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

June 24, 1983
ANPP-24170-BSK/RQT

50-530

U. S. Nuclear Regulatory Commission
Region V
Creekside Oaks Office Park
1450 Maria Lane - Suite 210
Walnut Creek, CA 94596-5368

Attention: Mr. D. M. Sternberg, Chief
Reactor Projects Branch 1

Subject: Final Report - DER 83-33
A 50.55(e) Potentially Reportable Deficiency Relating to GE AKR-50 Breakers With EC-1 Trips May Have A Generic Defect Which Could Cause A Malfunction.
File: 83-019-026; D.4.33.2

Reference: Telephone Conversation between T. Young and R. Tucker on May 25, 1983

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 Projects Management
ANPP Project Director

EEVB/RQT:ru

Enclosure

cc: See Page 2

1/1 IE-27

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

T. G. Woods, Jr.
G. C. Andognini
J. A. Roedel
D. B. Fasnacht
A. C. Rogers
B. S. Kaplan
W. E. Ide
J. Vorees
J. R. Bynum
P. P. Klute/D. D. Green
A. C. Gehr
W. J. Stubblefield
W. G. Bingham
R. L. Patterson
R. W. Welcher
R. M. Grant
D. R. Hawkinson
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S. R. Frost
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Records Center
Institute of Nuclear Power Operations
1100 Circle 75 Parkway - Suite 1500
Atlanta, Georgia 30339

FINAL REPORT - DER 83-33
POTENTIAL REPORTABLE DEFICIENCY
ARIZONA PUBLIC SERVICE COMPANY (APS)
PVNGS UNIT 3

I. Potential Problem

As documented by APS letter ANPM-16183-JTB/SLK dated 4-29-83 (Attachment 1), General Electric (GE) notified APS of a generic defect in GE model AKR-50 circuit breakers with an EC-1 trip device which could prevent proper operation of the tripping device. GE had previously notified the Nuclear Regulatory Commission of this defect per GE to NRC letter dated 6-15-82 (Attachment 2). Attachment 2 also identifies two additional defects in their model AKR-30 and AKR-50 circuit breakers. APS was notified of these two additional defects per GE Service Advice 175-CPD 9.11, as indicated in APS letter ANPM-16317-JTB/SLK dated 5-18-83 (Attachment 3). This Deficiency Evaluation Report was subsequently initiated to evaluate these three defects, which are described in the following:

1. Failure of AKR-30 and AKR-50 low voltage power circuit breakers to close upon command due to failure of an incompletely hardened steel part in the breaker operator.

2. Failure of AKR-30 and AKR-50 low voltage power circuit breakers to close upon command due to failure of the molded case of a switch in the breaker closing circuitry. The failure is caused by improper curing of the molded case which encloses the switch mechanism.

3. Spurious tripping of AKR-50 low voltage power circuit breakers due to failure of ground break relay components. The failure is caused by a manufacturing defect in the silicon controlled rectifier used in the ground break relay.

The subject breakers are used in the following equipment for each unit at PVNGS:

Breaker	Equipment	Breaker Number	Reference Bechtel Drawing(s)
AKR-50	Class IE Battery Breaker	PKA-M4102	13-E-PKA-002
AKR-50	Class IE Battery Breaker	PKB-M4202	13-E-PKA-005
AKR-50	Class IE Battery Breaker	PKC-M4302	13-E-PKA-004
AKR-50	Class IE Battery Breaker	PKD-M4402	13-E-PKA-007
AKR-30	Reactor Trip Switchgear	TCB-1 and	13-E-SBB-001 and
AKR-30	Circuit Breakers	TCB-2	N001-13.03-166-1

II. Approach To And Status Of Proposed Resolution

1. Defects 1 and 2

The first and second defects described in "Condition Description" (an incompletely hardened steel part in the breaker operator and an imporperly cured molded switch mechanism case, respectively) each result in a failure of the circuit breaker (AKR-30 and AKR-50) to close upon command

For the Class IE battery circuit breakers (model AKR-50), FSAR Technical Specification 16.3/4.8.2.3 (DC Distribution-Operating) requires all four Class IE battery banks to be energized and operable (i.e., capable of performing its design function) for plant operation. Should the Class IE battery breakers fail to close in preparation for startup, the technical specification would not be met, precluding the plant from starting up. During plant operation, these breakers are normally closed and are not operated.

For the reactor trip switchgear circuit breakers (model AKR-30), these circuit breakers must be closed before control rods can be withdrawn and the plant operated. These breakers are only opened after the control rods have been inserted and the reactor is being shut down.

Since these two defects, if left uncorrected, would not adversely affect the safety of operations of the plant during the lifetime of the plant, they are evaluated as not reportable under the requirements of 10CFR50.55(e).

Defect 3

The third defect described in "Condition Description" (a manufacturing defect in the silicon controlled rectifier used in the ground break relay) could result in spurious tripping of the circuit breaker. This defect, which exists in the model AKR-50 breakers, could result in a loss of a Class IE battery, which provides a backup source of power for the Class IE 125V DC power system.

This condition is evaluated as reportable under the requirements of 10CFR50.55(e) since, if left uncorrected, the operation of the safety-related 125V DC system could be impaired and the deficiency represents a significant deviation from performance specifications.

III. Projected Completion of Corrective Action And Submittal of the Final Report

Bechtel Construction will use the nonconformance report system to have the three identified breaker defects corrected prior to fuel load in each unit. The process of sequentially repairing the breakers at GE and at the jobsite is outlined in Attachment 3.

The PVNGS Project also considers "Defect 3" to be reportable under the requirements of 10CFR Part 21. As indicated by Attachment 2, GE has notified the NRC of this defect and this report therefore satisfies all project reporting requirements.

A copy of this report will be transmitted to the Bechtel Construction Manager to assure that the corrective action plan is properly coordinated.

212-00C
rev. 3/80

ARIZONA PUBLIC SERVICE COMPANY

COMPANY CORRESPONDENCE

DATE: April 29, 1983
ANPM-16183 - JTB/SLK

TO: D. B. Fasnacht
Sta. # 6330

FROM: A. C. Rogers
Sta. # 3003
Ext. # 6041

SUBJECT: Failure of GE Model AKR50 125 Breaker DC
File: EM-021

REF: (A) Telephone conversation between D. B. Fasnacht and J. T. Barrow dated April 26, 1983
(B) Telephone conversation between R. Shaw and J. T. Barrow dated April 22, 1983.

As discussed in Reference (A), GE has notified Nuclear Engineering, via Reference (B), that the model AKR-50 breaker with the EC-1 trip (manufactured between 1976 and 1983) has been determined to have a generic defect. They have notified the NRC and made an industry-wide factory recall. This defect may prevent proper operation of the tripping deveice. We have 14 breakers of this type on site (4 per unit and 2 spares). These breakers are for the battery feeders in the following DC Control Centers:

E-PKA-M41
E-PKB-M42
E-PKC-M43
E-PKD-M44

In order to expedite the resolution of this problem with the least impact on the Project Schedule, we propose that the Unit 3 breakers be removed, packaged, and returned to GE as soon as possible. When repaired and returned, these breakers could replace those in Unit 1. These would be shipped to GE and when returned, would be installed in Unit 2. Then the balance of the breakers could be shipped to GE.

Bechtel Construction has indicated that they can not take action on this matter without a written requrest. We request that the necessary action be taken to expedite the shipment of these breakers back to GE since daily delays in shipping could result in additional weeks to the lead time required to make corrections. We need to get at the "front of the line" of the many users of these breakers.

A response to our request is required as soon as possible.

ACR/SLK/sp

Carter

ATTACHMENT 2 to DER 33 (2 pages)

GENERAL ELECTRIC

DISTRIBUTION EQUIPMENT DIVISION

GENERAL ELECTRIC COMPANY, 41 WOODFORD AVENUE, PLAINVILLE, CONN. 06062
Phone (203) 747-7

June 15, 1982

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

Dear Mr. DeYoung:

The Distribution Equipment Division of the General Electric Company has determined that reportable defects exist on certain of its Low-Voltage Power Circuit Breakers and on Ground Break Relay Components. The following is the text of our notification for your use as necessary:

The General Electric Company has recently encountered a limited number of instances where electrically operated AKR-30 and AKR-50 Low-Voltage Power Circuit Breakers failed to close upon command. The cause of failure has been traced to a steel part used in these breakers which was incompletely hardened. As far as we have been able to determine, the percentage of breakers exhibiting this reduced life is small.

The General Electric Company has also recently encountered a limited number of occurrences of a switch used in conjunction with the electrical closing circuitry in AKR-30 and AKR-50 Low-Voltage Power Circuit Breakers failing to operate as intended. This malfunction occurs as a result of improper curing of t'e molded case which encloses the switch mechanism. The mis-operation of this switch results in the possibility that the breaker may not close upon electrical command.

The General Electric Company has also recently encountered a limited number of incidents where Ground Break Relay Components caused the associated circuit breaker to trip without a ground fault having occurred. This erroneous command results from a latent manufacturing defect in the Silicon Controlled Rectifier used in the Ground Break Relay.

While the number of identified failures is small in each instance identified above, and no failures have been reported in Nuclear Class 1E equipment, the General Electric Company has decided to correct these potential problems in all affected Class 1E applications. In all cases, the correction will consist of replacing the suspect parts or components. General Electric Company is in the process of determining the period of time over which the potentially affected devices were manufactured and will soon be contacting the affected nuclear sites to arrange for the corrections at a mutual convenient time.

If you require any further information, please contact me.

Very Truly Yours,

David J. Dixon, Manager
Quality Assurance

clt

(1125P)

rev. 3/80

ATTACHMENT 3 to DER 83-33 (5 pages)

MAY 19 1983
Job 10407

ARIZONA PUBLIC SERVICE COMPANY

COMPANY CORRESPONDENCE

DATE: May 18, 1983
ANPM-16317 - JTB/SLK

TO: J. Vorees
Sta. # 1742

FROM: A. C. Rogers
Sta. # 3003
Ext. # 6041

SUBJECT: AKR-30 and AKR-50 Electrically Operated Circuit Breakers
File: EM-020

REF: (A) AKR-30 and 50 Breaker Recall and Service Advice 175-CPD 9.11 (Attached)
(B) Letter from Norman David to John T. Barrow, dated May 13, 1983 (Attached)
(C) ANPM-16183 - JTB/SLK, dated April 29, 1983

General Electric (GE) has identified possible defects in their electrically operated AKR-30 and AKR-50 circuit breakers. AKR-30 and AKR-50 contain a defective switch and an improperly heat treated part which could result in failure of the circuit breaker to close upon command. The AKR-50 has a defect in the ECI trip device which could prevent proper tripping action.

The AKR-50 must be returned to the factory to correct the ECI trip defect, so GE will correct all the problems at that time. Bechtel Construction, at the request of Nuclear Construction, has developed a program to return the circuit breakers. The first shipment is on its way to GE.

The balance of the defects not associated with the ECI trip will be corrected on site with the assistance of a GE field representative. GE will coordinate this effort with the responsible parties.

No action or response is required by this letter, other than to provide affected groups in Operations and Startup with this information. If you have any questions, contact Steve Kesler at extension 828-6056.

A. C. Rogers

ACR/SLK/sp
Attachment

cc: E. E. Van Brunt, Jr. (w/a)
C. C. Miller "
D. B. Fasnacht "
J. R. Bynum "
J. E. Kirby "
S. M. Moyers "
W. H. Wilson "
J. T. Barrow (w/a)
S. G. Gudeman
G. C. Andognini
J. M. Allen
W. F. Fernow
D. P. Sanchez
W. J. Stubblefield

GENERAL ELECTRIC

WESTERN SERVICE DEPARTMENT
FOSSIL PLANT SERVICES
220 Corporate Center
10040 N. 25th Avenue
Phoenix, AZ 85021
DIAL COMM
8*453-1234

DATE
May 4, 1983

SUBJECT
AKR 30&50 BREAKER RECALL AND SERVICE ADVISE 175-CPD 9.11

COPIES

TELECOPIED: May 9-83
TO: Steve Lessler
FROM: Bob Hopkins

Mr. Steve St. John
Distribution Equipment Divison
41 Woodford Avenue
Plainville, CT 06062

Dear Steve:

The following is a listing of the AKR30 and AKR50 circuit breakers at the Palo Verde Nuclear site as of this date.

	Item	Unit	Tag #	Type	Serial Number	Equip. Class
*	1	1	E-PKA-M41	AK50	N0205740004	1E
*	2	1	E-PKB-M42	AK50	N0205740001	1E
*	3	1	E-PKC-M43	AK50	N0205740003	1E
*	4	1	E-PKD-M44	AK50	N0205740002	1E
**	5	1	E-MBN-E01B	AKR-NB-50	AK08915	Non 1E
***	6	1	J-SBA-C03	AK30	N2689500019	1E
***	7	1	J-SBB-C03	AK30	N2689500011	1E
*	8	2	E-PKA-M41	AK50	N2360810002	1E
*	9	2	E-PKB-M42	AK50	N2390480001	1E
*	10	2	E-PKC-M43	AK50	N2360810003	1E
*	11	2	E-PKD-M44	AK50	N2360810001	1E
**	12	2	E-MBN-E01B	AKR-NR-50F	AK13771	Non 1E

	Item	Unit	Tag #	Type	Serial Number	Equip. Class
***	13	2	J-SBA-C03	AK30	N2689500002	1E
***	14	2	J-SBB-C03	AK30	N2689500015	1E
*	15	3	E-PKA-M41	AK50	N6850640001	1E
*	16	3	E-PKB-M42	AK50	N6850640002	1E
*	17	3	E-PKC-M43	AK50	N6850640003	1E
*	18	3	E-PKD-M44	AK50	N6850640004	1E
**	19	3	E-NBN-E018	AKR-NB-50F	AK27927	Non 1E
***	20	3	J-SBA-C03	AK30	N2689500017	1E
***	21	3	J-SBB-C03	AK30	N2689500008	1E
*	22	Spare (Bechtel)		AK50	N0205740001	1E
*	23	Spare (Bechtel)		AK50	N2360810004	1E
*	24	Spare (Bechtel)		AK50	N8690840001	1E
*	25	Spare (Bechtel)		AK50	N8682800001	1E
*	26	Spare (APS)		AKR-2BE-50	N0661220001	1E

Note: The serial numbers listed may not still be located in the referenced equipment (Tag #) due to removal and replacement for normal maintenance. However, the list does reflect an accurate count to the best of my ability.

* Asterick indicates breakers to be returned to factory.

** Indicates field shorting breakers in Gennerex equipment.

*** Indicates breakers in Combustion Engineering Co. - reactor trip switchgear.

Mr. Steve St. John
May 5, 1983
Page Three

Per our telephone conversation of this date, you will be issuing a return authorization for 8 AK50 breakers listed above on items 15, 16, 17, 18, 22, 23, 24 and 25 and will be sending the authorization to Bob Shaw, EUSD, Phoenix.

When these are checked out and returned, they will be swapped with unit one and unit two breakers (items 1, 2, 3, 4, 8, 9, 10 and 11). These then will be returned along with item 26 for modification. When you issue your second return authorization, it should be for these 9 breakers. Item 26 was received at the site on 4/13/23 as a spare ordered by A.P.S.

It is our understanding that these returned breakers will have all service advices implemented or verified at the factory.

This then will leave items 5, 6, 7, 12, 13, 14, 19, 20 and 21 at Palo Verde Nuclear Station, which will have to have Service Advice 175-CPD 9.11 implemented in the field.

I will require 9 sets of parts to implement this service advice plus instructions. This quantity is only for Palo Verde and does not reflect parts required for non-nuclear users. I will generate this list at a later date.

If you have any questions, or things are not as I have stated, please contact us.

Sincerely,

Norman P. David

Norman P. David
Field Engineering Specialist

NPD/cm

xc: Bob Shaw
Paul Rinne
R. L. Anderson ✓
C. R. Rouse

GENERAL ELECTRIC

APPARATUS AND ENGINEERING SERVICE OPERATIONS
GENERAL ELECTRIC COMPANY • 220 CORPORATE CENTER, 10040 NORTH 25TH AVENUE • PHOENIX, ARIZONA 85021 • (602) 861-1291

May 3, 1983

Arizona Nuclear Power Project
% APS P.O. Box 21666
Phoenix, Arizona 85036
Attn.: John T. Barrow, Jr., P.E.

Subject: AKR-30 and AKR-50 Electrically Operated Circuit Breakers

Our records indicate that you have low voltage switchgear containing General Electric electrically operated low voltage power circuit breakers in Nuclear Power Plant applications. It has come to our attention that electrically operated AKR-30 and AKR-50 circuit breakers manufactured before May, 1980, may contain a defective switch and an improperly heat treated part which, under certain conditions, could result in failure of the circuit breaker to close upon command.

Although we are unaware of any such failures of electrically operated AKR-30 and AKR-50 circuit breakers in Nuclear Power Plant applications, we intend to modify all affected breakers by replacing the affected parts at no cost to you.

We will contact you in the very near future to schedule the appropriate corrective action and whatever support you require will be provided by us at no cost to you

Very truly yours,

Norman P. David

Norman P. David
Field Engineering Specialist

NOTE: AKR 50 Breakers which are being returned to the factory under another service advice because of a defect in the ECI trip device, will have this service advice implemented at that time and will be checked to insure that all past service advices have been implemented.

cc: Bob Shaw, EUSD
Steve St. John, CPPD
Paul Rinne, A&ES,

NPD:rmh