Arizona Public Service Company
P.O. BOX 21666 • PHOENIX, ARIZONA 85036

March 14, 1984
ANPP-29061-BSK/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: Final Report - DER 83-72
A 50.55(e) Reportable Condition Relating to Undersize Welds in Unit 1 Auxiliary Building Discovered During NRC CAT Inspections
File: 84-019-026; D.4.33.2

Reference: A) Telephone Conversation between P. Narbut and R. Tucker on October 26, 1983
B) ANPP-28287, dated November 28, 1983 (Interim Report)
C) ANPP-28662, dated January 23, 1984 (Time Extension)
D) ANPP-28936, dated February 24, 1984 (Time Extension)

Dear Sir:

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

Very truly yours,

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

EEVB/TRB:db

Attachment

cc: See Page Two

IE-27
1/1

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

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FINAL REPORT - DER 83-72
DEFICIENCY EVALUATION 50.55(e)
ARIZONA PUBLIC SERVICE COMPANY(APS)
PVNGS UNITS 1, 2, & 3

I. Description of Deficiency

Specification 13-CM-320, Rev. 8, Paragraph 9.2, states: "All welds shall be visually inspected, to verify, at least, the following: (a) Welds are correct size, length, and location. (b) No specified weld has been omitted. (c) No unspecified weld has been added without approval, except as otherwise covered in this specification. (d) Cracks in weld or base metal or other discontinuities do not exist."

As the result of NRC CAT Audit 50/528 and a review of NCR CA-4320, a follow-up reinspection of 144 structural welds for steel framing on Unit 1 Auxiliary Building at elevation 51'-6" was performed. The inspection revealed that 18 undersize welds as documented on NCR CA-4366, did not meet the requirements of drawing 13-C-ZAS-500, Rev. 10, but were previously accepted by Quality Control.

As the result of NCR CA-4366, an additional inspection of 204 structural welds at various elevations of Unit 1 Auxiliary Building was conducted. This inspection program revealed 2 more undersize welds and 20 oversize welds, as documented on NCR CA-4415. The nonconforming welds were also previously accepted by Quality Control.

Bechtel Engineering has reviewed the undersize welds based on calculation analysis (13-CC-ZA-0[illegible]), to ensure the non-conforming welds would not constitute a degradation of the structural integrity of the steel framing in the area where the welds appear. The requirement for 5/16" fillet welds on design drawing 13-C-ZAS-500 is not a structural or strength requirement, but rather the minimum size fillet recommended by AISC, 8th Edition, Section 1.17.2.

Bechtel Engineering has reviewed the findings of oversize welds and requested a reinspection to check for weld cracking, conditions of the base material, and any unusual joint distortion. The evaluation of this reinspection is contained in Part II of this report.

II. Analysis of Safety Implications

Reinspection of 348 additional structural welds was completed on November 7, 1983 and the evaluation of observed conditions is as follows:

Twenty of the total 348 welds or approximately 6 percent were found to be oversized. This condition is not safety significant. Oversize welds are of concern when they could result in lamellar tearing of the base metal. Particular concern is given to lamellar tearing when base materials greater than 1 inch in thickness are overwelded. The major purpose of limiting oversized welds on material less than 1 inch thick comes from economical and distortion considerations. The oversized welds identified here have been visually examined for excessive distortion and any indication of lamellar tearing. No cracking or unusual distortion was observed.

Out of the 348 welds inspected, a total of twenty or approximately 6 percent were found to be undersized, eighteen welds were between 1/31" and 1/16" undersized while two were 1/8" undersized. The design margin used for this type of connection is generally about 30 percent. Only a few connections are designed up to the allowable loads.

All design loads for the reinspected weld conditions were approximately 80 percent of the allowable loads. As is expected for the majority of the cases, where design loads approximate allowable loads, margin still exists (e.g., approximately 15 percent which can be demonstrated by testing or dynamic analysis).

A review of the undersize structural steel welds identified by NCRs CA-4320, 4366, and 4415, comprising all the undersize welds identified by the NRC inspection plus those found by the Bechtel reinspection program, have been evaluated for safety significance. The review by Bechtel Engineering found that all identified weld sizing defects could be dispositioned "Use-As-Is" since, if left uncorrected, none of the defects would represent a safety significant condition; therefore, this condition is evaluated as not reportable.

Combining the very conservative design loading requirements, the conservative AISC minimum weld requirements, and results of the reinspections which resulted in all weld defects being dispositioned "Use-As-Is", Bechtel Engineering concludes that the structural and miscellaneous steel welding already completed in Units 1, 2, and 3 is adequate. Based on this evaluation, no additional reinspection of structural steel welds in Units 2 and 3 is warranted.

III. Corrective Action

A. To more clearly define the structural and miscellaneous steel welding and inspection requirements, the following actions have been taken:

1. Specification 13-CM-320 has been revised for clarification and ease of interpretation by Field Change Request (FCR) 71,023-C and 72,146 -C. Specification Change Notice 3568 has been issued. The changes specifically address undersize, oversize welds and undercut requirements, and inspection accept/reject criteria.

2. A revision to the Project Quality Program Manual, Procedure 18.6 - Project Quality Assurance Surveillance has been completed. This revision requires a QA review of structural steel welded connections accepted by QC, based on selective samplings.

3. The FSAR will be revised by SAR Change Notice 1123, which will incorporate the specific welding requirements currently contained in Specification 13-CM-320. The exceptions taken to AWS D1.1-72, Revision 1, 1973 and the justification for the exceptions will be incorporated into the FSAR. This change clarifies the licensing document to incorporate the flexibility permitted by the Code. The change also provides consistency between the implemented practice reflected in the construction specification, as allowed by the Code, and the licensing document.

4. Training Sessions for QC Welding Inspectors were held on October and December 1983 to provide instructions on revised clarifications to Specification 13-CM-320. Training Sessions were also given on the use of fillet weld gauges.

5. Based on acceptable disposition of Unit 1 NCRs CA-4320, 4366 and 4415 as "USE-AS-IS", no reinspection of Unit 2 and 3 structural welds is anticipated.

B. A preliminary review of the following construction specifications has been completed. No conflicts with the SAR have been identified.

Specification No.	Description
13-CM-307	Design Installation, and Testing of Concrete Anchors
13-CM-308	Installation and Testing of Concrete Embeds and Insert Plates

13-CM-340	Field Erection of SS Liner Plate
13-CM-365	Forming, Placing, Finishing, and Curing Concrete
13-CM-370	Containment Building Liner Plate System
13-CM-375	Placing of Reinforcing Steel
13-CM-378	Installation Specification for Drilling Concrete Structure
13-CM-380	Construction Specification for the Containment Units 1, 2, and 3
13-EM-301	Installation Specification for Electrical Cables I Conduit and Duct Bank
13-EM-302	Installation Specification for Cable Tray Hangers
13-EM-304	Installation Specification for Seismic Category 1 Conduit Supports
13-EM-306	Installation Specification for Cable Splicing Termination and Supports
13-JM-702	Installation Specification for Quality Class Q, R, S, Equipment
13-PM-204	Field Fabrication and Installation of Nuclear Piping System

The final, detailed review will be completed by May 1, 1984 and the results will be documented by letter from Bechtel Power Corporation to Arizona Public Service Co. Any potentially reportable conditions found as a result of this review will be documented by issuance of new Deficiency Evaluation Reports, as applicable.