



Consumers  
Power  
Company

James W Cook  
Vice President - Projects, Engineering  
and Construction

82-09 #1

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

October 15, 1982

Mr J G Keppler  
Regional Administrator  
United States Nuclear Regulatory Commission  
Region III  
799 Roosevelt Rd  
Glen Ellyn, Illinois 60137

MIDLAND NUCLEAR COGENERATION PLANT  
Docket Nos 50-329 and 50-330  
Quality Program and Manufacturing Deficiencies  
At Victoreen, Inc.  
File: 0.4.9.65 Serial: 19074

This letter provides an interim 50.55(e) report concerning quality program and manufacturing deficiencies affecting radiation monitoring equipment being supplied by Victoreen. This was reported to Mr Wayne Shafer of your staff on September 17, 1982. The attachments to this letter provide a description of the deficiency and the actions being taken to correct the situation.

Another report, either interim or final, will be sent on or before January 7, 1983.

*James W. Cook*

WRB/jln

- Attachments: (1) Bechtel Management Corrective Action Report MCAR-1,  
Report No 60, Dated September 17, 1982
- (2) Bechtel MCAR-60, Interim Report 1, Dated October 14, 1982

CC: Document Control Desk, NRC  
Washington, D.C.

RJCook, NRC Resident Inspector  
Midland Nuclear Plant

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CC: CBechhoefer, ASLB Panel  
RSDecker, ASLB Panel  
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QUALITY ASSURANCE PROGRAM  
MANAGEMENT CORRECTIVE ACTION REPORT  
MCAR-1

Serial 19074  
82-09 #1

JOB NO.: 7220

Q NO.:

REPORT NO.: 60

DATE: 9/17/82

I DESCRIPTION\* (Including References):

Recent audit of Victoreen, Inc. of Cleveland, Ohio performed September 8-10, 1982 revealed that there are deficiencies in the execution of its QA program. 12 of the 19 criteria were identified as deficient, which represents a significant breakdown in the Supplier QA Program. Subsequent inspection by project personnel at the vendor and at Midland Site also revealed that Victoreen Workmanship Standard (con't.)

RECOMMENDED ACTION\* (Optional):

- 1. Engineering Control Systems: a) to evaluate impact of unacceptable workmanship on equipment qualification and life expectancy; b) if these deficiencies would affect the safety operation of the plant; c) take appropriate corrective action to preclude recurrence.
- 2. Supplier QA and Project QA: evaluate breakdown of Victoreen's QA program, determine root cause, and establish required corrective action.

REFERRED TO:  Engineering     Construction     QA Management     Supplier QA  
 Procurement     Project QA

Note: NRC was notified by the client on 9/17/82 that this is "potentially reportable".

ISSUED BY: D. Reia 9/23/82  
for Project QA Engineer Date

II REPORTABLE DEFICIENCY:

NO

YES

NOTIFIED CLIENT: 10/14/82  
Date

[Signature] 10/14/82  
Project Manager Date

III CAUSE:

CORRECTIVE ACTION TAKEN:

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

AAPD DISTRIBUTION  
MGR OF CONSTRUCTION  
MGR OF ENGINEERING  
MGR OF PROCUREMENT  
MGR OF PROJ OPERATIONS  
MGR OF QUALITY ASSURANCE  
CONSTRUCTION MGR  
ENGINEERING MGR  
SUPPLIER QUALITY MGR  
QE SUPERVISOR

PROJ DISTRIBUTION  
CHIEF CONSTR QC ENGR  
CLIENT  
PFOCE  
PROJECT CONSTR MGR  
PROJECT ENGINEER  
PROJECT MGR  
PROJ PROCUREMENT MGR  
SITE MGR

OTHER DISTRIBUTION  
MGR OF QA - TPO  
GPD - QA MGR  
LAPD - QA MGR  
SFPD - 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.

September 17, 1982

MCAR 60

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- I. Operating Procedure S.O.P. 500.002 (Bechtel V.P. 7220-J244-243-2) was not adhered to. This has resulted in nonconforming workmanship on up to 80% of the radiation monitoring system modules being produced by Victoreen. Inadequate in-process quality documentation is also involved. "Stop Process" and "Stop Shipment" orders have been imposed for all safety-related ("Q") equipment. It is possible that the unacceptable workmanship could be detrimental to the equipment's ability to successfully complete the Equipment Qualification Test Program (currently scheduled to commence in November 1982). It is also possible that the unacceptable workmanship could result in a reduction of the predicted reliable life expectancy of the equipment, thereby requiring early replacement of individual modules during normal maintenance periods.

Recommended Action (con't.)

3. Procurement obtain Victoreen implementation of required corrective action.
4. Issue report on or before October 8, 1982.

Management Corrective Action Report (MCAR)

SUBJECT: MCAR 60 (issued September 17, 1982)

INTERIM REPORT No. 1

DATE: October 14, 1982

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

Description of Deficiency

Approximately 80% of the Midland radiation monitoring system electronic modules (1E and non-1E), manufactured by Victoreen, Inc. of Cleveland, Ohio, and reviewed by project personnel, were found to be nonconforming due to workmanship problems because they did not meet the approved Victoreen's Standard Operating Procedure (SOP) 500.002.

Four out of the twelve class 1E radiation monitors were reviewed at the Midland jobsite and were found to have similar nonconforming conditions.

The majority of non-conforming conditions are in the area of soldered connections. The soldered connections were found to have (i) insufficient soldering, (ii) excessive soldering (iii) cold solder joints (iv) excessive heat, (v) capacitor body enamel protruding into the plated through holes, (vi) diode bodies partially embedded in solder, and (vii) flux not cleaned from boards. Also observed were several occurrences of circuit board delamination (measling), contamination on wire wrap connectors, duplicate serial numbers on like modules, lifted circuit foil, excessive insulation removal from jumper wires and components not properly attached mechanically.

Historical Background and Summary of Investigation

During the second week of August 1982, eight of the electronic modules were inspected at the vendors shop by project supplier quality personnel. Numerous occurrences of poor workmanship (rejectable per Victoreen SOP 500.002) were encountered and all electronic modules in the Victoreen plant were rejected for use in the Midland Plant.

During the period September 1 through 13, 1982, MPQAD and Bechtel supplier quality assembled a team of experienced individuals who went to Victoreen to quantify the workmanship problems. The team reviewed 877 modules, of which 730 were found to be nonconforming.

A full scope audit of the suppliers QA program performed on September 8 through 10, 1982, at Victoreen's facility, revealed that there are deficiencies in the execution of its QA program (12 of the 19 criteria were identified as deficient). On September 23, 1982, a sample inspection of workmanship on four of the twelve class 1E radiation monitors shipped to the Midland jobsite was conducted. Nonconforming workmanship was found in all four monitors.

#### Analysis of Safety Implication

There were approximately 1,500 nonconforming conditions found in the four class 1E monitors inspected at the jobsite. This represents approximately 35 deficiencies/module. The class 1E monitors had been conditionally shipped to the jobsite because their qualification was not complete. It is probable that during qualification testing one or more of the deficiencies would have been uncovered. However, had the deficiencies not been discovered and corrected, it is possible that the nonconforming workmanship could have resulted in a reduction of the predicted reliable life expectancy of the equipment resulting in a loss of operability.

The class 1E monitors are designed in a manner such that loss of power or failure of certain components will result in an alarm condition. However, due to the large number of nonconformances, the types of failures and results thereof cannot be analysed. It is considered probable that one or more of the nonconforming conditions could have adversely affected one or more of the class 1E radiation monitors, thereby affecting the safe operation of the plant.

#### Probable Cause

The cause of the poor workmanship appears to be inadequate employee training, inadequate supplier in-process quality inspection, and a breakdown of the supplier's QA program. The following significant areas of deficiencies in the supplier's QA program were noted:

1. Victoreen's QA department failed to review test and inspection documents as required by their SOPs.
2. Victoreen's QA department failed to review their purchase orders and also were delinquent in performing required evaluation of their suppliers.
3. Some of Victoreen's SOPs did not have the required formal sign-off by their Engineering, Manufacturing, and Quality assurance organizations.
4. Victoreen had used several tools/instruments which were not currently recorded in their calibration systems.

Corrective Action

1. A stop further process for inspection and testing activities and a restriction on shipment was placed on all 1E equipment on September 10, 1982, as a result of the audit.
2. On September 23, 1982, MPQAD over-inspected a sample of 4 of 12 class 1E monitors that had been shipped to the jobsite. In the four monitors over inspected approximately 1,500 nonconforming conditions were identified as described in the Analysis of Safety Implication section. These nonconforming conditions are also identified on Consumers Power Company Nonconformance Report M-01-9-2-129. Hold tags were applied to all twelve class 1E monitors. Further inspection was not conducted pending resolution of where the equipment would be repaired.
3. On September 30, 1982, Bechtel project personnel and Victoreen personnel again went to Midland to further investigate the deficiencies. Victoreen concurred with the nonconformances. Corrective action for these are still under development.
4. Bechtel supplier quality met with Victoreen on September 26, 1982, to establish corrective action required by Victoreen to resolve their QA program deficiencies. Victoreen has committed to provide intermediate dates for milestones by November 1, 1982.
5. A project team composed of engineering, supplier quality, MPQAD, quality engineering, and Consumers Power Company design production has been assembled and will visit Victoreen's shop to determine corrective action required to bring the equipment up to acceptable standards according to the approved SOPs.
6. The determination of how 12 Class 1E monitors with numerous nonconformances were shipped to Midland jobsite is under investigation and will be addressed in the next report.

Reportability

Based on the safety implication analysis of this report, the described deficiency is considered reportable in accordance with the code of Federal Regulation 10 CFR 50.55(e).

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Engineering Manager

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Project Quality  
Assurance Engineer

*90B*  
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10/6/1