluated and resolved in accordance with station procedures. This item is closed.

- (Closed) Open Item 313/8713-03: Further inspection of ANO-1 emergency operating procedures (EOPs) following NRR approval of the procedure generation package.

This item is closed administratively. Further review of ANO, Unit 1 EOPs will be tracked by the open items assigned in NRC Inspection Report 50-313/88-17.

- (Closed) Unresolved Item 313/8718-03: Operability of penetration room ventilation systems.

Problems identified during licensee testing of the ANO-1 penetration room ventilation systems in November 1988 were documented in NRC Inspection Report 50-313/88-38. Following modifications to door seals, preventive maintenance on ventilation duct check valves, and preventive maintenance and reinstallation of floor drain nonreturn valves, the systems were retested. The retests demonstrated system operability. This item is closed.

- (Closed) Open Item 313/8732-03: Natural circulation cooldown on ANO, Unit 1 simulator.

Appropriate changes to the program for the Unit 1 simulator have been completed. The capability of the simulator to perform a natural circulation cooldown has been demonstrated. This item is closed.

- (Closed) Open Item 313/8806-01; 368/8806-03: Shift administrative assistant (SAA) recording station parameters on log sheets.

Procedure 1015.01 has been revised to specify that log keeping is one of the responsibilities of the SAA. The NRC inspector was satisfied that the SAAs were technically competent to record process and area radiation monitor readings and to recognize when limits were exceeded. This item is closed.

- (Closed) Violation 368/8815-01: Failure to plug emergency diesel generator jacket cooling system drain lines as required by procedure.

Procedure 2104.36 has been revised to include separate checks on drain line plugs installed and drain valve handles removed. This item is closed.

- (Closed) Unresolved Item 368/8525-01: Process radiation monitor calibration.

The NRC inspector reviewed the records of the most recent performance of Procedure 2304.06, "Gaseous Process Radiation Monitoring System." This was performed under Job Order 776549 on April 5, 1989, in accordance with Revision 2 of the procedure. No technical problems were identified during this review. This item is closed.

- (Open) Open Item 313/8713-02: Target Rock solenoid valve applications.

Solenoid Valve SV-2663 was replaced with a different model Target Rock solenoid valve in February 1988. Design Change Packages 87-1081 and 87-2100 were under development by the licensee to determine suitable replacements for Target Rock solenoid valves in the Unit 1 emergency feedwater system and the Unit 2 reactor coolant system high point vent system. This item remains open.

- (Closed) Violation 313/8815-01: Failure to follow procedures involving control of components.

The NRC inspector reviewed the licensee's corrective actions for this violation and considered them to be appropriate. The licensee has issued Revision 23 to Procedure 1015.03B, "Unit Two Operations Logs." This procedure revision included a daily check (when in cold shutdown) on the position of critical manual valves associated with decay heat removal. Revision 8 of Procedure 1015.02, "Decay Heat Removal and LTOP System Control," included a similar status check for selected Unit 1 valves. While reviewing this procedure, the NRC inspector noted that Note 4 on Piping and Instrumentation Drawing (P&ID) M-232 provided erroneous operating instructions concerning the locked status and position of Manual Valves BW-8A and BW-8B. This note conflicted with the requirements of Procedure 1015.02. Though P&ID notes are not used at ANO as system

operating instructions, a licensee representative initiated Condition Report CR-1-89-309. In addition, the NRC inspector pointed out to a licensee representative an error in the verbal description of Valve BW-8B on Attachment F to the procedure. The licensee representative agreed to correct this error. This item is closed.

- ° (Open) Violation 313/8730-01; 368/8730-01: Inadequate preventive maintenance program for lubrication of pump couplings.

Following failure of a pump coupling on a Unit 1 makeup pump in September 1987, the licensee inspected and lubricated couplings for safety-related and other important pumps. The NRC inspector reviewed the completed job orders for the inspection and lubrication of safety-related pumps of both units performed in September 1987. No other couplings were found to be damaged due to lack of lubrication.

To check the implementation of the preventive maintenance program for pump coupling lubrication, the NRC inspector reviewed job orders documenting coupling lubrication since September 1987 for a sample of pumps. The pumps selected were:

- P7A, Unit 1 turbine driven emergency feedwater pump
- P34B, Unit 1 decay heat removal pump
- P35B, Unit 1 reactor building spray pump
- P36A, Unit 1 high pressure injection pump
- 2P1A, Unit 2 main feedwater pump
- 2P40A, Unit 2 spent fuel cooling pump

The couplings on these pumps had been lubricated at the scheduled interval with the exception of the nonsafety-related main feedwater pump. Its coupling was not lubricated as scheduled in April 1989. A licensee representative stated that a job order had been prepared and that it was planned to be performed during the next outage.

The gear case to pump coupling on High Pressure Injection Pump P36A was lubricated in November 1988 under Job Order 741600. This job order was issued for corrective maintenance which required disassembly of the gear case to pump coupling. Portions of Procedure 1402.010, "Unit 1 Primary Makeup Pumps (P36 A, B & C) Inspection/Repair," were used to perform the maintenance. Attachment 1 to this procedure provided instructions for coupling and uncoupling. Step 4.4 of this attachment required that the gear case to pump coupling be packed with Kop-Flex KHP grease. The licensee's preventive maintenance engineering evaluation (PMEE) for this pump specifies the use of Kop-Flex KHP grease in the gear to pump case coupling and the use of Kop-Flex KSG grease in the lower speed coupling between the motor and the gear case. During the NRC inspector's review of this job order, it was noted that only the gear case to pump coupling was uncoupled, lubricated, and recoupled. The material ticket used to requisition grease for this job was reviewed. Only Kop-Flex KSG grease was issued for this job. The use of the wrong grease in the gear case to

pump coupling of P36A is an apparent violation (313/8918-01). Upon notification the licensee wrote a condition report and evaluated the operability of P36A with its gear case to pump coupling lubricated with Kop-Flex KSG instead of the specified Kop-Flex KHP grease. The licensee's operability evaluation concluded that P36A was operable. It was concluded that although Kop-Flex KHP grease was considered superior and was preferred in the P36 gear case to pump coupling, Kop-Flex KSG grease was compatible with KHP and was acceptable for use in the coupling. The licensee was evaluating a proposed change in the specified grease such that both couplings on the P36 pumps would be lubricated with the same grease (KHP).

The NRC inspector found that the licensee has in place a program to schedule and perform pump coupling lubrication. Followup on that aspect of Violation 313/368/8730-01 is complete. The licensee has been working on an improved lubricant control program. Completion of this program and inspection of its adequacy and proper implementation will be necessary in followup to the current apparent violation involving the wrong grease being used in a P36A coupling. The NRC inspector discussed the status of the preventive maintenance improvement project (PMIP) with licensee personnel. Of the 179 PMEEs identified, 168 have been approved. Of the 850 PM procedures identified, 750 have been drafted and 550 have been approved. Of the 7250 PM tasks identified, 6600 have been planned and 3500 have been scheduled. Station Administrative Procedure 1000.115 was being developed to provide overall control of the preventive maintenance program. Violation 8730-01 remains open pending further licensee progress on the PMIP and NRC inspection of its implementation.

- ° (Closed) Violation 368/8825-01: Failure to properly calibrate a torque adapter.

The licensee has attributed this violation to personnel error and the failure to follow the applicable torquing procedure when using an adapter with a torque wrench. After discussions with the valve vendor, the licensee loosened the valve bonnet bolts then retorqued the fasteners. This item is closed.

- ° (Closed) Violation 368/8823-01: Failure to properly position a gage isolation valve.

This violation involved the failure to close the isolation valve for a high pressure injection pump discharge pressure gage following a surveillance test. The licensee reviewed Units 1 and 2 surveillance procedures and made appropriate revisions such that detailed instructions are included in the procedures to close gage isolation valve(s) at the completion of the surveillance. The NRC inspector reviewed a sample of the surveillance procedures and determined sufficient instructions were included in the procedures. This item is closed.

4. Followup of Events (Units 1 and 2) (93702)

a. Unit 2 Reactor Trip Caused by Steam Line Rupture

On April 18, 1989, Unit 2 experienced a reactor trip from 100 percent power. The trip resulted from a turbine trip caused by a rupture in an extraction steam line from the high pressure turbine. The cause of the rupture was erosion of the pipe to a wall thickness of less than 1/32 inch. NRC Inspection Report 50-368/89-17 contains the inspection results from an NRC inspection of the ruptured steam line.

Following the reactor trip, an emergency feedwater actuation occurred due to low steam generator levels. Both the turbine driven and motor driven pumps started, however, the turbine driven emergency feedwater pump (2P-7A) tripped on overspeed. The pump was restarted approximately 35 minutes later and performed satisfactorily. While troubleshooting and calibrating the turbine governor control system, the licensee replaced two components, the speed ramp generator and the electronic governor module, that were identified as defective. In addition, the licensee made a major revision to Procedure 2304.128, "2P-7A Speed Control Calibration," prior to calibrating the governor controls. The change to the procedure was based on a recent revision to the turbine technical manual (TM) that provided a more detailed method of performing a dynamic calibration of the control system. The revision to the TM was received by the licensee in June 1987, but the applicable ANO procedure (2304.128) was not updated. During the review, the NRC inspector found that no technical review was performed to determine if Procedure 2304.128 needed to be changed to reflect the TM revision. The licensee does have a system that notifies applicable personnel that a TM revision has been received but this system does not review procedural adequacy. The NRC inspector was concerned that relevant information from TM revisions is not being promptly reviewed to determine if plant procedures require an update. The current system requires a TM applicability review during each procedure biennial review. The licensee informed the NRC inspector that a study is being performed to determine a method for performing a technical procedural applicability review when TM revisions are received. This study and program implementation will be tracked by inspection followup (Item 313/8918-02; 368/8918-02).

b. Unit Shutdown Due to RCS Leakage

On May 16, 1989, Unit 1 was shut down to investigate the source of increased reactor coolant system (RCS) leakage. Previously unidentified RCS leakage had been slowly trending upward, however, on May 16, the leakage was increasing more rapidly and the unit was shut down prior to exceeding the one GPM Technical Specification limit for unidentified leakage. Leaks were found at a weld on a RCS drain valve and at the reactor vessel level detector probe. The drain valve and the defective weld were cut out to allow a destructive

examination of the weld. This particular field weld was made in February 1989 during repair of a leak at a weld upstream of the drain valve. The NRC inspector will review the licensee's root cause determination of the defective weld and future corrective actions.

The licensee repaired the leaking joints associated with the reactor vessel level detector probe. Additional leaks were identified by subsequent RCS pressure tests which required depressurization and repair. Several iterations of repairs followed by RCS pressurization were performed prior to the successful elevated RCS pressure test on June 2, 1989.

5. Operational Safety Verification (Units 1 and 2) (71707)

The NRC inspectors observed control room operations, reviewed applicable logs, and conducted discussions with control room operators. The NRC inspectors verified the operability of selected emergency systems, reviewed tag-out records and verified proper return to service of affected components, and ensured that maintenance requests had been initiated for equipment in need of maintenance. The NRC inspectors made spot checks to verify that the physical security plan was being implemented in accordance with the station security plan. The NRC inspectors verified implementation of radiation protection controls during observation of plant activities.

The NRC inspectors toured accessible areas of units to observe plant equipment conditions, including potential fire hazards, fluid leaks, and excessive vibration. The NRC inspectors also observed plant housekeeping and cleanliness conditions during the tours.

During a tour of the Unit 2 auxiliary building, a radiologically controlled area, the NRC inspector noticed the door to the radiological waste drumming room was open. This door is normally closed. The posting for the room required a respirator for entry. With the door open, the NRC inspector noted a large air flow existing from the drumming room into a portion of the auxiliary building that did not require the use of respirators. The health physics supervisor informed the NRC inspector that the door was open to create a negative pressure in the drumming room because a hatch to the train bay was open for equipment movement. The train bay is a nonradiologically controlled area. The NRC inspector suggested to the licensee that an alternate method of providing negative pressure to the drumming room be considered in the future. This was based on the poor radiological practice of allowing air flow from an area requiring respirators to an area with no respirator requirements. The licensee indicated that they would review this for future action.

These reviews and observations were conducted to verify that facility operations were in conformance with the requirements established under Technical Specifications, 10 CFR, and administrative procedures.

No violations or deviations were identified.

6. Monthly Surveillance Observation (Units 1 and 2) (61726)

The NRC inspector observed the Technical Specification required surveillance testing on the various components listed below and verified testing was performed in accordance with adequate procedures, test instrumentation was calibrated, limiting conditions for operation were met, removal and restoration of the affected components were accomplished, test results conformed with Technical Specifications and procedure requirements, test results were reviewed by personnel other than the individual directing the test, and any deficiencies identified during the testing were properly reviewed and resolved by appropriate management personnel.

The NRC inspector witnessed portions of the following test activities:

- In-place leak test and flow test of Unit 1 Control Room Emergency Air Filtering Unit VSF-9 (Procedure 1092.81, Job Order 779740)
 - Quarterly stroke test of Unit 2 high pressure safety injection (HPSI) valves (Procedure 2104.39, Supplement 4)
 - Monthly surveillance test of Unit 2 plant protection system Channel B (Procedure 2304.38 and Job Order 784306). The NRC inspector observed portions of the test involving the engineered safety features logic matrices and trip circuit breakers.
 - Monthly performance test of Service Water Pump 2P-4C (Procedure 2104.29, Supplement 1C)
- Quarterly test of Unit 1 main steam and main feedwater isolation valves (Procedure 1105.005, Supplement 1)
- Quarterly stroke test of Unit 2 emergency feedwater valves (Procedure 2106.06, Supplement 3)
 - Verification of Battery and Switchgear Room Cooler VCH-4A actuation by temperature switches (Procedure 1104.27, Attachment 4)
 - Stroke testing of Unit 1 emergency feedwater valves (Procedure 1106.06, Supplement 3)
 - Monthly calibration of EFIC Channel A (Procedure 1304.45)
 - Emergency diesel generator monthly test (Procedure 2104.36, Supplement 2). This test of Unit 2 emergency diesel generator (EDG) No. 2 was observed twice during this inspection period. The problem of exhaust system leakage and occasional flames, as leaking combustible material is heated by the exhaust system piping continues. Following a suggestion from an NRC inspector from NRC headquarters, the licensee collected samples of the material leaking from exhaust system joints. Subsequent analysis indicated that no

diesel fuel oil was present. The licensee has developed Plant Change 89-0490, "2K-4A and B Air Roll System." This change is intended to be installed during the next refueling outage. Use of the modified system is expected to more effectively remove lube oil from the upper cylinders following engine shutdown. The resident inspector will continue to monitor licensee actions on this problem.

- Sampling and testing the fuel oil in the Unit 1 and Unit 2 EDG fuel day tanks (Procedures 1618.028 and 2618.07). The fuel oil from the 4-day tanks was tested on May 25, 1989, in response to an earlier sample. On May 24, 1989, following a monthly test of Unit 2 EDG No. 2, the fuel oil sample from the day tank had a water concentration higher than allowed by Technical Specification. Approximately 100 gallons of fuel oil was drained from the tank. A subsequent sample had an acceptable water content. The samples taken on May 25, 1989, were acceptable except for the fuel oil from Unit 2 EDG No. 2 day tank which again had a high water concentration. After partially draining the day tank and refilling the tank, a sample was taken which had acceptable water content. Samples taken on May 26 and 30, 1989, were tested with acceptable water content. The licensee has not determined the source of the water but is continuing the investigation. The licensee has initiated sampling of the Unit 2 EDG No. 2 day tank on a weekly basis. The NRC inspector will continue to monitor the licensee's actions to determine the water source and to prevent recurrence.

In addition, the NRC inspector observed a surveillance test of Low Pressure Safety Injection (LPSI) Pump 2P-60B (Procedure 2104.40, Supplement 2) to verify operability of the pump. Earlier the pump was run to flush the LPSI discharge lines, which was required after decay heat removal operations. However, prior to starting the flushing operation, the suction supply valve to 2P-60B was not opened and the pump was run for 10 minutes without any flow. Based on the surveillance showing no signs of degraded pump parameters or damage, the licensee declared 2P-60B operable. The licensee attributed this event to an inadequate procedure and personnel error that failed to recognize the pump suction supply was not properly lined up. Procedure 2104.04, "LPSI System Operation," is being revised to clarify instructions for performing flushes of the LPSI discharge lines.

No violations or deviations were identified.

7. Monthly Maintenance Observation (Units 1 and 2) (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.

The following items were considered during this review: the limiting conditions for operation were met while components or systems were removed from service, approvals were obtained prior to initiating the work, activities were accomplished using approved procedures and were inspected as applicable, functional testing and/or calibrations were performed prior to returning components or systems to service, quality control records were maintained, activities were accomplished by qualified personnel, parts and materials used were properly certified, radiological controls were implemented, and fire prevention controls were implemented.

Work requests were reviewed to determine the status of outstanding jobs and to ensure that priority is assigned to safety-related equipment maintenance which may affect system performance.

The following maintenance activities were observed:

- Replacement of fuel supply crossover lines on Unit 2 emergency diesel generators (Plant Change 89-0205, Job Order 781044). A 10 CFR Part 21 report from Calvert Cliffs Nuclear Power Plant identified a potential defect involving cavitation erosion causing pinhole leaks in the fuel supply lines. The existing copper lines at ANO were replaced with carbon steel lines based on the vendor's recommended action to prevent the cavitation erosion in the crossover lines.
- Troubleshooting HPSI Valve 2CV-5016-2 (Job Order 783896). During a surveillance test that verifies the operability of check valves in the HPSI discharge lines, 2CV-5016-2 would not completely close. This test required 2CV-5016-2 to be cycled while a HPSI pump was operating. This provided a differential pressure across the valve when it was closed. Inspections revealed that the packing gland was cocked, adding to the overall loading of the valve. The additional loading of the packing gland caused the valve operator to "torque out" prior to reaching the fully closed position. The packing was adjusted in January 1989, however, this was the first time the valve was operated with an HPSI pump running. The packing gland was properly adjusted and the valve was retested to verify satisfactory operation.
- Repair of the Unit 2 main feedwater control system (Job Order 783904). Following the reactor trip on April 18, 1989, the "A" main feedwater regulating valve did not remain closed as required by the design of the system. The licensee identified two wires "shorting out" in the "A" train control cabinet which allowed the reactor trip override signal to clear after 20 seconds. The valve then went to the 50 percent open position and overfed the "A" steam generator. The licensee replaced the damaged wires then performed several functional tests of each control cabinet to verify proper operation.
- Replacement of the Geiger Mueller tube in the Unit 2 control room (CR) Radiation Monitor 2RITS-8750-1 (Procedure 2304.006, Job

Order 784442). Following the large number of recent actuations of the CR emergency ventilation system caused by spiking of 2RITS-8750-1, the Geiger Mueller was replaced due to a concern of potential shorting within the tube. During the tube replacement, the licensee identified and corrected damaged wires in the tube holder. Since these repairs, the licensee has experienced only one actuation of the CR emergency ventilation from May 2-31, 1989. The licensee is still pursuing long term corrective action concerning the design adequacy of the Unit 2 CR radiation monitor. The NRC inspector will continue to monitor the licensee's actions.

- o Installation of rebound spring on Unit 2 K-Line circuit breaker to ensure proper breaker operation following a seismic event. The licensee had earlier installed the rebound springs on Unit 1 and selected Unit 2 breakers. During the unit shutdown following the reactor trip on April 18, 1989, the rebound springs were installed on the remaining Unit 2 breakers. Six nonsafety-related breakers would not close when they were cycled during the postmaintenance testing. The licensee determined the cause of the breakers failing to operate properly was the accumulation of dust, dirt, and dried lubricant on the internal surface which restricted movement of the internal closing mechanism. This was similar to problems experienced with several Unit 1 breakers. The licensee has not completed all the corrective action items associated with the failures of the Unit 1 breakers. These action items include reevaluation of the preventive maintenance program for K-Line circuit breakers and a review to determine the need for periodic cycling of the circuit breakers. Open Item 313;368/8905-02 was previously issued to track this matter and will continue to be used for tracking purposes.
- o Troubleshooting the failure of Valve 2CV-5657-1 to open (Job Order 784377). During a monthly surveillance test of a sodium hydroxide pump, the sodium hydroxide tank outlet valve would not open remotely from the control room. The licensee determined that a latch in the limit and torque switch would move up unexpectedly when the valve was moving off the closed seat and would allow actuation of the open torque switch. A similar failure occurred on February 1, 1989, when the latch loosened and allowed actuation of the torque switch. To prevent recurrence the licensee increased the open torque switch setting to the maximum position. In addition, the licensee is considering the installation of a more reliable torque switch bypass. During review of this event, the licensee informed the NRC inspector that the engineered safety features signal for the valve to open on a containment spray actuation has a separate torque switch bypass that would prevent this type of valve failure.
- o Repair of Component Cooling Water Valve 2CV-5236-1 (Job Order 783881). During Surveillance Stroke Time Test 2CV-5236-1, a containment isolation valve, failed to meet the Technical Specification stroke time requirement. Corrective action involved adjusting the open limit switch so the valve would be limited to

80 degrees open (0 degrees being closed and 90 degrees being fully open). The NRC inspector reviewed the job order that provided instructions to complete the work and the engineering memorandum that provided justification to allow this adjustment. The NRC inspector noted during the review that the mechanical stops in the valve operator were not adjusted to correspond with the new open limit switch. This would allow the valve, if manually operated, to be opened to the original position. After discussions with operations personnel which identified the remote possibility that the valve would ever be manually positioned, this issue does not appear to be a significant concern. However, it is not clear to the NRC inspector that the licensee has adequately reviewed this issue to ensure that all safety-related aspects of the job have been addressed. For example, it is not clear that there are controls in place to assure that the limit switches will not be adjusted to full open during some future maintenance activity. Also, it appears that this should be considered a temporary condition which will be permanently resolved later. This matter will remain unresolved pending further review by the NRC inspector (Unresolved Item 368/8918-02).

- ° Troubleshooting the erratic indication of nuclear instrumentation channel "C" log power (Job Order 785720)
- ° Disassembly and inspection of Service Water Pump Discharge Check Valve SW-1C (Job Order 785661). The valve was disassembled to allow inspection of carbon steel parts that were installed during the last refueling to determine if any significant corrosion had occurred. The NRC inspector noted minor wearing of the parts, but their overall condition was good.
- ° Reassembly of Service Water Pump P-4C (Procedure 1402.061, Job Order 784387). The pump was being replaced due to recent surveillance parameters that indicated pump performance was degrading.
- ° Inspection of small bore Anchor Darling snubbers located in Unit 2 reactor building. This visual inspection of snubbers was performed by the licensee per Technical Specification Surveillance Requirement 4.7.8. During review of the area, the NRC inspector discussed two areas of concern with the licensee as described below:
 - (1) Six snubbers had cold settings that did not provide adequate strokes to accommodate the calculated thermal growth. A comparison of the as-built snubber configuration to the calculated thermal growth identified these deficiencies, while previous inspections compared snubber configuration to the installation drawing. The licensee attributed the deficient snubber settings to personnel error during the engineering design of the snubber installation and during the engineering as-built inspections. Support modifications were made for the six snubbers to provide the correct cold settings.

This inspection dealt with approximately 70 snubbers that were part of a design change package (DCP) that replaced approximately 100 snubbers. During the review, the NRC inspector noted that for each of the six snubber deficiencies a comparison of the calculated thermal growth to the as-built snubber installation drawing revealed the incorrect cold setting. At the suggestion of the NRC inspector, the licensee reviewed each of the snubber as-built drawings associated with the DCP. This included the 30 snubbers that were not part of this recent inspection. One additional snubber cold setting was identified that would not accommodate the calculated thermal growth. However, a stress analysis on the corresponding section of pipe revealed the snubber setting was acceptable. The initial engineering response to this problem did not provide a comprehensive evaluation. Based on the NRC inspector review, this problem now appears to be resolved for Unit 2. The licensee has not reviewed a similar DCP for the Unit 1 snubbers to determine if similar errors occurred. The NRC inspector was informed that this review is currently being planned. Completion of the licensee's review of Unit 1 snubbers will be tracked by inspection followup (Item 313/8918-03).

- (2) Snubber 2CCA-15-H34 was found disconnected from a pressurizer spray isolation valve during the visual inspections. The snubber had been removed from the valve on May 12, 1988, to allow repacking the valve. The job order performing the work required a visual inspection (VT-3) of the reinstalled snubber to comply with ASME code requirements. The licensee has been unable to locate any documentation to support that the visual inspection was performed and is now assuming the inspection was not performed. A new snubber has been installed.

The failure to reinstall the snubber, as related to the valve repacking maintenance activity, was attributed to inadequate work controls. The job order that repacked the valve and disconnected the snubber also provided similar instructions for three other pressurizer spray isolation valves. The work instructions in the job order were not detailed and provided no signoffs for completion of the work. The licensee stated that the corrective action from previous cases of inadequate work controls is sufficient to address the concerns of the snubber not being reinstalled. However, the NRC inspector was unable to find a root cause determination or corrective action associated with the missed visual inspection. The licensee has assigned additional corrective action items in an attempt to resolve this issue. Based on the NRC inspector's initial review of the program for scheduling and tracking of inspections, improvements are warranted. NRC review of the licensee's root cause evaluation and corrective actions related to the missed visual inspection will be tracked by inspection followup (Item 368/8918-01).

No violations or deviations were identified.

8. Installation and Testing of Modifications (Units 1 and 2) (37828)

The NRC inspector reviewed a recent plant change (PC) and a recent design change package (DCP) to ascertain whether they were installed and tested as required by plant procedures and in conformance with the requirements of the Technical Specifications, 10 CFR 50.59, and 10 CFR 50, Appendix B, Criterion III, "Design Control."

PC 89-0205 was installed in April 1989. This change replaced fuel oil crossover piping on both Unit 2 emergency diesel generators. The NRC inspector reviewed the PC package and determined that the requirements of 10 CFR 50.59 were met. Installation was performed under Job Orders 780693 and 781044. Postmodification testing included inspection for leaks and performance testing of the diesel generators. The NRC inspectors observed one of these test runs.

DCP 87-2105 was installed in April 1989. This change added an instrument on 2C80, the Unit 2 remote shutdown panel, to provide indication of shutdown cooling flow. The NRC inspector reviewed the DCP, including the 10 CFR 50.59 evaluation, procurement documents, the installation plan, installation job order and records, testing job order and records, and as-built drawings. Electrical schemes and connection drawings were compared to the installed components to verify that the installation had been completed properly and that any changes had been properly marked on the drawings. Testing included a calibration of the new flow indicator, calibration of the flow transmitter, and instrument string checks in accordance with Procedure 2304.010.

No violations or deviations were identified.

9. Exit Interview

The NRC inspectors met with Mr. N. S. Carns, Director, Nuclear Operations, and other members of the AP&L staff at the end of the inspection. At this meeting, the NRC inspectors summarized the scope of the inspection and the findings.