

U. S. NUCLEAR REGULATORY COMMISSION

REGION V

Report Nos. 50-528/90-15, 50-529/90-15, 50-530/90-15

Docket Nos. 50-528, 50-529, 50-530

License Nos. NPF-41, NPF-51 and NPF-74

Licensee: Arizona Public Service Company
P. O. Box 52034
Phoenix, Arizona 85072-2034

Facility Name: Palo Verde Nuclear Generating Station Units 1, 2 and 3

Inspection Conducted: March 19-23, 1990 and April 9-13, 1990

Inspectors: Howard P. Wong for
W. P. Ang, Project Inspector

5/10/90
Date Signed

Approved By: Howard P. Wong
H. Wong, Chief
Reactor Projects Branch, Section II

5/10/90
Date Signed

Inspection Summary:

Inspection on March 19-23, 1990 and April 9-13, 1990 (Report Nos. 50-528/90-15, 50-529/90-15, and 50-530/90-15)

During this inspection the following Inspection Procedures were utilized: 30703, 40703, 92700, 92701 and 90712.

Results: Of the areas inspected no violations or deviations were identified.

General Conclusions and Specific Findings

Significant Safety Matters:

No significant safety matters were identified. However weaknesses in closeout of Unit 1 restart list, items 4 and 138, were observed involving the adequacy of job performance training measures for operation of atmospheric dump valves (ADV's), adequacy of the procedure for operating ADV's from the remote shutdown panel, adequacy of Nuclear Engineering resolution of instrument air capacity inconsistencies and adequacy of QA review of restart item 138.

Summary of Violations: None

Summary of Deviations: None

Open Items Summary:

Inspector Followup Item 90-15-01 - Update of organization and responsibilities procedures to reflect management changes.

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Inspector Followup Item 90-15-02 - Adequacy of ADV operating procedures and job performance measures.



DETAILS

1. Persons Contacted

Arizona Public Service (APS)

- *J. Bailey, Vice President, Nuclear Safety and Licensing
- B. Ballard, Quality Assurance Director
- **T. Bradish, Compliance Manager
- T. Cogburn, Standards and Technical Support Deputy Director
- E. Firth, Training Manager
- R. Fullmer, QA Audits Manager
- *M. Hodge, Mechanical Engineering Supervisor
- *J. Levine, Vice President, Nuclear Power Production
- W. Marsh, Plant Operations and Maintenance Manager
- R. Prabhakar, Manager, Quality Engineering
- G. Shell, Quality Systems Manager
- *B. Simpson, Vice President Engineering and Construction
- E. Sterling, Nuclear Engineering Department Manager
- D. Stover, Nuclear Safety Group Manager

The inspectors also met with other licensee and contractor personnel during the course of the inspection.

*Attended the exit meeting held on March 23, 1990.

**Attended the exit meeting held on March 23, 1990 and April 13, 1990.

2. Offsite Support Staff (40703)

An inspection was performed to ascertain that offsite support staff functions were performed by qualified personnel in accordance with licensee approved administrative controls. The inspection included the following functional areas some of which are physically located on-site: Nuclear Engineering, Technical Support, Quality Assurance, and the Nuclear Safety Group. Section 6.2 of the Technical Specifications (TS) for Units 1, 2 and 3 provided the administrative requirements for onsite and offsite organizations. ANSI N18.7-1976 and ANSI/ANS-3.1-1978 provided owner organizational requirements and training requirements for the staff.

The following administrative procedures were reviewed:

010G-OZZ01 Revision 1 - Executive Vice President, ANPP, Organization and Responsibility Policy

020G-OZZ01 Revision 1 - Nuclear Production Organization and Responsibility Policy

030G-OZZ01 Revision 1 - Standards and Technical Support Organization and Responsibility Policy



600G-OZZ01 Revision 2 - QA/QC Organization and Responsibility Policy

730G-OZZ01 Revision 0 - Engineering Evaluation Organization and Responsibility Policy

800G-OZZ01 Revision 0 - Engineering Evaluation and Construction Organization and Responsibility Policy

810G-OZZ01 Revision 2 - Nuclear Engineering Department Organization and Responsibility Policy

900G-OZZ01 Revision 0 - Nuclear Safety and Licensing Division Organization and Responsibility Policy

910G-OZZ01 Revision 0 - Nuclear Safety Department Organization and Responsibility Policy

930G-OZZ01 Revision 1 - Nuclear Licensing Department Organization and Responsibility Policy

The above noted procedures and referenced procedures and organizational charts for the affected organizations established the lines of authority, communication relationships and responsibilities for the offsite support organizations reviewed. However, the inspector noted that for most of the above procedures, many organizational and management changes that had occurred since mid-1989 had not been reflected in the procedures. For example, the responsibilities and authority of the Vice President, Nuclear Safety and Licensing, are not contained in any of the procedures reviewed. That position was established in August 1989. Discussions with the licensee indicated that approximately 25 administrative procedures that describe the various organizations and specify responsibilities of personnel in those organizations were being revised due to the numerous organizational changes that had occurred during the previous year, and that all such procedures were expected to be updated by the end of May 1990. The updated procedures will be inspected during subsequent inspections - Inspector Follow-up Item 50-528/90-15-01.

A manager, a group leader and members of the staff of the following groups were interviewed and qualification records for those personnel were sampled to ascertain compliance with qualification requirements of TS 6.1, ANSI N18.7 and ANS 3.1: Nuclear Engineering, Nuclear Safety Department, Technical Support and Quality Assurance. Personnel contacted met the required qualifications and were generally knowledgeable about their areas of responsibility. The inspector noted however that the training program for system engineers was limited in that it did not include formal system training for their systems and the systems that interact with it. The inspector further noted that some System Engineers had considerable experience and were very knowledgeable about their systems, but there were some System Engineers that had limited experience (about one year) regarding their systems and were learning through on-the-job experience. The licensee recognized the need for establishing a training program for Technical Support Engineers including System Engineers, but was still in the process of developing the program.



The latest QA audit of design control/modification documented in Audit Report No. 89-003 and issued on March 30, 1989 was reviewed and found to be predominantly compliance oriented. The inspector further noted that the audit team did not include personnel with design engineering experience. Discussions with the QA Director indicated that this audit had also previously been reviewed by other oversight groups and similar comments had been made. In response to those comments, QA and NSG had contracted for and performed evaluations of QA audits. Recommended corrective actions were also received, and organizational and personnel qualification strengthening was being initiated. Additional recommendations such as providing technical training, incorporation of Probabilistic Risk Analysis considerations, and performance of better defined QA Monitoring were being planned. The inspector reviewed a January 1990 audit documented in QA Audit report number 89-027 which included an audit of Plant Review Board (PRB) activities. An improvement in the quality of the audit was noted in the substantive findings of that report. Specifically, a continuing inability of the PRB to consistently investigate all violations of TS was identified. Further discussions with QA and with the PRB chairman indicated that corrective action for the QA audit finding was in process and included a requested change of the TS regarding the composition of the PRB.

No violations or deviations were identified.

3. Followup (92700, 92701, 90712)

A. Unit 1 Restart Action Items

Licensee activities to complete the following Restart List Action Items, including QA reviews of the closure packages, were sampled and reviewed.

Action Item

- 4 - Train operations personnel how to properly operate ADV's remotely and locally (manually)
- 138 - Review adequacy of Instrument Air system nitrogen backup supply
- 243 - Review adequacy of Instrument Air system nitrogen backup pressure
- 602 - Evaluate response to the NRC Generic Letter 88-14 regarding adequacy of Instrument Air system. (This review only relates to Unit 1 restart. NRC:NRR is reviewing the licensee's response to the Generic Letter.)
- 706 - Revise procedure for draining the Instrument Air system compressor air regulator
- 709 - Verify proper operation of Instrument Air system air dryer cam setting and tower solenoid valves



- 712 - Monitor Instrument Air system air quality downstream of the after-filters for moisture content, particulates and hydrocarbons for three months.

The inspector had the following observations:

- (1) Restart Item 4 - The licensee generated Job Performance Measures (JPM) to ascertain that licensed Reactor Operators (RO) and Senior Reactor Operators (SRO) could operate the Atmospheric Dump Valves (ADV) from the Control Room (CR), the Remote Shutdown Panel (RSP) and manually at the valves. The inspector reviewed the operations procedures involved, the JPMs and the training records. JPM NLZ06-J-002-89 for operation of the ADVs from the CR had two revisions that appeared to follow revisions to the operating procedure, 410P-1SG01, that change the sequence of operating the permissives and the initiation of demand signals. Approximately 15 of 110 licensed RO's and SRO's completed earlier revisions of the JPM and had not completed revision 2 of the JPM. The licensee evaluation and response to this concern was that (a) procedure changes are provided to RO's and SRO's as required reading and (b) the ADV's are tested, and thus operated, many times due to the problems experienced by Unit 3, and the operators get a significant amount of hands on experience during the testing.

The review of the JPM NLZ06-J-002-89 also identified the following discrepancies with the JPM:

- (a) The JPM did not include the first step of the ADV operation instructions (paragraph 7.3.1 of 410P-1SG01, revision 9) which assures that control of the ADV's is in the CR and not in the RSP. Questions regarding whether ADV controls were in the CR or RSP arose during the March 3, 1989, Unit 3 Event.
- (b) Revision 2 of the JPM did not address a significant requirement contained in a note in paragraph 7.3.8 of 410P-1SG01 which requires that "Initial opening demand signal for any ADV shall be at least 30% demand." ADV testing subsequent to the March 3, 1989, event identified that lower demand signals may have led to conclusions that the valves were not functioning correctly, in that valve response time with lower demand signals was correspondingly slower and on occasion erratic.
- (c) The answer given for an examination question on revision 2 of the JPM indicated that the back-up safety-related nitrogen for the ADVs are placed in service when the Instrument Air header pressure falls below 70 psig. However, Paragraph 7.0 of 410P-1SG01 states in part that "When the instrument air system pressure decays below 100 psig, the nitrogen accumulators are placed into service by a low pressure switch." The JPM was inaccurate.



The inspector interviewed two ROs and two SROs from Unit 1 and discussed procedure 41OP-1SG01 with them to determine the effectiveness of the JPM and the effects of the discrepancies of the JPM. In all cases, the ROs and SROs referred to 41OP-1SG01 for operation of the ADV's as required and were then able to overcome the discrepancies of the JPM. The inspector concluded that as long as operation of the ADV's from the CR was performed using 41OP-1SG01, the discrepancies in the JPM would not affect operation of the ADVs. However, the inspector also concluded that the JPM was in need of correction for the identified discrepancies and that reperformance of the JPM during the routine schedule of licensed operator training should be considered to eliminate potential misinformation contained in the previous JPM. The licensee concurred.

The review of JPM NLZ06-J-001-89 identified the following discrepancies:

- (a) The procedure for operation of ADVs from the RSP is provided in paragraph 2.6.4 of 41AO-1ZZ44, revision 2, for shutdown outside the control room due to fire and/or smoke. Paragraph 2.6.4 did not contain requirements for minimum demand signal and possible wait time for the valves to start to open. Those requirements were contained in Appendix "P" of the procedure but Appendix "P" was not referred to by paragraph 2.6.4. In addition, the sequence in opening the permissives and setting the demand signal was reversed from that of the CR procedure, 41OP-1SG01. The JPM followed paragraph 2.6.4 of 41AO-1ZZ44 and contained no information regarding the minimum demand signal nor the possible wait time for the valves to start to open. The JPM also did not include reference to Appendix "P" of 41AO-1ZZ44. The JPM followed the sequence of 41AO-1ZZ44 which differed from the sequence of 41OP-1SG01 and JPM NLZ 06-J-002-89.
- (b) The JPM, as previously mentioned, followed paragraph 2.6.4 of 41AO-1ZZ44. The JPM did not recognize that previous paragraph 2.5 of 41AO-1ZZ44 required the realignment to local operation of the ADV disconnect switches at the remote shutdown panel, and did not contain a requirement to perform or verify realignment of the disconnect switches.

Operation of the ADV's from the RSP are very seldom performed and were not planned during this outage. The JPM was performed by a verbal walkthrough of the procedure at the RSP vice actual operation. Consequently, experience in operating the ADVs at the RSP is limited. The controls for the ADVs at the RSP is different from those in the CR. Discussions with Unit 1 ROs and SROs indicated that even after obtaining 41AO-1ZZ44, revision 2, and following the procedural steps, there was an uncertainty as to the required demand signal and the wait time for the valves to be opened. The inspector concluded that



41A0-1ZZ44, revision 2, paragraph 2.6.4 needed to be changed to include the minimum demand signal, the possible wait time and to consistently specify the sequence provided in 410P-1SG01 for opening permissives and setting valve position demand signals. The licensee concurred and stated that the Unit 3 procedures would be changed within one day and that the Units 1 and 2 procedures would be changed shortly thereafter but before restart of either unit. The inspector concluded that upon change of the procedures, operation of the ADVs using the revised procedures would not be affected by the JPMs lack of information. The inspector further determined that the JPM needed to be corrected upon issuance of the change to 41A0-1ZZ44 and that the licensee should consider reperformance of the revised JPM during the normal licensed training schedule.

The inspector reviewed JPM-NLZ06-J-003-89, local manual operation of the ADVs and had no concerns.

Licensee action in response to the noted discrepancies will be inspected during a future inspection (Inspector Follow-up Item 90-15-02).

- (2) Restart Item 138 - The licensee analyzed the adequacy of the compressed gas system, documented the evaluation and analysis in document number 13-MS-A20 revision 2, Compressed Gas System Evaluation and Analysis (CG report), and forwarded the documentation to the NRC for information via letter 102-01474-JNB/TDS dated October 16, 1989. Subsequent modification and testing of the Instrument Air backup nitrogen subsystem confirmed the design requirements for a maximum transient load of 884 SCFM at 85 psig as identified in the CG report. The restart package had been reviewed and considered satisfactory by QA on February 2, 1990, on the basis of a maximum air demand of 400 SCFM rather than 884 SCFM.

During discussion with Nuclear Engineering personnel, the inspector was informed that Bechtel had been requested to perform a review of the instrument air system and the review was documented in report 13-MS-A33, revision 1. The report identified that Instrument Air (IA) intermittent flow rates of 1049 SCFM for Loss of Power (LOP), 1269 SCFM for Safety Injection Actuation Signal (SIAS), 1239 SCFM for Auxiliary Feedwater Actuation Signal (AFAS) and 1500 SCFM for a Main Steam Isolation Signal (MSIS) were minimum required flow rates. The licensee had evaluated the LOP IA flow requirements and determined that 1049 SCFM was conservative and that 884 SCFM nitrogen capacity would be adequate. However, the intermittent flow requirements established in report 13-MS-A33 for SIAS, AFAS and MSIS had not been resolved by actually determining the appropriateness of the conservatism used in the actual calculations. The licensee noted and the inspector acknowledged that all safety-related functions of the IA system have dedicated, back-up safety-related nitrogen subsystems.



The inspector noted and informed the licensee that the back-up nitrogen for the IA system was supplied at 85 psig which indicated that the IA system would serve no function to the ADV's when IA compressors are not running (no power). As noted previously in this inspection report, when IA pressure drops below 100 psig, the safety-related back-up nitrogen subsystem for the ADVs are automatically lined up to provide the motive force for the ADVs, therefore the back-up nitrogen for IA which is supplied at 85 psig would have no function for ADV operation.

The inspector informed the licensee that the QA review of restart package 138 did not appear to be complete in that the review was performed using a 400 SCFM capacity vs 884 SCFM or 1500 SCFM capacity. The licensee agreed to reperform the QA review of restart package 138.

No violations or deviations were identified.

B. Licensee Event Reports

The following LER was reviewed and based on the information provided in the report, it was concluded that reporting requirement had been met, root causes had been identified, and corrective actions were appropriate. The below listed LER is considered closed.

50-528 LER 89-14 - Special Report Missed on Seismic Monitoring System

5. Exit Interview (30703)

The inspection scope and findings were summarized on March 23, 1990, with those persons indicated in paragraph one above. The inspector described the areas inspected and discussed the inspection findings.

