



Consumers  
Power  
Company

Stephen H. Howell  
Senior Vice President

General Offices: 1945 West Parnall Road, Jackson, Michigan 49201 • (517) 788-0453

January 15, 1979  
Howe 16-79

Mr J G Keppler, Regional Director  
Office of Inspection and Enforcement  
US Nuclear Regulatory Commission  
Region III  
799 Roosevelt Road  
Glen Ellyn, IL 60137

MIDLAND NUCLEAR PLANT -  
UNIT NO. 1, DOCKET NO. 50-329  
UNIT NO. 2, DOCKET NO. 50-330  
ELECTRICAL PENETRATION ASSEMBLY

In accordance with the requirements of 10 CFR 50.55(e), this letter constitutes an interim report on the status of discrepancies found in the inboard terminal boxes of Unit 1 and 2 electrical penetration assemblies.

A description of the discrepancy, potential safety implications, investigation and planned corrective actions are documented in the attachments to this letter.

Another report, either interim or final, will be sent on or before March 31, 1979.

*Stephen H. Howell*

Attachment: 1. Quality Assurance Program, Management Corrective Action Report, MCAR-1, Report 26, dated December 19, 1978.  
2. Letter, P. A. Martinez to G. S. Keeley, BLC 6993, MCAR-26, Interim Report #1, with attached report.

CC: Director of Office Inspection and Enforcement  
Att: Mr. John G. Davis, Acting Director, USNRC (15)

Director of Office of Management  
Information and Program Control, USNRC (1)

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# Bechtel Associates Professional Corporation

CAR 26 INTERIM REPORT 1

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January 8, 1979

Attachment to BLC-6993

## Safety Implication

Most of the discrepancies identified are of a nature that would be suspect to a failure mode. The failure mode would most likely be an electrical circuit disruption. The discrepancies were identified in penetration assemblies for Class 1E circuits. Therefore, a circuit disruption would be classified as a failure of the electrical penetration assembly to perform its intended safety function.

Based on the potential failure mode and resulting safety implication, these deficiencies are considered to be reportable as stated in the MCAR.

## Forecast Date on Corrective Action

A schedule for the corrective actions will be provided in Interim Report .

Submitted by:

J. D. Kovach

Approved by:

[Signature]

Concurrence by:

Earl Wiedner

JK/js

1/5/4

# Bechtel Associates Professional Corporation

MCAR 26 INTERIM REPORT 1

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January 8, 1979

Attachment to BLC-6993

## Probable Cause

Electrical connections are visually checked at random by Bechtel Supplier Quality Representative (SQR) as part of inprocess inspection. Electrical connections are subjected to a 100% electrical check according to the supplier's acceptance test procedure. Electrical tests are randomly witnessed by Bechtel SQR. All verification documents, including the required electrical tests (insulation resistance and continuity) are checked by Bechtel SQR prior to releasing material for shipment. Further investigation is being made to determine why the random check by the SQR did not discover any discrepancies.

The crimping tools which were used for the Midland work were subjected to regular calibration checks and pull tests to verify calibration. Pull tests were randomly witnessed by Bechtel SQR. The records for the calibration and pull test were rechecked in late December 1978 by Bechtel SQR and found satisfactory.

The supplier's QA manual and their acceptance test procedures require inspection and verification of each manufacturing operation. Based on this requirement and in view of the discrepancies identified, it would appear that there was a breakdown in the supplier's quality control program. The supplier (Bunker Ramo-Amphenol Sams Division) will be requested to provide their own assessment of the probable cause of the apparent breakdown in their quality control program.

## Corrective Action

Although all of Midland's presently known electrical penetration assemblies have been delivered to the jobsite, the supplier will be notified to identify corrective action to be taken to prevent recurrence for potential add-on orders.

With regard to the assemblies on the site, investigate the inboard terminal boxes on all penetrations for inadequate terminations and document the findings. Each individual nonconforming termination will be dispositioned accordingly. It is noted that of the total 92 electrical penetration assemblies (46 per unit), 26 assemblies (13 per unit) are designated for Class 1E circuits.

# Bechtel Associates Professional Corporation

Attachment to BLC-6993  
Page 1

SUBJECT:           MCAR 26 (Issued 12/19/78)  
                  Electrical Penetration Assembly, Inadequate Wire Terminations

INTERIM REPORT 1

DATE:             January 8, 1979

PROJECT:          Consumers Power Company  
                  Midland Plant Units 1 & 2  
                  Bechtel Job 7220

## Introduction

This report is submitted to advise regarding the interim status and course of action required pursuant to MCAR 26 and CPCo NCR M-01-4-8-107.

## Description of Discrepancy

Field inspection by CPCo of three installed electrical penetration assemblies revealed the following discrepancies associated with wire terminations located in the penetration assemblies' inboard terminal boxes:

1. Inadequate crimping of lugs - wires pulled out easily
2. Inadequate crimping of lugs - crimps not tight
3. Inadequate crimping of lugs - wires not fully penetrating lug barrel
4. Inadequate crimping of lugs - crimps caught the very tip of wire
5. Inadequate crimping of lugs - barrel of lug collapsed, preventing full wire compression
6. Incorrect type of lug used - insulated lugs specified, but uninsulated types found on some terminations
7. Inadequate termination of lug to terminal block - connections loose on terminal blocks

## Bechtel Power Corporation

777 East Eisenhower Parkway  
Ann Arbor, Michigan

Mail Address: P.O. Box 1000, Ann Arbor, Michigan 48106



January 10, 1979

BLC-6993

Mr. G. S. Keeley  
Project Manager  
CONSUMERS POWER COMPANY  
1945 West Parnall Road  
Jackson, Michigan 49201

Midland Units 1 and 2  
Consumers Power Company  
Bechtel Job 7220  
MCAR 26 INTERIM REPORT 1  
Files 2417/2801

Dear Mr. Keeley:

Transmitted for your information and use is the first interim report submitted for the electrical penetration assembly inadequate wire terminations (MCAR 26).

The next interim report is scheduled for March 15, 1979.

Very truly yours,

A handwritten signature in cursive script, appearing to read "P. A. Martinez".

for P. A. Martinez  
Project Manager

PAM/AEB/pp  
cc: Mr. R. C. Bauman  
Mr. W. R. Bird  
Mr. J. L. Corley

Attachment (3 pages).

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QUALITY ASSURANCE

Description (continued)

1. Terminal box for 2Z113
  - a) Terminals B-17 and K-4 wires pulled easily out of terminal lugs.
  - b) Terminals L-3 and L-8 connections were very loose on terminal block.
2. Terminal box for 1Z129
  - a) Terminals F-1, L-1 and E-15 wires pulled easily out of terminal lugs.
  - b) Terminals C-15 and E-19 have uninsulated lugs installed.
3. Terminal box for 1Z131
  - a) Terminal G-10 wire pulled easily out of terminal lug.
  - b) Terminals J-10, K-1, K-2, K-3, and K-4 - connections were very loose on terminal block.

In addition to these discrepancies, approximately 20% of the wiring in the three terminal boxes exhibited the following:

1. Wires not fully penetrating lug barrel
2. Crimps not tight
3. Crimps caught very tip of wire
4. Barrel of lug collapsed preventing full wire compression.

Note: There are no field inspections required to verify vendors workmanship. After the penetrations are released from the vendors and accepted by Bechtel's shop inspectors the penetrations are shipped to the site for installation.

Recommended Action: (continued)

4. Determine if there was a breakdown in the vendor quality control program and/or the Bechtel shop inspection program.

MANAGEMENT CORRECTIVE ACTION REPORT



Re-typed from tele/copy received MCAR-1  
12/20/78 signed by E. Smith on 12/19/78

REPORT NO. 26

DATE December 19, 1978

JOB NO. 7220

QNO. 3.002

I DESCRIPTION (Including references):

A client inspection of three installed electrical penetrations revealed inadequate crimping of wires located in the penetrations inboard terminal boxes. This has been documented in CPCo NCR M-01-4-8-107 issued 12/19/78. These terminations were done by the manufacturer Amphenol Lams/Dunker Ramo prior to shipment. This inspection as witnessed by Bechtel Field Engineering and Quality Control, identified the following discrepancies:

(see page two)

\* RECOMMENDED ACTION (Optional)

- Determine what effect these discrepancies, if gone undetected, would have on plant safety.
- Investigate the inboard terminal boxes on all penetrations for inadequate terminations and correct accordingly.
- Determine the root cause of the discrepancies and take appropriate corrective action to preclude recurrence.

(see page two)

REFERRED TO  ENGINEERING  CONSTRUCTION  QA MANAGEMENT  \_\_\_\_\_  
 PROCUREMENT

ISSUED BY W. G. [Signature] 12/20/78  
 Project QA Engineer Date

II REPORTABLE DEFICIENCY

NO  YES

NOTIFIED CLIENT 12/21/78 Date  
[Signature] 12/21/78  
 Project Manager Date

III CAUSE

CORRECTIVE ACTION TAKEN

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 DEC 22 1978  
 QUALITY ASSURANCE

AUTHORIZED BY \_\_\_\_\_ Date \_\_\_\_\_

DISTRIBUTION

- Div. QA Manager
- Mgr. of QA-IFO
- 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 QC Supervisor or
- Procurement Supplier Quality Mgr. and
- Div. Supplier Quality Mgr.
- QA Supervisor
- Client

FORMAL REPORT TO CLIENT \_\_\_\_\_ Date \_\_\_\_\_  
 (If Section II Applies)

CORRECTIVE ACTION IMPLEMENTED

VERIFIED BY \_\_\_\_\_ Date \_\_\_\_\_  
 Project QA Engineer

\* Describe in space provided and attach reference document.