U. S. NUCLEAR REGULATORY COMMISSION
REGION V

Report Nos. 50-528/85-47, 50-529/85-46, and 50-530/85-31

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

License Nos. NPF-41 and NPF-46

Construction Permit No. CPPR-143

Licensee: Arizona Nuclear Power Project
Post Office Box 52034
Phoenix, Arizona 85072-2034

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

Inspection Conducted: December 18, 1985 - January 25, 1986

Inspectors: G. H. Hernandez, Senior Resident Inspector — Date Signed: 2-7-86

J. R. Ball, Resident Inspector — Date Signed: 2-7-86

L. E. Vorderbrueggen, Resident Inspector — Date Signed: 2-7-86

Approved By: L. F. Miller, Chief, Reactor Projects Section No. 2 — Date Signed: 2-7-86

Summary:

Inspection from December 18, 1985 - January 25, 1986 (Report Nos. 50-528/85-47 50-529/85-46 and 50-530/85-31)

Areas Inspected: A routine, onsite inspection by the Construction Resident Inspectors of activities related to licensee action on six reported 50.55(e) reports, a review of quality records related to Unit No. 3 electrical instrument components and systems, an examination of the electrical cable separation in Unit No. 2 and a review of the quality assurance program and the overall preoperational test program for Unit No. 3. The current preoperational testing activities in progress in Unit No. 3 were also examined by the inspectors.

The inspection involved 250 inspector hours onsite by three NRC Resident Inspectors.

The following I.E. Manual Chapters were utilized during this inspection: Module Nos. 35301, 51063B, 52055, 70301, 71302 and 92700.

Results: In the areas inspected, no deviations or violations of NRC requirements were identified.

## DETAILS

1. Persons Contacted

a. Arizona Nuclear Power Project (ANPP)

E. E. Van Brunt, Jr., Executive Vice President
*W. E. Ide, Corporate Quality Assurance Manager
D. B. Fasnacht, Nuclear Construction Manager
W. F. Quinn, Licensing Manager
A. C. Rogers, Nuclear Engineering Manager
L. A. Souza, Assistant Corporate Quality Assurance Manger
*C. N. Russo, Quality Assurance Audits/Monitoring Manager
D. E. Fowler, Quality Control Manager
T. A. Shriver, Quality Systems Engineering Manager
R. J. Burgess, Field Engineering Supervisor
S. G. Penick, Quality Assurance Monitoring Supervisor
J. C. Sherrin, Quality Document Review Group Supervisor
A. T. Ramey, Quality System Supervisor
K. R. Daley, Quality Assurance Engineer
*W. W. Montefour, Quality Assurance Engineer
D. M. LeBoeuf, Quality Assurance Engineer
H. L. Green, Quality Assurance Engineer
W. J. Gratza, Quality Assurance Engineer
T. R. Bradish, Supervisor, Quality Systems
T. P. Siegfried, Quality Assurance Engineer
T. A. Petersen, Nuclear Licensing

b. Bechtel Power Corporation (Bechtel)

G. A. Hierzer, Field Construction Manager
W. P. Murphy, Unit 3 Project Superintendent
S. M. Nickell, Project Superintendent
D. R. Anderson, Chief Resident Engineer
T. L. Horst, Project Field Engineer
*D. R. Hawkinson, Project Quality Assurance Manager
*H. A. Foster, Project Quality Control Engineer
H. A. Mear, Assistant Project Quality Control Engineer
R. Ruff, Electrical/Instrumentation Quality Control Engineer
H. L. Thornberry, Area Project Field Engineer
G. Griffin, Lead Civil Quality Control Engineer
D. Merhoff, Quality Assurance Engineer
H. Guire, Project Quality Assurance Engineer
J. Silvins, Civil Field Engineer

*Denotes personnel attending the NRC Exit Management Meeting conducted on January 24, 1986.

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

2. Plant Status

Unit 3: Construction completion of Unit 3 is estimated at 98% by the licensee. See paragraph 7.0 for a discussion of preoperational test activities currently in progress.

3. Review of Potentially Reportable 50.55(e) Items - Units 1, 2 and 3

In 1984, the licensee's nonconformance identification system recorded 106 discrepant conditions which appeared to have sufficient safety significance to warrant reportability consideration. These were dispositioned through the licensee's Deficiency Evaluation Report (DER) program. Of the 106 DERs, 57 were finally judged by the licensee to be not reportable under the requirements of 10 CFR 50.55(e). The inspector randomly selected six of those 57 non-reportable DER's for review in order to evaluate the thoroughness of the licensee's analysis and the validity of the conclusions. The DER's reviewed were the following:

| DER No. | Orientation Date | Final Report Date | Description |
|---|---|---|---|
| 84-15 | 03/05/84 | 11/15/84 | Welding requirements for U-shaped pipe supports not adequately defined on design documents. |
| 84-20 | 04/10/84 | 10/15/84 | Misalignment in Unit 1 recirculation sump 24-inch suction line. |
| 84-39 | 05/21/84 | 09/26/84 | Abnormal rumbling noises in LPSI and Containment Spray pumps. |
| 84-61 | 08/21/84 | 10/17/84 | Potential loss of Pressurizer Auxiliary Spray System due to stuck open charging valve. |
| 84-69 | 08/30/84 | 11/09/84 | Physical interference with movement of shunt trip contacts on initiation relay of RPS channel "C". |
| 84-106 | 12/14/84 | 02/27/85 | Spurious load sheds and sequencer lock-up events on Unit 1 Train "B" ESFAS. |

Each DER and its supporting documents provided complete description of the discrepant condition and the evaluation of safety significance. Also, the root cause and corrective action for each condition were appropriately identified. The records for each DER indicated that the corrective action had been completed or had been arranged. The licensee submitted a detailed final report to the NRC Region V office for each DER

even though a report was not required. The inspector concluded that the licensee's program met the requirements of 10 CFR 50.55e.

No deviations or violations of NRC requirements were identified.

4. Instrument Components and Systems - Record Review - Unit 3

a. Summary of Areas Examined

The inspector examined quality records relating to the receipt, storage, and installation of instrument components and systems in Unit 3 to determine if the records reflected that items were handled and installed in accordance with specification requirements, and required inspections were properly performed, recorded, reviewed and evaluated by qualified personnel. The inspector reviewed documentation concerning the resolution of nonconforming conditions identified by the licensee during the course of component installation. Records pertaining to changes in design or modifications to equipment already installed in the plant were also reviewed.

b. Receiving Inspection and Storage of Instrument Components

The inspector reviewed a selected sample of receiving inspection packages for instrument components procured under the following material specifications.

- 13-JM-104 - "Quality Class Q Balance of Plant Engineered Safety Features Actuation System"
- 13-JM-311 - "Quality Class Q Electronic Field Instruments - Nuclear"
- 13-JM-556 - "Quality Class Q Thermocouple Assemblies and Test Wells"

The receiving inspection reports were found to be complete, controlled and appropriately reviewed. The inspector also reviewed storage records for a number of components, to determine if proper storage conditions had been maintained. The inspector toured the licensee's storage facilities to determine if the licensee was continuing to maintain components under proper storage condition, that components were being properly identified and controlled, and that non-conforming items were identified and segregated to avoid their inadvertent use.

No deviations or violations of NRC requirements were identified.

c. Installation of Instrument Components and Systems

The inspector reviewed documentation for installation of six resistance temperature detectors, six pressure transmitters, and six level transmitters to determine if instrument installations were accomplished in accordance with the latest specifications, drawings

and procedures and that appropriate inspections were conducted and documented. The following installed instruments were selected for inspection:

| Instrument System | Transmitter Number | Description | Channel |
|---|---|---|---|
| Shutdown Cooling Monitoring | 3JSIATE303X | Shutdown Cooling Heat Exchanger 1 Outlet Temperature | A |
| | 3JSIATE351X&Y | Shutdown Cooling Heat Exchanger 1 Differential Temperature | A |
| | 3JSIBTE303Y | Shutdown Cooling Heat Exchanger 2 Outlet Temperature | B |
| | 3JSIBTE352X&Y | Shutdown Cooling Heat Exchanger 2 Differential Temperature | B |
| Safety Injection | 3JSIAPT0331 | Safety Injection Tank 1A Pressure | A |
| | 3JSIALT0331 | Safety Injection Tank 1A Level | A |
| | 3JSIAPT0341 | Safety Injection Tank 1B Pressure | A |
| | 3JSIALT0341 | Safety Injection Tank 1B Level | A |
| | 3JSIBPT0311 | Safety Injection Tank 2A Pressure | B |
| | 3JSIBLT0311 | Safety Injection Tank 2A Level | B |
| | 3JSIBPT0321 | Safety Injection Tank 2B Pressure | B |
| | 3JSIBLT0321 | Safety Injection Tank 2B Level | B |
| Condensate System | 3JCIALT035 | Condensate Storage Tank Level | A |
| | 3JCIBLT036 | Condensate Storage Tank Level | B |

| | | | |
|---|---|---|---|
| Fuel Pool Cooling System | 3JPCAPT009 | Fuel Pool Cooling Pump Discharge Pressure | A |
| Fuel Pool Cooling System | 3JPCBPT010 | Fuel Pool Cooling Pump Discharge Pressure | B |

The following specification and Work Plan Procedures/Quality Control Instructions (WPP/QCIs) were used as a basis for this inspection activity:

- 13JM702 Installation Specification for Instrumentation and Controls.
- WPP/QCI 258.9 Electrical Instrumentation Installation.
- WPP/QCI 302.0 Instrumentation Installation.

The inspector also reviewed applicable instrumentation loop diagrams, sensing line isometrics, and vendor documents for the selected instrumentation installations.

No deviations or violations of NRC requirements were identified.

d. Construction Testing and Calibration

The inspector noted this activity was not performed by construction. All testing and calibration activities were done by the startup group.

e. Review of Nonconformance and Deviation Reports

The inspector reviewed ten Nonconformance Reports (NCRs) which were related to instrument components or system installations. In each case, the inspector observed the records to be complete, adequately reviewed and appropriately dispositioned. The records were found to be properly identified and easily retrievable.

No deviations or violations of NRC requirements were identified.

f. Design and Field Change Records (FCRs)

The inspector reviewed records for six design change packages (DCPs) related to instrumentation installations. The inspector found the records to reflect that design changes were subject to adequate controls. The inspector found the changes to have received the appropriate reviews and that appropriate inspection records were found to exist for the modifications to the installed equipment.

No deviations or violations of NRC requirements were identified.

5. Quality Assurance for Preoperational Testing Activities - Unit No. 3

a. Quality Assurance Manual Review

The Quality Assurance Program for startup and operations activities is established in the Final Safety Analysis Report (FSAR), Section 17.2 and further defined in the Operations Quality Assurance Criteria Manual. Additionally, the licensee has created an Administrative Policies and Procedures Manual which is used to define work activities that affect Palo Verde, including quality assurance. Administrative Policies and Procedures Manual, Procedure No. 1N202.02.00 defines the quality assurance organization and its responsibilities. A subset to this manual is the Department Instruction Manual, which was used to control activities within a particular department. Also, Quality Assurance procedures which were related to the technical aspect of startup and plant operations were incorporated into the Station Manual.

In May, 1984, the licensee reorganized their quality assurance organization by realigning the organization from one oriented along project phases (i.e. construction, startup or operations), to one that was oriented along functional responsibility. The program implementation is carried out through six organizational departments who are divided along functional responsibilities and whose respective manager/supervisors report to the corporate Quality Assurance Director. The corporate Quality Assurance Director reports directly to the ANPP Executive Vice President. The six departments are:

1. The Quality Systems and Engineering Department, under the direction of the Quality Systems and Engineering Manager;

2. The Procurement Quality Department, under the direction of the Procurement Quality Manager;

3. The Quality Audits and Monitoring Department, under the direction of the Quality Audits and Monitoring Manager;

4. The Quality Control Department, under the direction of the Quality Control Manager;

5. The Quality Investigation Section, under the direction of the Quality Investigations Supervisor;

6. And the Non-Nuclear Quality Assurance Section, under the direction of the Non-Nuclear Quality Assurance Supervisor.

Therefore, due to the organization structure as described above, no separate startup quality assurance organization exists, but rather a department within the organization (as described above) has responsibility for all phases of the plant (construction, startup, and operations) within the functional responsibility of the department.

b. Quality Assurance Surveillance and Inspection

The licensee has established in writing a program describing the scheduling, planning, and documentation of monitoring and inspection activities related to preoperational test activities. These procedures are contained in the ANPP Administrative Policies and Procedures Manual as procedure No. 6N417.10.00, "Inspection", and procedure No. 6N417.12.00, "Quality Monitoring Activities". These referenced procedures describe the duties and responsibilities of the Quality Assurance Organization, as they (the duties) relate to the various departments within the quality assurance organization. For example, procedure No. 6N417.10.00 describes in paragraph 3.0, the various responsibilities of the Quality Systems Engineering Department, to assure that inspection activities are established and identified, as well as, the duties of the Quality Control Department for the performance and documentation of inspections. Similarly, procedure No. 6N417.12.00 describes the duties and responsibilities for the Quality Audits and Monitoring Manager and the various supervisors within the department, as these duties relate to auditing or monitoring of construction, startup, or operational activities.

c. Surveillance Responsibilities

The licensee's program for the surveillance (termed monitoring by the licensee) of preoperational test activities is performed by the Quality Test Monitoring group, which is a sub-department of the Quality Audit and Monitoring Department. This group's responsibilities include reviewing and monitoring preoperational test activities to assure conformance to test criteria, tracking identified test deficiencies, maintaining logs of monitoring test activities, assuring proper control of measuring and test equipment, and reviewing test related documentation. The Quality Control Department is involved with the witnessing of preoperational tests only in those instances where the system being tested was modified, and quality control's presence is required to assure proper restoration of the system.

In summary, the inspector determined that the licensee's quality assurance program has been extensively revised to better assure that all activities, including preoperational testing activities, comply with FSAR committments and regulatory requirements. The inspector will examine this area during the next reporting period to assure that the licensee's program, as stated, has been effectively implemented.

No deviations or violations of NRC requirements were identified.

6. Overall Preoperational Test Program Review - Unit No. 3

The controls used during preoperational testing and the program tests conducted are the same as those used during the preoperational testing of both Units 1 and 2. The controls which include procedure review and approval, jurisdictional controls, test conduct, test results evaluation, work control, temporary modifications, design changes, document control,

and FSAR testing commitments were previously reviewed by the inspector for modifications made during the Unit 1 recovery period following the shutdown of safety related testing in the fall of 1983. This review is documented in NRC Report 50-529/85-31. During the current inspection, the inspector again reviewed the testing program controls and implementing procedures as they will be applied to Unit 3, making special note of any recent changes. Some changes were noted; however, these revisions involved only slight changes in organizational responsibility or clarifications to instructions. The changes have not negated regulatory commitments made by the licensee. The test program is consistent with FSAR commitments.

No deviations or violations of NRC requirements were identified.

7. Review of Preoperational Test Activities - Unit 3

a. Major preoperational test activities in progress during the reporting period included flushing of the Essential Cooling Water System, Fuel Pool Cooling Water System and portions of the Safety Injection/Shutdown Cooling System. Generic testing of motor operated valves and their associated motor control centers was also being conducted.

b. During the course of the inspection, tours of the following plant areas were conducted:

- Control Room
- Auxiliary Building
- Radwaste Building
- Turbine Building
- Main Steam Support Structure
- Containment
- Yard Area and Perimeter
- Control Building (Cable Spreading Rooms & Ventilation Support Systems)

c. The following areas were observed during the tours:

1. Control Room logs and records. Records were reviewed for completeness and accuracy to verify conformance with administrative procedure requirements.

2. Equipment tagging. Selected equipment in which tagging requests had been initiated, was observed to verify that tags were in place and the equipment in the condition specified.

3. Plant housekeeping. Plant conditions were observed for conformance with administrative procedures.

No deviations or violations of NRC requirements were identified.

8. Verification of Raceway Separation - Unit 2

During this reporting period, the inspector walked down various areas in the Unit 2 auxiliary and control buildings to verify the licensee's compliance with FSAR commitments related to implementation of Regulatory Guide 1.75 "Physical Independence of Electrical Systems", and the licensee's Work Plan Procedure/Quality Control Instruction No. 251.1, "Raceway Separation". The inspector's examination indicated that the licensee's program appears to have been effective in assuring compliance with their commitments.

No deviations or violations of NRC requirements were identified.

9. Exit Interview

The NRC inspectors met on January 24, 1986, with licensee management representatives denoted in paragraph 1. The scope of the inspection and inspection findings as noted in this report were discussed.