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November 9, 1984
ANPP-31090-TDS/TRB

REGION V FILE

U. S. Nuclear Regulatory Commission
Region V
1450 Maria Lane - Suite 210
Walnut Creek, California 94596-5368

Attention: Mr. T. W. Bishop, Director
Division of Reactor Safety and Projects

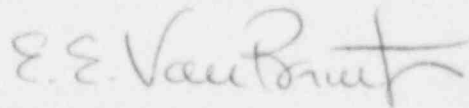
Subject: Final Report - DER 84-69
A 50.55(e) Reportable Condition Relating To Reactor Protection
System Shunt Trip Contacts
File: 84-019-026; D.4.33.2

Reference: A) Telephone Conversation between D. Hollenbach and T. Bradish
on August 29, 1984
B) ANPP-30674, dated September 27, 1984 (Interim Report)
C) ANPP-30931, dated October 23, 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 Production
ANPP Project Director

EEVB/TRB/nj
Attachment

cc: See Page Two

Mr. T. W. Bishop
DER 84-69
Page Two

cc: Richard DeYoung, Director
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FINAL REPORT - DER 84-69
DEFICIENCY EVALUATION 50.55(e)
ARIZONA PUBLIC SERVICE COMPANY (APS)
PVNGS UNITS 1, 2, 3

I. Description of Deficiency

This Deficiency Evaluation Report was initiated as a result of the Reactor Protection System (RPS) Channel "C" initiation relay K3/1530 shunt trip contacts failure to close as required during a startup test.

- A. The RPS initiation relays are energized during normal plant operation. Each of these relays has two pairs of contacts. One pair of contacts is "normally open" and the other pair is "normally closed" while the relay coil is energized. When the coil is de-energized, the contact pairs reverse position. Upon receipt of a reactor trip signal the relay coil is de-energized. This causes the "normally open" contacts to close, thus activating the "Shunt Trip Circuit." Simultaneously the "normally closed" contacts open, thus activating the "Undervoltage Trip Circuit." Either of these trip circuits will open/trip the Reactor Circuit Breaker.
- B. During one phase of pre-operational testing it is required to determine the response time of the "Shunt Trip" path. In order to accomplish this, the "Under Voltage" trip contacts (which are "normally closed" and open upon a trip signal) were jumpered/shorted out in order to maintain a closed position.
- C. During this test the "normally open" shunt trip contacts of the RPS Channel "C" Initiation Relay failed to close, thus failing to open the Channel "C" Reactor Trip Circuit Breaker.
- D. The RPS Channel "C" Initiation Relay is shown as Relay "K3" on Combustion Engineering (C-E) Dwg. No. E-SYS80-411-501: "Plant Protection System Simplified Functional Diagram" (Log N001-13.03-78) and as Relay "1530" on Electro-Mechanics, Inc. Dwg. No. 0000-33051-C: "Plant Protection System Schematic" (Log N001-13.03-1289). The relay is located in Reactor Trip Switchgear Cabinet "C" 1J-SBC-C01, which is furnished by Electro-Mechanics, Inc.
- E. An assembly of this relay and its method of mounting is shown on Electro-Mechanics, Inc. Dwg. No. 6474-33608A: "Plant Protection System Assembly-Relay Enclosure (Log N001-13.03-802; see attached drawing)" Item No. 10 on this drawing is the subject relay. It is a Potter Brumfield Model No. KAl1DG double pole-double throw (DPDT) relay. Item No. 3 on this drawing is a 0.062 inch thick plastic plate that was installed by Electro-Mechanics, Inc. into the Reactor Trip Circuit Breaker cabinet. This plate, with suitable cut-outs, serves as a barrier to separate the various relays in the cabinet. It also acts as a mounting plate for cable clamp "tie downs" that secure the cabling associated with these relays.

- F. After the failure, relay K3/1530 was examined and it was discovered that there was insufficient clearance between the shunt trip relay contacts and the barrier, thus preventing the movable contact from touching the fixed contact. It was also noted that the "normally closed" undervoltage contacts had opened but, since they had been jumpered/shorted for purposes of this particular test, the Channel "C" Reactor Circuit Breaker did not open/trip.

Evaluation

- A. It was determined that a 1/16 inch clearance around the relay would allow the relay contacts to open and close freely. Therefore, this condition was corrected (as per dispositioned Startup Field Report (SFR) No. 1SB-314) by removing some material from the relay barrier to provide a 1/16 inch clearance around all moving parts of the relay. This work was performed as authorized by Startup Work Authorization (SWA) No. 25543. Identical relays K1, K2, and K4 in cabinets 1J-SBA-C01, 1J-SBB-C01, and 1J-SBD-C01 respectively were also modified in the same fashion. Subsequently, all of these relays were re-tested per pre-operational test No. 92-PE-1SB17, Subsection No. 8.5.3, and all were found to function as required.
- B. The root cause of this failure was that Electro-Mechanics, Inc. did not properly install and/or inspect the plastic barrier plate, thus causing the barrier to interfere with the "normally open" shunt trip contacts.

II. Analysis of Safety Implications

If this condition had remained uncorrected, the RPS initiation relay undervoltage contacts would have opened, thus causing the Reactor Circuit Breaker to trip as required for a safe shutdown. Only under the peculiar test circumstances, in which these undervoltage contacts were shorted (not allowed to open electrically), did the relay fail to perform as per design intent. Due to the capacity of this relay to still perform its safety-related function under this condition, this deficiency is evaluated as not reportable under the requirements of 10CFR 50.55(e) and 10CFR Part 21.

III. Corrective Action

- A. The corrective action of removal of barrier material to provide 1/16" clearance around moving parts for Unit 1 relays was implemented via SWA No. 25543.
- B. After corrective action, the relays were tested per pre-op test No. 92-PE-1SB17.
- C. Corresponding relays in Units 2 and 3 will be modified in a like manner per Design Change Packages 2SJ- & 3CJ-SB-047 prior to fuel load of the respective units. Engineering will track this as an open item until the Design Change Packages are issued for implementation.
- D. A copy of this report will be sent to CE to inform them of this evaluation. CE will also be requested to inform Electro-Mechanics, Inc.

