

U. S. NUCLEAR REGULATORY COMMISSION

REGION V

Report Nos. 50-528/89-53, 50-529/89-53, 50-530/89-53

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

License Nos. NPF-41, NPF-51, NPF-74

Licensee: Arizona Nuclear Power Project
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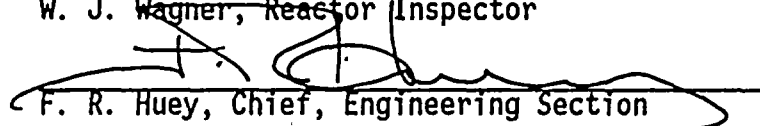
Facility Name: Palo Verde Nuclear Generating Station (PVNGS) Units 1, 2 and 3

Inspection at: Palo Verde Site, Wintersburg, Arizona

Inspection Conducted: December 4, 1989 through January 29, 1990

Inspector: W. J. Wagner, Reactor Inspector

Approved by:


F. R. Huey, Chief, Engineering Section

2/12/90
Date Signed

Summary:

Inspection on December 4 through January 29, 1990 (Report Nos. 50-528/89-53, 50-529/89-53, 50-530/89-53)

Areas Inspected: A special inspection by a regional inspector of commercial grade procurement. Inspection Procedure Nos. 30703, 38703 and 92701 were used as guidance for the inspection.

Results:

General Conclusions

The licensee's procurement program is weak in the way commercial grade items are dedicated for safety-related use in that the critical characteristics of the items are not fully verified by testing or inspections.

Significant Safety Matters: None

Summary of Violations or Deviations: None

Open Items Summary: One new unresolved item was identified.



DETAILS

1. Persons Contacted

+P. Caudill, Director, Site Services
+R. Fullmer, Manager, Quality Audits
+R. Prabhakar, Manager, Quality Engineering
+S. Grier, Supervisor, Procurement Engineering
+A. Fakhar, Lead Procurement Engineer
+A. Waicelunas, Lead Procurement Engineer
*+J. Tench, Manager, Material Control
*T. Bradish, (Acting) Compliance Manager
*R. Rouse, (Acting) Commitment Supervisor
D. Kissinger, (Acting) Procurement Quality Supervisor
J. Ferguson, Procurement Engineer
A. Ellis, Procurement Engineer
J. Quan, Licensing Engineer
G. Zaghloul, Nuclear Electrical Engineer
M. Dougherty, Supervisor Stores
S. Penick, Operations Quality Engineering Supervisor
J. Zalitis, QC Inspector

+Denotes those attending the exit meeting on December 12, 1989.

*Denotes those attending the exit meeting on January 12, 1990.

2. (Open) Unresolved Item (50-528/89-38-01, 50-529/89-38-01, 50-530/89-38-01) Inadequate Dedication of Commercial Grade Items

The procurement requirements for dedication of commercial grade items for safety-related use were previously reviewed by the inspector and documented in NRC Report No. 50-528/89-38. The program appeared to address the requirements for adequately identifying each commercial grade item's critical characteristic that must be inspected or tested to verify its suitability for use in a safety-related application. The inspector's concerns were with the technical adequacy of the dedication process regarding insufficient verification of the critical characteristics.

The licensee provided the inspector with additional information regarding eight previously identified examples of inadequately dedicated commercial grade procured items. Specific concerns involved critical characteristics which were missing to properly dedicate an item, and/or inadequate verification of critical characteristics. These concerns were evaluated by the licensee and documented in their report submitted to Region V on September 22, 1989 (Letter No. 229-0034-2-PJC/JNB-TDS). Two additional examples of procurement related problems are included in this report; the first addresses an inadequate dedication process which allowed counterfeit molded case switches to be installed in safety systems; the second example involved a vendor supplying valve replacement parts without notifying the licensee that a design change had occurred since the initial purchase. The inspector's review of the evaluation and additional information provided during the inspection did not substantiate the licensee's conclusion that all items were acceptable for



use. Specifically, three of the eight items appeared to have been inadequately dedicated. Specific observations are discussed below:

- a. Eyebolts - The eyebolts are packing gland eyebolts used to secure the valve gland retainer to the valve body on various 3/4-inch Borg-Warner root valves. Procurement had received 153 of these eyebolts which, as of September 1, 1989, were distributed as follows:

<u>No. of Eyebolts</u>	<u>Distribution</u>
44	<u>Unit 1</u> 2 being installed in 1 PSIEV125 2 being installed in 1 PSIEV145 2 being installed in 1 PSIEV126 2 being installed in 1 PSIEV146 36 installed in 18 valves in the RC system
4	<u>Unit 2</u> 2 installed in 2PRCDV271 2 installed in 2CHEV405
40	<u>Unit 3</u> 40 installed in 20 valves in the RC system
55	Located in the warehouse
1	Damaged during installation and scrapped
3	Located in Unit 2 "Q" class storage
1	Used for practice/training during the November 1988 eyebolt replacement on 2 PRCDV271
5	Presently indeterminate. The last known location was Unit 2 Maintenance.

These valves are part of sampling or instrument lines connected to various Reactor Coolant (RH), Safety Injection (SI) and Chemical and Volume Control (CH) system piping.

Consequence of failure: loss of pressure boundary.

The licensee has stated that the eyebolt material was changed to resolve boric acid corrosion problems. A magnetic test was to verify material composition, and a hardness test, was specified to verify physical property.

The NRC inspector stated that the licensee dedication was inadequate for the following reasons:

- (1) corrosion resistance is an important material property dependent upon the material composition which can only be verified by chemical analysis,



- (2) the magnetic test provides little assurance of material composition, and
 - (3) the licensee's upper limit on acceptable hardness places the material properties (impact and tensiles) out of specification.
- b. Journal Bearing and Throat Bushing (PO No. 60109446) - The bearing and bushing were purchased from Bingham-Willamette Company (B-W) and both items perform a safety-related function on the turbine driven Auxiliary Feedwater pump.

The licensee has stated that these parts were produced under B-W's safety-related parts program, although the parts were reclassified (after receipt), by B-W as commercial grade. The licensee basis for dedication included the originally supplied Certificate of Compliance (C of C), and Engineering Change Evaluation (ECE) and QC receipt inspection. This position was expressed in the licensee's September 22, 1989 evaluation. Subsequent inspector discussion with licensee personnel appeared to contradict this conclusion in that, B-W does not manufacture these items under their QA or Code Program, B-W has always supplied these items as commercial grade, and therefore no credit should be taken for the B-W C of C.

The NRC inspector considered that the C of C became invalid when B-W rescinded the Part 21 requirements of this originally safety-related purchase order. The dedication process for these commercial grade items did not include any additional audits or inspections, and no statement was received from B-W certifying the validity of the C of C; therefore, no certification exists attesting to the quality of the items supplied.

- c. Camshaft Hub Drive - The drive was supplied by Cooper Energy Services Groups for use on the Cooper-Bessemer emergency diesel engine camshafts. Failure could impact the ability of the diesel to start.

The licensee considered that critical characteristics such as configuration, part number and steel material, provided adequate dedication, since a Cooper drawing categorized the part as "non-critical."

The NRC inspector considered, that since this part performs a safety-related function, the dedication was inadequate. Steel material verification by the ability to draw a magnet does not provide reasonable assurance of the physical properties needed to dedicate this item. Hardness is a critical characteristic that was not verified but is significant, since the part is subject to wear and contact loading.

- d. Molded Case Switches - The inspector reviewed the dedication process which allowed the installation of counterfeit molded case switches (MCS) into safety-related systems. These MCSs were procured from California Breakers, Inc., one of several California companies identified in Information Notice No. 88-46 as having supplied



improperly refurbished molded case circuit breakers. ECE-ZZ-A017 Revision 1, dated July 24, 1986 was prepared to upgrade the California Breakers MCSs for use in safety-related applications. ECE-ZZ-A017 determined that the MCSs were seismically and environmentally qualified. Part of this ECE is the Component Qualification Data File, prepared by Bechtel, which is a qualification evaluation for GE Molded Case Switches and Circuit Breakers. Section 1.0, Summary of Procurement Requirements, of the Bechtel evaluation recommended that a Certificate of Compliance (C of C) be obtained as part of the supplier documentation. Section IV, Acceptability of Manufacturer/Supplier, based acceptability of the MCSs on the manufacturer's historical record but failed to include the supplier. These switches were accepted, in part, based on the C of C from California Breaker, without having performed an audit of California Breaker to verify the validity of the C of C. The California Breakers C of C was signed off by their Quality Control Department on February 15, 1985. Had an audit been performed at that time, the licensee would have learned what the NRC's Office of Investigations discovered in their investigation into this issue in 1989, that a QA/QC program did not exist at California Breaker.

The licensee's response evaluating the other commercial grade procured items were also reviewed by the inspector. In some instances additional information was provided to clarify the concerns. Adequate evidence was available to support the licensee's conclusion that there is reasonable assurance that the following five items are acceptable for use in the intended safety-related application:

- e. Terminal Boards - GE EB-1 terminal boards dedicated for Class 1 E 4.16KV and 13.8KV switchgear.
- f. Integral Motor Pinion Shaft Assembly - Assembly for the auxiliary hoist 225/35 ton polar crane.
- g. Barksdale Pressure Switches - Serves as an alarm in the Emergency Diesel Generator starting system.
- h. Control Valves - Prohibits starting of the diesel engine when the turning gear is engaged.
- i. Gear Reducers - Charging pump gear reducers.

The inspector also questioned Procurement, Licensing and Electrical personnel regarding why it took fourteen months from the issuance of IN No. 88-46 to identify the counterfeit California Breakers. This inquiry was prompted by a letter from Procurement to Nuclear Engineering (011-1537-JNT-AEE) dated August 12, 1988, in response to the Information Notice. This letter notified engineering that twenty-four Field Material Requisitions to California Breakers were being transmitted to assist in their review of ECE documents to determine if any equipment was dedicated for use in safety-related applications. There was no response to this letter and none was requested. In light of IN 88-46 and this letter the inspector questioned why they didn't feel they had a concern regarding



these breakers. The consensus was that no immediate concern existed because; (1) none of the breakers were procured as safety-related as expressed in the Information Notice (2) an engineering evaluation was performed to dedicate the breakers, and (3) a successful breaker test performed in accordance with the Bechtel Breaker Testing Program. Also, the licensee was awaiting new direction of the yet to be issued NRC Bulletin No. 88-10 addressing "Nonconforming Molded-Case Circuit Breakers".

The licensee has initiated a Project Plan entitled "ANPP Commercial Grade Dedication Program Enhancement" which will address these NRC concerns as part of the overall plan to determine the adequacy of their dedication process. This Unresolved item will remain open pending the inspector's review of the procurement procedure enhancements resulting from this Project Plan, specifically program changes regarding the determination and subsequent verification of the items critical characteristics.

During review of the documents associated with the counterfeit MCSs from California Breaker the inspector observed that the upgrading from commercial grade procurement to installation for safety-related application, was controlled under the QA program procedure for processing nonconforming items. NCR 0-037-85-1 was initiated on February 12, 1985 and closed on December 6, 1986. Unit 1 went critical on May 25, 1985 followed by generation of electrical energy during June 1985. The inspector questioned how the NCR process allowed the plant to operate prior to closing out the NCR. The procedure in affect was number 6N417.21.00, entitled "Control of Nonconforming Items", Revision 0 dated March 27, 1985. Section 4.6 of the procedure requires that nonconforming items be corrected prior to declaring the applicable system operable. Further, if the nonconforming condition cannot be totally resolved it must be properly dispositioned and the effect of that disposition considered in any discussion to declare the system operable prior to correcting the condition. In such cases, the decision to proceed with installation shall be supported by an evaluation that demonstrates that the nonconformance can be resolved with the item installed. The evaluation which supported NCR 0-037-85-1 is ECE-ZZ-A017, Revision 1, dated July 24, 1986. Unless some other justification existed to support the decision to declare the system operable prior to correcting the condition, it appears that the licensee may not have been following their procedures. This will be examined further by Region V as a potential violation of Criterion V of Appendix B to 10 CFR 50 (Unresolved Item 528/89-53-01).

The inspector reviewed safety-related Purchase Order No. 33800850 issued on November 14, 1989 to Control Components, Inc. (CCI) for valve replacement parts. These parts are a tab washer and stem for a limitorque valve plug assembly for the AFW Regulating valve. The licensee requested a design change for the stem from 316 stainless steel to 410 stainless steel after four stems had bent during operation of the valves. The tab washer had undergone a design change about four years earlier from the original two port plug to a four port plug. The tab washer was ordered under the original part number with CCI supplying the part that had undergone the design change; this subsequently caused warpage of the stem during post-installation testing of the AFW



regulating valve. The inspector reviewed the Bechtel audit report of September 19, 1985 and the ANPP audit report of August 14, 1987 which qualified CCI to be placed on the Approved Vendors List. This review revealed a weakness in the auditing process in that there were no provisions to ensure that vendors of safety-related or commercial grade items understand the purpose and need for complying with the procurement QA requirement for reporting design or manufacturing changes made to spare or replacement parts.

Unresolved Items

An Unresolved Item is a matter about which more information is required to ascertain whether it is an acceptable item, a deviation, or a violation. The unresolved item identified during this inspection is discussed in Section 2.

3. Exit Meeting

The scope and findings of this inspection were discussed with the licensee's management during exit meetings on December 20, 1989 and January 12, 1990. Additional information requested during and after the January 12, 1990 meeting was received on January 26 and reviewed on January 29, 1990. The licensee was also informed, on February 5, 1990, of the Unresolved Item discussed Section 2.

