

APPENDIX B

U. S. NUCLEAR REGULATORY COMMISSION
REGION IV

NRC Inspection Report: 50-313/86-02
50-368/86-02

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: January 1-31, 1986

Inspectors:

W D Johnson
W. D. Johnson, Senior Resident
Reactor Inspector
(pars. 4, 6, 7, 8)

2/10/86
Date

W D Johnson for
C. C. Harbuck, Resident Reactor
Inspector
(pars. 2, 3, 4, 5, 6, 7)

2/10/86
Date

D M Hunnicutt
D. M. Hunnicutt, Acting Chief,
Project Section B, Reactor Project
Branch
(par. 9)

2/14/86
Date

Approved:

D M Hunnicutt
D. M. Hunnicutt, Acting Chief,
Project Section B, Reactor Project
Branch

2/14/86
Date

Inspection Summary

Inspection Conducted January 1-31, 1986 (Report 50-313/86-02)

Areas Inspected: Routine, unannounced inspection including operational safety verification, maintenance, surveillance, seismic pipe support review, condensate storage tank construction, and followup on Three Mile Island Action Plan requirements.

The inspection involved 99 inspector-hours (including 16 backshift hours) onsite by three NRC inspectors.

Results: Within the six areas inspected, one violation was identified (failure to follow a quality control procedure in seismic pipe support inspection, paragraph 7).

Inspection Summary

Inspection Conducted January 1-31, 1986 (Report 50-368/86-02)

Areas Inspected: Routine, unannounced inspection including operational safety verification, maintenance, surveillance, followup on a previously identified item, followup on a licensee event report, condensate storage tank construction, and followup on Three Mile Island Action Plan requirements.

The inspection involved 62 inspector-hours (including 12 backshift hours) onsite by three NRC inspectors.

Results: Within the seven areas inspected, one violation was identified (pump test procedure did not meet requirements of ASME Section XI, paragraph 5).

DETAILS1. Persons Contacted

*J. Levine, ANO General Manager
R. Ashcraft, Electrical Maintenance Supervisor
B. Baker, Operations Manager
M. Bolanis, Health Physics Superintendent
M. Browning, Mechanical Maintenance Engineer
*P. Campbell, Licensing Engineer
T. Cogburn, General Manager, Nuclear Services
A. Cox, Operations Technical Support
*E. Ewing, Engineering & Technical Support Manager
G. Fiser, Radiochemistry Supervisor
M. Frala, Assistant Radiochemistry Supervisor
B. Garrison, Operations Technical Support
M. Goodson, Civil Engineer
L. Gulick, Unit 2 Operations Superintendent
C. Halbert, Mechanical Engineering Supervisor
H. Hollis, Security Coordinator
D. Horton, Quality Assurance Manager
*R. Howerton, Manager, Civil Engineering
*L. Humphrey, Administrative Manager
D. Johnson, Licensing Engineer
*H. Jones, Field Construction Manager
*D. Lomax, Licensing Supervisor
B. Lovett, Electrical Maintenance Engineer
*J. McWilliams, Unit 1 Operations Supervisor
*J. Orlicek, Field Engineering Supervisor
V. Pettus, Mechanical Maintenance Superintendent
R. Poole, Assistant Radiochemistry Supervisor
*D. Provencher, Quality Engineering Supervisor
P. Rogers, Plant Licensing Engineer
*L. Sanders, Maintenance Manager
*L. Schempp, Nuclear Quality Control Manager
*C. Shively, Plant Engineering Superintendent
R. Simmons, Planning and Scheduling Supervisor
C. Taylor, Operations Technical Support
B. Terwilliger, Operations Assessment Supervisor
R. Tucker, Electrical Maintenance Superintendent
D. Wagner, Health Physics Supervisor
*R. Wewers, Work Control Center Manager
G. Woolf, Operations Technical Support
G. Wrightam, I&C Supervisor
S. Yancy, Mechanical Maintenance Supervisor
C. Zimmerman, Operations Technical Support

*Present at exit interview.

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

2. Followup on Previously Identified Items (Unit 2)

(Closed) Violation 368/8517-01: Category 'E' valve found out of its required position.

The NRC inspector reviewed the licensee's corrective actions which were to (a) review this violation with Operations personnel, (b) revise procedures as necessary, and (c) conduct detailed operator training on all procedures related to category 'E' valves. All actions were verified to have been completed. In conjunction with this review, the NRC inspector reviewed the licensee's actions taken in response to Licensee Event Report (LER) 84-018-00, "Category 'E' Valve Improperly Aligned," for Unit 2. The violation and the LER are similar in that both valves were in the Unit 2 containment spray system and were improperly positioned because of personnel error. However, the violation was identified approximately a year after the issuance of the LER. Additionally, corrective actions for the violation were more extensive than for the LER, specifically items (b) and (c) noted above. The NRC inspector concluded that the completed actions in response to the violation appeared to be adequate to prevent recurrence of category 'E' valve mispositioning. Therefore, violation 368/8517-01 and LER 84-018-00 are considered closed.

3. Licensee Event Report (LER) Followup (Unit 2)

Through direct observation, discussions with licensee personnel, and review of records, the following event report was reviewed to determine that reportability requirements were fulfilled, immediate corrective action was accomplished, and corrective action to prevent recurrence has been accomplished in accordance with Technical Specifications.

- 84-018-00 "Category 'E' Valve Improperly Aligned." This was reviewed in conjunction with the licensee's actions in response to violation 368/8517-01. See paragraph 2 of this report.

No violations or deviations were identified.

4. Operational Safety Verification (Units 1 and 2)

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

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

The NRC inspectors walked down portions of the Unit 1 electrical distribution system using Procedure 1107.01 and single-line Drawings E5, E8, E15, E16, E17, E18, E19, E22, E23, and E24. This walkdown included review of approximately 600 breakers. Label problems such as no breaker label or an erroneous label were noted on about 7 percent of the breakers. In most cases, the listing in Procedure 1107.01 was correct. An exception was discussed with licensee operations department personnel. They had identified this procedure error and a procedure revision was being prepared. The licensee is in the process of developing a means of controlling the breaker lists which are mounted on the doors of the 120 volt AC and DC distribution panels. The licensee's ongoing plant labeling improvement program includes a review of labels on motor control centers, and this program is expected to result in addition or correction of labels on 480 volt breaker cabinets.

Most of the single-line electrical drawings reviewed contained errors. Most of the errors appeared to result from a failure to update the drawings to reflect design changes. A review of the drawing control log for Drawing E15 indicated that four design change packages (DCPs) had not yet been reflected on the latest revision of this drawing. The licensee is involved in a major effort to eliminate the backlog of DCPs which have been implemented but not closed out.

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.

5. Monthly Surveillance Observation (Units 1 and 2)

The NRC inspector observed the Technical Specification required surveillance testing on the Unit 1 penetration room emergency ventilation lead system and on the Unit 2 motor driven emergency feedwater pump 2P7B. Except as noted below, it was verified that 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.

- Monthly and Quarterly 2P7B Test, Procedure 2106.06, "Emergency Feedwater System Operations," Revision 15 of December 12, 1985, Supplement II.

The test procedure was reviewed and it appeared to meet the Technical Specification acceptance criteria of minimum flow of 485 gpm at a minimum discharge pressure of 1200 psig for both 2P7A and 2P7B (T.S. 4.7.1.2.a.2). However, TS requirement 4.0.5 for inservice inspection and testing also requires that this pump be tested in accordance with Section XI of the ASME Boiler and Pressure Vessel

Code 1974 Edition, and Addenda through Summer 1975. Article IWP-3000, "Inservice Test Procedures," of Section XI of the Code requires that reference values be defined for differential pressure (dP) and flow rate (Q). The resistance of the system is then varied until either the reference dP or Q is reached. The corresponding Q or dP , respectively, is then recorded and compared to the acceptance criteria, defined as an acceptable range of values for that quantity. The code further defines an "Alert Range" and a "Required Action Range." Contrary to the code requirements, the test procedure does not contain reference values of dP or Q and the corresponding acceptable range of values.

This is an apparent violation of Technical Specification surveillance requirement 4.0.5 for the emergency feedwater pumps 2P7A and 2P7B. (50-368/8602-01)

- Lead system monthly test, Procedure 1104.43, "Penetration Room Ventilation System," Revision 4 of May 3, 1984, Supplement I.

The NRC inspector reviewed the procedure and found that it appeared to meet the testing requirements of the Technical Specifications. However, the following items were observed during the test which raised a concern about the design of the system.

During the test it was noted that the North Penetration Room (NPR) was at a higher pressure, essentially 0" WC (zero inches water column) of vacuum, than the South Penetration Room (SPR) which was at 0.3" WC vacuum. The ventilation lines from each room are in parallel, coming together into a single suction line to the system fan. The lines from each of the three levels of each room have check valves to prevent backflow. Based on the observed differential pressure (dP) between the rooms, the NRC inspector postulated that either all of the flow was coming from the NPR, with the SPR check valves seated due to the dP , or that all the flow was coming from the SPR with the NPR check valves stuck shut.

The NRC inspector also noted that the Penetration Room Low Vacuum alarm was set at a higher vacuum (0.5" WC) than was attained during the surveillance (0.3" WC). It remained to be determined if this implied that the system was designed to be able, under accident conditions, to attain a vacuum of greater than 0.5" WC. Pending further review, these concerns will remain as an open item. (50-313/8602-02)

The NRC inspector also witnessed portions of the following test activities:

- Reactor trip breaker portion of the reactor protection system channel 'A' monthly test (Unit 1, J.O. 706161).
- CEA Exercise Test, Appendix 'A' to Procedure 2105.09, "CEDM Control System Operation."

No violations or deviations were identified.

6. Monthly Maintenance Observation (Units 1 and 2)

Station maintenance activities of 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 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 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 drain valve MS-1053 (J.O. 706697)
- Installation of check valve MS-272 (J.O. 707125)
- Post-maintenance performance test of 'A' emergency diesel generator (Work Plan 1409.06)
- Mechanical portion of Design Change Package 86-1005 (J.O. 707469)
- Replacement of power packs and bearings on 'B' emergency diesel generator (J.O. 707279)
- Packing leak repair on Unit 1 high pressure injection flow transmitter (PDT-1210) isolation valve (J.O. 705145)
- Replacement of discharge accumulator for charging pump 'A' (Procedure 2406.32, J.O. 524969)

No violations or deviations were identified.

7. Seismic Pipe Support Review

The purpose of this part of the report is to document problems noted by the NRC inspectors concerning pipe support installation activities on the Unit 1 emergency feedwater (EFW) system.

During the safety system functional inspection of the EFW system, a walkdown of the system was performed. Deficiencies found that are not related to pipe supports will be documented in NRC Inspection Report 50-313/86-01.

- a. The NRC inspector found that pipe support 3EFW-116-H20 had approximately six concrete expansion anchors (CEAs) that had less than the minimum imbedment depth required. On one CEA, the nut had no bearing on the washer, and was apparently torqued to the end of the bolt thread travel. Licensee Field Inspection Procedure G-6, "Inspection, Examination and Test Control, Arkansas GSA 11306," Revision 2 of January 23, 1981, paragraph 3.6, required in part, that the quality control inspection verify that the dimensions and general workmanship were as specified in the governing specifications and drawings. The NRC inspector determined that the QC inspection of this pipe support was not performed properly because the QC inspection report (Quality Control Inspection Record 72930-84, completed March 27, 1985) had documented no deficiencies. This failure to follow a QC inspection procedure is an apparent violation (50-313/8602-01). Based upon a licensee engineering evaluation, the deficiencies noted for this pipe support did not impact the operability of the EFW system.
- b. The NRC inspectors observed concrete expansion anchor installation activities for the EFW System Design Change Package 86-1005 to verify the adequacy of in-process quality control. Based upon the observed problems listed below, the NRC inspectors concluded that craft personnel were either inadequately trained, had inadequate guidance to perform the task assigned, or both.
 - . The guidance provided on how deep to drill the holes for the Phillips Wedge Anchors (PWAs) for support 1-MS-118-H11 was not based on criteria in the applicable specification (C-2408).
 - . The guidance provided for placing grout under the base plate of the kicker to support 1-MS-5-H1 did not include:
 - The requirement to repair two unused anchor bolt holes beneath the base plate before placing grout on top of them.
 - The specifications regarding the mixing of "Bondcrete Acrylic Adhesive" with grout.
 - The importance of beveling the grout from the bottom of the baseplate instead of from the top.
 - The proper technique for packing the grout beneath the base plate.
 - . The guidance provided for torquing the PWAs for support 1-MS-118-H11 was in error (160 ft-lbs instead of 85 ft-lbs). Subsequent guidance on how to correct this (loosen and retorque at the correct value) was also in error. The licensee issued Non-Conformance Report 86-005-1 after this determination, redrilled the holes, and installed the next larger size PWAs at the proper torque.

These activities are governed by the following licensee Technical Specifications:

- APL-C-2406 "Technical Specification for Forming, Placing, Finishing, and Curing of Concrete," approved June 27, 1980.
- APL-C-2408 "Technical Specification for Installation of Seismic Category I and Non-Category I Concrete Expansion Type Shell Wedge or Stud Anchors Type 10 Grouted Anchors, and Undercut Anchors," Revision 3 of August 14, 1984.

The NRC inspector found that these specifications lacked guidance on the following points:

- C-2406 provides no description of the acceptable techniques for placing grout beneath a pipe support base plate. Additionally, concerning the repair of unused anchor bolt holes which are less than the minimum spacing from adjacent anchor bolts, it is unclear how long the repair must be allowed to set before torquing the anchor bolts.
- C-2408 provides no criteria for determining the acceptability of concrete expansion anchors that are not normal to the base plate resulting in the nut not seating flush to the washer. The NRC inspector noted numerous examples of this in the EFW system pipe supports. Some examples were:

3EFW-116-H20
3EFW-114-H13
3EFW-114-H5
1MS-229-H1

The adequacy of seismic pipe supports which use concrete expansion anchor is dependent upon the quality of the work performed by the craft persons. The NRC inspectors questioned whether an adequate level of quality is being achieved when it appears that the craft persons are given inadequate guidance. This concern over the control of seismic pipe support installation will remain open pending further review. (Open Item 50-313/8602-02).

8. Followup on Three Mile Island Action Plan Requirements (Units 1 and 2)

The NRC inspector is reviewing, on a continuing basis, the licensee's actions in response to the requirements of NUREG-0737 and Generic Letter 82-33. The inspector's review of certain of the licensee's actions in this regard is summarized below. The numbering system and short titles correspond to those used in NUREG-0737.

• II.B.1 Reactor Coolant System Vents (Unit 2)

NRC Inspection Report 50-368/81-16 discussed the installation of the remotely operated reactor coolant system (RCS) vent valves. In accordance with its commitment to the NRC, the licensee is currently

operating the system with the key operated power switches in the control room in the "on" position. This makes solenoid valve position indication in the control room operable. The NRC inspector reviewed the emergency operating procedure (EOP) and noted that the vents are addressed as appropriate and that they are procedurally used only as a backup to the ECCS vent in the EOP. The NRC inspector noted that operability testing of the RCS vent valves is performed every 18 months as required by the Technical Specifications. (Procedure 2305.06, Supplement 3)

II.B.1 RCS Vents (Unit 1)

The NRC inspector reviewed design change package DCP80-1004 which was used to control the installation of remotely operated vents on the reactor vessel head, the RCS hot legs, and the pressurizer. This installation was completed and tested in accordance with Procedure 1407.10 in March 1983. As in Unit 2, the licensee is operating this system with power available to the solenoid valve handswitches in order to provide continuous valve position indication in the control room. The NRC inspector noted that the RCS vents are addressed in the EOP as appropriate. Testing in accordance with Technical Specification Table 4.1-2 is performed using Attachment G of Procedure 1102.02.

No violations or deviations were identified.

9. Condensate Storage Tank and Tie-Ins (Units 1 and 2)

The NRC inspector observed portions of the excavation for the foundation and tie-ins for the proposed seismic condensate storage tank (CST) on January 14, 16, 17, and 31, 1986. The excavation is the first construction phase of the CST project. The NRC inspector reviewed Design Change Package (DCP) 82-2086. This DCP covers the foundation, valve pits, pipe trenches, pier support columns, and tornado missile protection walls for the CST. Review of the DCP determined the following had been included and was adequately covered in the DCP:

- a. No special or unusual construction practices are required for this CST.
- b. Designs were for seismic Category I structures and analyzed for this design criteria. The NRC inspector has not completed a detailed review of the calculations for all loads discussed in the DCP.
- c. Applicable codes and standards were identified.
- d. QA requirements are to be met in accordance with the NUTECH Quality Assurance Manual. The latest revision of this Manual is specified.
- e. Construction records are specified in the appropriate specifications.
- f. The 19 controlled design documents for ANO (civil portion only) are listed.

The NRC inspectors will make observations of the construction work in progress during its entirety. These observations will include removal of earth and sand from the excavation, placement of backfill and measurements of backfill density, placement of reinforcement bars, placement of concrete forms, placement and sampling of concrete during scheduled pours, and reviews of records, data, and test results.

No violations or deviations were identified.

10. Exit Interview

The NRC inspectors met with Mr. J. M. Levine (ANO General Manager) and other members of the AP&L staff at the end of this inspection. At this meeting, the inspectors summarized the scope of the inspection and the findings.