



Consumers
Power
Company

General Offices: 212 West Michigan Avenue, Jackson, MI 49201 • (517) 788-0550

February 11, 1983

83-02 #1

Mr J G Keppler, Regional Administrator
US Nuclear Regulatory Commission
Region III
799 Roosevelt Road
Glen Ellyn, IL 60137

MIDLAND NUCLEAR COGENERATION PLANT -
DOCKET NOS 50-329 AND 50-330
NSSS AND BOP INSTRUMENT CABINETS
FILE: 0.4.9.74 SERIAL: 20697

This letter is an interim 50.55(e) report on a deficiency in the installation design of certain Class 1E cabinets/panels. This was reported to Mr R Gardner of your staff on January 12, 1983. The attachments to this letter provide a description of the deficiency and the corrective actions being taken to resolve this problem.

Since MCAR 67, Interim Report 1, was issued on January 28, 1983, an additional 8 Class 1E cabinets/panels have been discovered. Because all 8 appear to have insufficient clearances from adjacent equipment or walls, this discovery increases the overall total to 254 cabinets/panels and the number of nonconforming installations to 41. The Project is verifying that all Class 1E cabinets/panels have been identified.

Another report, either interim or final, will be sent on or before May 16, 1983.

JWC/WRB/cd

- Attachments: (1) Management Corrective Action Report MCAR-1, Report 67, dated January 13, 1983.
- (2) MCAR 67, Interim Report 1, dated January 28, 1983.

CC Document Control Desk, NRC
Washington, DC

RJCook, NRC Resident Inspector
Midland Nuclear Plant

FEB 16 1983

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CC: CBechhoefer, ASLB Panel
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101177

QUALITY ASSURANCE PROGRAM MANAGEMENT CORRECTIVE ACTION REPORT

MCAR-1

REPORT NO.: 67

JOB NO.: 7220

Q NO.:

DATE: 1/13/83

I DESCRIPTION* (Including References):

Class 1E electrical control cabinets that are not meant to be physically attached to each other and are seismically qualified independently must not interact with each other or adjacent structures during seismic events. BC-TOP-4A, Section 4.1 states, "The minimum clearance between any two structures, components or equipment is maintained at twice the absolute sum of the predicted displacements of the two items under consideration." (continued on page 2)

RECOMMENDED ACTION* (Optional):

1. Identify all Class 1E electrical cabinets/panels that have the above proximity problem.
2. Analyze the deficiency and take the appropriate corrective actions.
3. Determine the root cause of this deficiency and take appropriate corrective action to preclude recurrence.
4. Issue interim report by January 28, 1983.

REFERRED TO:

☒ Engineering☒ Construction☐ QA Management☐☐ Procurement

ISSUED BY:

D. Reia 1/13/83
for Project QA Engineer Date

II REPORTABLE DEFICIENCY:☐ NO

potentially reportable

☒ YES

NOTIFIED CLIENT:

1/12/83

Alvin B. ... for *A. Rutgers*
Project Manager Date 1/13/83

III CAUSE:

CORRECTIVE ACTION TAKEN:

AUTHORIZED BY: _____

Date

AAPD DISTRIBUTION

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MGR OF ENGINEERING

MGR OF PROCUREMENT

MGR OF PROJ OPERATIONS

MGR OF QUALITY ASSURANCE

CONSTRUCTION MGR

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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.

I. Description (continued)

The Class 1E cabinets in question (including the devices mounted inside) perform required safety functions during and after a seismic event. Because of this, these cabinets are required to undergo a qualification program that demonstrates their ability to function during and after a safe shutdown earthquake at the Midland plant. However, the potential effects of the interaction between adjacent cabinets or structures was not considered during the seismic qualification of the cabinets. Therefore, installation of those cabinets without the minimum separation may cause seismic responses exceeding those in the seismic qualification of the cabinets/panels. The magnitude of these loads and their impact on the ability of these cabinets to perform their safety functions is not defined and therefore could invalidate the cabinet/panel original seismic qualification.

Reference: SCRE 32

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SUBJECT: MCAR 67, Rev 1, issued January 13, 1983
Electrical Control Cabinet/Panel Clearances

INTERIM REPORT 1

DATE: January 28, 1983

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

Introduction

This report addresses a deficiency of the installation design of certain Class 1E cabinets/panels in the Midland plant. The installation design for these Class 1E cabinets/panels did not provide sufficient clearances between adjacent cabinets/panels or building walls to account for deflections during a seismic event. The Class 1E cabinets/panels involved are control panels, instrumentation cabinets, relay cabinets, and motor control centers. The installation design of Class 1E switchgear, power distribution panels, load centers, transformers, battery chargers, and lighting panels were reviewed and found acceptable.

Description of Deficiency

Midland FSAR Subsection 3.2.1.1.1 states:

Seismic Category I structures, components, and systems are designed to withstand the appropriate seismic loads... and other applicable loads without loss of function.

To conform to these criteria, Class 1E electrical control cabinets/panels that are not meant to be physically attached to each other and are seismically qualified independently must not interact with each other or adjacent structures during seismic events. The required clearances have been calculated for the Class 1E cabinets/panels at the Midland plant based on the recommendations of BC-TOP-4A (Topical Report, Seismic Analysis of Structures and Equipment for Nuclear Power Plants,

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Rev 3, November 1974) and were compared to the existing clearances. Those cabinets/panels whose existing clearance is less than that calculated are considered to pose possible safety/qualification problems subject to additional evaluation.

Historical Background and Summary of Investigation

Modifications to the existing design resulted in addition of Class 1E cabinets/panels in the Midland plant. Review of the installation design of these cabinets/panels indicated that clearances should be maintained between the Class 1E cabinets/panels to be consistent with the seismic qualification of the cabinets/panels. An evaluation was performed and an investigation of all Class 1E cabinets/panels was undertaken utilizing as guidelines the recommendations of BC-TOP-4A, which states that the minimum clearance between any two structures, components, or equipment is maintained at twice the absolute sum of the predicted displacements of the two items under consideration. The ensuing investigation consisted of several multidiscipline meetings, discussions with other Bechtel offices, jobsite trips to measure clearances around Class 1E panels/cabinets and to preliminarily measure panel natural frequencies by in-situ testing, review of seismic qualification documents, and calculation of required clearances for Class 1E cabinets/panels. This investigation identified those cabinets/panels with insufficient clearances.

Analysis of Safety Implication

The Class 1E cabinets/panels in question (including the devices mounted inside) perform required safety functions during and after a seismic event. Because of this, these cabinets/panels are required to undergo a qualification program that demonstrates their ability to function during and after a safe shutdown earthquake at the Midland plant. However, the potential effects of the interaction with adjacent cabinets or building walls was not considered during the seismic qualification of the cabinets/panels. Therefore, installation without the minimum clearance may cause impact loads that were not considered in the original seismic qualification of these cabinets/panels. The magnitude of impact loads and their effect on the ability of these cabinets/panels to perform their safety functions is not defined and therefore could invalidate the cabinet/panel original seismic qualification. There is no established analysis or test procedure to evaluate the effect of impact loads on seismic qualification.

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Probable Cause

The probable cause for these problems is the failure to identify the potential for interaction between Class IE cabinets/panels and adjacent cabinets/panels or building walls during a seismic event.

Corrective Action

The problem can be resolved by one of the following methods:

- a. Moving the cabinets/panels to achieve the desired seismic envelop
- b. Providing additional support to the cabinet/panel to make it seismically rigid

There are a total of 246 Class IE cabinets/panels, of which 33 cabinets/panels have been identified as having insufficient clearance from adjacent cabinets/panels or building walls. The installation design for 12 cabinets/panels has been revised to relocate the cabinets/panels. Resolution using method a or b above continues on the remaining cabinets/panels.

Corrective action to preclude recurrence of these problems will be addressed in a subsequent MCAR 67 interim report.

Reportability

Because the seismic qualification of Class IE cabinets/panels with less than the required clearances is indeterminate, we take the conservative position that the original seismic qualification may no longer be valid. Thus, this condition, if uncorrected, could have a potentially adverse effect on the safety of operations in the event of an earthquake at the Midland plant. This condition is considered to be potentially

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reportable under the criteria of the Code of Federal Regulations,
10 CFR 50.55(e).

Submitted by:

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9/84
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