

Date: NOV 17 1978

Serial No.: IE:RCI: 78-05

TRANSFER OF LEAD RESPONSIBILITY

TO: D. B. Vassallo, Assistant Director for Light Water Reactors,
Division of Project Management, NRR

SUBJECT: SETTLEMENT OF DIESEL GENERATOR BUILDING FOUNDATIONS AT
MIDLAND PLANT, UNITS 1 AND 2

RESPONSIBLE ASSISTANT DIRECTOR: G. W. Reinmuth

DESCRIPTION OF ITEM REQUIRING RESOLUTION:

As a result of a recent inspection during the period of October 24-27, 1978 at which time Region III inspectors examined details related to reported settlement, it has become apparent that the magnitude of differential settlement observed by the licensee may be significant.

Information related to the subject of settlement of the diesel generator building foundations was first reported to Region III on September 7, 1978 as a 10 CFR 50.55(e) item. On September 29, 1978 an interim report was submitted. The inspection followed this item the next month.

The FSAR in Table 2.5-14 specifies "controlled compacted cohesive soil" be used as the supporting soils for the Diesel Generator Building, portions of the Auxiliary Building, Borated Water Storage Tank foundation, Diesel Fuel Oil Tank foundation, Radwaste Building and other structures. However, the supporting soil actually used for these structures was random fill material (Zone 2), which is defined as any material free of humus, organic or other deleterious material (Table 2.5-10). The material included sand, silts, clay and lean concrete.

The applicable specifications, procedures and drawings contained conflicting requirements, were at variance with FSAR requirements and/or did not implement recommendations of the architect-engineer's consultant in such areas as: percent compaction requirements, lift thickness, required number of passes with specified equipment and type of fill material.

CONTACT: R. E. Shewmaker, RCI
49-27551

7812280343

NOV 17 1978

The licensee's architect-engineer engaged the services of an additional consultant in the geotechnical engineering area to perform laboratory tests on soil samples obtained during a soil boring program which began on August 25, 1978.

The final results of the investigative soils test program and the recommended alternatives and actions concerning the resolution of this problem were scheduled to be presented to the licensee during the week of November 6, 1978.

While other structures mentioned previously are being monitored and are experiencing settlement, the licensee has characterized these settlements to be not as severe as that of the diesel generator Building.

RECOMMENDATIONS AND PROPOSED COURSE OF ACTION:

1. NRR will evaluate the situation based on current facts to determine whether additional information is needed to assess the acceptability of the plan the licensee intends to execute.
2. NRR will determine the acceptability of the proposed corrective action, if any and advise IE.
3. IE will provide assistance as necessary and will assure compliance with any new or revised requirements.

CONCURRENCE:

for G. W. Reinmuth
G. W. Reinmuth, Assistant Director
Division of Reactor Construction
Inspection, IE

11/17/78
Date

D. B. Vassallo
D. B. Vassallo, Assistant Director
for Light Water Reactors, DPM, NRR

11-17-78
Date

D. B. Vassallo

3

Enclosures:

1. Initial QA Report on Deficiency
2. Interim Report dtd 9/22/78
3. Transmittal ltr., Howell to
Keppler, dtd 9/29/78

cc: w/encls.

R. S. Boyd, NRR
R. J. Mattson, NRR
S. A. Varga, NRR
D. S. Hood, NRR
J. G. Davis, IE
H. D. Thornburg, IE
N. C. Moseley, IE
B. H. Grier, RI
J. P. O'Reilly, RII
J. G. Keppler, RIII
K. V. Seyfrit, RIV
R. H. Engelken, RV
R. E. Heishman, RIII
C. Terney, MPA



I *DESCRIPTION (including references):

The Bechtel "Foundation Data Survey Program" has indicated that the settlement of the Diesel Generator Building has been greater than expected. This has been documented in NCR-1482 dated (8/21/78). A preliminary evaluation of soil boring data from an investigation being conducted by Project Engineering indicated that the magnitude of the investigative tests and analysis of test results makes this item reportable under 10CFR50.55 e, 1, iii.

*RECOMMENDED ACTION (Optional)

1. Determine the amount of settlement of the Diesel Generator Building (DGB) and increase the frequency of foundation survey measurements to find if the settlement is or will be excessive.
2. Determine the cause of the settlement.
3. If the settlement is or will be excessive, determine what actions are required to correct the condition and preclude recurrence.

REFERRED TO ENGINEERING CONSTRUCTION QA MANAGEMENT

ISSUED BY L. A. Dreisbach 9/7/78
Project QA Engineer Date

II REPORTABLE DISCREPANCY NO

YES

NOTIFIED CLIENT 9/7/78
[Signature] Date
Project Manager

III CAUSE

CORRECTIVE ACTION TAKEN

SEP 8 1978
QUALITY ASSURANCE

AUTHORIZED BY _____ Date

- DISTRIBUTION:
- Project Manager
 - Construction Manager
 - Engineering Manager
 - Project Engineer
 - Proj. Supt. / Proj. Const. Mgr. or P & I Procurement Mgr.
 - Chief Field QC Engineer or Procurement Insp. Mgr.
 - QA Supervisor
 - Client

- J.B. Violette
- S.I. Heisler
- L.A. Dreisbach
- J. Arenal (Gaithersburg)
- J.E. Bashore (Norwalk)

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

Enclosure 2

777 East Eisenhower Parkway
Ann Arbor, Michigan

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

September 22, 1978

ELC-6578

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

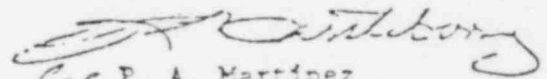
Midland Units 1 and 2
Consumers Power Company
Bechtel Job 7220
MCAR 24 INTERIM REPORT 1
Files 2417/2801

Dear Mr. Keeley:

Attached is Interim Report 1 addressing the Diesel Generator Building Settlement as described in MCAR 24 (issued September 7, 1978).

As agreed with W. R. Bird on September 21, 1978, the next report will be issued November 3, 1978.

Very truly yours,


for P. A. Martinez
Project Manager

PAM/WGM/pp

cc: Mr. R. C. Bauman
Mr. W. R. Bird
Mr. J. L. Corley
Mr. B. W. Marguglio

Attachment (5 pages).

RECEIVED

SEP 25 1978

QUALITY ASSURANCE

Bechtel Associates Professional Corporation

Attachment to BLC-6578

SUBJECT: MCAR #24 (Issued 9/7/78)

Settlement of the diesel generator foundations and building

INTERIM REPORT # 1

DATE: September 22, 1978

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

Introduction

This report summarizes the project's actions relating to the settlement of the diesel generator foundations and building as described in MCAR #24 and NCR 1462.

The fill material in this area was placed between 1975 and 1977. Construction was started on the diesel generator building in mid-1977. The diesel generator building settlements were noticed to exceed anticipated values in July 1978. The diesel generator building construction was placed on hold on August 23, 1978. A diesel generator building soil boring program was started on August 25, 1978. Based on preliminary soil boring data evaluation, MCAR #24 was issued.

The actions requested by MCAR #24 are being performed as follows:

- 1) The Foundation Data Survey Program, Specification 7220-C-76, has been expanded by increasing the number of data locations and the frequency of measurements.
- 2) The cause of the settlement and the corrective actions required to preclude the recurrence of this condition will be addressed after the testing and monitoring programs have been evaluated.
- 3) The options available to resolve the existing settlement conditions will be discussed in the Corrective Actions section.

Bechtel Associates Professional Corporation

MCAR # 24 INTERIM REPORT 1

Page 2

September 22, 1978

Attachment to ELC-6578

Deficiency

The Bechtel Foundation Data Survey Program (Specification 7220-C-76) generated data that indicated the settlement of the diesel generator foundations and building was greater than anticipated. Nonconformance Report 1482 was generated on August 21, 1978, describing the settlements.

The general foundation and building settlements, as of September 19, 1978, are shown on Figure 1 (attached).

Due to the magnitude of the settlements observed, a soils boring program was started. Based on the borings completed to date, the fill under the building has variable strength properties ranging from good to poor.

Further clarification of the fill deficiency will be made when the soil test results have been completed and evaluated.

An independent soils consultant has been retained to help in the data evaluation and feasibility of the corrective actions.

Safety Implications

Large settlements can pose possible safety problems for buildings. A preliminary evaluation of soil boring data from the investigation being conducted indicates that the magnitude of the investigative tests and analysis of test results makes this item reportable under 10 CFR 50.55 e, 1, iii.

These structures are monitored for settlement as part of the foundation data survey program. Hence, any unusual settlement of the structure would be detected before the diesel generators would be rendered inoperable due to the resulting distortions.

Activities in Progress

Several activities are in progress to generate information needed to evaluate the feasibility of possible corrective actions. The activities are:

- 1) The Foundation Data Survey Program has been expanded to include additional settlement data locations as well as monitoring these data locations more frequently. Building time rate of settlement curves are being developed based on this datum for a better understanding of the problem.

Bechtel Associates Professor I Corporation

MCAR 024 INTERIM REPORT 1

Page 3

September 22, 1978

Attachment to BLC-6578

- 2) A boring program has been initiated to provide better definition of the fill conditions under the building and to obtain soil samples for laboratory tests. Dutch cone penetration tests are also being performed under the building area to better define the variable strength properties of the fill material.
- 3) Laboratory tests being performed are:
 - a. Shear strength tests to determine fill characteristic for bearing capacity evaluation.
 - b. Consolidation tests to predict building settlement for the present fill material.
 - c. Soil classifications.
 - d. Mineralogy tests to evaluate the swelling potential of the fill material.

This portion of the Bechtel Report is deleted because it contains a premature discussion of possible corrective action options. Specific options will be included in subsequent reports following a complete evaluation of soil conditions.


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MDAR 624 INTERIM REPORT 1

Page 4

September 22, 1978

Attachment to BLC-6578



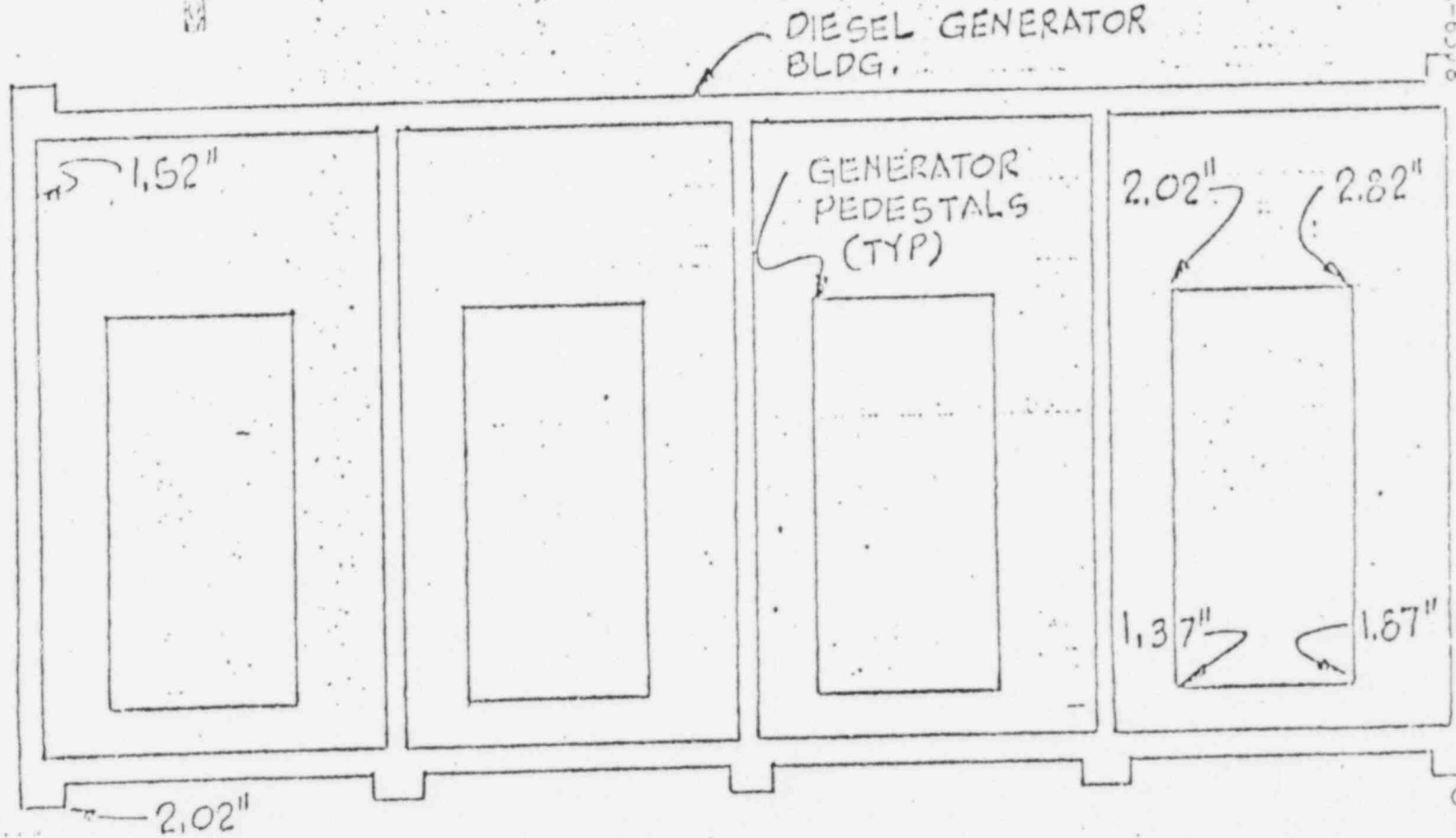
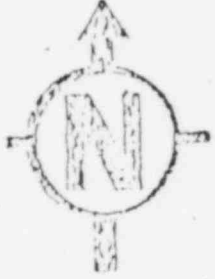
Detailed descriptions of the selected options will be presented in subsequent reports.

Submitted by: B. Charles McConnel
Approved by: J. D. [Signature]
Concurrence by: [Signature]

JH/cap
9/19/78

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Page 5
 September 22, 1978
 Attachment to EIC-6078



	CONSUMER POWER COMPANY MIDLAND PLANTS UNIT 1 AND 2 MC AR # 24
	JOE H. TERRY SPEC. DES. ENGINEER
REVISIONS	NO. DATE
1 ISSUED FOR INFO. TO NCR # 24, INTERIM REPORT # 1	1 9-19-78
2 CHECKED	2 9-19-78
3 APPROVED	3 9-19-78

DIESEL GENERATOR BLDG.
 SETTLEMENT DATA AS OF 9-19-78



Stephen H. Howell
Vice President

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

September 29, 1978
Howe-183-78

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

MIDLAND NUCLEAR PLANT -
UNIT NO 1, DOCKET NO 50-329
UNIT NO 2, DOCKET NO 50-330
SETTLEMENT OF DIESEL GENERATOR FOUNDATIONS AND BUILDING

In accordance with the requirements of 10 CFR 50.55(e), this letter constitutes an interim report on the status of the settlement of the diesel generator foundations and building.

A description of the conditions relative to the settlements and the investigative actions planned are documented in the enclosures to this letter.

Another report, either interim or final, will be sent on or before November 17, 1978.

- Enclosures: 1) Quality Assurance Program, Management Corrective Action Report, MCAR-1, Report 24, dated September 7, 1978.
- 2) Letter, P A Martinez to G S Keeley, BLC-6578, MCAR-24, Interim Report #1, dated 9/22/78, with attached report.

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

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

1978