Arizona Public Service Company

September 20, 1984
ANPP-30591-TDS/TRB

U. S. Nuclear Regulatory Commission
Region V
Creekside Oaks Office Park
1450 Maria Lane - Suite 210
Walnut Creek, CA 94596-5368

Attention: Mr. T. W. Bishop, Director
Division of Resident
Reactor Projects and Engineering Programs

Subject: Interim Report - DER 84-41
A 50.55(e) Potentially Reportable Deficiency Relating to Adequacy Of Cardinal Industrial Products Program For Supplier Qualification.
File: 84-019-026; D.4.33.2

Reference: (A) Telephone Conversation between P. Narbut and T. Bradish on May 24, 1984
(B) ANPP-29809, dated June 22, 1984 (Interim Report)
(C) ANPP-30410, dated August 31, 1984 (Time Extension)

Dear Sir:

The NRC was notified of a potentially reportable deficiency in Reference (A), an Interim Report was transmitted by Reference (B), and a Time Extension was requested by Reference (C). At that time, it was estimated that a Final Report would be available by September 21, 1984.

Due to the extensive investigation and evaluation required, an Interim Report is attached. It is now expected that this information will be finalized by November 9, 1984, at which time a complete report will be submitted.

Very truly yours,

EE Van Brunt/DSK

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

EEVB/TRB/nj
Attachment

cc: See Page Two

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cc: Richard DeYoung, Director
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U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

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INTERIM REPORT - DER 84-41
POTENTIAL REPORTABLE DEFICIENCY
ARIZONA PUBLIC SERVICE COMPANY (APS)
PVNGS UNITS 1, 2, 3

I. Potential Problem

An NRC Audit of Cardinal Industrial Products (CIP) in October and November of 1983 and May of 1984 determined that CIP had been using improper size coupons to perform Charpy impact testing of ASME III, Class 1 bolts greater than 1.5 inches in diameter and incorrect impact test procedures were used. The NRC also expressed concern that CIP had not properly managed sub-supplier qualification, ASTM Material upgrading procedures, and correct ASME material testing for correct code compliance. Also, concerns exist with CIP's ability to provide correct references identifying heat treatments of supplier materials to maintain compliance with ASTM and ASME material specifications.

The NRC jobsite exit interview held in Phoenix on April 27, 1984 developed questions regarding CIP documentation for materials supplied to PVNGS. APS's audit of CIP (February 16, 1984) and the BPC/CIP meeting (May 16, 1984) substantiated that CIP documentation may not be adequate to substantiate materials certification.

As a result of the combined NRC/APS concerns, project investigations and in-depth audits of CIP supplied materials were completed and the following conditions reported:

- NCR PX-8529 was issued to document the indeterminate bolting material(s) supplied by CIP, as a result of a CIP quality program breakdown.

- NCR PA-8541 was issued for sixteen 1-3/8" dia. x 5-1/2" long bolts SA 564 Grade 630 condition H1100. Material is non-conforming since the solution annealed heat treatment cycle was not performed after heading and before age hardening to condition H1100.

- Procurement Supplier Quality Department/Technical Services WPD conducted an investigation at CIP on 5/14-16/84. Conditions reported included: (a) No English translation of some sub-supplier CMTRs, and Quality Program Manuals were unavailable; (b) Lack of objective documentation to verify adequate sub-vendor approval controls, i.e., surveys, audits, quality program manual reviews; (c) Insufficient quality requirements imposed in procurement documents to sub-suppliers; (d) Lack of correlation between sub-suppliers' material testing programs (chemical, mechanical, Charpy, IZOD) to those specified by ASTM/SA material testing requirements.

- Procurement Supplier Quality Department/Technical Services and Materials and Quality Services Department conducted an NCA 3800 audit of CIP on 6/26-29/84. Conditions reported, not previously noted, included: (a) Sub-suppliers' CMTRs are not being transcribed correctly; (b) Impact data omitted from some CMTRs; (c) CMTRs do not reflect compliance to NCA 3800; (d) Materials furnished and certified to later additions of the ASME Code than specified by the project.

- Materials purchased on Field Order #10407-F-141730 (150, SA-193-B7 studs 1-1/2" x 8 x 6") Heat #N589B were disclosed as having lacked Impact test data, as required by sub-section NC-2311. The CMTR (#0020495), supplied by CIP stated that the material provided complied with the requirements of ASME Section III Class 2 (Sub-Section NC), 1980 Edition.

- CIP Heat Nos. 7536B (1-1/4" x 8 x 6-1/2") SA-193-B7 stud material, Heat Nos. 8F784, A08320, 662540, 04059, 664524, Y0A3909, CY2647, C23929, B121270, 07930, 8F817, and K8176 (1-1/8", 1-1/4", 1-1/2", 1-3/8", 2, 2-1/4", and 2-1/2" SA-194 material) were found to be certified to ASME Section III Sub-Section NC 1980 Edition and lacking evidence of Charpy impact testing.

For technical acceptability of CIP material delivered to PVNGS five issues have been identified from investigation of purchase orders and supplementary in-depth audits of CIP. These issues have been evaluated as follows:

1. Adequacy of Impact Testing

   There are two sub-issues involved here: (1) The use of the IZOD impact test method vs. the ASME Charpy impact test method as an acceptable ASME/ASTM test, (2) The length of the coupons used in relationship to material diameter as required per NX-2300 and ASTM A-370.

   An investigation regarding the sub-size Charpy impact testing issue was completed and no PVNGS material has been found to date which would be affected. No further action is required at this time.

2. Applicable NDE Examination

   For ASME III, Class 1 material greater than 1 inch, MT or PT is required by NB 2500.

Bechtel Field Purchase Order No. 10407-F-140441, dated December 14, 1981, added 28 1-1/2 inch SA 325 hex head bolts to be used in Unit 2 ICI guide tube support structure. Under the governing rules of ASME III, Class 1 application, the subject bolting material requires MT examination and Charpy impact testing. A review of the applicable backup data at CIP indicated that no NDE or Charpy impact testing had been conducted. On June 8, 1984, BCI received official notification from CIP to identify and place subject material in quarantine awaiting further disposition.

Further investigation by the project confirmed the forementioned missed MT examination and failure to obtain impact data had been discovered during recent investigations. During receipt inspection NCR NC-678, dated 1/18/82, was issued and the 28 bolts were scrapped.

The project has completed a 100% review of all ASME, Class 1 purchase orders, and has concluded that NDE or Charpy testing imposed as a requirement of the applicable ASME Code class (Class 1), or as a requirement for certification to the applicable material specification, was accomplished.

3. Appropriate Heat Treatments of AISI - 4140/SA 193B7 Stud Material

This concern is due to the requirement of correct stress relieving temperature of SA 193B7 stud material after cold drawing. This material is quenched from 1600°F and tempered at 1100-1200°F before cold drawing.

A review of the CIP documentation supporting several purchase orders indicated the chemistry and mechanical properties for the B7 bolts and studs conformed to the requirements of ASME SA 193 material specification. This documentation showed that the bolts were furnished in the quenched and tempered heat treat condition and the studs were furnished in the quenched, tempered and stress relieved heat treat condition. The studs were stress relieved after cold drawing operation which is required by the material specification

Sub-vendor backup documentation was reviewed to determine if stress relief temperatures were maintained within a range of 25-100°F below the actual tempering temperatures. This is a requirement in the SA 193 material specification, Section II, Part A, commencing with the 1977 Edition, Summer 1978 Addenda.

The effective ASME Code date for the PVNGS Project is the 1974 Edition, Winter 1975 Addenda. The material specification within this Code edition and addenda does not specify a requirement to control the stress relief temperature. The only stipulated requirement cited concerning stress relief of "cold drawing" material is that the material shall be stress relieved. There is no problem, provided the material manufacturer, Cardinal Industrial Products Corporation, certifies in the heat treatment documentation that all the requirements of the SA 193, B7 studs and bolts meet all the requirements of this material specification in Section II, Part A, 1974 Edition, Winter 1975 Addenda. It was observed at CIP that the material manufacturer's Certified Materials Test Reports and Certificates of Compliance indicated that the bolts and studs conformed to the 1974 Edition, Winter 1975 Addenda of the Code.

4. Acceptability of ANSI N45.2 (ASTM) Materials

CIP utilizes identical vendors to fill ASME orders as those for ASTM. The Quality Assurance controls being implemented to ASTM material suppliers are identical to those extended to ASME suppliers.

The results of this evaluation identify the root cause for this condition as the lack of control of and quality program breakdown of CIP and their material suppliers.

5. Availability of Translated Quality Assurance Manuals

NA-3762/NCA-3862 of ASME III sub-section NA requires that a controlled copy of the sub-supplier's quality manual and procedures which are necessary to provide an understanding of the sub-vendors' quality program must be provided to the qualifying party for on-site review, but submittal and retention for customer records is not required.

6. Material Certifications

The effective ASME Code date for the PVNGS project is the 1974 Edition, Winter 1975 Addenda. This Code edition and addenda do not specify a mandatory requirement to impact test Class 2 materials. The only stipulated requirement cited within this Code and addenda concerning Charpy impact testing, is "The Design Specifications shall state whether or not impact testing is required for the pressure retaining material of which the component is constructed. When impact testing is required, the test temperature shall be specified and the tests become a requirement of this Subsection."

However, as of this date, no evidence of delivered defective materials have been identified.

II. Approach To and Status Of Proposed Resolution

1. An independent material verification sampling plan is being implemented by BPC/BCI which will check actual inventory material for physical and chemical characteristics for compliance with the applicable SA/ASTM material specification.

2. BPC has revised the NCA 3800 survey checklist to provide a more in-depth review during survey activities which would disclose deficiencies of this nature. BPC is also in the process of revising the audit checklist for ANSI N45.2 suppliers to preclude a recurrence of these types of deficiencies regarding the "Q" class safety-related procurements.

3. A CIP warehoused sample of the SA-193-B7 stud material Heat #N589B purchased on Field Purchase Order #10407-F-141730 was Charpy impact tested on September 6, 1984, CIP Work Order #8579. The results were acceptable.

III. Projected Completion of Corrective Action and Submittal of the Final Report

The complete evaluation and final report are forecast to be completed by November 9, 1984.