

September 1, 1983

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U.S. Nuclear Regulatory Commission  
Washington, DC 20555

Dr. Richard F. Cole  
Administrative Judge  
Atomic Safety and Licensing Board  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555

Dr. Dixon Callihan  
Administrative Judge  
Union Carbide Corporation  
P.O. Box Y  
Oak Ridge, TN 37830

In the Matter of  
ARIZONA PUBLIC SERVICE COMPANY, ET AL.  
(Palo Verde Nuclear Generating Station, Units 2 and 3)  
Docket Nos. STN 50-529 and STN 50-530

Dear Administrative Judges:

Pursuant to your interest in the outcome of several NRC investigations regarding allegations by former Palo Verde construction workers, I am forwarding you another report dealing with this matter which was completed on July 28, 1983 by Region V. The portions of this report of concern to you include paragraphs (l) and (m) dealing with the allegations of Robert Gunderson and paragraph (j) dealing with the allegations of the unnamed individual which appeared in the August 1, 1982 letter to the Board.

I shall forward you additional reports as soon as they become available.

Sincerely,

Lee Scott Dewey  
Counsel for NRC Staff

cc: w/Enclosure  
Arthur C. Gehr, Esq.  
Rand L. Greenfield  
Atomic Safety and Licensing  
Board Panel  
Lynne Bernabei, Esq.  
Docketing and Service Section

Charles Bischoff, Esq.  
Ms. Lee Hourihan  
Atomic Safety and Licensing  
Appeal Board  
Kenneth Berlin

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UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION V  
1450 MARIA LANE, SUITE 210  
WALNUT CREEK, CALIFORNIA 94596

JUL 29 1983

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

DESIGNATED ORIGINAL  
Certified By Kat Neack

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

Attention: Mr. E. E. Van Brunt, Jr., Vice President  
Nuclear Projects Management

Gentlemen:

Subject: NRC Inspection of Palo Verde Units 1, 2, and 3

This refers to the inspection conducted by Mr. P. P. Narbut of this office during the period June 27 through July 1, 1983, of activities authorized by NRC Construction Permit Nos. CPPR-141, -142, and -143, and to the discussion of his findings with you and members of your staff at the conclusion of the inspection.

Areas examined during this inspection are described in the enclosed inspection report. Within these areas, the inspection consisted of selective examinations of procedures and representative records, interviews with personnel, and observations by the inspector.

No items of noncompliance with NRC requirements were identified within the scope of this inspection.

In accordance with 10 CFR 2.790(a), a copy of this letter and the enclosure will be placed in the NRC Public Document Room unless you notify this office, by telephone, within ten days of the date of this letter and submit written application to withhold information contained therein within thirty days of the date of this letter. Such application must be consistent with the requirements of 2.790(b)(1).

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Arizona Public Service Company

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JUL 29 1983

Should you have any questions concerning this inspection, we will be glad to discuss them with you.

Sincerely,

(P)

D. M. Sternberg, Chief  
Reactor Projects Branch No. 1

Enclosure:

NPC Inspection Report

Nos. 50-528/83-29

50-529/83-14

50-530/83-11

bcc: RSB/Document Control Desk (RIDS)

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Resident Inspector (Vorderbruggen)

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Narbut

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for YOUNG

7/28/83

for NARBUT  
~~VORDERBRUGGEN~~

7/28/83

for STEENBERG

7/29/83

U. S. NUCLEAR REGULATORY COMMISSION

REGION V

Report No. 50-528/83-29  
50-529/83-14  
50-530/83-11

Docket Nos. 50-528, 50-529, 50-530 License Nos. CPPR-141, CPPR-142, CPPR-143

Licensee: Arizona Public Service Company

P. O. Box 21666

Phoenix, Arizona 85036

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

Inspection at: Palo Verde Construction Site, Wintersburg, Arizona

Inspection Conducted: June 27 - July 1, 1983

Inspectors: *PA Johnson* 7/28/83  
for P. P. Narbut, Reactor Inspector Date Signed

Approved by: *PA Johnson* 7/28/83  
for T. Young, Jr., Chief Date Signed  
Reactor Projects Section 2

Summary: Inspection on June 27 - July 1, 1983 - (Report Nos. 50-528/83-29, 50-529/83-14, and 50-530/83-11)

Areas Inspected: Routine, unannounced inspection by a regional inspector of construction related activities pertaining to the followup of previous inspection items, and licensee actions regarding bulletins. The inspection involved 39 inspector hours on-site by one NRC inspector.

Results: No items of noncompliance or deviations were identified.

## DETAILS

### 1. Persons Contacted

#### a. Arizona Public Service Company (APS)

\*J. A. Roedel, Corporate Quality Assurance Manager  
\*W. E. Ide, Construction Quality Assurance/Quality Control Manager  
S. Penick, QA Engineer  
\*L. Souza, Construction QA Engineering and Audit Supervisor  
R. Forrester, QA Engineer  
P. Moore, QA Engineer  
S. Frost, Nuclear Operations Support

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

\*J. E. Pfunder, Assistant QA Supervisor  
D. Darnes, Unit 2 Electrical F.E.  
C. Hayes, Unit 2 Electrical QCI  
E. Stone, Assistant LFWE

Other persons contacted during the inspection period included construction craftsmen, inspectors, and supervisory personnel.

\*Denotes personnel present at the management meeting July 1, 1983.

### 2. Licensee Action on Previously Identified Items

#### a. (Open) Follow-up Item (50-528/78-03-03) Seismic Qualification of Unistrut Tray Supports

The original question raised in 1978 was whether the cable tray supports had been seismically qualified. In a followup inspection in 1980 (Inspection Report 50-528/80-06), the inspectors determined that Bechtel had submitted a seismic analysis in February 1980 for review by the NRC.

This item remains open pending the determination of the results of that review.

#### b. (Closed) Unresolved Item (50-528/78-08-01) Site Pipe Spool Storage Practices

The inspector had identified, in 1978, a hot leg pipe spool in the storage yard which had higher than acceptable humidity indication and a hole in one of the pipe cap covers. The condition was corrected immediately at that time and the inspector considered the item unresolved pending subsequent inspections of site storage practices. Site storage practices have been examined in numerous follow-up inspection including an immediate followup in Inspection Report 50-528/78-09. The open issue regarding storage maintenance is addressed in the followup item discussed immediately below. The subject unresolved item addressed in 1978 is considered closed on the basis of the followup inspections conducted since the item was identified.

c. (Open) Followup Item 50-528/81-02-04 Maintenance Program and Requirements

The issues remaining in this item were identified in Inspection Report 50-528/83-17.

In regard to the issue of the maintenance engineer accepting verbal instructions to revise the maintenance program, the inspector had further discussions with the maintenance engineer. The maintenance engineer stated that he considered his instructions were not verbal in that the procedure, WPP/QCI 28.0, paragraph 8.4.2, clearly stated heaters need not be energized in buildings which meet Level B storage requirements. He further considered the nonconformance report which cited the units as level B storage areas to be a clarification applicable to all safety and nonsafety equipment. Therefore, he stated he acted on what he considered to be written instruction in deenergizing the space heaters for safety-related switchgear. The inspector considers this aspect of the item closed.

In regards to the aspect of the item dealing with detailing on the maintenance cards the specific visual inspections to be performed, the licensee stated that the corrections were completed. The inspector randomly sampled the maintenance card instructions and satisfactorily verified the corrections were completed. This aspect of the item is considered closed.

In regards to the aspects of the item dealing with departure from the FSAR commitments to ANSI N45.2.2 the licensee issued procedure change notice (PCN) No. 32 to WPP/QCI 28.0 Revision 11, issued May 24, 1983, which reinstated the requirement to energize space heaters in agreement with the FSAR commitment.

The remaining open aspect of this item, which was committed in Inspection Report 50-528/83-17, is to identify whether heaters were deenergized in the warehouses or the units, for how long, and the technical consequences of those actions.

d. (Open) Followup Item (50-528/81-04-01) Prestressing Tendon Record Discrepancy

There were two remaining aspects of this item identified in Inspection Report 50-528/83-22. Those were to amend the demonstration program records to show engineering evaluation and acceptance, and to review and evaluate open nonconformances prior to Unit 1 fuel load.

The licensee representative stated the records had been amended. The inspector's check showed that the records had not been amended, apparently due to a clerical chain of command breakdown.

This item remains open pending completion of both aspects previously identified.

e. (Open) Unresolved Item (50-528/81-04-02) Compliance with Preheat Requirements

The original examination of this item identified that:

(1) temporary attachments to structural steel were apparently made without preheat being applied (based on a lack of paint discoloration) and (2) the weld rod issue slip (WR-6 form) was not retained as a permanent record for temporary attachment welds to structural steel. The original description of the item also identified that the licensee reported by telephone that the paint was not discolored until the temperature of 150°F was exceeded.

During the conduct of an inspection from April 28 to May 1, 1983, the licensee performed a demonstration for the inspectors by heating painted structural steel and demonstrating that no discoloration occurred at 150°F and only slight discoloration occurred at 300°F. Therefore the original premise of the item was considered invalid.

In regards to not retaining the rod issue slips for temporary attachment welds, the licensee stated that their position in the PSAR Section 17.1A.17 regarding quality assurance records was considered to apply. Section 17.1A.17 states that organizations which do work on items important to safety will submit records as required by applicable codes and standards. The inspector's examination of AWS D.1.1.-1972 shows that it does not specifically require that records of rod withdrawal slips be retained. Specific records requirements are given in paragraph 6.5.7 of the Code and the welding inspector is chartered by the code to observe at suitable intervals the technique and performance of each welder and to assure that the applicable requirements are met.

Therefore the licensee's decision not to retain weld rod slips for temporary attachments to structural steel is deemed to be in accordance with his PSAR commitment and the AWS D.1.1. Code.

The inspector then attempted to verify that the welding inspectors who verify preheat requirements were observed at suitable intervals. Discussions with weld inspector supervision and four Unit 3 welding inspectors showed recorded surveillances of Bechtel and Waldinger structural welding. Additionally each structural weld is verified by the welding inspector on the construction inspection plan (CIP) for the item. However, the inspector determined the application of preheat for structural welds at Palo Verde has been essentially eliminated by a change made to the General Welding Standard GWS-Structural Steel, Revision 2, Amendment 1, dated May 29, 1981, which departs from the AWS D.1.1 weld preheat requirements. Whereas the Code requires preheat for base metal thicknesses greater than 3/4 inch, the GWS change requires preheat only when the attachment weld throat thickness is greater than 3/4 inch, regardless of base metal thickness. The inspector examined structural welding in Unit 3 and noted that the vast majority (essentially all) the structural welds had throat thickness less than 3/4 inch and therefore were made without preheat being required as of May 1981.

However, the Palo Verde FSAR, Section 3.8.1.6.6.1, subparagraph A.1.b., regarding structural steel welding to AWS D1.1.72 very clearly states the exception taken to the Code requirements for preheat. This was added to the FSAR in Revision 3 dated December 1980.

This item remains open pending verification that the exceptions to AWS D.1.1 preheat requirements were reviewed and accepted.

f. (Open) Followup Item (50-528/81-09-01) Seismic Support Over Batteries

The calculations requested by the inspector in Inspection Report 50-528/83-17 were committed by the licensee to be provided by August 1, 1983.

g. (Closed) Enforcement Item (50-529/82-09-01) Failure to Prepare a Defective Instrument Report

The subject item of noncompliance was issued because a Diametrics welding machine was found to have certain parameters out of calibration during a calibration check. The licensee's procedure required that a defective instrument report (DIR) be prepared, but this was not done. This was an item of noncompliance for procedure compliance.

The licensee responded to the item in letter ANPP-22357-BSK/JAR dated November 22, 1982, and stated the quality of welds was determined by nondestructive examinations (NDE) and that the out-of-range conditions did not effect the quality of the welds and that the purpose of the calibration was periodic maintenance and adjustment of the machine to optimum conditions and not to verify the quality of the welds. Consequently, the letter stated the procedure had been revised to delete the requirement to write a DIR for the welding machine.

The inspector verified that the change to the procedure (PCN34 to WPP/QCI 7.0, Revision 17) had been issued.

There appear to be two separate questions: (1) whether there is a technical issue regarding the quality of welds and (2) whether there is an ASME code compliance issue.

Regarding the potential technical issue (whether the quality of welds is affected), the inspector had determined from previous inspections that the range of parameters that the welding operator is permitted to use is very broad, whereas the acceptance values for the calibration check parameter ranges are narrow.

For example, one of the parameters noted in the item of noncompliance was wire speed. The as-found condition during calibration check was 39 inches per minute on one machine and 41.5 inches per minute on another machine; whereas the calibration acceptance value was  $40 \pm 0.8$  inches per minute. The qualified welding procedures used in the field (e.g., Procedure P1-AT-LH-I-0) allow the operator to use a wire feed of 0-90 inches per minute in making the weld.

Based on the above and the nondestructive examinations of the welds used as acceptance criteria, the inspector did not consider a technical problem to exist with the welds.

Regarding the potential code compliance issue, the licensee was given an item of noncompliance against his procedure (which required the preparation of a defective instrument report). The licensee subsequently revised his procedure to eliminate the requirement. The original source of the requirement was the ASME Code, Section NA 4531 (Summary 1975 Addenda), which requires basically that measuring and testing equipment shall be of the proper accuracy and shall be calibrated and adjusted periodically to maintain accuracy. The code further indicates that when discrepancies are found at calibration, corrective action should include an evaluation of work checked with the out-of-calibration measuring and test equipment. The licensee states welding machines are not measuring and test equipment, and the code requirements do not apply.

In a letter dated December 29, 1976, the ASME Society responded to an inquiry from Kemper Insurance and stated it was the intent of the code that semi-automatic welding equipment be included in the codes's calibration program. In a later letter to Brown and Root dated April 20, 1979, the ASME Society stated that semiautomatic welding equipment is not required to be calibrated.

The NRC policy regarding welding machine calibration is provided in a letter dated May 16, 1980 (Reinmuth to Regional Branch Chiefs), which states it is not feasible to provide a generic list of what welding machine parameters should be periodically tested. The letter states each licensee should address the need for welding machine test and calibration.

The licensee currently requires periodic calibration and adjustment of semi-automatic weld machines but does not require an engineering evaluation when machine adjustments are required.

Due to the broad range of parameter values qualified in the weld procedures and the acceptance testing of welds by nondestructive examination, the inspector considers the licensee's approach meets code requirements.

This item is considered closed.

h. (Closed) Enforcement Item (50-528/82-25-01) Failure to Assure Components are installed in accordance with procedures

The item of noncompliance dealt with insufficient weld length used to attach Main Control Panels to floor embedments in the Unit 1 Control Room. The original report stated that the insufficient weld length was in part due to confusion in the way the welds were designated on drawings. The drawings specified the weld length as "approximately 16 inches" but also "circled" these dimensions which, per a note on drawing, indicated a "minimum" dimension.

The licensee's response to the item of noncompliance, ANPP-22357 BSK/JAR, dated November 22, 1982, stated that the QC inspector who accepted the welds should have requested engineering to establish a minimum length for the welds. The letter further stated that the welds were reinspected and nonconformances were written. Calculations of the as-built condition were performed and found to be acceptable. Therefore, the nonconformances were dispositioned use-as-is, and QC inspectors were reinstructed.

The inspector examined the nonconformance reports, NCR No. E-2337 for Unit 1 and NCR No. EJ-2338 for Unit 2, and verified they were dispositioned use-as-is.

The inspector also examined Unit 3 work and reviewed the revised drawings in use. COMSIP Drawing 5875-1, Revision 6, Bechtel Revision J200-10-8, depicted the actual weld achievable. The inspector examined the Unit 3 welds for size and length and, although the work was only partially complete and none had been inspected, the welds were found to be in accordance with the drawings and applicable design change package (CJ-RM-011). Based on the above, this item is considered closed.

i. (Closed) Follow-up Item (50-528/82-25-02) Lack of Detail in Drawings

This item dealt with inspector concerns regarding the main control panel welding discussed in the previous paragraph (2.h). Based on that discussion, this item is also considered closed.

j. (Closed) Enforcement Item (50-528/83-02-01) Undocumented Weld in a Safety Related Floor Drain

The remaining aspects of this item were discussed in Inspection Report 50-528/83-17. The remaining aspects consisted of verifying training of crafts in Units 1 and 2 and the provision of the licensee's rationale for describing this as an isolated case.

The inspector examined the craft training records for Units 1 and 2 for special training given regarding the undocumented weld. This aspect of the item is considered closed.

The licensee representatives provided the following rationale for identifying this instance of an undocumented weld as an isolated case:

- . The Bechtel/APS audits and surveillances were reviewed; no cases of unauthorized welds were identified.
- . Bechtel QC was directed to review all welding and piping nonconformance reports for cases of unauthorized welds. No additional examples were identified.

This item is considered closed.

k. (Open) Enforcement Item (50-528/83-02-04) Failure to Provide Pipe Supports

The remaining aspect of this item was described in Inspection Report 50-528/83-17. The licensee was to provide the design calculations for the supports and piping. The proprietary calculations were forwarded by the licensee's letter AN.24066-LAS/WEI, dated June 14, 1983, titled "Radioactive Waste Drain System Piping Calculation No. 13-MC-ZA-502, File G.1.10."

The inspector verified that the calculations were performed and checked prior to completion of work and prior to the NRC request for calculations. The inspector also verified that the vertical supports shown on 13-RD-006 H-001 and 13-RD-012 H-001, installed without concrete anchors, only received compression loading.

This item remains open pending further review of the calculations.

l. (Open) Followup Item (50-530/83-03-02) Water Spray Used on Welds

The remaining aspect of this item was that the licensee was to complete a study of the effects of water spray on carbon steel welds. The committed study was to include identification of the welded carbon steel materials used in safety-related applications at PVNGS, and a metallurgical evaluation of the effects of water spray on those materials.

The licensee presented Bechtel to APS letter B/ANPP-Q-103006 dated June 8, 1983, with attached Bechtel letter dated May 23, 1983, "Water Sprayed Welds, Welding Tests, Palo Verde Project, Bechtel Job 10407." The letter states six carbon steel welds were made, three with water spray cooling and three without. Three joint types and three material types were examined:

Structural Tee Joint	-	A36 carbon steel
Pipe butt weld	-	6, Schedule 40, A106B
Socket Weld	-	3/4", A105

All joints were sectioned and hardness tests were conducted on the weld metal, heat affected zone and the base metal. Metallographic examinations were performed on all joints. No significant differences were noted in hardness values and the metallographic examination showed typical microstructures in all joints. Therefore, the results of the study for the three materials tested appears to be satisfactory.

The study does not address whether all carbon steel weld materials used at PVNGS were represented by the three materials tested. Therefore, this item remains open.

m. (Closed) Unresolved Item (50-529/83-12-01) Cable Tray Support Welds Not in Accordance with Drawing Requirements

The weld deficiencies noted by the inspector were recorded on Nonconformance Report (NCR) E-A-2969, dated June 3, 1983. The NCR was dispositioned by engineering on July 1, 1983. The disposition stated that the as-found condition was technically acceptable.

The original welding was accepted by QC welding inspectors on March 7, 1979, for Hanger 28 and Hanger 25. The supports had/had not been reinspected in the cable tray support engineering walkdown reinspection program.

Responsible licensee QA personnel stated they had performed an extensive inspection of the welding in the area and determined the cases identified by the inspector to be isolated. The deficient welds were accepted by a single inspector. Other examples of the inspector's work were reinspected by the licensee and found to be acceptable.

Additionally, the licensee checked revisions to the cable tray support installation specification and noted that at the time of the original QC inspection, only 10% of the welds were required to be checked. Revision 4 to the specification, issued October 15, 1979, required 100% weld inspection.

Based on the lack of technical significance of the undersize welds found and the engineering walkdown reinspections being performed on cable tray supports, this item is considered closed.

n. (Closed) Followup Item (50-529/83-12-02) Torquing of Bolts on Cable Tray Supports

In Inspection Report 50-528/83-22, the inspector examined an allegation that cable tray supports were removed, revised and reinstalled after QC inspection and acceptance. The inspector determined that the licensee's reinspection program for cable tray supports checked configuration adequately but did not include provisions to check bolt torque. As a followup to the allegation, the inspector checked the torque values of cable tray support bolts, primarily those marked with the QC inspector's "QC number" (indicating that those particular bolts had been verified properly torqued by the QC inspector in his sampling of bolts). Random bolts on several supports were selected in the pump rooms of Unit 2 described by the allegor. The torque check was performed by craft personnel while the inspector examined the bolt for breakaway movement. All bolts checked (approximately 30) were found to be satisfactory, neither under or over torqued, with two exceptions. Two bolts moved prior to reaching minimum torque. One bolt had been torque checked by QC, the other had not. Both were located in the corner of brackets where the crow's foot (open-ended) wrench had physical interference with the bracket. The craftsman estimated

breakaway torque at 38 ft-lbs in one case and 34 ft-lbs in the other case (the minimum torque value being 40 ft-lbs). Since some torque relaxation is expected with time, and since the two bolts were located where physical interference was a potential problem, and since the estimated torque values were not significantly below minimum, the inspector does not consider that the conditions found indicate that the bolts were other than normally inspected installations; that is, the conditions found do not provide evidence that supports were removed after QC inspection and then reinstalled by craft personnel in an unacceptable manner.

This item is considered closed.

### 3. Construction Deficiency Reports

A discussion was held by the inspector with licensee QA management regarding construction deficiency reports made to the NRC. Although the licensee's performance in reportable items was considered generally good, three areas for possible improvement were identified: (1) the timeliness of obviously reportable items occurring in the startup testing area (e.g., the thermoweld failures); (2) knowledge of the technical aspects of the deficiency by the person making the initial verbal notification, and (3) increased emphasis on identifying the "cause" and the "action to prevent recurrence" in the written reports.

The licensee representative promised cooperation regarding the items discussed.

### 4. IE Bulletins

The inspector examined the licensee's actions regarding the IE Bulletins listed below. Closure status is as indicated. The licensee's review of older bulletins and circulars previously committed to be completed in July was not complete at the time of inspection. The licensee representative stated the review would be complete by the end of July, 1983.

#### a. (Closed) IEB 77-03, On-Line Testing of Westinghouse Solid State Protection System

The licensee's letter NOS-83-832 dated May 26, 1983 states the bulletin was reviewed and closed on the basis that it is applicable to Westinghouse plants and is not applicable to PVNGS.

#### b. (Closed) IEB 79-01, Environmental Qualification of Class IE Equipment

The original Bulletin 79-01, dated February 8, 1979, was not applicable to plants under construction. The ensuing bulletins and supplements and ancilliary requirements in other NRC documents generally did not require specific action or response from

construction plants. The requirements of the bulletin, its revisions and supplements, and the ancillary NRC documents are implemented for construction plants through the licensing process as reflected in Section 3.11 of NUREG 0857, the "Safety Evaluation Report related to the operation of Palo Verde Nuclear Generating Station, Units 1, 2, and 3."

Therefore, this bulletin and its supplements and revisions are considered closed.

5. Exit Interview

The inspector met with licensee representatives (denoted in paragraph 1) on July 1, 1983. The scope of the inspection and the inspector's findings as noted in this report were discussed.