Arizona Nuclear Power Project
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September 9, 1985
ANPP-33412-TDS/TPS

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 & Projects

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Subject: Final Report - DER 85-07
A 50.55(e) Evaluation Relating to CE Instrument Rack Deficiencies
File: 85-019-026; D.4.33.2

Reference: A) Telephone conversation between L. Miller and T. Bradish on March 5, 1985
B) ANPP-32329, dated 4/8/85 (Interim Report)
C) ANPP-32654, dated 5/16/85 (Time Extension)
D) ANPP-32828, dated 6/13/85 (Time Extension)
E) ANPP-33013, dated 7/15/85 (Time Extension)
F) ANPP-33206, dated 8/13/85 (Time Extension)
G) Telephone conversation between C. Sorensen and T. Siegfried on September 6, 1985

Dear Sir:

Attached is our final written report of the deficiency referenced above, which has been determined Not Reportable under the requirements of 10CFR50.55(e) and 10CFR21.

Very truly yours,

E. E. Van Brunt, Jr.
Executive Vice President
Project Director

EEVB/TPS/nj

Attachment

cc: See Page Two

IE-27

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

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FINAL REPORT - DER 85-07
DEFICIENCY EVALUATION 50.55(e)
ARIZONA NUCLEAR POWER PROJECT (ANPP)
PVNGS UNITS 1, 2, 3

I. Description of Deficiency

A. Locking Devices

The fasteners of the instrument racks supplied by Combustion Engineering (13-NM-001) were not provided with locking devices per ASME Section III, paragraph NF-4725 on components falling within the jurisdictional boundaries of ASME III (i.e., bolts for tubing clamps, valve support brackets, etc.). This locking device deficiency was first reported by CAR No. S-85-7, dated February 11, 1985, and also in CE letter V-CE-31943, dated February 15, 1985.

B. Material Identification

The bolt heads for the ASME Section III instrument rack components do not display the manufacturer's identification symbol for ASME and Quality Class "Q" installed bolts (Reference A-193/SA-193, paragraph S.5.1). Some bolt heads do not display a proper ATSM/ASME material designation; other bolt heads display two types of designation such as two radial lines 90 degrees apart (⊥) and a "B8," making knowledge of the material type indeterminate.

Evaluation

A. Locking Devices

The CE letter, V-CE-31943, contained detailed information and instructions for installing additional locking nuts to the existing nuts on the coded components (tubing clamps, isolation valve brackets, 3-way manifold support brackets and 3-way manifolds) of the CE instrument racks. With the addition of these locking nuts, the mounting of the coded components meets the ASME Section III requirements.

The root cause of the locking device deficiency was that due to an oversight on ASME NF Boundary Identification, CE did not realize that the method of installation of the hardware must comply with the NF section of the code in regard to the hardware vibration security during service and did not provide any special installation procedure for mounting NF hardware on the instrument racks.

Combustion Engineering has evaluated the locking device deficiency for reportability under the guidelines of 10CFR50.55(e) from both the structural and seismic qualification aspects. Structurally the CE instrument racks are installed either to the biological shield walls or floor slabs.

Neither installation contains any vibration sources, therefore, possibility that a significant number of bolts would loosen during normal operation is unlikely. If some fasteners should become loose, the integrity of the system would not be compromised since both the

racks and the attached instruments are supported in a highly redundant manner (see Reference 1).

The seismic qualification (test reports Bechtel log no. N001-13.03-1036 and N001-13.01-868) of the complete rack assemblies was performed with the components in a tight condition. During these seismic tests the ASME components were installed with only one nut on their fasteners. No failures of the ASME III NF components, supports or fasteners were reported during these seismic tests.

B. Material Identification

The Quality Class "Q" mounting hardware for electric equipment located on the CE transmitter racks was supplied by both CE Avery and Electro Mechanics. These fasteners are Item 31 of the CE Drawing No. 14273-510-011 (Bechtel log no. N001-13.01-728).

James C. White Company provided certification to ASME Code Section III Division I, Subsection NF and certified that the bolting material conformed to ASTM-A193-B8. James C. White procured the bolts from Century Fasteners. The James C. White purchase order to Century Fasteners imposed the requirement that the bolts be type 304 Stainless Steel with bolt heads marked "B-8" and certified to ASTM-A193-B8. Century Fasteners provided a certification to the James C. White Company purchase order, and marked on the front of the Certification of Compliance "B8 Stainless ASTM-A193-B8." CE and James C. White both assumed that Century was the manufacturer of these bolts based on the Certification of Compliance. However, while researching the bolt marking problem, Century Fasteners identified the fact that Bell Fasteners was the manufacturer.

Bell Fasteners reported to CE they are unable to retrieve their Quality Records on this order as their records were destroyed. Bell Fasteners did, however, state in a letter dated June 26, 1985 (Attachment to Reference 3) that the bolts conformed to ASTM-A193 specifications. CE conducted a test on five bolts that James C. White had in stock from the original order. The results of the testing concluded that four bolts conformed to ASTM-A193-B8 AISI 304 specification and one bolt conformed to ASTM-A193-B8M AISI 316 specification. These test results contradicted J. C. White's Certificate of Conformance that all the bolts conformed to ASTM-A193-B8 AISI 304 specifications.

From a Materials point of view, all ASTM-A193 bolts have the same yield and tensile strength, therefore, a safety concern about the mechanical properties of the bolts does not exist. The only material-related problem that does exist is that quality documentation is not available to validate the as-built conditions.

The James C. White Company has also supplied the ASME Section III NF fastener material to the PVNGS project under Bechtel Specification 13-JM-712. The bolting material is to meet the requirements of ASME III Division 1 Subsection NF and Code Case 1644-7. The bolting material specified on the James C. White drawings is ASTM-A307 Grade A except for one drawing (Bechtel log no. J712-9) which specifies S.A.E. Grade 2. This material is equivalent to ASTM-A307 Grade A except for having a slightly higher yield strength (74 KSI vs. 60 KSI).

Based on previous bolting material investigations and the lack of any other material nonconformances concerning the James C. White supplied material, this condition is evaluated as isolated to the CE instrument racks.

The probable cause of this material identification deficiency is poor workmanship, e.g., removal of the bolt head designation by grinding, at either the third tier supplier (Century Fasteners) or the fourth tier supplier (Bell Fasteners). Evidently the original Bell Fasteners were identified with the " ⌟ " mark and then stamped with "B8." The grinding was incomplete and some bolt heads appear to be identified with both the " ⌟ " and the "B8" markings.

II. Analysis of Safety Implications

A. Locking Devices

Based on the evaluation in Section I, the locking device condition is not reportable under the provisions of 10CFR50.55(e) or 10CFR21 since if this condition were to remain uncorrected it would not have presented a significant deficiency or substantial deficiency or substantial safety hazard.

B. Material Identification

The bolt materials supplied by the James C. White Company to CE conform to ASTM-A193 and have the same yield and tensile strength.

Therefore, a safety concern about the mechanical properties of the bolt materials does not exist. It has been determined that no significant deficiency or substantial safety hazard would be caused if this were left uncorrected, so it is not reportable under the requirements of 10CFR50.55(e) or 10CFR21.

III. Corrective Action

A. Locking Devices

Locking nuts have been added to the CE instrument rack mounting bolts by DCPs Nos. 1QJ-SB-050, 2SJ-SB-050, and 3CJ-SB-050. These DCPs were based on information provided by CE in letter V-CE-32236, dated April 11, 1985.

B. Material Identification

The fasteners identified as item 20 on CE Transmitter Rack Drawing 14273-510-011 (Bechtel log no. N001-13.01-728) are being removed and replaced with new fasteners procured to ASTM-A193-B8 requirements. The replacement is being implemented by the following documents:

Unit 1 - EER 85-RC-129

Unit 2 - EER 85-SI-123, SFR/NCR 2XX-5632 and NCR SJ-6025

Unit 3 - NCR SJ-6025 and NCR JC-13-20

Work is expected to be completed prior to fuel load for Units 2 and 3 and by the first outage for Unit 1.

A sample of ASME NF Boundaries indicated by CE documents will be checked to verify adequacy of material identification and proper requirements have been met. Discrepancies will be documented by the appropriate deficiency document.

Bechtel will modify their receipt inspection checklist to perform sample verification of bolting material received to verify material meets code and specification requirements.

IV. References

1. CE Letter V-CE-32236, dated April 11, 1985
2. CE Letter V-CE-32514, dated June 13, 1985
3. CE Letter V-CE-32697, dated August 5, 1985