

U.S. NUCLEAR REGULATORY COMMISSION

REGION V

Report No. 50-528/84-40

Docket No. 50-528

License No. CPPR-141

Licensee: Arizona Public Service Company  
P. O. Box 21666  
Phoenix, Arizona 85036

Facility Name: Palo Verde Nuclear Generating Station - Unit 1

Inspection at: Palo Verde Site (Wintersburg, Arizona)

Inspection conducted: December 12-13, 1983 and February 6-9 and 21-22, 1984

Inspectors: PH Johnson 9/7/84  
P. H. Johnson, Reactor Inspector Date Signed

PH Johnson 9/7/84  
for P. Gage, Reactor Inspector (12/12-13/83) Date Signed

Approved by: L. F. Miller 9/11/84  
L. F. Miller, Chief Date Signed  
Reactor Projects Section No. 2

Summary:

Inspection on December 12-13, 1983 and February 6-9 and 21-22, 1984 (Report No. 50-528/84-40)

Areas Inspected: Special inspection of allegations related to test engineer certifications and conduct of the startup test program. The inspection involved 44 inspector-hours onsite by two region-based NRC inspectors.

Results: No violations or deviations were identified.

## DETAILS

### 1. Persons Contacted

- \*E. E. Van Brunt, Jr., Vice President, Nuclear
- \*J. E. Kirby, Startup Manager
- \*R. T. Fotter, Startup Technical Support Manager
- \*W. E. Ide, Manager, Corporate Quality Assurance
- R. Taylor, Startup Admin and Technical Support Manager
- R. Moody, Startup Training Supervisor

In addition, the inspectors also talked with other licensee representatives, including test engineers, lead startup engineers, and startup training staff personnel.

\*Denotes those attending exit interview on February 9, 1984.

### 2. General

On November 4, 1983, two contractor startup engineers sent a letter to the Executive Vice President, Arizona Public Service Company, with copies to the NRC, the Arizona Republic, and Voshell & Wright, Chartered. The letter stated that as part of termination procedures on that date they were asked to identify any safety hazard which existed at Palo Verde, and that the letter was being written in response to that request.

In the November 4 letter, the startup engineers (allegers) expressed concerns regarding the qualifications and experience of APS Startup management and certain other members of the startup organization. The APS Executive Vice President responded in a letter dated November 8, 1984, which stated that the corporate Quality Assurance organization had been directed to look into their concerns.

Following receipt of a copy of the allegers' November 4 letter, NRC inspectors from the Region V office contacted them by phone to more specifically characterize the issues of concern. A January 2, 1984 letter from one of the allegers also provided additional information. Characterization of the allegations presented and the results of onsite NRC inspections are presented in paragraph 3 below.

### 3. Allegations and Inspection Findings

The allegations are addressed below as characterized in letters to the allegers from NRC Region V dated December 9 and 20, 1983.

- a. Allegation No. 1: Some members of APS Startup management are not qualified for their positions.

Approach to Resolution: To evaluate this allegation the inspector examined available references which relate to the qualifications of startup management personnel. The personal resumes of specified individuals were also examined.

Discussion: The Palo Verde FSAR or Station Manual did not specify any particular qualification or experience requirements as a function of the various management positions in the APS Startup organization. As discussed further below under Allegation No. 4, certifications were required for Startup Department personnel based upon whether they performed, directed, reviewed, or approved test procedures or test results. Palo Verde Station Manual Procedure 90AC-OZZ17, "Startup Qualifications, Certifications, and Training," Revision 3 (effective September 27, 1983), stated the following:

5.1.1.5 Management personnel above the level of Group Supervisor are not required to be certified unless they have approval authority on or are required to review test procedures or test results.

NRC Inspection Finding: One of the allegers identified three members of Startup management whose experience and qualifications were questioned. The records of these three individuals were examined. This examination showed that all three were certified Level III (discussed further under Allegation No. 4). Resumes for the three individuals showed that they had from 16 to 30 years of total power plant experience, including 10 to 16 years of nuclear power plant experience. The inspector could see no basis for concluding that the individuals identified by the allegers were not qualified to hold their positions.

- b. Allegation No. 2: The licensee did not take adequate corrective actions for problems experienced with certain Borg-Warner gate valves in the safety injection (SI) system.

Approach to Resolution: To evaluate this allegation the inspector examined the completed test procedure identified by the allegers, documents referring to valve problems experienced during the test, and a construction deficiency report submitted to the NRC. The inspector also discussed SI valve problems with cognizant Startup Department personnel.

Discussion: The allegers expressed concern regarding the resolution of problems experienced with safety injection tank outlet isolation valves (SI-UV-614, -624, -634, and -644, manufactured by Borg-Warner) during the performance of preoperational test 91PE-1SI08, "SI Full Flow Verification Test". They also alleged that other safety injection valves manufactured by Borg-Warner had experienced problems, and expressed dissatisfaction with the timeliness of APS's corrective actions.

NRC Inspection Findings: Examination of a portion of the SI08 procedure showed that operational problems had been experienced with the valves identified by the allegers. These four valves were the subject of Startup Field Report SFR-1SI-274, issued on September 7, 1983. Other SFRs related to SI system valves included 1SI-276, 261, 250, and 249. Resolution of these SFRs was being tracked by the licensee. The licensee also submitted a construction deficiency report per 10 CFR 50.55(e) regarding the eight high pressure SI

discharge isolation valves. This report was identified as DER 83-63, initially submitted in writing to the NRC on October 24, 1983. This DER was closed out in a report dated March 22, 1984 after modifications were made to the valves affected. Because of additional operational problems experienced with the valves during testing, DER 83-63 was reopened in a followup report dated July 16, 1984. The licensee's resolution of these problems is still pending. The NRC will examine the licensee's corrective actions related to these valves as part of its regular inspection program.

The inspector's examination of the SI-08 procedure did not reveal any SI valve problems identified in the conduct of the test procedure which were not documented and being tracked by the licensee to ensure proper corrective action. However, the Construction Assessment Team (CAT) inspection conducted in September and October 1983 identified one SI system valve with an improperly installed position indicator which allowed the valve to open only about one third of its travel. This condition, cited as a violation in NRC Inspection Report 50-528/83-34, identified a need for better control of systems under test, and was included in an enforcement package which resulted in the assessment of a civil penalty. Resolution of all SI system valve operability problems will be examined prior to the issuance of an operating license.

- c. Allegation No. 3: The licensee experienced numerous problems in the performance of the safety injection tank preoperational test (Unit 1 test SI08).

Approach to Resolution: To evaluate this allegation the inspector examined the completed SI08 test procedure and discussed test results with cognizant Startup Department personnel.

Discussion: This concern, expressed by one of the allegers, was that the numerous problems experienced during the performance of the SI08 test made the results questionable. These included the valve problems discussed in Allegation No. 2 above, flow balancing difficulties, procedural problems, and questionable test data. The allexer stated in a December 12, 1983 telephone conversation that he had heard that APS was planning to repeat the test.

NRC Inspection Finding: APS Startup management representatives stated that their review of the Unit 1 SI08 procedure had identified numerous hardware and other problems. For this reason, as the NRC resident inspector had been previously advised, the decision had been made to repeat the test in its entirety.

The licensee restructured the Startup Department in September 1983 and issued revised administrative control procedures to govern the conduct of testing. The CAT inspection conducted in September and October 1983 identified a need for additional improvements in management controls. These were discussed in the licensee's January 31, 1984 response to the NRC Notice of Violation. The licensee's corrective actions and continued attention to management controls

have been and will be examined by the NRC's ongoing inspection program.

- d. Allegation No. 4: Some test personnel have been certified to levels not supported by their education and experience.

Approach to Resolution: To evaluate this allegation the inspector examined the licensee's commitments and procedures related to certification of test personnel. A sample of certification records was also examined to determine whether personnel were appropriately certified.

Discussion: Common practice within the nuclear industry is to certify test engineers based upon the type of activity they perform, as follows:

- ° Level I - authorized to perform tests
- ° Level II - authorized to direct or supervise individual tests
- ° Level III - authorized to review and/or approve test procedures and test results

For the performance of prerequisite testing, the licensee was committed to ANSI N45.2.6-1978, which defines experience and education requirements for an individual to be certified a Level I, II, or III test engineer. Section 14.2 of the Palo Verde FSAR specifies experience and training requirements for persons performing test-related functions during Phase I (pre-fuel load) preoperational tests. Although the FSAR did not use the Level I, II, and III nomenclature, the licensee's procedure 90AC-0ZZ17, "Startup Qualifications, Certifications and Training," defined the certification levels in these terms, with experience and training requirements consistent with those specified in the FSAR. Procedure 90AC-0ZZ17 allowed Level I test engineers to direct or supervise the conduct of individual prerequisite or preoperational tests. However, the education and experience requirements for certification as Level I per 90AC-0ZZ17 exceeded those required for Level II per ANSI N45.2.6 and met the commitments in FSAR section 14.2.2.1.0.1.A for persons directing or supervising individual tests.

NRC Inspection Findings: The inspectors selected a sample of 16 test engineer certification records for examination. Although this sample represented a small percentage (less than 5%) of the total certification records on file, it included the records of 12 persons identified by name who the allegers felt were not properly qualified for the level to which they were certified. This examination showed 15 of the 16 individuals to possess the experience and educational background required for their level of certification, as defined in the FSAR and procedure 90AC-0ZZ17. The resume for one individual who was certified Level II in May 1982 indicated that he possessed (at that time) a high school diploma and a total of 50 months of "applicable power plant experience," including nine months of



vocational electrical training. The amount of experience specified for a high school graduate to hold a Level II was as follows:

- ° ANSI N45.2.6-1978, to which the licensee was committed for the prerequisite test phase, required three years of "related experience".
- ° Section 14.2.2.10.1.A.2 of the Palo Verde FSAR required four years of "power plant experience".
- ° The licensee's procedure 90AC-0ZZ17, Revision 2, prescribed five years of "applicable power plant experience".

Although the individual referred to did not possess the level of experience specified in the licensee's procedure for certification to a Level II test engineer, this did not represent a violation of an NRC regulatory requirement, since the individual did meet the licensee's FSAR and ANSI N45.2.6 commitments. However, the licensee expressed a desire to maintain the Level II certification requirements in excess of the FSAR commitment, and stated that an audit of certification records would be performed.

- e. Allegation No. 5: Test conditions are not routinely reverified when resuming a test following a prolonged interruption.

Approach to Resolution: To evaluate this allegation the inspector examined procedural controls relating to test control and reviewed selected test procedures for consistence with the procedures.

Discussion: Preoperational test procedures prescribe prerequisite conditions which must be met before a test is commenced. If testing were resumed after a prolonged suspension, failure to reverify test conditions prior to resumption of testing could yield invalid test results.

NRC Inspection Findings: The licensee's procedure 90AC-0ZZ02, "Startup Test Conduct," specified in section 5.2.3.2.1(a) that an entry is to be made in the Test Log regarding "The restart of testing after a stoppage or suspension and the verification of establishment of initial conditions that will allow the test to restart." Section 5.2.5.10 of the same procedure also requires the Test Director to determine what plant conditions in the test procedure must be reestablished. In addition, section 5.1.5 required startup QC to be notified prior to resumption of testing on any quality-related, ASME, fire protection, or Radwaste system or component. As an additional check, the inspector examined portions of four completed test procedures. This did not identify any situations in which test resumption was not conducted as specified in the procedure. Related Test Log entries were found to have been made where appropriate.

- f. Allegation No. 6: The licensee's use of a "Limited Level I" is improper.

Approach to Resolution: To evaluate this allegation the inspector examined the licensee's definition and utilization of Limited Level I. The Limited Level I classification was also compared with the pertinent industry standard.

Discussion: Refer to discussion under Allegation No. 4, above.

NRC Inspection Findings: Prior to September 27, 1983, test engineer qualifications were governed by more than one administrative procedure. Bechtel prerequisite test personnel were certified pursuant to Bechtel procedure AD-109; APS startup personnel were certified in accordance with 90AC-OZZ17, Revision 2. All test personnel were integrated into a combined Startup Department organization on September 27, 1983. Revision 3 to 90AC-OZZ17, issued on that date, superseded AD-109 and Revision 2 to 90AC-OZZ17. After that date all test personnel were required to be certified in accordance with 90AC-OZZ17, Revision 3 (although Bechtel prerequisite test personnel certified per AD 109 remained so certified until the next periodic recertification became due). This procedure provided for a Limited Level I certification. Section 5.1.1.1 of this procedure stated that Limited Level I persons could serve as data takers or implement individual test procedures (not to include the setting up of tests or related equipment). Appendix B to the procedure specified experience and education requirements for Limited Level I. Examination showed that these qualification requirements equaled or exceeded those specified in ANSI N45.2.6 for a Level I person. Section 3.2 of ANSI N45.2.6 states that a Level I person "shall be capable of performing...tests..." The use of a Limited Level I certification therefore appeared to be consistent with ANSI N45.2.6, and was consistent with the licensee's commitments as stated in Section 14.2.2.10 of the Palo Verde FSAR.

- g. Allegation No. 7: Persons reviewing preoperational test procedures do not possess appropriate certifications.

Approach to Resolution: To evaluate this allegation the inspector examined (1) the licensee's procedures and commitments related to test procedure and test results review and (2) the certifications possessed by individuals performing such reviews.

Discussion: Section 14.2.2.10.1.C of the Palo Verde FSAR established qualification requirements for individuals who review or approve test procedures and test results. Also refer to discussion under Allegation No. 4 above.

NRC Inspection Findings: Appendix B to procedure 90AC-OZZ17 specified qualification requirements for certification as a Level III test engineer. Examination showed these requirements to be consistent with those provided in FSAR Section 14.2.2.10.1.C. Section 5.1.1.4 of 90AC-OZZ17 required the Test Group Supervisor, Lead Startup Engineer, and all persons with approval authority on test procedures or test results to be certified Level III.

Procedure 90AC-OZZ14, "PVNGS Startup Procedures Preparation, Review and Approval," required review of individual preoperational test procedures by QA, the Test Group Supervisor, the Lead Startup Engineer, and the Test Working Group (TWG), with approval by the PVNGS Startup Manager (certified Level III). Procedure 90AC-OZZ09, "Startup Test Working Group," required TWG members to be certified Level III. Thus, a number of Level III reviews were provided for in 90AC-OZZ14. Procedure 90AC-OZZ18, "Startup Test Results Review," established similar review and approval requirements for completed test results. Examination of a selection of preoperational test procedures did not identify any which lacked proper review and approval signatures.

No violations or deviations were identified in the course of this inspection.

#### 4. Conclusions

The concerns expressed by the allegers involved two principal areas: (1) qualifications of Startup Department personnel, and (2) problems associated with the conduct of preoperational tests, including problems with several valves in the SI system. Examination of these concerns as discussed above led to the following conclusions:

- ° Inspection followup on these allegations did not identify technical problems of which the licensee was not aware. The allegations correctly reported valve problems which were known to the licensee. No individuals were identified who were not properly certified in accordance with the licensee's commitments, although one test engineer was found not to have been certified per the licensee's internal procedures (refer to paragraph 3.d above).
- ° Within the scope of these specific allegations, the licensee's activities appeared to have been properly managed. The licensee also appeared to be providing for proper certification of test personnel. Valve problems identified by the allegers were being tracked to ensure appropriate corrective action. As discussed earlier, however, NRC inspections have identified other problems associated with the control of systems undergoing test. The NRC inspection program will continue to focus attention on this area.

#### 5. Exit Interview

The inspectors met with APS representatives (denoted in paragraph 1) on February 9, 1984. The inspection findings were discussed, as presented in paragraph 3. In response to the finding related to Allegation No. 4, the licensee stated that an audit of certification records for test personnel would be performed.