50-528

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

September 26, 1983
ANPP-27895-BSK/RQT

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 83-45
A 50.55(e) Reportable Condition Relating To Cable Separations
In Unit 1 Control Room Panels
File: 83-019-026; D.4.33.2

Reference: (A) Telephone Conversation between P. Narbut and R. Tucker on July 7, 1983
(B) ANPP-27500, dated August 4, 1983 (Interim Report)

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

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

EEVBJr/RQT:sn

Attachment

cc: See Attached 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
D. D. Green/P. P. Klute
A. C. Gehr
W. J. Stubblefield
W. G. Bingham
R. L. Patterson
R. W. Welcher
R. M. Grant
D. R. Hawkinson
L. E. Vorderbrueggen
G. A. Fiorelli
S. R. Frost
J. Self
D. Canady

Records Center
Institute of Nuclear Power Operations
1100 Circle 75 Parkway - Suite 1500
Atlanta, Georgia 30339

FINAL REPORT - DER 83-45

DEFICIENCY EVALUATION 50.55(e)

ARIZONA PUBLIC SERVICE COMPANY (APS)

PVNGS UNIT 1, 2 and 3

I. DESCRIPTION OF DEFICIENCY

During startup testing of Unit 1 some of the class IE panels were found to be in violation of separation requirements for field cabling within enclosures per construction specification 13-EM-306 section 11.0. The conditions occurred during incorporation of modifications within the panels by Bechtel and APS. The reason is attributed to not having and/or implementing specific construction, start-up, and maintenance procedures in regard to separation requirements.

DER 81-53 identified and corrected a similar condition in 1982. As a result of DER 81-53, specification 13-EM-306 Revision 5 was issued to provide revised and clarified separation criteria. At that time, Engineering coordinated the corrective action as documented by IOM-E-9637 and NCR EC-1668 to bring the main control panels into full compliance; however, due to oversights, the clarified specification requirements were not promulgated into the working procedures used by construction, startup, and the station maintenance department.

Subsequently, all safety related cabinets in Unit 1 were inspected for separation requirements on a case by case basis, and the NCR's were issued for cabinets found in violation of separation requirements and the respective NCR's are listed below:

NCR NO.	Cubicle/Equipment
SE-1847	IJ-HCBP-DSL5C
SE-1861	IJ-RMC-B05
SE-2045	IJ-RMN-1306E
SE-2046	IJ-RMB-04A and B
SE-2312	IE-PGE-U36
SE-2313	IE-PBA-S03I
SE-2314	IE-PBA-S03B
SE-2352	IE-PBA-S03P
SE-2315	IE-PBA-S03R
SE-2316	IE-PBB-S04B
SE-2317	IE-PBB-S04I
SE-2318	IE-PBB-S04K
SE-2319	IE-PBB-S04L
SE-2320	IE-PBB-S04R
SE-2321	IE-PGA-L31E
SE-2322	IE-PGA-L33D
SE-2323	IE-PGA-L35D
SE-2324	IE-PGA-L32E
SE-2325	IE-PGB-L32E

NCR No.	Cubicle/Equipment
SE-2326	IE-QBA-V01
SE-2333	IJ-SAA-C01-06
SE-2334	IJ-SAA-C01-08
SE-2329	IJ-SAA-C01-05
SE-2330	IJ-SAB-C01-06
SE-2331	IJ-SAB-C01-07
SE-2332	IJ-SAB-C01-08
SE-2335	IJ-SAA-C03
SE-2336	IJ-SAB-C03
SE-2337	IJ-SAC-C03
SE-2338	IJ-SAD-C03
SE-2339	IJ-SAB-C04
SE-2340	IJ-SAC-C04
SE-2341	IJ-SAD-C04
SE-2342	IJ-SBA-C01
SE-2343	IJ-SBB-C01
SE-2344	IJ-SBC-C01
SE-2345	IJ-SBD-C01
SE-2346	IJ-SBA-C02A
SE-2347	IJ-SBB-C02A/B
SE-2348	IJ-SBC-C02
SE-2349	IJ-SBD-C02
SE-2351	IJ-SQA-C05
SE-2327	IJ-SQB-C01
SE-2350	IJ-SQB-C05
SE-2328	IJ-ZJA-C02A
SE-2380	IJ-RMA-B01
SE-2379	IJ-RMB-B01
SE-2378	IJ-RMA-B02
SE-2377	IJ-RMB-B02
SE-2376	IJ-RMC-B02
SE-2375	IJ-RMD-B02
SE-2374	IJ-RME-B02
SE-2373	IJ-RMA-B03
SE-2372	IJ-RMB/C-B03
SE-2371	IJ-RMD-B03
SE-2370	IJ-RMB-B04
SE-2369	IJ-RMC-B04
SE-2368	IJ-RMD-B04
SE-2382	IJ-RMA-B05
SE-2383	IJ-RM-B/C-B05
SE-2384	IJ-RMA-B06
SE-2385	IJ-RMB-B06
SE-2386	IJ-RMC-B06

NCR No.	Cubicle/Equipment
SE-2387	IJ-RMD-B06
SE-2388	IJ-RMN-B06E
SE-2389	IJ-RMA-B07
SE-2390	IJ-RMB-B07
SE-2391	IJ-RMC-B07
SE-2392	IJ-RMD-B07

II. ANALYSIS OF SAFETY IMPLICATIONS

This condition is evaluated as reportable under the requirements of 10CFR50.55(e). Extensive instances have been identified where electrical isolation and physical separation were inadequate to provide compliance with separation criteria requirements. Therefore, this condition is evaluated as safety significant. In addition, this condition is considered as reportable under the requirements of 10CFR Part 21.

III. CORRECTIVE ACTION

a) NCR's listed in Section I of this DER will be dispositioned to provide compliance with separation requirements of construction specification 13-EM-306 Section 11.

b) Construction WPP/QCI 255.0, APS start-up procedure AD105 and APS maintenance procedure 30AC-9ZZ01 have been revised to specifically reference construction specification 13-EM-306 for separation criteria requirements to preclude recurrence.

c) As documented by APS Corrective Action Request S-83-184-N the respective Engineering, Construction, Startup, Operations, and Quality Control Managers have reviewed this condition and will take action to preclude recurrence. This DER also completes the corrective action required for APS Corrective Action Request C83-94N.

d) Separate inspections for Units 2 and 3 will be scheduled prior to Fuel Load in each unit to identify and correct any cabling separation requirements not in compliance with specification 13-EM-306. All future nonconformance reports generated as a result of these activities will reference this DER.

ATTACHMENT 1 to DER 83-45

Bechtel Power Corporation

Interoffice Memorandum

To W. J. Stubblefield

Subject ANPP Job 10407
Electrical Separation in
Main Control Board

File No. E.11.03
IOM-E-9637 MOC 191507

Date March 23, 1982

From W. G. Bingham

Of Engineering

At LAPD Ext. 539

Copies to W. E. Wilson
F. Herman
R. R. Stiens
K. Soteropoulos
[redacted]
V. Arora
All w/encl.

This will inform you that Engineering has performed a field walkdown to inspect Electrical Separation Problems in Unit 1 Main Control Boards as a result of Field Memo RE-056, dated October 14, 1981.

Project criteria for wire/cable safety separation is based on meeting Regulatory Guide 1.75 and is noted specifically in Specification 13-EM-306, Section 11.0. A minimum of six (6) inches between redundant Class IE field cables or internal redundant Class IE wiring is required when relying on air separation. The safety separation may be reduced to one (1) inch (wire to barrier) if acceptable barriers are utilized. Please be advised that as a result of the field inspection, non-compliances to this criteria were discovered.

To date, only an advance copy of NCR EC-1668, which addresses separation in Main Control Boards but doesn't include all the non-compliances cited during the field walk, has been received by Engineering. Specifics determined at the time of walkdown are enclosed for your information with Electrical's input provided to aid in determining formal dispositions. For cases where separation non-conformances have not been included in NCRs written to date it is suggested that the field perform the necessary modifications with consent of vendor in order to fix the separation deficiencies or issue appropriate NCRs for specific dispositioning.

We would also like to advise that special precautions be taken to avoid similar separation problems in Units 2 and 3 implementations.

W. G. Bingham

WGB:ST:lcc

Enclosure: Separation Non-Conformances in MCB (15 pages, 1 copy)

RECEIVED

MAY 27 1983

STARTUP QA/QC DEPT.

ATTACHMENT 1 to
DER 83-45

aps. CORRECTIVE ACTION REPORT

Classification of Adverse Condition: (See Back of Form)
[X] NONCOMPLIANCE [ ] Deviation

CAR No. S-83-184-N

How Discovered:
[ ] Audit No. _____ [X] Other NCR Processing

Reportability Evaluation: ~~REPORT~~
[ ] Not Reportable [X] RE 83-1345

Organization Responsible:	Date Discovered:	Date Reply Due:
Operations/Startup/Construction	4/18/83	5/18/83

Initiator(s):	Controlling Document:	Discussed With:
D. A. Klinger DAK P. W. Sargent PWS	10 CFR 50, Appendix B, Criterion V "Instructions Procedures and Drawings" and Criterion XVI "Corrective Action"	J. Houchen J. Kelly S. Moyer

Requirement: 10 CFR 50, Appendix B Criterion V states in part: "Activities affecting Quality shall be prescribed by documented instructions, procedures or drawings of a type appropriate to the circumstances, and shall be accomplished in accordance with these instructions, procedures, or drawings."---- (Con't on page 2)

Description of Adverse Condition: Action to preclude recurrence of electrical isolation and separation violations as stated in DER 81-53 has not been effective. Electrical isolation and separation violations continue, as documented by NCR's SE-1861, SE-1847 and S-327-1E. Nonconforming conditions are not promptly corrected, as demonstrated by NCR SE-0546, recorded date of 4/12/82 and remains open. DER 81-53 response to preclude recurrence is "compliance with installation specification 13-EM-306 Rev. 5". (Con't on page 2)

Recommended Corrective Action:

Investigate cause and extent of isolation/separation violations; attach findings. Ensure existing documents specifically and specially identify when isolation/separation work will be involved and procedures provide instructions to meet isolation/separation requirements.

Corrective Action - Including Action to Prevent Recurrence: (See Back of Form)

Reference: B/ANPP-MF-009, dated 5/17/83
Response to CAR S-83-184-N

Prepared By: D A Houchen Authorized By: D A Houchen Date: 5/23/83

Corrective Action Evaluation:

Comments Acceptable X Not Acceptable ____ Verification Required YES X NO ____

Evaluator: D A Houchen Date: 5/27/83

Verification:

Comments Acceptable ____ Not Acceptable ____

Evaluator: _____ Date: _____

aps.

CORRECTIVE ACTION REPORT
CONTINUATION SHEET

CAR No. S-83-184-N

Organization Responsible:	Date Discovered:	Date Reply Due:
Operations/Startup/Construction	4/18/83	5/18/83

Requirement (Con't from page 1):

10 CFR 50 Appendix B, Criterion XVI states in part: "Measures shall be established to assure that conditions adverse to quality, such as---Deficiencies, Deviations---Nonconformances are promptly identified and corrected---Measures shall assure that the cause of the condition is determined and corrective action taken to preclude repetition.---

Adverse Condition (Con't from page 1):

WPP/QCI 255.0 Rev. 12 Cable Terminations, does refer to specification 13-EM-306, however compliance is deficient/indeterminate as evidenced by NCR's.

SWP Procedure AD-105 Rev. 2 does not provide instructions or requirements for Block 11D, separation criteria affected.

Work Control Procedure 30AC-9ZZ01 Rev. 3 does not provide instructions or requirements for work involving cable isolation/separation.

aps.

CORRECTIVE ACTION REPORT
CONTINUATION SHEET

CAR No. S-83-184-N

Organization Responsible:	Date Discovered:	Date Reply Due:
Operations/Startup/Construction	4/18/83	5/18/83

Followup Report Evaluation: 7/13/83

1. Construction responsible items are considered acceptable and no further action is required.

2. Startup responsible items are considered acceptable. A followup report is required when all Startup personnel have had training conducted. Followup report due by 7/22/83.

3. Operations responsible items are considered acceptable. A followup report is required when Revision 4 to 30AC-9ZZ01 has been issued. . Followup report due by 7/22/83.

4. When the audit of the Unit 1 safety related panels is complete, a followup report is required listing SFR/NCR generated. Followup report due by 7/22/83.

5. Final closure of CAR S-83-184-N is pending completion of items 2, 3 and 4 above and the final disposition of DER 83-45.

ATTACHMENT 2 to DER 83-45

Bechtel Power Corporation
Engineers—Constructors

Palo Verde Nuclear Generating Station
P.O. Box 49
Palo Verde, Arizona 85343

B/ANPP-MF-011
June 28, 1983

Arizona Nuclear Power Project
P. O. Box 21666 - Mail Station 3003
Phoenix, Arizona 85036

Attention: Mr. G. E. Pankonin
PVNGS Startup QA/QC Manager

Subject: Arizona Nuclear Power Project
Bechtel Job 10407
CAR S-83-184-N
Follow Up Report
File: Q.32

Reference: 1) APS Letter PVNGS/GEP/M83/320 dated 5/27/83
(Pankonin to Houchen);
Subject: Startup QA/QC Review/Evaluation of Corrective Action Taken to Resolve Deficiency Identified in CAR S-83-184-N

2) BPC Letter B/ANPP-MF-009 dated 5/17/83
(Houchen to Roedel);
Subject: Response to CAR S-83-184-N

Dear Gil:

This follow up report is being transmitted in accordance with your letter (reference 1) and follows the same sequence as given in our response (reference 2.)

1) Bechtel Construction Procedures -

WPP/QCI 255.0 was revised by PCN 45, dated May 19, 1983, to specifically refer to Engineering Specification 13-EM-306 for separation requirements: Refer to attachment #1.

2) APS Startup Procedures -

Startup Procedure AD-105 "Startup Work Permit" was revised by APCN #5 dated June 6, 1983, to reference Engineering Specification 13-EM-306 for field cabling separation within enclosures. Refer to Attachment #2.

Training of Electrical Startup personnel was completed on the procedure revision on June 27, 1983. Training of additional affected personnel will be completed by July 15, 1983.

3) APS Maintenance Procedures -

Work Control Procedure 30AC-9ZZ01, Revision 4, will be issued by July 5, 1983, to reference Engineering Specification 13-EM-306 for field cabling separation within enclosures. Refer to attachment #3 for a draft of the procedure revision.

Training of affected personnel was completed on the draft procedure revision on June 23, 1983.

4) Field Cabling Separation Verification Within Enclosures -

Engineering/Startup have started an audit of the Unit 1 safety related panels using the requirements of Specification 13-EM-306.

The separation problems identified during the audit will be documented on SFR/NCR's and the corrections will be made before fuel load.

Very truly yours,

BECHTEL POWER CORPORATION

J. D. Houchen
Assistant Project Manager

JDH:ba

cc: (See Page 3)

cc: G. C. Andognini
W. G. Bingham
J. R. Bynum
J. D. Hayes
J. E. Kirby
S. M. Moyers
R. K. Nelson
J. A. Roedel
C. N. Russo
W. J. Stubblefield
W. H. Wilson

The following responsible managers have reviewed this response and will follow up on the outstanding corrective action:

W. G. Bingham
Bechtel Project Engineering Manager

J. E. Kirby
APS Startup Manager

J. R. Bynum
APS Manager of Nuclear Operations

ATTACHMENT 3 to DER 83-45

Bechtel Power Corporation
Engineers—Constructors

Palo Verde Nuclear Generating Station
P.O. Box 49
Palo Verde, Arizona 85343

B/ANPP-MF-009
May 17, 1983

Arizona Nuclear Power Project
P. O. Box 21666 - Mail Station 3003
Phoenix, Arizona 85036

Attention: Mr. J. A. Roedel
Corporate Quality Assurance Manager

Subject: Arizona Nuclear Power Project
Bechtel Job 10407
Response to CAR S-83-184-N
File: Q.32

Dear John:

Meetings have been held with Bechtel Engineering, Bechtel Construction, APS Startup, APS Maintenance and APS Startup QA to discuss the subject CAR. The following corrective action is necessary to address field cabling separation within enclosures:

1) Bechtel Construction Procedures

WPP/QCI 255.0, Rev. 12, "Cable Terminations," refers to Engineering Specification 13-EM-306, "Installation Specification for Cable Splicing, Termination and Supports." Specification 13-EM-306 in Section 11.0 sets forth the separation requirements for field cabling within enclosures. These separation requirements are used by Construction QC when inspecting 1E cable terminations and the Field Engineer when inspecting Non-1E cable terminations. Construction has given extensive training on this subject and in their judgment further training is not necessary.

In order to put additional emphasis on field cabling separation within enclosures, WPP/QCI 255.0 will be revised to specifically refer to 13-EM-306 for separation requirements. This procedure revision will be issued by June 1, 1983.

2) APS Startup Procedures

Startup Procedure AD-105, "Startup Work Permit," will be revised to reference WPP/QCI 255.0 and Specification 13-EM-306 for field cabling separation within enclosures. These separation requirements will be used by Startup QC when inspecting 1E cable terminations and the Startup Engineer when inspecting Non-1E cable terminations. This procedure revision will be issued by June 1, 1983, and training will be given to the affected personnel by July 1, 1983.

3) APS Maintenance Procedures

Work Control Procedure 30AC-9ZZ01 will be revised to reference Specification 13-EM-306 for field cabling separation requirements within enclosures. This procedure revision will be issued by June 1, 1983, and training will be given to the affected personnel by July 1, 1983.

4) Field Cabling Separation Verification Within Enclosures

Since the foregoing organizations have been doing wiring and termination work within safety-related panels and separation problems are evident; a program is being developed by Engineering to audit Unit 1 safety-related panels using the requirements of Specification 13-EM-306. The audit team will be led by Engineering with assistance from Startup and Startup QC personnel. The program will be complete by June 15, 1983, and the separation audit/corrections will be complete before fuel load.

A similar audit is planned for Units 2 and 3 after the associated panel modification work is completed.

Please advise me if you have any questions or comments on this response.

Very truly yours,

BECHTEL POWER CORPORATION

J. D. Houchen
Assistant Project Manager

JDH:ba

cc: (See Page 3)

ATTACHMENT 3 to DER 83-45

cc: G. C. Andognini
J. R. Bynum
W. E. Ide
B. S. Kaplan
J. E. Kirby
S. M. Moyers
G. E. Pankonin
T. E. Quiggle
C. N. Russo
W. J. Stubblefield
R. M. Taylor
T. G. Woods
J. L. Zerucha
W. G. Bingham
J. L. Black
W. H. Wilson

The following responsible managers have reviewed this response and will follow-up on the corrective action:

W. G. Bingham
Bechtel Project Engineering Manager

W. J. Stubblefield
Bechtel Field Construction Manager

J. E. Kirby
APS Startup Manager

J. R. Bynum
APS Manager of Nuclear Operations

G. E. Pankonin
APS Startup QA QC Manager