U. S. NUCLEAR REGULATORY COMMISSION

REGION V

Report No. 50-528/82-29
50-529/82-12
50-530/82-13

Docket No. 50-528, 50-529, 50-530 License No. CPPR-141, 142, 143 Safeguards Group

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: October 4-8, 1982

Inspectors: J. H. Eckhardt, Reactor Inspector — 11/26/82 Date Signed

A. D'Angelo, Reactor Inspector — 11/29/82 Date Signed

Approved by: T. Young, Jr., Chief
Reactor Projects Section No. 2 — 11/29/82 Date Signed

Summary:

Inspection on October 4-8, 1982 (Report Nos. 50-528/82-29, 50-529/82-12, and 50-530/82-13)

Areas Inspected: Routine, unannounced inspection by regional based inspectors of construction activities associated with licensee action on previous inspection findings, Unit 2 electrical cable and termination installation, Unit 2 safety-related component installation, and Unit 3 containment structural steel welding. The inspection involved 54 inspector-hours on-site by two NRC inspectors.

Results: No deviations or items of noncompliance were identified.

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DETAILS

1. Persons Contacted

a. Arizona Public Service Company (APS)

*J. A. Roedel, Corporate QA Manager
*D. B. Fasnacht, Nuclear Construction Manager
*W. E. Ide, Construction QA Manager
*D. E. Fowler, Construction Engineer
L. Souza, QA Engineer
R. Forrester, QA Engineer
D. Wittas, QA Engineer
P. Moore, QA Engineer
S. Penick, QA Engineer
K. Anderson, QA Engineer

b. Bechtel Power Corporation (Bechtel)

*S. M. Nickell, Project Superintendent
*R. M. Grant, Project QC Engineer
*D. R. Hawkinson, Project QA Supervisor
*W. A. Miller, Project Field Engineer
J. Black, Project Engineer
J. Johnson, Lead Unit Field Welding Engineer
L. Stone, Welding Engineer
D. Murphy, Lead Cable Pulling Engineer

*Denotes those attending exit meeting. Also, present was the NRC Senior Resident Inspector, L. E. Vorderbrueggen.

2. Licensee Action on Previous Inspection Findings

The licensee action pertaining to the following items was examined:

a. (Closed) Noncompliance (50-529/82-05/01) Removal of Installed Equipment without Proper Documentation

To correct the immediate problem, noncomformance report EA-1964 was issued by Bechtel on April 2, 1982. The disposition specified retorquing the anchor bolts to ensure proper installation. The inspector re-examined the subject conduit support and verified that the bolts had in fact been retorqued. To avoid future noncompliance, the Unit Engineer, Lead Field Engineer, and Superintendent were briefed at a Unit 2 staff meeting on April 9, 1982 concerning the finding. The inspector reviewed the staff meeting agenda notes and verified this action. Also, memos were issued to Units 1 and 3 management discussing the finding. In addition, Procedure Change Notice (PCN) 69 to WPP/QCI-251.0, "Raceway Installation", was issued July 19, 1982 to clarify and more strongly emphasize the requirement to document the removal, reinstallation, relocation, or modification of raceways or raceway supports.

The inspector has not identified any similar discrepancies. This item is closed.

b. (Closed) Noncompliance (50-528/82-02/01) Missing Welds on Columns

In response to the item of noncompliance, Bechtel issued nonconformance report CC-3186 and completed the missing welds on the three columns on February 2, 1982. The inspector re-examined these columns and verified proper weld configuration.

To avoid further noncompliance, Bechtel issued a memorandum to Marathon Steel Company advising them of the weld problem and requested that Marathon dispatch an inspector to Palo Verde to perform an inspection to assure that the problem did not exist on other Marathon supplied columns. Inspection by Marathon identified three additional columns with missing welds, two in Unit 1 and one in Unit 3. Nonconformance reports were issued concerning these columns, and the missing welds were added.

The inspector has not identified any similar discrepancies. This item is closed.

c. (Closed) Followup Item (50-528/81-09/02) Main Feed Pump Pressure Tap

The pipe clamp for pipe support 13-FW-008-H007 on the Unit 1 main feed pump A discharge piping was installed such that it was in contact with the discharge pressure tap socket weld. Bechtel issued nonconformance report PT-2587 on July 10, 1981 to document the condition. The disposition, which is complete, was to relocate the clamp to avoid interference with the socket connection. The inspector examined the clamp and pressure tap and verified that the condition has been corrected. This item is closed.

d. (Closed) Followup Item (50-528/81-12/02) Verification of Proper Thread Engagement on Spring Hangers

The licensee committed to revise the procedure for piping system inspection to include inspection of spring hangers for proper thread engagement. Procedure Change Notice 99 to WPP/QCI-201.1, "Nuclear Pipe Hangers and Supports Installation", was issued on June 3, 1982. The PCN adds requirements to visually verify and document, at the time of cold setting of the springs, that proper thread engagement is achieved. This item is closed.

3. Electrical Cable Installation and Termination - Unit 2

Unit 2 electrical cable installation and termination were examined to ascertain compliance with the following Bechtel work procedures and construction specifications:

- WPP/QCI-254.0, "Cable Installation"
- WPP/QCI-255.0, "Cable Termination"
- Specification No. 13-EM-301, "Installation Specification for Electrical Cables in Conduits and Duct Banks"

. Specification No. 13-EM-306, Installation Specification for Cable Splicing, Terminations, and Supports

a. Cable Installation

The inspector observed portions of the installation activities associated with the following Class IE cables which were being installed in the Unit 2 control building.

Cable	Division	From/To
2EHJ02BC1RB	B (Green)	Load center to plant protection system instrumentation cabinet.
2EHJ25BC1RA	B (Green)	Load center to plant protection system instrumentation cabinet.
23HJ02BC1RG	B (Green)	Load center to plant protection system instrumentation cabinet.
2EHJ14AC2RG	A (Red)	Position switch to safety equipment status board.

Cable routing in both trays and conduits was involved. Particular attributes checked during the cable pulls included adequate crew size and communication, QC coverage, tray cleanliness, edge protectors, sufficient number of rollers, and cable routing. In addition to actual observation of the installations, the inspector reviewed the cable pull cards for the above cables.

No deviations or items of noncompliance were identified.

b. Cable Terminations

The inspector observed termination number 2ES185BJ1XB being performed in NSSS Channel B Analog Instrument Cabinet (2J-SBB-C02B) in the Unit 2 control building. The termination involved the termination of three wires to terminal board TB1 and three wires to terminal board TB2. Particular attributes checked included wire stripping, crimping, wires connected to proper terminals as specified on the termination card, cleanliness, tie down, labeling, crimp tool number properly identified on the card, and condition of crimp tool. The electrician appeared knowledgable of the correct termination techniques and procedures. In addition, the calibration records of the crimp tool used (number JEB0481) were reviewed to evaluate the calibration program.

No deviations or items of noncompliance were identified.

c. Battery Rooms

The Unit 2 Class 1E battery rooms were examined to ascertain level of cleanliness, environmental conditions, and adequacy of installed cable and terminations. The entrances to each of the four rooms

were covered by temporary doors posted as "zone IV" (no eating or smoking) cleanliness areas, and the humidity and temperature in the rooms was controlled with portable air conditioners. During examination of the installed cables and terminations, the inspector noted the following examples where the Class 1E cable bend radius (at the battery termination and/or where the cables exit the supporting conduit) was less than the minimum bend radius specified in specification no. 13-EM-301:

- Battery room A - two 1/c 500 MCM Rockbestos 600 v cables.
- Battery room C - one 1/c 4/0 AWG Rockbestos 600 v cable.
- Battery room D - two 1/c 4/0 AWG Rockbestos 600 v cables.

The violation of minimum bend radius appeared to have taken place when the cables were terminated, due to the cables exiting from the conduits having to be bent upward and then downward to facilitate termination on the batteries. Review of the quality records indicated that none of these cable terminations had as yet been inspected by quality control (QC). The inspector considers that the minimum bend radius violations would have been identified by QC during their termination inspections and noncomformance reports written as appropriate. Since the terminations had not yet been inspected and the inspector considers that the problem would have been identified by QC during their inspection, the inspector does not consider that an item of noncompliance is appropriate. The inspector also examined the Unit 1 battery rooms and did not note any similar bend radius problems. The Unit 1 cable conduits ended farther above the batteries such that the sharp bends were not necessary to facilitate termination.

Additionally, the inspector noted examples of black jumper cables between battery racks in the battery rooms to have a tight bend radius at the points of termination. Since these jumper cables, designated as DELCO 250MCM 600V, were supplied by the battery vendor, they were not included in the minimum radius data given in Bechtel specification 13-EM-301, and therefore the minimum bend radius for these cables was not determined during the inspection.

The bend radius concerns identified are considered a followup item, and the licensee's action will be evaluated during a future inspection (50-529/82-12/01).

4. Safety Related Components - Unit 2

a. Observation of Work

The inspector examined in process assembly and installation of the steam generator upper support in Unit 2. The installation was examined to ascertain compliance with the following Bechtel procedures.

(1) WPP/QCI 13.10, "Housekeeping".

(2) WPP/QCI 350.155-2 "Special Construction Inspection Planning for NSSS Equipment".

Particular attributes examined included snubber protection and cleanliness, maintenance checks and location. Required quality control inspections for the steam generator upper supports are delineated in the construction inspection plan (CIP) WPP/QCI 350.155-2. The CIP lists a number of tasks to be verified by QC and documented on the task verification record of the CIP. When the tasks verification record is completed, the CIP is then initiated and the task is considered complete. The use of the task verification record, however, was not described by procedure. However in practice, the tasks verification record and CIP was found to be used correctly by the QC inspectors for the installation of the steam generators upper supports. When this procedure omission was pointed out to QC personnel they took immediate action and revised the procedure to describe the task verification record.

All installation work examined was found to be in compliance with the applicable procedures. No deviations or items of noncompliance were identified.

b. Review of Quality Records

Quality records for the installation of the Unit 2 steam generator upper supports were reviewed to ascertain compliance with the procedures indicated. The records reviewed included maintenance records and installation records. Also, audits performed by APS on NSSS equipment in storage were examined. Specific areas covered by the audits included compliance with ANSI N45.2.2 (Storage and Handling standard), examination of shelf life and expiration date, and maintenance of resilient seals.

All documents examined were found to be in compliance with the procedure. No deviations or items of noncompliance were identified.

5. Containment Structural Steel Welding - Unit 3

a. Observation of Work

The inspector examined Unit 3 containment liner in-process welding to ascertain compliance with the following Bechtel procedures and drawing.

(1) WPP/QCI No. 101.4, "Control of Welding and Weld Map, Documentation of Containment Liner".

(2) Drawing 13-C-ZCS-217, "Containment Building Dome Liner Plate Plan and Sections".

(3) Specification 13-CM-370 "Installation for Erection of Containment Liner Plate System".

Sequence 3 of the containment dome for Unit 3 was examined. Particular attributes examined included fillet size, contour and location of stiffiners.

All welding examined was found to be in compliance with the applicable drawing and procedures. No deviations or items of noncompliance were identified.

b. Review of Quality Records

Quality records of the welding identified above were reviewed to ascertain compliance with the procedures indicated. The records reviewed included welder's footage log, weld map for the dome liner, and the construction inspection plan (CIP) for the liner and penetration plates. Also examined were radiograph and magnetic particle examination reports of NDE performed on dome welding. In addition, audit reports of audits performed by APS on the dome liner welding were reviewed. Specific areas covered by the audits were fillet size and chipping.

All documents examined were found to be in compliance with the procedures. No deviations or items of noncompliance were identified.

6. Exit Meeting

On October 8, 1982, the inspectors met with the licensee representatives identified in paragraph 1 and summarized the scope of the inspection activities and findings, as described in this report.