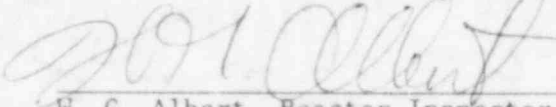
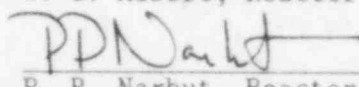
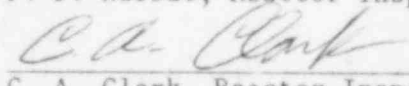
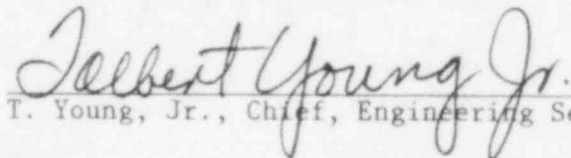


U. S. NUCLEAR REGULATORY COMMISSION

REGION V

Report No. 50-529/85-29 and 50-530/85-23  
Docket No. 50-529 and 50-530  
Construction Permit Nos. CPPR-142 and 143  
Licensee: Arizona Nuclear Power Project  
P. O. Box 52034  
Phoenix, Arizona 85072-2034  
Facility Name: Palo Verde Nuclear Generating Station - Units 2 and 3  
Inspection at: Palo Verde Site, Wintersburg, Arizona  
Inspection conducted: September 23-27, 1985

Inspectors:		10/10/85
	W. G. Albert, Reactor Inspector	Date Signed
		10/9/85
	P. P. Narbut, Reactor Inspector	Date Signed
		10/9/85
	C. A. Clark, Reactor Inspector	Date Signed
Approved By:		10/11/85
	T. Young, Jr., Chief, Engineering Section	Date Signed

Summary:

Inspection on September 23-27, 1985 (Report Nos. 50-529/85-29, 50-530/85-23)

Areas Inspected: Unannounced inspection of the licensee's quality assurance program and implementation with emphasis on changes which have been made to this program during 1984 and 1985.

The inspection involved 107 hours onsite by three NRC inspectors. Inspection Procedures 35060, 35061 and 50090 were applicable to this inspection.

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

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## DETAILS

### 1. Persons Contacted

#### a. Arizona Nuclear Power Project (ANPP)

- \*S. G. Penick, Quality Monitoring Supervisor
- \*C. N. Russo, Manager, Quality Audits and Monitoring
- T. D. Shriver, Quality Systems/Engineering Manager
- \*T. R. Bradish, Quality Systems Supervisor
- L. Souza, Assistant Director, Corporate QA/QC
- \*W. E. Ide, Corporate QA/QC Director
- A. T. Ramey, Quality Audits Supervisor
- D. A. Hackbert, Quality Engineer
- \*E. E. Van Brunt, Vice President, Nuclear Project Manager
- R. C. Fullmer, Vendor Quality Supervisor
- W. E. Craig, Procurement Quality Manager
- \*J. Provasoli, Licensing
- \*J. Olsen, Licensing
- \*B. F. Love, QA Engineer
- J. Bayless, QA Engineer
- \*J. C. Matteson, Transition Team QA/QC
- \*M. Frusti, Operations Engineer
- \*J. Tills, Operations Engineer

#### b. Bechtel Power Corporation (Bechtel)

- \*R. E. Vote, Assistant Project QA Manager
- \*P. Huber, Project Quality Coordinator
- \*G. Gelinas, QC
- \*H. Foster, QC
- J. Stubblefield, Lead QA Engineer Audits and Surveillances
- J. Sabol, Lead Pipe Support Engineer

\*Denotes those attending the exit meeting on September 27, 1985.

The inspectors also interviewed other licensee employees, including members of the technical, operations, maintenance, and construction staff.

### 2. Licensee Management of QA Activities for Units 2 and 3 (35060)

#### Organization Structure

It was found that the licensee has made fundamental changes in the structure of the ANPP quality assurance organization. The changes which were effective in May 1984 changed the organization from one which was oriented to project phases to one which was oriented to quality assurance functions. Thus, at the time of the last comprehensive look at the QA organization, the organization was divided into Construction, Startup, Operations and Systems/Programs sections. During this inspection the organization was found to be divided into Procurement, Audits, Investigation, Quality Control, and Quality Systems/Engineering sections.

In addition, a training coordinator reported to the corporate QA/QC director and an organization for the licensee's non-nuclear operations was also a part of the operation. The realignment described above appears to be effective. During interviews, ANPP personnel indicated or stated that the new functionally oriented organization provided better coverage of such QA functions as audits and inspections.

#### Management Changes

The realignment of the quality assurance organization coincided with the replacement of the quality assurance manager. The new manager came from within the ANPP QA organization. He formally had responsibility for site quality assurance.

#### Quality Assurance Staff

The present staffing level of the ANPP QA/QC organization is about 150 persons of which approximately 60 are contract personnel. The organization has been authorized to be staffed to 120 permanent ANPP employees. The goal of 120 permanent ANPP employees, without significant contract people, is expected to be achieved at the time Palo Verde Unit 3 achieves commercial operation. The level of staffing appears to be adequate.

#### Quality Assurance Policy

The fundamental policies of the organization do not appear to be changed. It was the observation of the NRC inspector that considerable effort was being expended to better define the quality assurance activities in procedures and to assure that these QA activities were an integral part of the entire ANPP management control system.

For instance, the procedures for qualifying or requalifying a new supplier, provided for input to the qualification process from other interested organizations besides procurement and quality assurance. The organization is essentially as described in the FSAR, Section 17.1A,1 as amended.

#### Quality Assurance Program/Procedures

The fundamental changes in the quality assurance program are reflected in the revisions being made to the procedure system. Figure 1 shows the governing quality assurance manuals which have been developed or partially developed for the various phases of the project. The policies, procedures manual and the station manual are not quality assurance documents per se, but rather are manual systems which either contain procedures specifically relating to quality or have quality control/quality assurance sections.

Figure 1

<u>Construction Phase for all Units</u>	<u>Transition Phase</u>	<u>Operations Phase for all Units</u>
	Operations Quality Assurance Criteria Manual	Operations Quality Assurance Criteria Manual
Quality Assurance Manual	Quality Assurance Manual	
	Corporate Quality Assurance Department Procedures	
	Station Manual	Station Manual
	Administrative Policies and Procedure	Administrative Policies and Procedure
	Department Instructions	Department Instructions

Content and function of the various manuals were examined as follows:

a. Operations Quality Assurance Criteria Manual

This manual essentially expands on the criteria of 10 CFR Appendix B, and ANSI 18.7, the document is organized according to the 10 CFR Appendix B criteria and provides to some extent a cross reference to other governing criteria and instructions such as FSAR sections.

The document appeared to be a mixture of cross references to other criteria, statements of policy, statements of organization and contractor responsibilities, definitions and some procedure material, as well as an expansion of the 10 CFR Appendix B criteria.

The inspector found no significant problems with this manual in its present form although its usefulness in the hierarchy of QA program documents appeared to be somewhat limited.

b. Quality Assurance Manual

This manual contains the Quality Assurance Directives (QADs) applicable to the construction effort. The material in this manual is superseded to a large extent by the more definitive documents of the corporate Quality Assurance Department Procedures (QADPs). The document will continue to exist as long as the commitment to section 17.1 of the SAR is applicable, i.e., throughout the construction phase of PVNGS Unit 3.

However, the document is of limited usefulness in the present day system because all of its "directives" have been restated in QADPs or other procedures. The licensee states that the newer more definitive procedures have not changed any of the existing directives. The last revision to this directive manual was in November 1983.

A review of this QAD document by a sampling of selected procedures shows that the manual is still applicable to construction activity. However, the manual exists for the most part because of the requirement imposed by the commitment to the manual in Section 17.1 of the FSAR. The manual was found to be quite general in nature. It was difficult to determine how the procedures are covered by the QADPs of the corporate Quality Assurance Department procedure manual, the administrative policies and procedures manual or other successor documents since the material is organized differently than these other documents. The inspector chose two QADs, Procurement Document Control and Control of measuring and Test Equipment, and examined how these activities were covered in successor or lower tier documents. No problems were found, however, the material needed to be traced to different procedures in three manual categories.

c. Corporate Quality Assurance Department Procedures Manual

This particular manual contains detailed procedures on how business is actually conducted as compared to the more general quality assurance manual. The manual contains those procedures generally referred to as "QADPs". Like the Quality Assurance Manual, this manual is being superseded. Several procedures have been removed and placed in successor documents with different designations to the procedures. However, the procedures which have been moved have been moved with little or no revision so there is a direct correlation between the material in this manual and succeeding manuals. The three succeeding manuals into which the material of this manual is being incorporated are the Station Manual, the Administrative Policies and Procedures Manual, and the Department Instruction Manual.

d. Station Manual

This manual is the major procedure system for operation and maintenance of the plant. Many QA procedures which deal specifically with the technical aspects of plant operation e.g., measuring and test equipment, have been incorporated into this manual, although those which are administrative in character are being moved into the Administrative Policies and Procedures Manual providing they affect more than one organization.

e. Administrative Policies and Procedures Manual

This manual appears to be the ultimate administrative procedure system covering many areas other than quality assurance. Procedures

from the "Corporate Quality Assurance Department Procedure Manual", QADPs, are being moved to this manual with minimal revision.

Also certain station manual procedures which are designated as administrative procedures are being rolled over into this manual, e.g., 75AC-9ZZ03 (the "A" means administrative). The determination as to which procedures are converted will essentially be based on whether the administrative procedure applies to more than one organization.

f. Department Instruction

This document is a subsection of the administrative policies and procedures manual which controls the activities within a particular department. Development on this procedure system for the Quality Assurance Department was found to be very limited at this time.

Licensee QA Program Effectiveness Review

The management reviews conducted annually were not examined. However, the inspector found that the Corporate Quality Assurance/ Quality Control Manager spent a large portion of his time at the site. During the week of this inspection it was noted that this individual spent approximately 50% of his time onsite on QA activities unrelated to NRC inspections.

Corporate QA - Site QA Interface

The NRC inspector sampled one type of reporting which trended monitoring findings. No problems were noted.

Audit Planning/Scheduling

The master Quality Assurance audit plan prepared on a yearly basis was examined. This master plan was supported by a planning document for each audit area known as an "audit scoping matrix."

The planning system was examined and sampled and was found to conform to existing procedures and requirements.

Auditor Qualifications

The licensee's organization has qualified quality assurance auditors in three organizations, Quality Assurance Audits, Quality Assurance Monitoring, and Vendor Quality Assurance. The qualifications were verified for a sample of individuals from all three groups.

Audits of the Architect/Engineer (A/E) in Bechtel Home Offices

The licensee audits the A/E in Norwalk on a yearly basis. The report for the most recent audit had not been prepared at the time of the inspection. However, the scope of the audit and the results were examined and discussed.

In the design area, audit activity has been limited because plant design is essentially complete. The audit of the AE in the AE's home office did not address design controls in the 1984 audit which was also examined. See also Inspection Report 85-02 which examined this subject.

#### Bechtel Audits Onsite

In general it was found that the onsite ANPP program for Bechtel takes credit for Bechtel's own audit program. The program of ANPP is based on Regulatory Guide 1.44 ANSI N45.2.12 "Auditing of Quality Assurance Programs for Nuclear Power Plants". Section 3.a(2) Design and Construction audits states "Applicable Elements of an organization quality assurance program should be audited at least annually or at least once within life of the activity..." Applicable elements to the ANPP audit of the Bechtel program onsite are:

- ° Procurement
- ° Control of Purchased Material and Services
- ° Inspection
- ° Handling Storage and Shipping
- ° Housekeeping and Cleanliness control

Other aspects of the ANPP audit program, both onsite and offsite, rely on Bechtel audits themselves. ANPP exams this by three means:

- ° Home office review of both Bechtel and C. E. design and procurement activity. (above)
- ° An audit of the Bechtel QA audit program, ANPP gets reports routinely.
- ° Accompaniment of Bechtel on their audits by providing a team member.

Procedures to be audited by the program are about 98% covered, according to ANPP, but there is no specific method of assuring that all aspects of procedures are included in the audit matrices. Applicable procedures shown on audit matrix are for reference; the lead auditor is free to look anywhere as the need arises.

#### Monitoring (Surveillance) Program

The licensee's system of conducting QA surveillances was examined. The term "Monitoring" is used for this activity to avoid confusion with surveillances required by technical specifications.

The scheduling system was examined. The area sampled was the use of tags to control construction activity and system turnover. In sampling this activity a plant tour was made. The monitoring reports on this area were examined and corrective action confirmed.

The personnel in the monitoring section were found to be qualified QA auditors. The licensee stated that the people assigned to this activity



are highly specialized technically such as an I&C technician, water and chemistry specialist etc.

#### Procurement Quality Assurance

The methods by which the licensee selects vendors, qualifies vendors and assures that purchase orders and contracts contain appropriate quality provisions were examined by discussions in the corporate office and a review of a sample of procurement documents.

A recent significant change was found in the system which designates approved vendors (Approved Vendors List, AVL). This activity had been largely a Bechtel function until 1982, with ANPP limiting their contracting to the purchase of services, e.g., calibration laboratory. During this inspection it was found that the licensee had assumed control over vendor qualification although Bechtel and other inputs were utilized in the qualification process where applicable.

Two recent qualifications (one a requalification) were examined. Also a sample of about one hundred purchase orders in the procurement quality assurance office were examined against the procedural checklist in use.

#### ANPP Quality Assurance Program

During the reviews discussed above, no violations or deviations from NRC requirements were identified.

### 3. In-depth Quality Assurance Inspection of Performance in the area of Dynamic Pipe Supports, Units 2 and 3 (35061 and 50090)

The inspectors examined the performance of the QA program in Units 2 and 3. This was done to verify that site work is being performed in accordance with NRC requirements, SAR commitments and implementing procedures, to verify that the QA/QC program is functioning in a manner to ensure that requirements and commitments are being met, and to examine whether prompt and effective action is taken to achieve permanent corrective action on significant discrepancies.

The methodology chosen by the inspectors was to select a safety-related commodity, to examine the final as installed condition of the commodity (relative to requirements) and to examine the licensees control systems that ensure conformance to quality requirements.

The commodity chosen for examination was dynamic pipe supports. As a sampling method the inspectors selected all dynamic pipe supports in one flow path from the refueling water storage tank through the charging pumps to the auxiliary spray nozzles on the pressurizer. This important safety system is one of the primary means of reactor system pressure control in an accident situation.

Since two units were being examined and the units are essentially identical, the inspectors examined approximately half the system in each unit. Generally, in Unit 3, the suction side was examined and in Unit 2, the discharge side was examined.



### Field Inspection

The dynamic pipe supports were examined for conformance to drawing requirements welding and critical dimensions. Detailed physical measurements were made of selected drawing dimensions to independently assure conformance.

The flow path selected included 21 dynamic pipe supports. The following 21 were examined.

<u>Support Number</u>	<u>Type</u>
2CH008HAAL	Mechanical Snubber
2CH008HOAC	Mechanical Snubber
2CH006HOAF	Mechanical Snubber
2CH008HOAG	Mechanical Snubber
2CH008HOAN	Mechanical Snubber
2CH008HOAU	Mechanical Snubber
2RC018H011	Mechanical Snubber
2RC018H016	Mechanical Snubber
2RC018H018	Mechanical Snubber
3CH003H071	Mechanical Snubber
3CH003H076	Mechanical Snubber
3CH004H003	Mechanical Snubber
3CH004H008	Mechanical Snubber
3CH148H003	Mechanical Snubber
3CH233H009	Mechanical Snubber
2CH008HOAV	Spring Can
2RC018H010	Spring Can
2RC018H017	Spring Can
3CH004H001	Spring Can
3CH004H006	Spring Can
3CH148H002	Spring Can

No violations or deviations were identified. All apparent discrepancies were satisfactorily resolved by discussion with responsible engineering and quality control personnel.

The results of this physical inspection by NRC were decidedly different than the results of the team inspection conducted in the fall of 1983 in Unit 1, wherein a substantial as built error rate was noted in the pipe support area.

### Field Drawings and Work Procedures

The inspectors reviewed applicable pipe support installation procedures and specifications and found them substantially the same as previously reviewed. The procedures adequately described critical inspection and hold points.

### Field Engineer and QC Inspection Reports and Nonconformance Reports

The inspectors examined Field Engineer and QC inspection reports for a selection of the inspected supports for conformance to procedure requirements.

No violations or deviations were identified.

### Audits

The inspector examined the 1984 and 1985 audits performed in the pipe support area. The audits had primarily been performed by Bechtel Site Quality Assurance personnel. APS Quality Assurance personnel had participated in two of the Bechtel audits. The audits examined were performed in March and September 1984 and March and May 1985.

There are several other quality assuring factors at work at Palo Verde regarding pipe supports. For example, pipe supports are being extensively reinspected as a result of the 1983 Construction Appraisal Team (CAT) inspection and resultant licensee followup actions. Additionally, the Bechtel QA organization is performing a sampling "reverification" inspection of the QC reinspection efforts. The 1984 and 1985 QA audits previously mentioned are yet another layer of quality assurance actions applied to pipe supports at Palo Verde.

The inspector found the QA audits to be in-depth physical examinations of hardware and not simply paperwork reviews. The actions taken by the licensee regarding audit findings appeared appropriate.

### Personnel Interviews

The inspector had private discussions with randomly selected personnel involved in pipe support work. Specifically the inspector selected two QC inspector and two Field Engineers from the personnel rosters.

The personnel selected generally expressed the opinion that licensee management and "the system" were genuinely concerned with achieving a quality product, that the achieved quality of pipe supports was good.

Additionally, certain unique program improvements were identified through the interviews. Specifically the following were identified:

### The Adequacy of Field Engineer Inspections is Monitored

Field Engineers inspect and accept a pipe support prior to requesting a final QC inspection. The adequacy of that field engineering inspection is monitored by QC by keeping track of the QC "accepts" or "rejects" (after Field engineering inspection). The percentage of "rejects" is reported to project management by QC management.

### The Adequacy of QC Inspection is Monitored

Each QC inspectors work is sampled and reinspected by another QC inspector. The usual sample is one pipe support per week.

### Material and Equipment

Using selected safety-related pipe supports and restraints for a sample, the inspector examined applicable licensee/contractor inspection reports and other pertinent documents to determine the following:

- ° If meaningful inspections were made to verify that material met specifications and to what degree the licensee/contractor had inspected or verified performance by the vendor.
- ° If item met design and purchase order requirements.
- ° If documentation is adequate, based on individual certification or on certificates of conformance properly qualified according to 10 CFR 50 Appendix B, to assure that the item meets design intent.
- ° If licensee is verifying the validity of the certificate of conformance.

Some of the documents examined are listed below:

- ° Hanger Control Card
- ° Documentation Supplement Sheet
- ° Construction Inspection Plan Nuclear Class Mechanical Snubbers
- ° Form NF-1 NPT Certification Holders Data Report for Component Supports
- ° Field Welding Checklist
- ° Modification Change Notice
- ° Certified Report of Nondestructive Examination
- ° Receiving Inspection Planning for Permanent Plant Items
- ° Packing List
- ° Quality Verification Document Requirements
- ° Nonconformance Report
- ° Form NIS-2 Owner's Report of Repair or Replacement
- ° Purchase Orders
- ° Inspection and Documentation Checklist

There were no violations or deviation identified.

4. Exit Meeting

On September 27, 1985, an exit meeting was conducted with the licensee representatives identified in paragraph 1. The inspectors summarized the scope of the inspection and findings as described in this report.