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U. S. Nuclear Regulatory Commission
Region V
Creskide 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

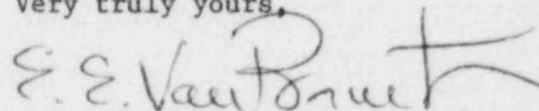
Subject: Final Report - DER 84-16
A 50.55(e) Reportable Condition Relating To ESFAS Relay
Cabinets Baseplates.
File: 84-019-026; D.4.33.2

Reference: A) Telephone Conversation between P. Narbut and T. Bradish on
March 21, 1984
B) ANPP-29239, dated April 6, 1984 (Interim Report)
C) ANPP-29829, dated June 26, 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. Van Brunt, Jr.
APS Vice President
Nuclear Production
ANPP Project Director

EEVB/TRB:db
Attachment

cc: See Page Two

Mr. T. W. Bishop
DER 84-16
Page Two

cc: Richard DeYoung, Director
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FINAL REPORT - DER 84-16
DEFICIENCY EVALUATION 50.55(e)
ARIZONA PUBLIC SERVICE COMPANY (APS)
PVNGS UNITS 1, 2, 3

I. Description of Deficiency

During the Seismic Class I Equipment Field Installation Audit, a deficiency was discovered in the installation of the ESFAS Auxiliary Relay Cabinets located at elevation 140' -0" in the Control Building for Units 1, 2, and 3. The Combustion Engineering (C-E) installation drawing E-SYS80-412-800 calls for 1/4-inch thick horizontal mounting plates, and the installed plates are 1/4-inch thick. However, the ESFAS Qualification Document, N001-1.01-350, Rev. 4, received in October, 1983 after the cabinets were installed, requires 1/2-inch thick mounting plates.

The cabinets were installed with six 1/4-inch thick horizontal mounting plates on both the front and back sides. The back side plates were plug-welded to existing embed plates as permitted by installation drawing E-SYS80-412-800. However, the front side mounting plates were not located over existing embed plates so they could not be plug-welded. Instead, the front side was anchored by fillet-welding the cabinet frame directly to existing embed plates. Therefore, the six mounting plates on the front were not used. This method of anchoring the front side was a modification to C-E installation drawing E-SYS80-412-800, but was approved by Bechtel engineering after an investigation which determined the modification to be equivalent to or stronger than the plug-welded connections. For Unit 1 and 2, the modification was documented by FCR 9621-N, and for Unit 3 the modifications was documented by FCR 75446-N.

Combustion Engineering (C-E) stated that had the cabinets been plug-welded using only the bolt holes in the 1/4-inch thick plates (per E-SYS80-412-800) the installation would not have met seismic requirements (Letter V-CE-30382 dated 13JN84).

Bechtel engineering determined that with the Bechtel-modified installation allowable stresses in the 1/4-inch thick mounting plates on the back side would still be exceeded during a seismic event. (Bechtel Calculation No. 13-CC-ZQ-N01).

The stiffness of the cabinet front side (which is welded directly to the embed) is equal to or greater than that which would be achieved by using 1/2-inch thick mounting plates. If the cabinet back anchorage is stiffened with a 3/8-inch thick vertical plate it becomes equivalent to the 1/2-inch plate used in seismic qualification tests. This single modification to the "as-installed" configuration renders the cabinet mounting acceptable. (Bechtel Calculation No. 13-CC-ZQ-N01).

The as-installed condition of all seismic Class I equipment where installation could alter its seismic response characteristics have been reviewed during the Seismic Class I Equipment Field Installation Audit to verify consistency between the as-installed condition and the respective seismic qualification report. All identified deviations have been analyzed by Engineering and either accepted "as-is" or reworked. Any change in the seismic qualification report initiated by the equipment supplier must be submitted to Bechtel Engineering for review and approval. Bechtel Engineering will initiate any field action required as a result of a vendor change to the seismic qualification report.

II. Analysis of Safety Implications

Both the vendor-recommended installation and the Bechtel-modified installation could, during a seismic event, produce stresses in the mounting plates that could exceed allowable limits and alter the cabinet vibration frequencies which might adversely affect the ability of the instruments and control devices installed inside the cabinets to function properly. These devices are required for essential safety system actuation.

Therefore, the conditions described herein are evaluated as reportable under 10CFR Part 50.55(e) and Part 21 since, if left uncorrected they may have impaired the capability to safely shut down the reactor in case of a SSE.

III. Corrective Action

- A. DCP's, 1SC, 2SC and 3CC-SF-014 were issued to modify the "as-installed" condition in Units 1, 2, and 3 by reinforcing each 1/4-inch thick mounting plate on the back side of the cabinets with a 3/8-inch thick vertical stiffener plate. These DCP's provide the necessary Bechtel revisions to the cabinet installation drawings.
- B. By copy of this DER, Combustion Engineering will be advised of the Project evaluation of their cabinet installation design as reportable under 10CFR Part 21.