

NECENVED

Arizona Nuclear Power Project

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December 12, 1984 ANPP-31488-TDS/TRB

U. S. Nuclear Regulatory Commission Region V 1450 Maria Lane - Suite 210 Walnut Creek, California 94596-5368

Attention: Mr. D. F. Kirsch, Acting Director Division of Reactor Safety and Projects

Subject: Final Report - DER 84-27 A 50.55(e) Reportable Condition Relating To Improperly Handled Instrumentation From The Waldinger Corporation. File: 84-019-026; D.4.33.2

Reference: A) Telephone Conversation between P. Narbut and T. Bradish on May 10, 1984

- B) ANPP-29648, dated June 4, 1984 (Interim Report)
- C) ANPP-30317, dated August 23, 1984 (Time Extension)
- D) ANPP-30665, dated September 26, 1984 (Time Extension)
- E) ANPP-30953, dated October 25, 1984 (Time Extension)
- F) ANPP-31095, dated November 12, 1984 (Time Extension)
- G) ANPP-31219, dated November 26, 1984 (Time Extension)
- H) ANPP-31330, dated December 5, 1984 (Time Extension)

Dear Sir:

Attached is our final written report of the Reportable Deficiency under 10CFR50.55(e) referenced above.

Very truly yours, E.E. Vauton

E. E. Van Brunt, Jr. APS Vice President Nuclear Production ANPP Project Director

EEVB/TRB/nj Atlachment

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cc: See Page Two

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Mr. D. F. Kirsch DER 84-27 Page Two

cc:

Richard DeYoung, Director Office of Inspection and Enforcement U. S. Nuclear Regulatory Commission Washington, D. C. 20555

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Records Center Institute of Nuclear Power Operations 1100 Circle 75 Parkway, Suite 1500 Atlanta, GA 30339 FINAL REPORT - DER 84-27 DEFICIENCY EVALUATION 50.55(e) ARIZONA PUBLIC SERVICF COMPARY (APS) PVNGS UNITS 1, 2, 3

# I. Description of Deficiency

Deficiency Evaluation Report (DER) 82-81 had identified irregularities in the installation of "Q" class HVAC instruments in the Units 1 and 2 Diesel Generator buildings. As part of the remedial action initiated to correct this potentially generic condition The Waldinger Corporation (TWC), the prime HVAC subcontractor to Bechtel, was directed to perform a reinspection of all "Q" class and a sample of "R" class instrumentation istall(d in Units 1, 2, and 3.

During this reinspection performed by TWC's subcontractor, Honeywell Inc., Honeywell reported numerous installations that had been modified after final inspection was conducted. Honeywell reported that these unauthorized modifications had occurred during removal, recalibration or relocation activities performed by parties other than Honeywell. These modifications, along with other documented cases of improper original installation performed by Honeywell, as well as a specific deficiency regarding inadvertent interchanging of the sensing components in two wall mounted instruments; 2-J-HDA-TSL-17 and 2-J-HDN-TSHL-25 in the Unit 2 Diesel Generator building led to initiation of this DER.

The affected "Q" class instruments are temperature, pressure and flow sensing and controlling devices for the HVAC System in the Containment, Diesel Generator, Fuel and Control Buildings of Units 1, 2, and 3. A review of documentation of the nonconforming installations revealed the following deficiencies:

- Instruments had their sensing components interchanged;
- Switch housings had open conduit ports;
- Steel washers missing from under one or more mounting lugs. These washers are required to satisfy seismic qualification;
- Instrument identification tags missing or not attached correctly;
- <sup>o</sup> Misaligned or cracked gaskets;
- Missing "scru-tite" fittings;
- Missing lockwashers used to secure terminal strips;
- Instrument enclosure mounting unistrut nuts incorrectly installed resulting in incomplete thread engagement and inadequate load bearing surface contact.

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> The above deficiencies are identified in various Honeywell/Waldinger to Bechtel correspondence, and two NRC Notice of Violations (dated August 7 and 8, 1984) and documented by Startup Field Reports (SFR) and Startup Work Authorization (SWA).

## Evaluation

Investigation has determined that the probable cause of these discrepancies was the result of one or more of the following:

- a) Initial incorrect installation by Honeywell;
- b) Incorrect reinstallation by construction during Bechtel-scoped work or relocation to permit field routing of commodities without interferences;
- c) Incorrect reinstallation by Startup Maintenance during performance of maintenance or calibration activities prior to resumption of testing; or
- d) Improper reinstallation of instruments affected by material transfer activities.

The exact cause of deficiencies identified above cannot be categorically determined, however, correct HVAC instrument installation is being ensured by performance of an engineering walkdown of all safety-related HVAC instruments in Units 1, 2, and 3.

Engineering has initiated procedure 5.26-06 (part of Internal Procedure IP-5.26) to verify correct instrument installations and to identify any deficiencies for corrective action.

The walkdown will:

- a) Compare the as-built configuration of the installation to the applicable supplier drawing.
- b) Verify the installation of field-mounted instruments for correctness of tag number, model number, manufacturer, location and mounting to include proper thread engagement on bolts, washers, where required, and correct anchor installation as indicated on design drawings.
- c) Visually examine the physical integrity of the instrument (e.g., face glass broken, probes bent, instrument broken, bolts loose, latches missing on cover panels, screws missing).

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> Furthermore, to confirm that the cited deficiencies are related only to HVAC (Honeywell) instrumentation, a 10 percent sample of other "Q" instruments installed in Units 1 and 2 will be performed by Engineering with the assistance of Construction Quality Control. This sample walkdown will be performed utilizing the procedure and method described above. The walkdown will be initiated to evaluate whether similar deficencies exist in other instrument installations, as a result of activities conducted after initial installation.

### II. Analysis of Safety Implications

This condition is evaluated as safety significant since, if left uncorrected, these deficiencies could preclude the safety-related HVAC systems from performing their design intent. This condition requires extensive evaluation to establish the adequacy of the components to perform their safety functions.

This condition is evaluated as reportable under the requirements of 10CFR50.55(e). The project has evaluated this condition as not reportable under the requirements of 10CFR Part 21 since it is not a defect in a basic component.

## III. Corrective Action

#### Correction of Honeywell Deficiencies

- A review of the instrument index/calibration data list identified twenty-nine (29) Honeywell installed Q class instruments per unit that could be subject to the same deficiencies as noted above. These instruments have been re-inspected in accordance with the criteria given to Section I. Deficiencies have been identified on the appropriate documents for resolution prior to entering Mode 6.
- 2. The inspection of Unit 2 "Q" instrument internals is completed and the results of the walkdown are documented. Any identified deficiencies will be corrected prior to operating license.
- 3. The inspection of Unit 3 "Q", "R", and "S" instruments, installed and accepted prior to completion of the training described in Item No. 5 below, including an inspection of the internals of "Q" class installations, will be completed prior to operating license. Any deficiencies will be corrected prior to operating license.

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#### Corrective Actions to Prevent Recurrence

- 1. A review has been conducted by Bechtel for all WPP/QCI procedures pertinent to instrument installation and modifications and the documents will be updated where necessary to arsure that adequate control can be maintained to properly perform all reinstallation activities of disassembled instruments.
- 2. A review has been conducted by Bechtel of all TWC and Honeywell procedures in the areas of new installations and work which supports APS Startup or Operations, to assure that initial installations are being properly completed by the subcontractor.
- 3. The results of the above procedure reviews have been documented by memorandum to the Project Quality Assurance Manager.
- 4. Bechtel has conducted training for piping, electrical and instrumentation supervision and field engineering on the requirements for relocating components to facilitate subsequent work.
- 5. Bechtel has verified that TWC and Honeywell conducted training on the appropriate procedures governing instrument installations.
- 6. A Quality Talk session for Bechtel and subcontractor personnel has been held to discuss the importance of correctly performing initial installations, inspection and documenting relocations of components.
- 7. APS Startup has reviewed the applicable procedures and verified that procedural guidance and controls exist to preclude the type of problems identified in this DER.
- 8. APS Nuclear Operations has reviewed the applicable administrative procedures governing control and instrumentation work control and verified that procedural guidance and controls exist to preclude recurrence of the type of problems identified in this DER.
- 9. Both APS Startup and Operations have confirmed that all affected personnel are provided wih instruction and obtain formal training in regards to the work control during their indoctrination and certification process.

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> Corrective Steps to Intensify Control of Ongoing HVAC Hardware Installations

- Bechtel Construction QC surveillance of "Q" subcontract decumentation and work activities are conducted on a daily basis. When a subcontractor is actively involved in "Q" work, a QCE will be assigned to survey the activities.
- The Field Subcontracts organization has been instructed to direct the subcontractors to submit and document, via the Supplier Deviation Dispositin Request (SDDR) process, all requests for deviations from specifications.
- 3. A process has been instituted to review subcontractor documentation for completeness and compliance to the subcontract for all work performed.
- More emphasis has been placed by QA on surveillance of hardware installations.
- 5. All new construction subcontract personnel are required to attend a Quality Orientation Program.

#### Corrective Action on Non-Honeywell Installed Instruments

Since a number of other problems have been identified with instrument installations, as reported in DERs 83-73, 84-21, and 84-55, a review of the installation of safety related instrumentation installations (Honeywell, Barton, Rosemount and Foxboro) was conducted as follows:

- 1. Honeywell described in this DER.
- 2. In addition to the above inspection an additional walkdown was conducted of Non-Honeywell installed Q class instruments. The deficiencies noted during these walkdowns were documented on the appropriate documents for resolution and have been evaluated for Unit 1 as having no overall safety impact by BC Engineering with the exception of two deficiencies concerning nuts. As a result of these deficiencies all (100%) Rosemount and Barton safety-related instruments will be inspected for proper bolting material as described below:

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> In reference to DER 84-21, approximately ninety percent (90%) of all Rosemount and Barton Q class transmitters have been walkdowned to verify the correct use of bolting material and torquing requirements. The deficiencies noted have been or will be reworked prior to entry into Mode 6. Based upon the deficiencies noted dui ag the walkdowns, and as described above, the remaining cen percent (10%) are being inspected and/or reworked as necessary. This action will also be completed prior to Mode 6.

- 3. In reference to DER 83-73, Unit 1 Foxboro Q class field installed power supplies were inspected under 10-IR-017. Deficiencies noted were documented and reworked under the appropriate document.
- 4. In reference to DER 84-55, Unit 1 Foxboro Q class field installed modules have been inspected with noted deficiencies documented on EER 84-SB-026. The results of the inspections are currently being evaluated by ANPP Operations Engineering. Necessary corrections will be completed prior to entry into Mode 6.
- 5. In reference to DER 84-77, the deficiencies identified relate to a manufacturing defect, as reported by Rosemount in accordance with 10CFR Part 21, and do not relate to an installation deficiency. The applicable transmitters will be refurbished or replaced prior to entry into Mode 4 for each unit.

Based upon the completion of a one hundred percent (100%) inspection of and/or rework of all Barton and Rosemount Q class transmitters and Foxboro Q class power supplies and modules, the deficiencies identified in DERs 83-73, 84-55, 84-21 and 84-27 will have no overall safety impact.