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January 15, 1979

REGULATORY DOCKET FILE COPY

Mr. Boyce H. Grier
Director, Region I
U.S. Nuclear Regulatory Commission
631 Park Avenue
King of Prussia, Pennsylvania 17406

SUSQUEHANNA STEAM ELECTRIC STATION
SUPPLEMENTAL INFORMATION TO INTERIM REPORT OF
FABRICATION DAMAGE TO WIRING ON TERMINATION MODULE
CONNECTORS FOR ACR EQUIPMENT

(REF. PLA-301, NOVEMBER 14, 1978)

DOCKET NO.: 50-397

LICENSE NO.: CPPR-101

ER 100450

FILE 840-4

PLA-313

Dear Mr. Grier:

This will serve to confirm PP&L's report of 1/9/79 (A. R. Sabol, PP&L to NRC Reactor Inspector, A. Finkel) which conveyed supplemental information relative to the subject interim report.

The initial report advised that the deficiency, which was peculiar to termination module connector plugs, was under further investigation. Subsequently, during the process of shortening PGCC cables, it was noted that a high percentage (approximately 30%) of non-safety related cables also exhibited cuts and nicks similar to those reported for the T-modules. These PGCC cables, which were also supplied by G.E., are used to interconnect the ACR panels and the termination cabinets.

Specifically, the deficient conditions noted during the process of shortening the PGCC cables included the following:

- o Conductor insulation nicked or damaged
- o Wires not properly installed or crimped in the connector pins
- o Improper soldering (this involves carrying the cable shield through the connector plugs via a connector pin)

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PENNSYLVANIA POWER & LIGHT COMPANY

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January 15, 1979

Cable shortening of safety-related cables has not yet started and there is no absolute evidence that they are so affected; however, due to problems identified for the high percentage of non-safety related cables, the condition is being projected as generic and, therefore, potentially reportable under 10CFR50.55(e).

The conditions relative to PGCC cable have been identified by Bechtel and are being controlled under NCR-3231 even though the deficiencies concern non-safety related circuits. Bechtel has also documented the conditions in its MCAR-1-29 (attached) and a January 2, 1979, supplement thereto.

You will be advised of further developments as they occur.

Very truly yours,



N. W. Curtis
Vice President-Engineering & Construction

ARS:mcb

cc: Mr. J. G. Davis (15)
Acting Director-Office of Inspection & Enforcement
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

Mr. G. McDonald, Director (1)
Office of Management Information & Program Control
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Washington, D.C. 20555

Mr. Robert M. Gallo (1)
U. S. Nuclear Regulatory Commission
P. O. Box 52
Shickshinny, Pennsylvania 18655



JOB NO. 8856 Q NO. 30.0 DATE 9-29-78

I *DESCRIPTION (Including references):

NCR 3030 was issued 9-28-78 to identify damaged insulation on conductors installed in termination modules located in termination cabinet LTC621. Thirty-nine termination modules were inspected for cut, stripped or damaged insulation on module conductors and thirty-three modules were found with damaged conductors. An average of four to five conductors were determined to be damaged in each terminal module connector inspected. The termination cabinets are supplied by GE under the M-1 NSSS contract.

*RECOMMENDED ACTION (Optional)

1. Construction to perform an investigation to determine the extent of damaged conductor insulation in termination modules not inspected to date.
2. Construction to document nonconformances identified during investigation requested in One above.
3. Project Engineering to advise QA regarding reportability for this deficiency under 10 CFR 50.55e by 10-6-78.

REFERRED TO ENGINEERING CONSTRUCTION QA MANAGEMENT _____
 PROCUREMENT ISSUED BY H.F. Hill 9-29-78
 Project QA Engineer Date

II REPORTABLE DEFICIENCY

NO YES

NOTIFIED CLIENT ** 1-4-79
M.A. Morris 1/4/79
 Project Manager Date

III CAUSE

CORRECTIVE ACTION TAKEN

See attached interim report and interim report supplement.

** PP&L notified
 NRC per PLA-301

AUTHORIZED BY _____
 Date

DISTRIBUTION

- Div. QA Manager
- Mgr. of QA-TPO
- Div. Procurement Mgr.
- Project Manager
- Construction Manager
- Engineering Manager
- Project Engineer
- Proj. Supt./Proj. Const. Mgr. or
- Proj. Procurement Mgr.
- Chief Const. QC Engineer or QE Supervisor or
- Procurement Supplier Quality Mgr. and
- Div. Supplier Quality Mgr.
- QA Supervisor
- Client
- GPD QA Mgr.
- LAPD QA Mgr.

FORMAL REPORT TO CLIENT _____
 (If Section II Applies) Date

CORRECTIVE ACTION IMPLEMENTED

VERIFIED BY _____
 Project QA Engineer Date


* Describe in space provided and attach reference document.

DEC 21 '78 097546

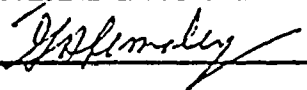
MCAR 1-29
INTERIM REPORT
ON
TERMINATION CABINET - TERMINATION MODULES
DAMAGED CONDUCTOR INSULATION

SUSQUEHANNA STEAM ELECTRIC STATION
UNITS 1 & 2

Prepared by:

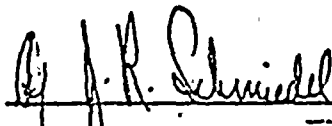


Checked by:

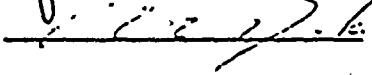


Approved by:

- Project Engineer



- Engineering Manager



BECHTEL POWER CORPORATION

San Francisco, California

December 19, 1978

ATTACHMENT

DEC 21 78 097546

INTERIM REPORT MCAR 1-29 -

Description

NCR 3030 was issued 9/28/78 to identify damaged insulation on conductors installed in termination modules located in termination cabinet 1TC621. Thirty nine termination modules were inspected for cut, stripped or damaged insulation on module conductors and thirty-three modules were found with damaged conductors. Subsequently NCR 3030 was revised to identify approximately 200 damaged T-MODS. An average of four to five conductors were determined to be damaged in each terminal module connector inspected. The termination cabinets are supplied by GE under the M-1 NSSS contract.

Cause

The cause of the damage is attributed to the manual insertion and extraction of terminated pins on connector shells.

Analysis of the Safety Implications

The system design was reviewed and the following was concluded for the worst condition. The deficiency which involves damaged insulation of PGCC T-MODS if undetected or uncorrected could permit shorting or introduction of external voltage sources into safety related circuits which could prevent the circuits from performing the designed safety function. Since the occurrence of damaged insulation is a random thing and could occur in any and all safety related circuits the possibility of a common mode failure exists. The simultaneous degradation and loss of safety-related circuits could result in a safety hazard to the operation of the plant.

Project Engineering has determined the PGCC T-MODS deficiency to be reportable under 10CFR 50.55(e).

Corrective Action

GE San Jose is preparing a repair procedure for the T-MODS. The first 32 are in the process of being totally reworked. The remaining 85 will be shipped to GE San Jose for repair/rework per the above procedure upon completion of a report by GE on the same subject.

Conclusion

Upon completion of the repair/rework and re-test of the T-MODS per GE procedures and criteria, the deficiency will have been corrected and the potential safety hazard will have been eliminated. GE forecasts completion of this effort by February 15, 1979.

SUPPLEMENT TO INTERIM REPORT ON MCAR 1-29Description of Related Cable Problems

Subsequent to the issue of MCAR 1-29 and during the investigation relative to the termination modules located in termination cabinet 1TC621, additional problems were identified.

In letter BCLPC-5105, dated October 3, 1978, SFHO Document Control No. 094517, the Field Construction Manager, Mr. S. Schoenenberger informed PP&L, that on PGCC/ACR, during implementation of General Electric's FDDR-KR1-521, Rev. 0 (Generic Cable Retrofit) rework, it was noted that numerous insulation damages (cuts, nicks and shield solder connections, etc.) were found. Due to the high percentage of damaged cable, the quality of all terminations is rendered indeterminate.

Below is a list of those cables which were found damaged:

- | | |
|------------------|-------------------|
| 1) 7442/C94A-408 | 7) 4113/C94A-744 |
| 2) 7442/C94A-410 | 8) 4113/C94A-714 |
| 3) 7442/C94A-412 | 9) 4119/C94A-736 |
| 4) 7442/C94A-409 | 10) 4128/C94A-806 |
| 5) 7119/C94A-715 | 11) 4112/C94A-733 |
| 6) 4111/C94A-822 | |

In letter BCLPC-5106, dated October 3, 1978, SFHO Document Control No. 094517, the Field Construction Manager, Mr. S. Schoenenberger, also informed PP&L, that on the PGCC/ACR, during implementation of General Electric's FDDR-KR1-521, Rev. 0, (Generic Cable Retrofit) rework, it was noted that one cable #4108/C94A-712 was found to have four (4) conductors pulled out of its pin connectors. The quality of this cable is rendered indeterminate.

The above noted letters, plus BCLPC-5104, dated October 3, 1978 - basically describing the same problem given in the MCAR description - were forwarded to Project Engineering by IOM CME-4066, dated October 17, 1978, SFHO Document Control No. 094517, from the Field Construction Manager. The IOM was provided as an assist in determining possible reportability of cable deficiencies found in the Power Generation Control Complex/Advanced Control Room (PGCC/ACR).

An updated status on T-MOD inspection was provided in TWX CWE-2044, dated 10/30/78, to J. R. Schmiedel from S. Schoenenberger. A copy is attached. This TWX provides additional detail on Bechtel inspection results of the T-MODs in Unit 1.

Nonconformance Report (NCR) 3231 was generated to document the additional items/problems within the PGCC/ACR complex. General Electric (GE) is in the process of preparing an FDI which is to detail a complete inspection plan

SUPPLEMENT TO INTERIM REPORT ON MCAR 1-29
PAGE TWO

and an approved repair procedure (reference IOM Document Control No. 097038 to H. Lilligh from C. Turnbow - copy attached). For types of problems found see pages 3, 4, 5, and 6 of the attached NCR 3231.

The Pennsylvania Power and Light Company (PP&L) issued a letter to Project Engineering, dated November 10, 1978, SFHO Document Control No. 096038, stating their requirements for resolving the PGCC T-MOD problems. A copy is attached. Project Engineering responded to PP&L with a letter BLP-10055, dated November 21, 1978, Document Control No. 096266, providing a Bechtel inspection program as requested by PP&L. A copy is attached.

Cause

The cause of problems associated with the PGCC/ACR, according to GE is established as related to inadequate fabrication technique.

Analysis of Safety Implications

The system design was reviewed and the following was concluded for the worst condition. The deficiency which involves damaged PGCC/ACR cable connectors if undetected or uncorrected could permit shorting or introduction of external voltage sources into safety related circuits which could prevent the circuits from performing the designed safety function. Since the occurrence of damaged cable connectors is a random thing and could occur in any and all safety-related circuits, the possibility of a common mode failure exists. The simultaneous degradation and loss of safety-related circuits could result in a safety hazard to the operation of the plant.

Project Engineering has determined the PGCC/ACR deficiency to be reportable under 10CFR 50.55(e).

Corrective Actions

Corrective actions in the form of Inspection programs by Bechtel and GE are identified in correspondence indicated in the above description and in PP&L letter to Project Engineering, PLB-9354, dated December 14, 1978, SFHO Document Control No. 097413. A copy is attached.

Corrective actions to-date have been basically the initiation of the inspection program and repair-rework procedures. It is currently anticipated that repair or rework of all deficient Unit 1 PGCC/ACR cables are scheduled for completion by February 15, 1979.

SUPPLEMENT TO INTERIM REPORT ON MCAR 1-29
PAGE THREE

Corrective actions to prevent recurrences of like problems in the future including Unit 2 facilities are indicated by GE to be:

- 1) Appropriate training of personnel involved,
- 2) Revision of fabrication techniques,
- 3) Increased/revise inspection activities,
- 4) Assess all Unit 2 PGCC/ACR to assure against similar problems.

Conclusions

Upon completion of the repair/rework and re-test of the PGCC/ACR items per GE procedures and criteria, the deficiencies will be corrected and the potential safety hazard will be eliminated. GE forecasts completion of repair/rework effort by February 15, 1979. Additional GE fabrication personnel training, inspection and revised fabrication techniques should preclude recurrence of similar problems in the future.



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