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Arizona Public Service Company

August 31, 1984  
ANPP-30414-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: Final Report - DER 82-80  
A 50.55(e) Reportable Condition Relating To Low Insulation  
Resistance Values For Terminal Blocks Supplied By Conax  
Corporation.  
File: 84-019-026; D.4.33.2

Reference: A) Telephone Conversation between T. Young and G. Duckworth on  
December 17, 1982  
B) ANPP-22736, dated January 17, 1983 (Interim Report)  
C) ANPP-23642, dated May 3, 1983 (Time Extension)  
D) ANPP-27619, dated August 23, 1983 (Time Extension)  
E) ANPP-28539, dated January 3, 1984 (Interim Report)  
F) ANPP-28933, dated February 24, 1984 (Time Extension)  
G) ANPP-29351, dated April 24, 1984 (Time Extension)  
H) ANPP-29667, dated June 5, 1984 (Interim Report)  
I) ANPP-30064, dated July 30, 1984 (Time Extension)  
J) ANPP-30269, dated August 17, 1984 (Time Extension)

Dear Sir:

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

Very truly yours,

*EE Van Brunt / rsk*  
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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PDR ADOCK 05000528  
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Mr. T. W. Bishop  
DER 82-80  
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cc: Richard DeYoung, Director  
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U. S. Nuclear Regulatory Commission  
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FINAL REPORT - DER 82-80  
DEFICIENCY EVALUATION 50.55(e)  
ARIZONA PUBLIC SERVICE COMPANY (APS)  
PVNGS UNITS 1, 2, 3

I. Description of Deficiency

Specification 13-EM-035A stipulates that Electrical Penetration Assemblies (EPA) be qualified to IEEE Standard 317-1976. Section 5.2.1 of this standard stipulates that the instrument circuits in EPA be designed to meet the requirements of the instrumentation system in which they are used.

A review of the qualification test report for EPA instrument channel terminal blocks by Conax Corp. has revealed surface conductivity measurements after DBE simulation which directly affect Post Accident Monitoring Instrumentation (PAMI) system performance. The increased surface conductivity resulted from the steam and chemical spray on the exposed terminals during simulation of a MSLB/LOCA event. Subsequent investigation showed that the error contribution of these blocks to the system's performance resulted in errors in excess of those specified for some instrument channels. It is important to note that this does not mean that the terminal blocks were deficient in any manner, but only that their use in certain instrument channels was a misapplication.

II. Analysis of Safety Implications

Information concerning this terminal block problem is contained in NRC IE Information Notice No. 84-47, issued June 15, 1984.

The condition described above does not represent a nonconformance in terms of reportability under the requirements of 10CFR50.55(e) and/or Part 21 because the terminal blocks were (like many other components used throughout the PVNGS) accepted on the condition that:

- 1) by completion of their existing IEEE 323 Environmental Qualification Program, they were later proven to be environmentally qualified; and
- 2) they fall within the system accuracy requirements, i.e., are acceptable for their application.

Condition 1 (Environmental Qualification) was satisfied by testing. For some PAMI applications, given the performance deviations for penetration terminal blocks, Condition 2 was not satisfied.

After environmental qualification testing and a system accuracy evaluation were completed, it was determined that with the existing RTD, pressure and level transmitters, the terminal blocks did not satisfy their portion of the channel error requirements. At that point the conditional acceptability was nullified and for the PAMI RTD, pressure and level transmitters terminal blocks were replaced with environmentally qualified splices which met the system accuracy requirements.

In all other cases, since their demonstrated performance is well within system requirements as determined by the project, the terminal blocks have been left as installed. This terminal block issue was subsequently addressed in NRC IE Notice 84-47.

Based upon the above, this condition is evaluated as not reportable under the requirements of 10CFR50.55(e) and Part 21.

III. Corrective Action

- A. Conax initiated tests which verified that the effects of degraded insulation resistance of terminal blocks could be eliminated by replacing affected EPA terminal blocks with splices utilizing Amps Special Industries' crimp connectors and Raychem's heat shrinkable insulating kits (Ref. 2). The Conax report has been reviewed by C-E and found acceptable (Ref. 3).
- B. One hundred and sixty-eight (56 per unit) RTD, pressure and level transmitter circuits in Units 1, 2, and 3 were identified by C-E as affected by LOCA EPA terminal block insulation resistance (Ref. 4). Design Change Packages 1SE-SB-033, 2SE-SB-033, and 3CE-SB-033 were initiated for replacing these EPA (Kulka) terminal blocks with splices that use Amps Special Industries' crimp connectors and Raychem's heat shrinkable insulators.

The above actions are consistent with the recommendations of NRC IE Information Notice No. 84-47.

IV. References

- 1) Conax Report No. IPS-1011.4 (Bechtel DDC Log No. E035A-599-1) - Design Qualification Functional Test Report for Kulka Terminal Blocks for Class 1E Service for Palo Verde Nuclear Generating Station Units 1, 2, and 3.
- 2) Conax Report No. IPS-1011.6 (Bechtel DDC Log No. E035A-609-1 - Design Qualification Functional Test Report for Splice Termination Assemblies for Class 1E Service for Palo Verde Nuclear Generating Station, Units 1, 2, and 3.
- 3) Combustion Engineering letter V-CE-30392, June 18, 1984, MIC No. 226591.
- 4) Combustion Engineering letter V-CE-19890, March 13, 1984, MIC No. 222581.
- 5) Combustion Engineering letter V-CE-18426, May 18, 1983, MIC No. 208301.
- 6) Bechtel letter B/CE-E-48326, MOC No. 318883, June 5, 1984.
- 7) NRC Information Notice No. 84-47.