

PDR



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION III  
799 ROOSEVELT ROAD  
GLEN ELLYN, ILLINOIS 60137

DEC 14 378

Mr. Myron M. Cherry  
One IBM Plaza  
Chicago, Illinois 60611

Dear Mr. Cherry:

This is in reply to your letter of November 20, 1978, concerning the diesel generator building settlement problem at Consumers Power Company's Midland site and your serious assertion that "the resident inspector may have been co-opted by Midland personnel". The information requested by your letter is provided in the enclosure.

I would like to assure you that this office shares your interest in the proper construction of nuclear power plants. Recognizing the history of this project, the NRC has given considerable inspection attention toward verifying that the licensee and its contractors are satisfying applicable regulatory requirements. While some deficiencies in the implementation of the quality assurance programs have been found during construction since the cadwelding suspension in 1973, in our judgment these deficiencies were isolated rather than generic in nature, were resolved in a responsible manner, and did not represent a serious breakdown in quality assurance. In this regard, I have not forgotten the commitments I made before the ASLB in 1974 and will not hesitate to recommend strong enforcement action should a serious breakdown in quality assurance occur.

With respect to the diesel generator building settlement problem, we have not yet determined the basic cause of the problem nor when it occurred. We have initiated an investigation into the circumstances of the settling problem and will base our enforcement actions on the findings from this investigation.

With respect to your assertion regarding the resident inspector, I have referred this matter to our Headquarters for investigation by the NRC's Office of Inspector and Auditor. You will be contacted by that office directly to obtain specific information relative to this matter.

If you have any questions regarding this response, please contact me.

Sincerely,

*James G. Keppier*  
James G. Keppier  
Director

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50-329  
50-330  
H

Myron M. Cherry

- 2 -

DEC 14 378

Enclosure:  
Information Requested by  
Myron Cherry w/attachments

cc w/enclosure and Incoming  
Letter

J. C. Davis, IE

H. D. Thornburg, IE

W. J. Olmstead, ELD

R. Fortuna, OLA

R. S. Boyd, NRR

✓ PDR

Local PDR

1. Requested Information

"In view of the seriousness of this statement<sup>1/</sup> and the enormous sums of money which Consumers continues to spend, I should like a more full explanation, including a submission or a listing of all memorandums, communications, letters and reviews, whether formal or informal, which form the basis for the Region III's conclusions made by you."

Summary Response

The Resident Inspector was initially informed by Consumers Power Company of a possible problem with the settlement of the Diesel Generator Building on August 21, 1978. Subsequently, on September 7, 1978, Region III was informed that the settlement was considered reportable pursuant to 10 CFR 50.55(e). A listing of correspondence generated in connection with this matter is provided as Attachment 1. (Copies of the listed correspondence are provided)

The concerns which prompted me to raise this problem as a potential safety issue can be summarized as follows:

- a. Evidence of settlement in excess of design specifications has been observed with the Diesel Generator Building. This building is a safety related structure in that it houses the emergency diesel generators, which are required to provide emergency power to equipment important to nuclear safety in the event of loss of normal offsite power. Our concern was that proper operability of the diesel generators could be affected by the excessive settlement.
- b. The excessive settlement of the Diesel Generator Building appears to be related to the fact that sufficient compaction of the supporting soil was not achieved. This, in turn, appears to result from random fill material being used to support the structure rather than "controlled, compacted cohesive soils" (FSAR commitment). Several other buildings or portions of foundations are also supported by random fill material. As such, although no excessive settlement of these structures had been observed to date, we are concerned that the potential may exist for excessive settlement which could possibly affect the operability of safety related equipment.

<sup>1/</sup> Statement in memorandum from J. G. Keppler to H. D. Thornburg dated November 1, 1978 --- "In our view, this deficiency has the potential for affecting the design adequacy of several safety related structures at the Midland site."

In that the issue is a design question and one which involves the design criteria initially reviewed and accepted by the NRC, we recommended that this problem be evaluated by the NRC's Office of Nuclear Reactor Regulation --- the NRC Office responsible for assuring that the facility design meets the General Design Criteria contained in Appendix A of 10 CFR Part 50. This transfer of review responsibility was formally completed on November 17, 1978.

2. Requested Information

"Please also tell me how you justify continued construction, in view of this serious breach of quality control, unless, of course, you are content to permit "magic" to ensure safety. I am most concerned over what appears to be a cavalier attitude towards construction. Can it be that your organization (whether intentionally or otherwise and whether conscious or unconscious) is affected by the amounts of money Consumers has spent so that you blind your eyes to reality. If so, you do a disservice not only to the people of the United States but also to the utilities who unfortunately take advantage of such lax enforcement. Do we need a serious accident before enforcement, in your mind at least, equals the importance of monetary investment?"

Summary Response

As discussed in my letter, the NRC has not yet determined fully the fundamental cause(s) that has resulted in the excessive settlement of the Diesel Generator Building --- nor have we established the time frame associated with the problem. We have initiated an investigation to determine the facts associated with the problem and will base our enforcement actions on the findings from this investigation.

With respect to the safety implications of continued construction, the following considerations are important:

- a. The underlying philosophy of the design of nuclear power facilities and the NRC regulation of them is the defense-in-depth concept. This concept consists of three levels of safety involving: (1) the design for safety in normal operation, providing tolerances for system malfunctions, (2) the assumption that incidents will nonetheless occur and the inclusion of safety systems in the facility to minimize damage and protect the public, and (3) the inclusion of systems to protect the public based on the analysis of very unlikely accidents.



In the safety design of nuclear power plants, the objective is to achieve a competent design at each level and for each physical barrier provided to prevent the release of radioactivity from the plant. At the same time, it is realized that, although extensive efforts are made to obtain high quality, perfection can never be achieved because of the normal deficiencies in all processes involving men and materials. In fact, it is the realization that deficiencies will occur that has led the safety design of reactors to be based on the defense-in-depth concept.

Saying it another way, nuclear facilities are protected by exacting standards of design and construction, independent safety systems and redundant safety systems to provide protection in the unlikely event of multiple failures. Because of "defense-in-depth," nuclear reactors do not require perfect performance and perfect quality for the protection of the health and safety of the public.

- b. The excessive settlement problem with the Diesel Generator Building is recognized and will have to be resolved to the satisfaction of the NRC.
- c. The settlement of other safety related structures is within design specifications and is being monitored continuously. As such, there is no problem at this time. However, this matter will be considered as part of the NRC's overall evaluation of this problem.
- d. Excluding this soils foundation problem, which is being investigated, deficiencies identified at Midland since the cadwelding problems (1973-1974) have not been indicative of a serious breakdown in the quality assurance or quality control programs.
- e. The amount of money spent by Consumers Power Company has not been a factor in our inspection and enforcement decisions.

With respect to your comments about what you characterize as our "cavalier attitude towards construction," I want you to know that while public health and safety is not predicated on error-free construction, my staff and I are every bit as concerned as you are that nuclear power plants are built with proper attention to quality. The NRC has the authority to stop construction or operation of a facility if there is sufficient cause to do so

and, in fact, has taken such action at Midland. As you know, I testified before the Midland Atomic Safety and Licensing Board in July 1974: "I want to go on record as saying that it is my position that if the Company fails to live up to its obligations that we're not afraid to step in and stop construction just like we did this time." I continue to stand behind that statement.

3. Requested Information

"In connection with the last mentioned report, page 3 has a significant deletion whereby Consumers Power or Bechtel apparently deleted information submitted regarding what you labeled as a serious safety problem, i.e., the diesel building settlement .... Please let me know whether you plan to follow up with Consumers and obtain the information which they have withheld."

Summary Response

The interim report on the settling of the Diesel Generator Building was submitted in accordance with the requirements of 10 CFR 50.55(e). This regulation provides that an interim report on a reportable deficiency be provided if the final report can not be submitted within the 30-day period.

The written report of a reportable construction deficiency is to include a description of the deficiency, an analysis of the safety implication and the corrective actions taken, and sufficient information to permit analysis and evaluation of the deficiency and of the corrective action. The final report will contain the above information. It should be noted that no corrective action had been taken at the time Consumers Power Company submitted the interim report and, as such, I have no basic problem with the deletion of the preliminary discussion from the Bechtel Report.

My staff has seen the full Bechtel report at the site, including the deleted section. I will assure you that the final report will satisfy the requirements of 10 CFR 50.55(e).

4. Requested Information

"In view of all of these situations I should also like to request advance notice of any inspection which Region III intends to make at the Midland plant, so that either I or a representative on my behalf can make arrangements to be in attendance. If any inspection is to be surprise in nature, I will pledge my confidence to maintain the confidentiality of any such unannounced on-site visitation and inspection. I would appreciate sufficient advance notice to permit me to arrange my schedule so as to conform with any upcoming inspection (or to permit making arrangements for the attendance on my behalf of a representative). Please let me know at your earliest convenience whether such arrangements will be made."

Summary Response

The NRC has, for some time, permitted government representatives or interested members of the public to accompany NRC inspectors during an inspection. To accompany the inspector an individual must agree to follow the "Protocol for Accompaniment on NRC Inspections" (a copy is enclosed)(Attachment 2) and obtain permission from the licensee for access to the site.

The resident inspector is routinely at the site 40 hours a week, and his inspection effort is supplemented by inspections by personnel from the Regional office. The inspections by Regional Office personnel are usually scheduled about a week in advance.

It would not be practical to routinely notify you of inspections sufficiently far in advance to make the necessary arrangements to accompany our inspectors. If you would inform us of the general time you are interested in accompanying our inspectors, we could probably adjust inspection schedules to accomodate you.

Most inspections are not announced to the licensee in advance. Your making arrangements with the licensee to enter the construction site would no doubt indicate an inspection were imminent. In the past, however, this has not proved to be an obstacle in permitting the accompaniment.

Docket No. 50-329  
Docket No. 50-330

CORRESPONDENCE RELATED TO DIESEL GENERATOR BUILDING SETTLEMENT

- 09/07/78 - Verbal notification and tracking form for licensee reports per 10 CFR 50.55(e) (Site inspector notified of possible settlement problem on 8/21/78)
- 09/08/78 - IE Morning Report item
- 09/29/78 - Interim report from licensee, Howell to Keppler
- 10/24/78 - Acknowledgement letter for 9/29/78 interim report
- 11/01/78 - Memo, Keppler to Thornburg, w/attachments requesting transfer of lead responsibility
- 11/03/78 - Transmittal letter, Appendix A, and IE Report Nos. 50-329/78-13 and 50-330/78-13
- 11/03/78 - Memo, Olmstead to Vassallo
- 11/07/78 - Second interim report from licensee, Howell to Keppler
- 11/08/78 - Transmittal letter and IE Report Nos. 50-329/78-14 and 50-330/78-14
- 11/09/78 - Memo, Thornburg to Gower
- 11/13/78 - Memo, Vassallo to Engelhardt
- 11/13/78 - Memo, Bryan to Vassallo
- 11/17/78 - Transmittal letter and IE Report Nos. 50-329/78-12 and 50-330/78-12
- 11/17/78 - Transfer of lead responsibility, Reinmuth (IE) to Vassallo (NRR)
- 11/22/78 - Acknowledgement letter for 11/7/78 interim report

LICENSEE REPORTS PER 10 CFR 50.55(e)

SECTION I - INFORMATION

FACILITY Midland TIME 1600 DATE 7 Sept. 1978  
PERSON CALLING W. Bird / J. Cooley PERSON RECEIVING P. J. Cook  
EVENT DATE AND DETAILS Diesel generator foundation and structures have settled more than anticipated - soil compaction is less than originally installed.

FINAL/INTERIM REPORT DUE 7 Oct., 1978 RECEIVED \_\_\_\_\_

SECTION II - NOTIFICATION

- MORNING REPORT  PAO  HQ  PN
- OTHER \_\_\_\_\_
- INSPECTOR/TEAM DISPATCHED TO SITE

SECTION III - ASSIGNMENT

- EVALUATE REPLY  EVENT LATER DETERMINED NOT REPORTABLE
- CONDUCT VERIFICATION INSPECTION

OTHER INFORMATION/INSTRUCTIONS

lead responsibility transferred to NER  
Ref - Memo 11/1/78 Koppke to Thornburg  
Memo 11/7/78 Remmick to Vassallo  
JUT

ASSIGNED  PROJECT  ENGINEERING I  ENGINEERING II

DATE \_\_\_\_\_ INSPECTOR \_\_\_\_\_

REQUIRED COMPLETION DATE \_\_\_\_\_

SECTION IV - CLOSEOUT

- ADEQUATE REPLY RECEIVED NO VERIFICATION INSPECTION

COMPLETED BY \_\_\_\_\_ DATE \_\_\_\_\_

09/08/78

Daily Report-RIII

Facility/Licensee

Notification

Item or Event

Regional Action

CONSTRUCTION

General

K. D. Ward is attending the Steam Generator Conference in HQ on 9/7-8/78.

Information.

Clinton

Telephone-9/7/78

RIII was informed that the licensee had essentially completed its investigation of Husky Products, Incorporated. Their review included a week's audit of Husky at the vendor site, as well as inspection and test of components received at the site. Their conclusion was that no allegation items were substantiated.

Information. Regional investigation to begin with Clinton week of 9/11/78.

Tyrone Energy Park

Radio-9/7/78;  
Telephone to NSP-  
9/8/78

Occupation of Tyrone site occurred on 9/6/78, in Wisconsin by a group of 25-to-40 people, calling themselves the Tyrone National Guard, who are against the building of a nuclear power plant there. No construction has started at the site, with the exception of a test well that is being drilled.

Information.

Midland 1 & 2

Resident Inspector

It has been determined that the compaction of soils under and around the diesel generator building is presently less than when originally installed. This has resulted in a greater amount of settlement of the diesel generator foundation and structures. Additional exploration and evaluation is being performed by the licensee and contractor. This matter is being reported pursuant to 50.55(e).

Routine followup.



UNITED STATES  
NUCLEAR REGULATORY COMMISSION

Stephen M. Howell  
Vice President

General Offices: 1945 West Parnell 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, ELC-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)

SEP 29 1978



QUALITY ASSURANCE PROGRAM  
MANAGEMENT CORRECTIVE ACTION REPORT  
MCAR-1



REPORT NO. 24

JOB NO. 7220 Q NO. 1.40 DATE 9/7/78

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

III CAUSE

CORRECTIVE ACTION TAKEN

SEP 8 1978  
QUALITY ASSURANCE

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

DISTRIBUTION:

Project Manager	J.B. Violette
Construction Manager	S.I. Heisler
Engineering Manager	L.A. Dreisbach
Project Engineer	J. Amaral (Gaithersburg)
Proj. Supt. / Proj. Const. Mgr.	J.E. Bashore (Norwalk)
or P & I Procurement Mgr.	
Chief Field QC Engineer	
or Procurement Insp. 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.

Enclosure 2  
Howe-183-78

# Bechtel Power Corporation

777 East Eisenhower Parkway  
Ann Arbor, Michigan

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



September 22, 1978

BLC-6578

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

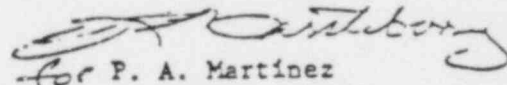
Midland Units 1 and 2  
Consumers Power Company  
Bechtel Job 7220  
MCAR 24 INTERIM REPORT 1  
Files 2417/2801

Dear Mr. Keeley:

Attached is Interim Report 1 addressing the Deisel 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 1482.

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 BLC-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 Professional 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.

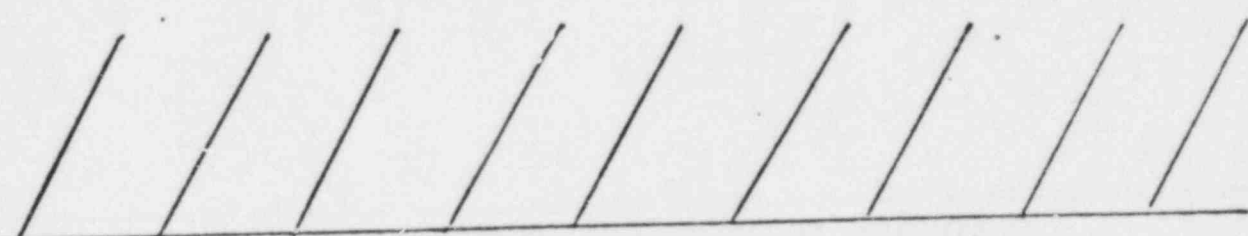
# Bechtel Associates Professional Corporation

MCAR 024 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 Mc Cormel*

Approved by:

*J.P. [Signature]*

Concurrence by:

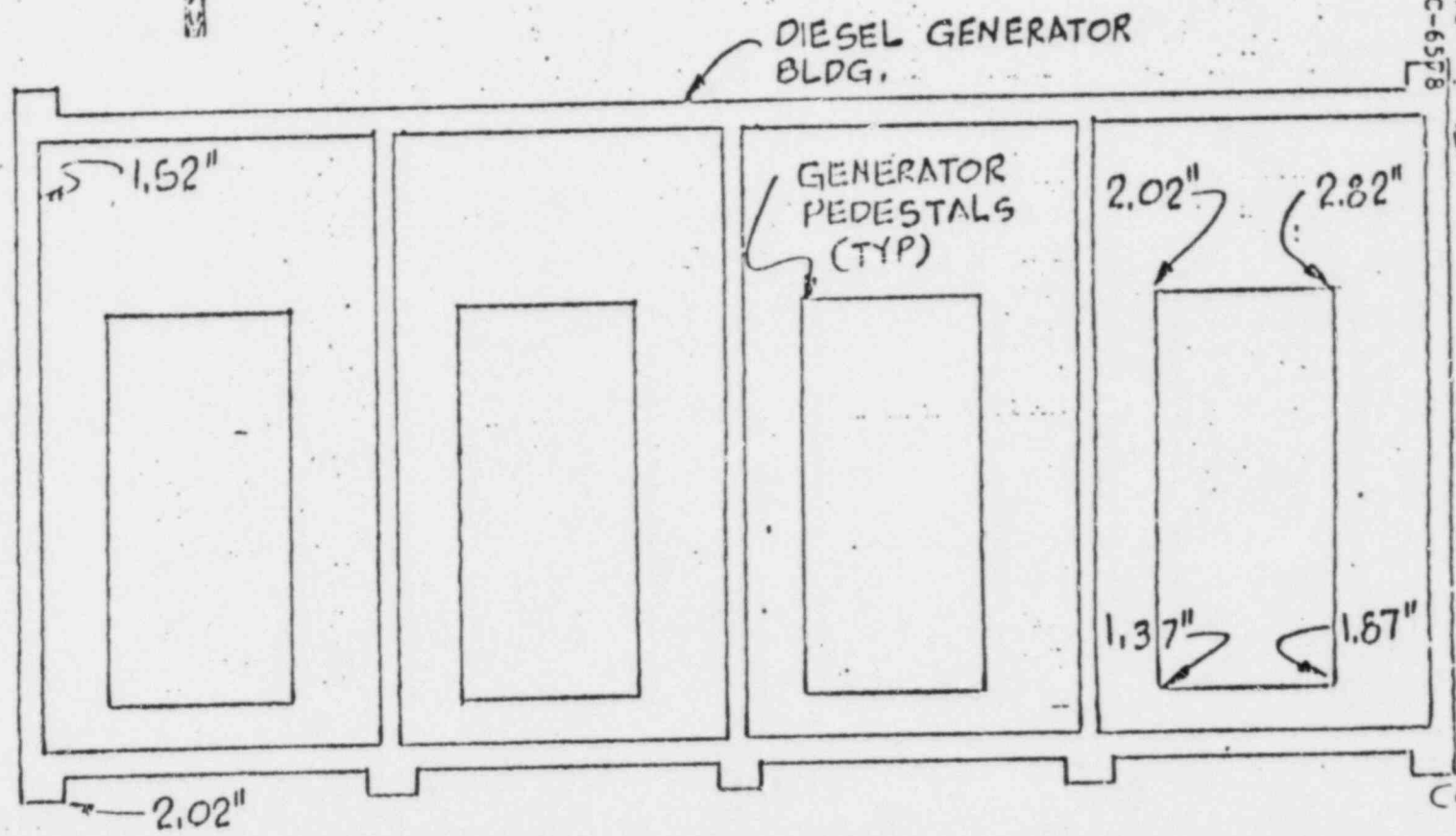
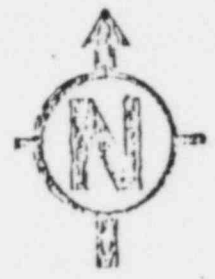
*[Signature]*

JH/cap

9/19/78

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MCAR 24 INTERIM REPORT 1  
 Page 5  
 September 22, 1978  
 Attachment to BLC-6578



DIESEL GENERATOR BLDG.  
 SETTLEMENT DATA AS OF 9-19-78  
 (IN INCHES)

NO.	DATE	REVISIONS	
1	9-22-78	ISSUED FOR INFO. TO MCAR # 24 INTERIM REPORT # 1	
ORIGIN		 CONSUMERS POWER COMPANY MIDLAND PLANTS UNIT 1 AND 2 MCAR # 24	
JOB NO.	REV.	BY	CHKD.
7830			
SPEC. DES. GUIDE NO.	FIGURE 1		

SHEET 1 OF 1



OCT 24 1978

Docket No. 50-329  
Docket No. 50-330

Consumers Power Company  
ATTN: Mr. Stephen h. Howell  
Vice President  
1945 West Farnall Road  
Jackson, MI 49201

Gentlemen:

Thank you for your interim report dated September 29, 1978, pursuant to 10 CFR 50.55(e) regarding Settlement of Diesel Generator Foundations and Building. We will review your final report on this matter upon receipt.

Your cooperation with us is appreciated.

Sincerely,

R. F. Heishman, Chief  
Reactor Construction and  
Engineering Support Branch

cc: Central Files  
Reproduction Unit NRC 20b  
PDR  
Local PDR  
NSIC  
TIC  
Donald Callen, Michigan Public  
Service Commission  
Dr. Wayne E. North  
Myron M. Cherry, Chicago



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION III  
788 ROOSEVELT ROAD  
GLEN ELLYN, ILLINOIS 60137

November 1, 1978

Docket No. 50-329  
Docket No. 50-330

MEMORANDUM FOR: H. D. Thornburg, Director, RCI, IE  
FROM: James G. Keppler, Director, RIII  
SUBJECT: MIDLAND 1 AND 2 - EXCESSIVE SETTLEMENT OF  
DIESEL GENERATOR BUILDING FOUNDATIONS (A/I F30437H1)

Pursuant to 10 CFR 50.55(e), Consumers Power Company (CPC) notified RIII on September 7, 1978 that the settlement of the Diesel Generator Building foundations was greater than anticipated and, therefore, a soils boring program was started to determine the cause and extent of the problem. A copy of CPC's report is attached.

An inspection was conducted at the Midland site on October 24-27, 1978 to review this matter, and the results will be documented in Inspection Report No. 50-329/78-12; 50-330/78-12. The following summarizes the pertinent inspection findings:

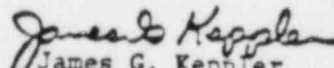
1. The excessive total and differential settlements of the Diesel Generator building foundation and generator pedestals appear to be the result of several contributing factors. These are: variable properties of random fill material used to support the structure, influence of condensate piping and electrical conduit banks under a portion of the building, percent compaction requirements, raising the natural ground water level approximately 20 feet by filling the cooling water pond, and the design and construction sequence of the generator pedestals and spread footing foundations for the building.
2. The FSAR specifies "controlled, compacted cohesive soils" 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. The material included sand, silts, clay and lean concrete.

November 1, 1978

3. The applicable specifications, procedures and drawings contained conflicting requirements, were at variance with FSAR requirements and/or did not implement recommendations of the A-E's consultant (Dames & Moore) in such areas as: percent compaction requirements, lift thickness, required number of passes with specific equipment and type of fill material.
4. Settlement of the structures listed in paragraph 2 above has been observed, and it continues to be monitored along with that of the Diesel Generator Building. The A-E category of the settlement of these structures as not as severe as that of the Diesel Generator Building at this time.
5. The A-E has contracted Goldberg, Zoino, Dunnicliff & Associates (Consultant in Geotechnical Engineering) to perform laboratory tests on soil samples obtained during the soils boring program including a series of soils classification tests and determination of engineering soils properties.
6. The final results of the A-E's investigative soils test program and the A-E's recommended alternatives and actions concerning the resolution of this problem are scheduled to be presented to CPC during the week of November 6, 1978. CPC is desirous of making a presentation concerning their plans on this matter to the NRC approximately one week after the meeting with their A-E.

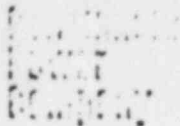
In our view, this deficiency has the potential for affecting the design adequacy of several safety related structures at the Midland site. As such, we believe that the responsibility for evaluation and resolution of this problem should be transferred to NRR since their evaluation of the application is in progress. Additionally, we believe that this deficiency is relevant and material for Board notification pursuant to MC 1530 and, therefore, recommend that this matter be forwarded to NRR for Board notification.

If you have questions or comments, please contact us.

  
James G. Keppler  
Director

Enclosure:  
Letter from CPC  
dtd 9/29/78

cc w/encl:  
J. G. Davis  
G. W. Reinmuth



Stephen H. Howell  
Vice President

General Offices: 1945 West Farnhall 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, ELC-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



QUALITY ASSURANCE PROGRAM  
MANAGEMENT CORRECTIVE ACTION REPORT  
MCAR-1

REPORT NO. 24

JOB NO. 7220

Q NO. 1.40

DATE 9/7/78

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 W. Dreisbach 9/7/78  
Project QA Engineer Date

II REPORTABLE DISCREPANCY  NO  YES  
NOTIFIED CLIENT 9/7/78 9/7/78  
Date Date  
Robert...  
Project Manager

III CAUSE  
CORRECTIVE ACTION TAKEN

SEP 8 1978  
QUALITY ASSURANCE

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

DISTRIBUTION:  
Project Manager J.B. Violette  
Construction Manager S.I. Heisler  
Engineering Manager L.A. Dreisbach  
Project Engineer J. Amara (Gaithersburg)  
Proj. Supt. / Proj. Const. Mgr. J.E. Bashore (Norwalk)  
or P & I Procurement Mgr.  
Chief Field QC Engineer  
or Procurement Insp. Mgr.  
QA Supervisor  
Client

FORMAL REPORT TO CLIENT \_\_\_\_\_ Date \_\_\_\_\_  
(If Section II Applies)  
CORRECTIVE ACTION IMPLEMENTED  
VERIFIED BY \_\_\_\_\_ Date \_\_\_\_\_  
Project QA Engineer

Enclosure 4  
Howe-183-78

# Bechtel Power Corporation

777 East Eisenhower Parkway  
Ann Arbor, Michigan

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



September 22, 1978

BLC-6578

Mr. G. S. Keeley  
Project Manager  
CONSUMERS POWER COMPANY  
1945 West Farnall 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/WQM/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 1482.

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 BLC-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 Professional Corporation

MCAR #24 INTERIM REPORT 1

Page 3

September 22, 1978

Attachment to ELC-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 characteristics 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.

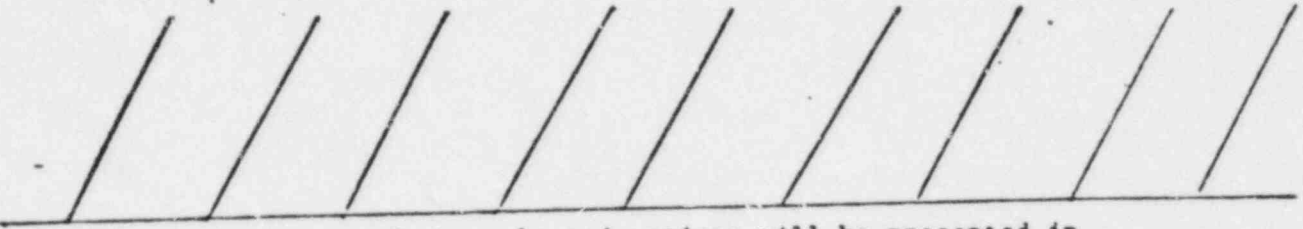
Bechtel Associates Professional Corporation

MCAR #24 INTERIM REPORT 1

Page 4

September 22, 1978

Attachment to BLC-6578



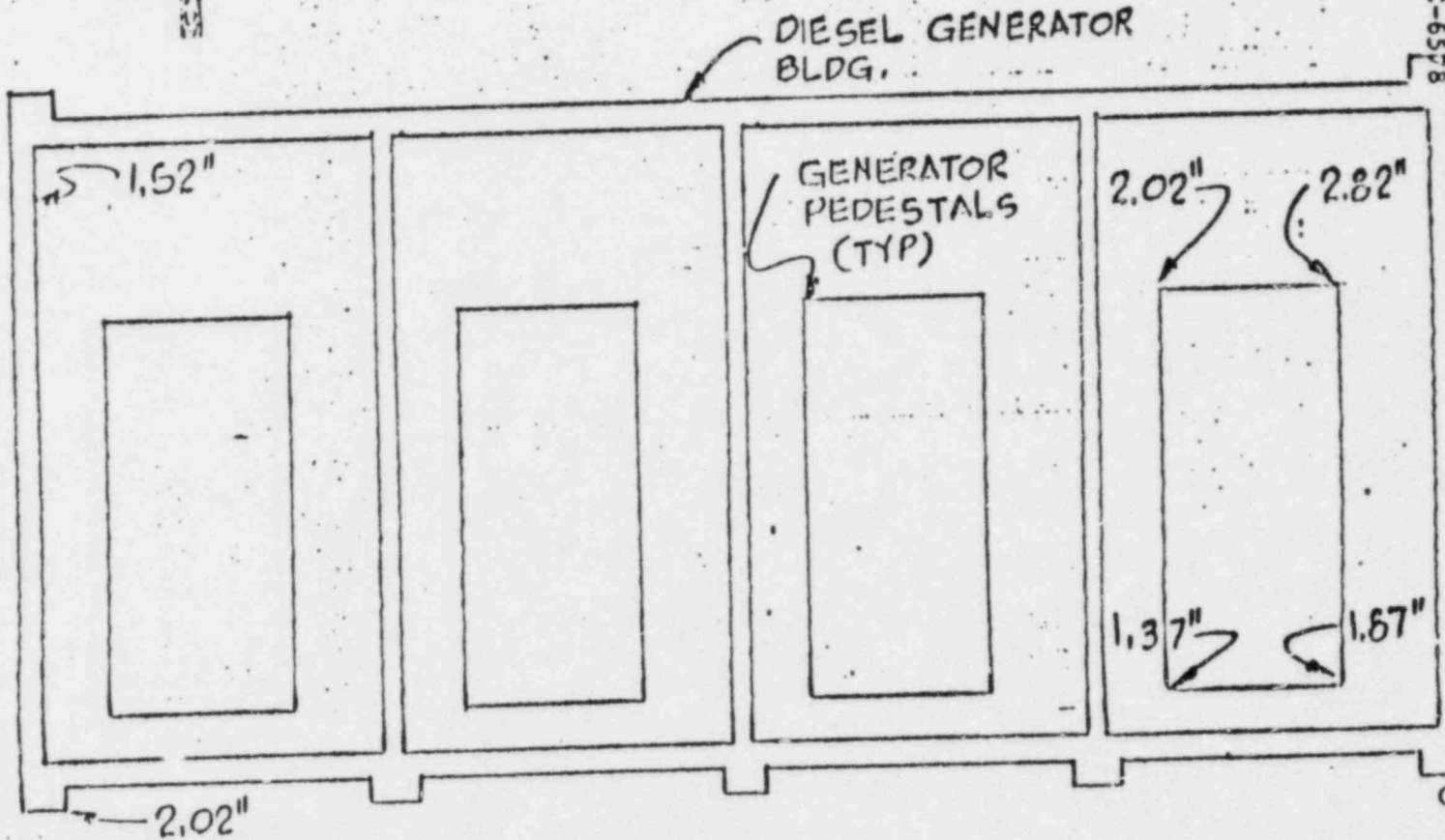
Detailed descriptions of the selected options will be presented in subsequent reports.

Submitted by: B. Charles Mc Cormel  
Approved by: J. P. [Signature]  
Concurrence by: [Signature]

JH/cap  
9/19/6

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Page 5  
 September 22, 1978  
 Attachment to BLC-6578



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

NO.	DATE	REVISIONS	JOB NO.	SPEC. DIS. GUIDE NO.
	5-22-78			
ORIGIN	ISSUED FOR INFO. TO MCR # 24 INTERIM REPORT # 1		BY	CMR
	CONSUMERS POWER COMPANY			
	MIDLAND PLANTS LANDS			
	MCR # 24			
FIGURE 1				

SHEET 1 OF 1



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION III  
799 ROOSEVELT ROAD  
GLENELLYN, ILLINOIS 60137

Docket No. 50-329  
Docket No. 50-330

NOV 3 1973

Consumers Power Company  
ATTN: Mr. Stephen H. Howell  
Vice President  
1945 West Parnall Road  
Jackson, MI 49201

Gentlemen:

This refers to the inspection conducted by Mr. R. J. Cook of this office during the period July 24-28, 31, August 1-31, and September 1-8, 1978, of activities at Midland Nuclear Power Plant Construction site authorized by NRC Construction Permits No. CPPR-81 and CPPR-82 and to the discussion of our findings with Mr. Corley and others of your staff at the conclusion of the inspection.

The enclosed copy of our inspection report identifies areas examined during the inspection. Within these areas, the inspection consisted of a selective examination of procedures and representative records, observations, and interviews with personnel.

During this inspection, certain of your activities appeared to be in noncompliance with NRC requirements, as described in the enclosed Appendix A. The inspection showed that action had been taken to correct the identified noncompliance and to prevent recurrence. Consequently, no reply to this noncompliance is required and we have no further questions regarding this matter at this time.

In accordance with Section 2.790 of the NRC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations, a copy of this letter, Appendix A to the letter and the enclosed inspection report will be placed in the NRC's Public Document Room, except as follows. If this report contains information that you or your contractors believe to be proprietary, you must apply in writing to this office, within twenty days of your receipt of this letter, to withhold such information from public disclosure. The application must include a full statement of the reasons for which the information is considered proprietary, and should be prepared so that proprietary information identified in the application is contained in an enclosure to the application.

Consumers Power Company - 2 -

NOV 3 1978

We will gladly discuss any questions you have concerning this inspection.

Sincerely,

R. F. Heishman, Chief  
Reactor Construction and  
Engineering Support Branch

Enclosures:

1. Appendix A, Notice  
of Violation
2. IE Inspection Rpt No.  
50-329/78-13 and  
50-330/78-13

cc w/encls:

Central Files  
Reproduction Unit NRC 20b  
PDR  
Local PDR  
NSIC  
TIC  
Ronald Callen, Michigan Public  
Service Commission  
Dr. Wayne E. North  
Myron M. Cherry, Chicago



Appendix A

NOTICE OF VIOLATION

Consumer Power Company

Docket No. 50-329

Docket No. 50-330

Based on the results of an NRC inspection conducted on July 24-31, August 1-31, and September 1-8, 1978, it appears that certain of your activities were in non-compliance with NRC requirements as noted below. These items are considered infractions.

1. 10 CFR 50, Appendix B, Criterion V states, in part, "activities affecting quality shall be prescribed by documented instructions, Procedure or Drawings, . . ., and shall be accomplished in accordance with Instructions, Procedure or Drawings".

Technical Specification for Field Fabrication and Installation of Piping 722C-M-204(Q) states, in part, "Where pipe to be joined has unequal outside or inside diameters, or when a fitting has a thickness greater than the connecting pipe, the weld and transition Drawing referenced in the applicable Piping Class Sheet shall be followed. No part of the weld on the thicker side, beyond the crown, shall be of a lesser diameter than the crown. In cases where welds are ground smooth this applies after grinding".

Contrary to the above, it was determined on August 15, 1978, that weld joints with unequal outside diameters had been accepted after a visual examination which did not meet the existing specification.

2. 10 CFR 50, Appendix B, Criterion XIII states, in part, that "measurements shall be established to control the Handling, Storage, . . . and Preservation of material and equipment in accordance with work and inspection instructions to prevent damage or deteriorations".

Bechtel Power Corporation field procedure No. FPG-5.000, Maintenance/Inspection of Material Equipment Release for Construction states, in part, that "maintenance activities to maintain the integrity of the item or its containers to include; Maintain all closures and sealing tape, . . . and providing maintenance in accordance with Manufacturer Maintenance instructions as applicable to the item being maintained". This statement is made in reference to developing protective environments for equipment. The appropriate manufacturer



instructions state, in part, "The Cabinets, Transformer and Voltage Regulators will be stored in an enclosed dry area where the temperature and humidity conditions remain constant."

Field Procedure FPG-5.000 makes reference to ANSI-4.5.2.2 which states, in part, "Level A items shall be stored under special conditions similar to those described for level B items but with additional requirements such as temperature and humidity control within specified limits . . ." - "Level B items shall be stored within a fire resistant, weather tight, and well ventilated building or equivalent enclosure".

Contrary to the above it was determined on August 16, 1978, that Safety Related Control Rod Drive Primary Breakers were stored in an area which did not afford adequate protection from the weather or constituted a controlled humidity and temperature environment.

U.S. NUCLEAR REGULATORY COMMISSION  
OFFICE OF INSPECTION AND ENFORCEMENT

REGION I/II

Report No. 50-329/78-13; 50-330/78-13

Docket No. 50-329; 50-330

License No. CPPR-81; CPPR-82

Licensee: Consumers Power Company  
1945 West Parnall Road  
Jackson, MI 49201

Facility Name: Midland Nuclear Power Plant, Units 1 and 2

Inspection At: Midland Site, Midland, MI

Inspection Conducted: July 24-28, 31, August 1-4, 7-11, 14-18, 21-26,  
28-31, September 1, and 5-8, 1978

Inspector: *T.E. Vandell for*  
R. J. Cook

*11-2-78*

Approved By: *T.E. Vandell for*  
D. W. Hayes, Chief  
Projects Section

*11-2-78*

Inspection Summary

Inspection on July 24-28, 31, August 1-4, 7-11, 14-18, 21-26, 28-31, September 1, and 5-8, 1978 (Report No. 50-320/78-13; 50-330/78-13)

Areas Inspected: Assembly of decay heat removal pumps; holdown bolting techniques for steam generators and reactor vessels; lifting and setting of Unit 1 pressurizer, weld preparations for steam generator nozzles, in-place storage conditions for electrical equipment; welding and fitting of decay heat removal and make up feed systems; curing of concrete in Unit 1; a typical weld material in Unit 1 reactor vessel; settlement of diesel generator foundations and structures; and review of damage sustained by the LP turbine rotors and possible impact on test schedules. This inspection effort involved a total of 141 inspector-hours by one NRC inspector.

Results: Of the twelve areas inspected, no apparent items of noncompliance or deviations were identified in 10 areas; two apparent items of noncompliance were identified in two areas (infraction - failure to supply adequate storage protection for safety related electrical breakers - paragraph 6; infraction - failure to identify welds as nonconforming which did not meet the visual inspection requirements of the existing Technical Specification - paragraph 7).

## DETAILS

### Persons Contacted

#### Consumers Power Company

W. Bird, Section Head, Quality Engineering  
J. Balazer, Lead Electrical Engineer  
J. Corley, Project QA Superintendent  
D. Keating, Field QA Engineer  
P. Kyner, Field QA Engineer  
D. Miller, Site Manager  
B. Peck, Construction Supervisor  
M. Schaeffer, QA Engineer  
B. Wollney, Field QA Engineer

#### Bechtel Power Corporation

L. Dreisbach, Project Field QA Engineer  
H. Foster, Project Field QC Engineer  
G. Richardson, Lead QA Engineer

Those persons listed above attended at least one of the five exit interviews conducted during the report period. Numerous other principal staff and personnel including craftsmen were contacted during the reporting period.

### Inspection Areas

#### 1. Site Tours

At periodic intervals generalized tours of the facility were performed by the Resident Inspector. These tours covered essentially every area of the site. These tours were intended to assess the state of cleanliness of the site; construction and installation activities; storage conditions of equipment and the potential for fire or other hazards which might affect personnel or equipment.

#### 2. Decay Heat Pumps

The licensee had identified that "D" decay heat removal pump (serial No. 69080) had been received with the casing assembled in reverse orientation. The pump was returned to B&W Canada Int. for reassembly. The reassembly was witnessed by a member of the licensee QA organization. The orientation and compatibility of decay heat removal pumps and pump pedestals was examined by

the Resident Inspector and found to be matched. The orientation of the impeller within the pumps serial No. 69082 and 69083 was verified by the inspector. Access to the other two decay heat removal pump impellers was not available during this inspection period. The licensee stated that the Resident Inspector would be informed when the examination for the impeller orientation for the remaining pumps would be available.

3. Steam Generator and Reactor Vessel Hold Down Bolting

The methods employed for setting the hold down bolts for steam generator and reactor vessels were examined. It has not been completely established at this time whether a "turn of the nut" method or another alternate method would be employed. The inspector informed the licensee that regardless of the method employed, the bolt pre-loading requirements<sup>1/</sup> should be substantiated. (329/78-13-02; 330/78-13-02)

4. Lifting and Setting of Unit 1 Pressurizer

The lifting and placing of the pressurizer for Unit 1 was witnessed by the inspector. During the "upending" operation the pressurizer bumped against the transporting carriage. This bumping created a gouge area at the surge nozzle to lower head weld and a gouge area on the lower head between the surge nozzle and the head to shell weld. B&W generated Noncompliance Report No. 421 which identifies these damaged areas. Corrective action has not been completed.

5. Unit 1 Steam Generator Hot Leg Nozzle Weld Preparation

The inspector witnessed partial aspects of removing the lifting lugs from both steam generators in Unit 1 and the subsequent in-place machining operations for the hot leg side weld preparation. The inspector encouraged the licensee to use only highly qualified personnel for specialized operations.

6. In Place Storage of Control Rod Drive (CRD) Breakers

On August 16, 1978, the inspector noted that boxed electrical equipment stored in place above the control room on the 674 ft. elevation had been rained upon the previous night because the temporary polyethylene roof covering the area had become dislodged from the containment wall. It was later determined that these boxes contained Control Rod Drive (CRD) Voltage Regulators, CRD Transformers and CRD Primary Breakers. The CRD Primary Breakers, designated 2B-91A, 2B-92B, 2B-91C and 2B-92D, are classed for storage

1/ Reference Drawing No. 376Q.

requirements compatible with ANSI N45.2.2 Level A and Field Procedure FPG-5.000 which requires a controlled humidity and temperature environment and protection from weathering conditions.

This failure to provide adequate storage for safety related equipment is considered an item of noncompliance with 10 CFR 50, Appendix E, Criterion XIII.

The licensee initiated immediate corrective action to bring the storage environment into controlled specifications and generated Nonconformance Report No. M-01-4-8-068 to ensure that a detailed inspection of the equipment is performed after more permanent storage conditions are established. Administrative procedures for release of equipment from the warehouse to locations of installed storage have been upgraded to ensure that the new location offers adequate protection for the safety related equipment.

Because of the actions taken by the licensee including steps to prevent recurrence no response to the above item of noncompliance is necessary.

7. Auxiliary Piping System Field Welding and Fabrication

Essentially all phases of field fabrication of piping being installed in the auxiliary building were examined. This included fitup, welding, and physical examination of pipe and valve joints for the decay heat removal system, makeup feed system and other system joints being welded in the auxiliary building.

During the examination of 18" x 3/8" wall piping to valve welds in the decay heat removal system (designated 2HCB-611) on August 10, 1978, it was noted that the visual inspection criteria established to meet the requirements of Specification 7220-M-204, Section 5.1.3.g for welding of unequal outside diameter piping could not be met. The inability to meet the specification of Section 5.1.3.g was brought about by the geometry of the weld preparation performed on the valve and having to include the weld reinforcement when considering a maximum transition slope of 3 to 1 and remain within the constraints of a limited weld zone. It was also noted that several other completed valve to pipe welds for smaller diameter pipe fell into this same category and had been accepted as to meeting visual inspection requirements.

Additional review revealed that the valves had been purchased with a "code allowable" weld preparation and that in actuality it appeared that the welding was being performed within the

limitations of the applicable ASME Code. However, the applicable specifications for welding this type of joint and subsequent visual inspection requirements were not compatible with the limitations of the ASME Code.

Therefore, accepting unequal outside diameter welds which physically could not have met the established criteria of Technical Specification for Field Fabrication and Installation of Piping, No. 7220-M-204 Section 5.1.3.g is considered an item of noncompliance with 10 CFR 50, Appendix B, Criteria X.

The licensee has changed the wording of Specification 7220-M-204, Section 5.1.3.g to reflect the style of weld joint preparation being installed within the limits of the ASME Code and subsequent visual inspection requirements. QC personnel involved in visual examination of these welds have been given additional instructions pertinent to this change. An overview visual examination of nominally 125 selected welds which could have the geometric limitations discussed above has been performed. A portion of this overview visual examination was witnessed by the inspector. Because of the above actions of the licensee, no response to the item of noncompliance is necessary.

8. Curing of Concrete in Unit 1

During the reporting period seismic Class 1 concrete has been poured within the containment of Unit 1, i.e., Slab 2 containment and steam generator cavity walls. The adequacy of curing conditions have been noted at periodic intervals.

9. Atypical Weld Material Used in B&W Reactor Vessel Welds

On August 7, 1978 the licensee informed the Resident Inspector that weld material containing less amounts of nickel and greater amounts of silicone than originally intended may have been used in the Unit 1 reactor vessel. These incorrect welding materials may increase the nil-ductility transition temperature more than anticipated. The resolution of this matter has been referred to NRR and IE headquarter personnel.

10. 50.55e Item Settling of the Diesel Generator Foundations and Structures

On September 7, 1978, the licensee informed the Resident Inspector that settlement of the diesel generator foundations and structures was considered a reportable item under the provisions of 10 CFR 50.55(e). The licensee stated that the abnormal settlement was



determined through the routine surveillance survey program. The licensee stated that additional investigation to define the extent of the situation was being performed. Further review of this matter is planned (329/78-13-03; 330/78-13-03).

11. Environmental Review - Operating License Stage Meetings

On September 6, 1978, Environmental Reviewers from NRR visited the site for meetings with the licensee. The Resident Inspector attended a portion of these meetings pertaining to archeological and socio-economic interests. On September 7, 1978 separate meetings were scheduled between NRR socioeconomic reviewers and the Midland City Planning Department, Midland County Planning Commission and the Midland County Road Commission. The Resident Inspector attended these meetings in the interest of supplying first hand information pertinent to the review process.

12. LP Turbine Damage from Derailment

On August 7, 1978, the inspector was informed that the train carrying both LP turbine spindles experienced a derailment close to Lorain, Ohio which resulted in damage to the turbines. The turbines have been returned to the vendor for repairs. At this time there is no known gross impact on the scheduling of the plant.

13. Meeting with Local Officials

On August 30, 1978, a meeting was held between elected officials from the local community, regional based representatives and the resident inspector. The meeting was conducted to explain the NRC regulatory program and to introduce the resident inspector program concept to the community.

14. Exit Interview

The Resident Inspector met with licensee representatives (denoted under Persons Contacted) on July 28, August 10, August 16, August 24, and September 8, 1978. The inspector summarized the scope and findings of the inspection effort to date. The licensee acknowledged the findings reported herein.





UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

November 3, 1978

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

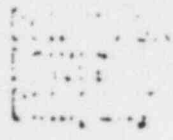
From: William J. Oimstead, OELD

Subject: BOARD NOTIFICATION OF DIESEL GENERATOR FOUNDATIONS  
AND BUILDING SETTLEMENT AT MIDLAND

The attached 50.55(e) letter from Consumers Power has just come to my attention. While I realize that the NRC policy on notification of licensing boards does not require notification prior to publication of the relevant Staff documents, the unusual circumstances of the Midland proceedings seem to dictate notification in this instance.

As you know, certain CP questions are still pending before the Commission for decision. In addition, a prehearing conference on the DL is scheduled for November 15 in Midland. Mapleton Intervenors are seeking to admit a contention on building settlement at the site. Consequently, I recommend that a letter of notification be prepared which would apprise the respective boards and the Commission of developments on this matter.

*William J. Oimstead*  
William J. Oimstead, Attorney  
Office of the Executive Legal Director



Stephen H. Howell  
Senior Vice President

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

November 7, 1978  
Howe-230-78

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  
SETTLEMENT OF DIESEL GENERATOR FOUNDATIONS AND BUILDING

Reference: Letter, S E Howell to J G Keppler; Midland Nuclear Plant;  
Unit No 1, Docket No 50-329; Unit No 2, Docket No 50-330;  
Settlement of Diesel Generator Foundations and Building;  
Serial Howe-183-78; dated September 29, 1978

This letter, as was the referenced letter, is an interim 50.55(e) report on  
the settlement of the diesel generator foundations and building.

The enclosure provides the status of the actions being taken to resolve the  
problem. It is tentatively planned to hold a review meeting during the  
last two weeks in November. The Nuclear Regulatory Commission will be  
invited to participate when the time and place have been finalized.

Another report, either interim or final, will be sent on or before December 29,  
1978.

Enclosure: MCAR #24, Settlement of the Diesel Generator Foundations and  
Building, Interim Report #2, dated November 3, 1978

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)

NOV 15 1978

# Bechtel Associates Professional Corporation

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

Settlement of the diesel generator foundations and building

INTERIM REPORT # 2

DATE: November 3, 1978

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

## Introduction

This report is submitted to advise of the interim status of the project's actions relating to the settlement of the diesel generator foundations and building as described in MCAR #24 and NCR 1482.

## General Background

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. One concrete pour was made to finish the structure to a common elevation of 662'-0" and to allow removal of formwork. A soil boring program was started on August 25, 1978. Based on the 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 subsequent reports following the complete evaluation of soil conditions.

# Bechtel Associates Professional Corporation

MCAR #24  
Page 2

## Description of Deficiency

The general foundation and building settlements as of October 31, 1978, and October 27, 1978, respectively, are shown in Figure 1 (attached).

## Activities in Progress

The activities are:

- 1) The Foundation Data Survey Program as discussed in the previous report is being continued.
- 2) The soil boring program has been completed. There were 29 soil borings and 13 dutch cone penetrations made in the area of the diesel generator building to provide better definition of the fill conditions under the building and to obtain soil samples for laboratory tests.
- 3) Laboratory tests for the soil samples obtained from the borings are being performed by Goldberg-Zonino-Dunnicliff and Associates, Inc.

The tests are:

- a. Shear strength tests
- b. Consolidation tests
- c. Soil classification
- d. Mineralogy tests

All of the above tests are approximately 100% complete except the mineralogy tests, which have not been started. As the test results are available to Bechtel, they are forwarded to the consultants who have been retained. The tests are estimated to be completed by November 15, 1978.

- 4) Independent Soils Consultants

A team of consultants who specialize in soils has been retained to provide their independent evaluation and recommendations concerning the soil conditions existing under the diesel generator building. The consultants, Dr. R.B. Peck, previously with the University of Illinois, and Dr. A.J. Hendron, presently with the University of Illinois, have visited the site and reviewed the existing conditions. Based on Dr. Peck's consultation, the following resulted:

# Bechtel Associates Professional Corporation

MCAR #24  
Page 3

- a. Dr. R.D. Woods of the University of Michigan will provide an interpretation of the dutch cone penetration tests.
- b. Mr. J. Dunnicliff (Goldberg-Zoino-Dunnicliff & Associates, Inc.), who specializes in soils instrumentation, reviewed the building and site to assist in developing a soil monitoring program.

## 5) Related Activities

Based on preliminary evaluation of the soil borings, soil test results, the consultants' comments, and the construction schedule, several activities common to any corrective actions may be started before the next interim report.

- a. Placement of the soil and underground utility instrumentation will be done.
- b. Separate the electrical duct banks penetrating or otherwise restricting the equalized settlement of the building from the footing to allow unrestricted settlements to occur. Grout any remaining separations between the building footings. Any separations between building footing and supporting fill will be grouted.
- c. Raise the cooling pond water level from elevation 622'-0" to its design height of elevation 627'-0," which will bring the water table in the building area to its operation level.
- d. Visual monitoring and a survey of the diesel generator building and appropriate utilities under the building will be performed before, during, and after Item b above.

## 6) Other Areas

Soils borings have been made in the other plant fill areas. Soil samples from the borings have been sent to the laboratory for testing. The same group of tests will be performed for these samples as described in Item 3 above.

Bechtel Associates Professional Corporation

MCAR #24

Page 4

Potential Safety Implications

This item is considered reportable under 10 CFR 50.55 e, 1, iii because of the magnitude of the investigative tests and analysis of test results to support the corrective actions.

GAJ.

Submitted by: BC McConnell

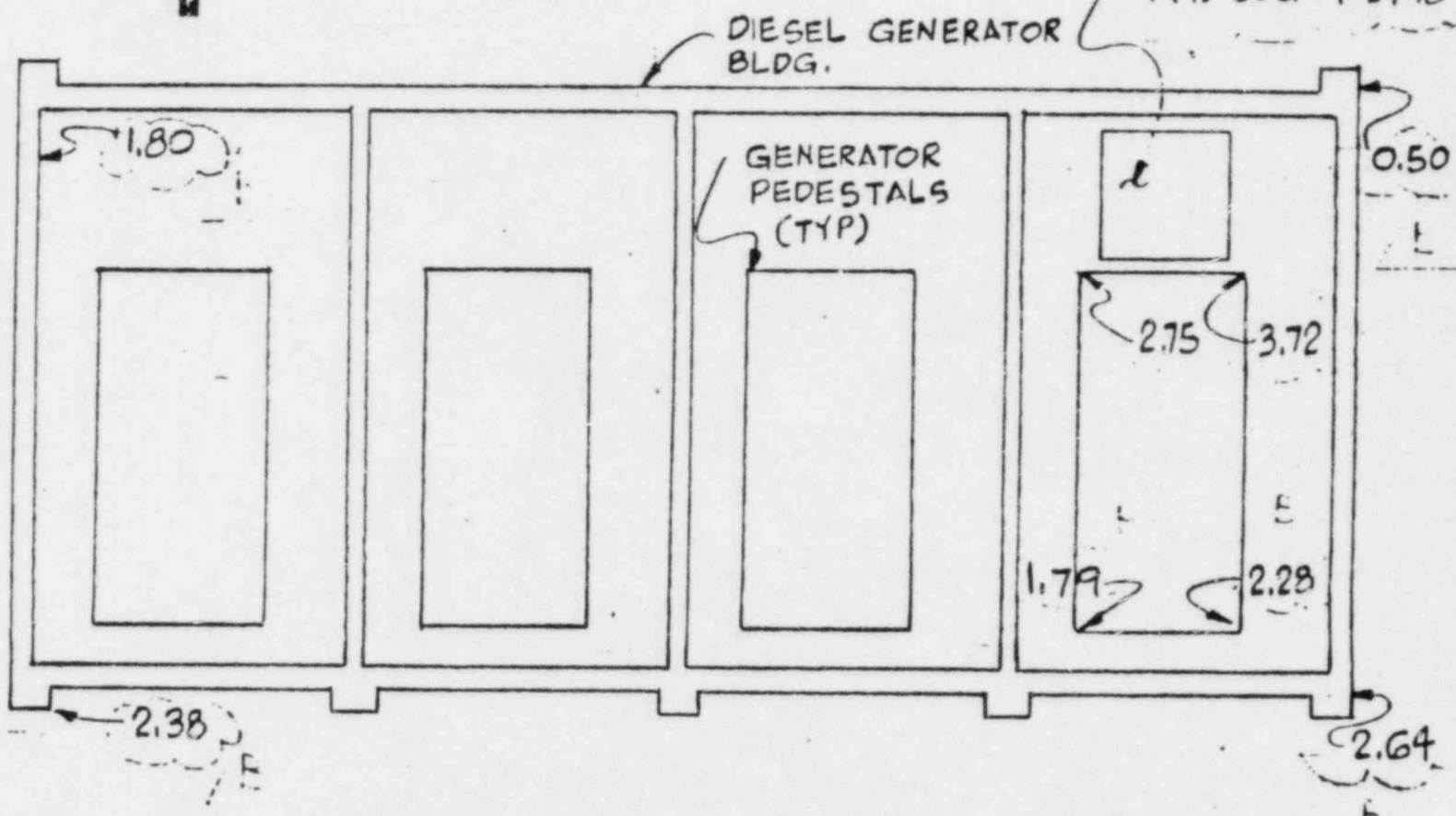
Approved by: [Signature]

Concurrence by: Carl W. [Signature]

JH/rg  
10/27/12



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DIESEL GENERATOR BLDG.

BUILDING SETTLEMENT DATA (IN INCHES) AS OF 10-27-78  
 GENERATOR PEDESTAL SETTLEMENT DATA (IN INCHES) AS OF 10-31-78.

OFFICE	NO.	DATE	REVISIONS	JOB NO.	BY	CHK.	APP.
	1	10-31-78	ISSUED FOR INFO. TO MCAR # 24, INTERIM REPORT # 2	7220	PB		
	2	9-22-78	ISSUED FOR INFO. TO MCAR # 24, INTERIM REPORT # 1		PB		
	CONSUMERS POWER COMPANY MIDLAND PLANTS UNITS 1 AND 2 MCAR # 24						
FIGURE 1				SPEC DES GUIDE NO.	REV	8	





UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION III  
799 ROOSEVELT ROAD  
GLEN ELLYN, ILLINOIS 60137

NOV 8 1973

Docket No. 50-329  
Docket No. 50-330

Consumers Power Company  
ATTN: Mr. Stephen E. Howell  
Vice President  
1975 West Parnall Road  
Jackson, MI 49201

Gentlemen:

This refers to the inspection conducted by Mr. R. J. Cook of this office during the period September 10-29, 1978, of activities at Midland Nuclear Power Plant construction site authorized by NRC Construction Permits No. CPPR-81 and No. CPPR-82 and to the discussion of our findings with Mr. Corley and others of your staff at the conclusion of the inspection.

The enclosed copy of our inspection report identifies areas examined during the inspection. Within these areas, the inspection consisted of a selective examination of procedures and representative records, observations, and interviews with personnel.

No items of noncompliance with NRC requirements were identified during the course of this inspection.

In accordance with Section 2.790 of the NRC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations, a copy of this letter and the enclosed inspection report will be placed in the NRC's Public Document Room, except as follows. If this report contains information that you or your contractors believe to be proprietary, you must apply in writing to this office, within twenty days of your receipt of this letter, to withhold such information from public disclosure. The application must include a full statement of the reasons for which the information is considered proprietary, and should be prepared so that proprietary information identified in the application is contained in an enclosure to the application.

Consumers Power Company - 2 -

NOV 8 1973

We will gladly discuss any questions you have concerning this inspection.

Sincerely,

R. F. Heishman, Chief  
Reactor Construction and  
Engineering Support Branch

Enclosure: IE Inspection  
Report No. 50-329/78-14  
and No. 50-330/78-14

cc w/encl:  
Central Files  
Reproduction Unit NRC 20b  
PDR  
Local PDR  
NSIC  
TIC  
Ronald Callen, Michigan Public  
Service Commission  
Dr. Wayne E. North  
Myron M. Cherry, Chicago

U.S. NUCLEAR REGULATORY COMMISSION  
OFFICE OF INSPECTION AND ENFORCEMENT

REGION III

Report No. 50-329/78-14; 50-330/78-14

Docket No. 50-329; 50-330

License No. CPPR-81, CPPR-82

Licensee: Consumers Power Company  
1945 West Parnall Road  
Jackson, MI 49201

Facility Name: Midland Nuclear Power Plant, Units 1 and 2

Inspection At: Midland Site, Midland, MI

Inspection Conducted: September 10-29, 1978

Inspector:

*T. E. Caudel for*  
R. J. Cook

Approved by:

*D. W. Hayes*  
D. W. Hayes, Chief  
Projects Section

11-6-78  
11/6/78

Inspection Summary

Inspection on September 10-29, 1978 (Report No. 50-329/78-14; 50-330/78-14)  
Areas Inspected: Examination of the general site condition, steam generator and reactor vessel hold down bolting, auxiliary piping system field welding and fabrication, status of repair to the l.p. turbine rotors, settlement of the diesel generator foundations and structures, erection of Unit 2 reactor coolant system piping, welding on Unit 2 core flood system piping, review of NDE procedures used by B&W Construction Company, in place storage condition of electrical equipment, information meetings with licensee personnel. This inspection effort involved a total of 71 inspection-hours by one NRC inspector.

Results: No items of noncompliance or deviations were identified.



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

NOV 9 1978

Docket No. 50-329/330

MEMORANDUM FOR: George C. Gower, Acting Executive Officer for  
Operations Support, IE

FROM: Harold D. Thornburg, Director, Division of Reactor  
Construction Inspection, IE

SUBJECT: RECOMMENDATION FOR BOARD NOTIFICATION RELATIVE TO  
REPORTED SETTLEMENTS IN THE DIESEL GENERATOR BLDG.  
COMPLEX AT MIDLAND

Forwarded for action is a recent problem reported at the Midland site. We are recommending that this matter be brought to the attention of the Board for the Midland Plant, Units 1 and 2.

This subject was 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. During the period of October 24-27, 1978 Region III conducted an inspection at the site to examine the details of the reported problem. As a result of that inspection RIII in a memorandum dated November 1, 1978 (Enclosure) recommended Board notification.

We have reviewed the matter and have reached the conclusion that the Board should in fact be notified. In addition, we are preparing a Transfer of Lead Responsibility to NRR. We are also reviewing the subject for possible enforcement action.

Enclosed are the pertinent documents we have available at the present time. If you have any questions on this matter please contact us.

*Harold D. Thornburg*  
Harold D. Thornburg  
Director  
Division of Reactor  
Construction Inspection  
Office of Inspection and Enforcement

Enclosure: Memo from Keppler to  
Thornburg, November 1, 1978  
w/enclosure

cc/w enclosure: J. G. Davis, IE  
G. W. Rainmuth, IE

CONTACT: R. E. Shewmaker, IE  
49-2755L

AIIS F769 37 H1



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

November 13, 1978

MEMORANDUM FOR: Thomas F. Engelhardt, Acting Hearing Division  
Director and Chief Counsel, OELD

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

SUBJECT: BOARD NOTIFICATION - MIDLAND SETTLEMENT PROBLEM  
(BN-78-27)

On November 3, 1978, we received a recommendation from OELD to notify the Midland CP and OL Boards as well as the Commission of a 50.55(e) matter regarding settlement of the Diesel Generator Building foundations. The recommendation, while recognizing that procedures did not require notification of the OL Board at this time, pointed to the unusual circumstances of the Midland proceedings as a basis for notification.

Since a Prehearing Conference which will consider a contention on building settlement is scheduled for November 15, 1978, we agree that the OL Board should be made aware of the existing situation in this area.

Although we see no need to inform either the CP Board or the Commission, we have no objection to providing them with the same documentation for their information.

In addition to providing the information forwarded with the OELD memo, we recommend that you include the enclosed memorandum from Region III.

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

Enclosures:  
As stated

ccs w/enclosures:

K. Denton	B. Grimes
E. Case	J. Stolz
J. Davis	R. Baer
R. Boyd	O. Parr
R. Mattson	S. Varga
V. Stello	IE (7)
R. DeYoung	
D. Eisenhut	
L. Nichols	



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

NOV 13 1978

MEMORANDUM FOR: Domenic B. Vassallo, Assistant Director  
for Light Water Reactors, NRR

FROM: Samuel E. Bryan, Executive Officer  
for Operations Support, IE

SUBJECT: INFORMATION TO BE CONSIDERED FOR BOARD NOTIFICATION -  
REPORTED SETTLEMENTS IN DIESEL GENERATOR BUILDING  
AT MIDLAND

The enclosed information is being forwarded for consideration and possible Board notification. Your contact on this matter for additional technical information is R. E. Shewmaker, ext. 27551.

We request to be informed whether or not this matter is transmitted to the Board.

A handwritten signature in cursive script that reads "Samuel E. Bryan".

Samuel E. Bryan, Executive Officer  
for Operations Support, IE

Enclosures:

1. memo Thornburg to  
Gower dtd 11/9/78
2. memo Keppler to  
Thornburg dtd 11/1/78

cc: w/o enclosure  
J. G. Davis  
H. D. Thornburg

w/ enclosure  
G. C. Gower  
IE Files



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION III  
799 ROOSEVELT ROAD  
GLEN ELLYN, ILLINOIS 60137

Docket No. 50-329  
Docket No. 50-330

NOV 17 1978

Consumers Power Company  
ATTN: Mr. Stephen H. Howell  
Vice President  
1945 West Parnall Road  
Jackson, MI 49201

Gentlemen:

This refers to the inspection conducted by Mr. E. J. Gallagher of this office on October 24-27, 1978, of activities at the Midland Nuclear Plant, Units 1 and 2, authorized by NRC Construction Permits No. CPPR-81 and No. CPPR-82 and to the discussion of our findings with Messrs. J. L. Corley and T. C. Cooke and others of your staff at the conclusion of the inspection.

The enclosed copy of our inspection report identifies areas examined during the inspection. Within these areas, the inspection consisted of a selective examination of procedures and representative records, observations, and interviews with personnel.

No items of noncompliance with NRC requirements were identified during the course of this inspection.

In accordance with Section 2.790 of the NRC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations, a copy of this letter and the enclosed inspection report will be placed in the NRC's Public Document Room, except as follows. If this report contains information that you or your contractors believe to be proprietary, you must apply in writing to this office, within twenty days of your receipt of this letter, to withhold such information from public disclosure. The application must include a full statement of the reasons for which the information is considered proprietary, and should be prepared so that proprietary information identified in the application is contained in an enclosure to the application.



Consumers Power Company

- 2 -

NOV 17 1978

We will gladly discuss any questions you have concerning this inspection.

Sincerely,

R. F. Beishman, Chief  
Reactor Construction and  
Engineering Support Branch

Enclosure: IE Inspection  
Reports No. 50-329/78-12  
and No. 50-330/78-12

cc w/encl:  
Central Files  
Reproduction Unit NRC 20b  
PDR  
Local PDR  
NSIC  
TIC  
Ronald Callen, Michigan Public  
Service Commission  
Dr. Wayne E. North  
Myron M. Cherry, Chicago

U.S. NUCLEAR REGULATORY COMMISSION  
OFFICE OF INSPECTION AND ENFORCEMENT

REGION III

Report No. 50-329/78-12; 50-330/78-12

Docket No. 50-329; 50-330

License No. CPPR-81; CPPR-82

Licensee: Consumers Power Company  
1945 West Parnall Road  
Jackson, MI 49201

Facility Name: Midland Nuclear Power Plant, Units 1 and 2

Inspection At: Midland Site, Midland, MI

Inspection Conducted: October 24-27, 1978

Inspector: *R. J. Gaflagher*  
E. J. Gaflagher

11/14/78

Approved By: *R. L. Spessard*  
R. L. Spessard, Chief  
Engineering Support Section 1

11/14/78

Inspection Summary

Inspection on October 24-27, 1978 (Report No. 50-329/78-12; 50-330/78-12)  
Areas Inspected: 10 CFR 50.55(e) report concerning settlement of diesel generator foundation and building; backfill specifications and quality control instructions; preliminary soils test results from core boring investigation; site implementing procedures; performance of soils testing; and diesel generator building and pedestal details. The inspection involved a total of 36 inspector-hours onsite by one NRC inspector.  
Results: No items of noncompliance or deviations were identified.

DETAILS

Persons Contacted

Principal Licensee Employees (Consumers Power Company)

- \*T. C. Cooke, Project Superintendent
- \*J. L. Corley, Station Head IE and TV
- \*D. E. Horn, Civil Supervisor, QAE
- \*R. M. Wheeler, Civil Engineer
- \*E. H. Peck, Construction Supervisor
- \*R. Bauman, Project Engineer
- \*G. S. Keeley, Project Manager
- \*D. B. Miller, Site Manager

Bechtel Associates Professional Corporation

- \*L. A. Dreisbach, PQAE
- \*R. L. Castleberry, Project Engineer
- \*W. L. Barclay, PFQCE
- \*P. A. Martinez, Project Manager
- \*A. Boos, Project Field Engineer
- J. Betts, Field Engineer
- A. Marshall, Geotechnical Engineer
- S. Blue, Geotechnical Engineer
- J. Wazack, Geotechnical Engineer
- N. Swanberg, Chief Engineers Staff
- B. McConnel, Civil Design Group
- P. K. Chen, Civil Design Group
- T. Lieb, Quality Control Engineer

U.S. Testing Laboratory

J. Speltz, Lab Supervisor

NRC Resident Inspector

\*R. Cook, Inspector

\*Denotes those present at exit meeting.

Functional or Program Areas Inspected

1. Followup of Reportable Occurrence (10 CFR 50.55(e)) - Settlement of Diesel Generator Foundations and Building

In accordance with the requirements of 10 CFR 50.55(e), Consumers Power Company notified the NRC Region III office of a reportable

occurrence relative to the settlement of the diesel generator foundations and building.

a. Deficiency

The Bechtel Foundation Data Survey Program (spec. C-76) generated data that indicated the settlement of the diesel generator foundations was greater than anticipated. Nonconformance Report No. 1482 was generated on August 21, 1978 to document the occurrence.

Due to the magnitude of the settlements observed, a soils boring program was initiated.

b. Safety Implications

Large settlements can pose safety problems for the building. These structures are monitored for settlement during construction and operation as part of the foundation data survey program. Unusual settlements of the structure would be detected before the diesel generators would be rendered inoperable due to resulting distortions.

c. Activities in Progress

- (1) Foundation Data Survey Program has been expanded to include additional data locations and to increase the frequency of monitoring these locations to a weekly basis rather than the previous 60 day basis.
- (2) A Boring program has been initiated to provide better definition of the compacted fill conditions supporting the diesel generator building as well as other plant structures, e.g., Class 1 tanks, transformer foundations and plant fill area. Soil samples have been recovered for laboratory tests. Details of these tests are provided in later sections of this report.

d. Planned Activities for Future Work

Discussions with licensee representatives indicate the following planned activities for future work relative to diesel generator building foundations and other plant structures:

- (1) Extend bench mark monitors for settlement study.
- (2) Install inclinometers

- (3) Preload diesel generator building and foundations; both inside and around the building with 20 to 22 feet of sand for approximately 5 to 7 months.
- (4) Build retaining wall to separate preload material from turbine building on the north side.
- (5) Check calculation to see if turbine building can carry effect of preload surcharge.
- (6) Monitor condensate lines under diesel generator building.
- (7) Monitor soil movement during preload.
- (8) Provide freeze protection around diesel generator area during winter.
- (9) Monitor concrete cracks using stain gauges.
- (10) Monitor pore water pressure in soil.
- (11) Cut loose the four electrical duck banks which run under the building and project vertically becoming an integral part of the structure.
- (12) Continue filling pond from elevation 622' to 627'.
- (13) Identify item effected by the structure, i.e. plant safety, operations and layout.

e. Other Activities to be Planned

- (1) Possible core borings in cooling pond dike area to verify integrity of dikes.
- (2) Continue visual inspection of dikes for movement.

f. Other Structures Being Monitored for Settlement

- (1) Borated water storage tank foundations
- (2) C.W. intake structure
- (3) Emergency diesel fuel oil tank
- (4) Service water valve pits
- (5) Chlorination building
- (6) Radwaste building
- (7) Cooling towers

2. Review of Preliminary Data Compiled through Soil Borings in Diesel Generator Building Area

A review of the preliminary report data compiled by Goldberg, Zoino, Dummcliff and Associates, consultants in geotechnical engineering was performed. This investigative soils work is being performed in accordance with the specification for technical services for soils testing, C-79(Q), Rev. 0, issued September 8, 1978. Tests are performed in accordance with applicable quality assurance requirements included in the specification, in particular, test control, control of measuring equipment, handling and storage of materials and document control.

A total of 23 core borings to various elevations into and through the compacted fill and into natural soil in and around the diesel generator building have been performed. In addition, dutch cone probes were taken to determine the bearing capacity of the in-place soils. Soil samples were recovered from the borings in order to perform a battery of soil tests which include: soils classification, mechanical analysis, atterberg limits, natural moisture contents, unit weights, compaction, unconfined compressive strength, unconsolidated-undrained triaxial compression tests, consolidation tests and organic content determination.

Preliminary results of the investigative soils borings work indicate the fill under the diesel generator building has variable strength properties. For example:

- a. Unconfined compressive strength tests range from 163 PSF (boring DG 2, sample 5) to 5230 PSF (boring DG 1) with the majority of results less than 2000 PSF.
- b. Blow counts through the fill range from 3 to 6 blows per foot (DG 2) to 2 to 40 blows per foot (DG 12), and as much as 100 blows per foot in some areas.
- c. Dutch cone probes to determine bearing capacities indicate less than 5 kips per square foot (KSF) in probe Nos. 1, 2, 4, 8, 10. 5 KSF is the design bearing capacity based on discussion with the Bechtel design staff.
- d. Penetrometer tests were performed in test pit No. 1 between elevations 628' and 616' in the east bay of the diesel generator building. Results indicate an unconfined compressive strength average of 1.0 ton per square foot (TSF) with a range from 0 to 4.5 TSF.

The final evaluation of the soils borings in the diesel generator area is expected to be presented to Consumers Power Company during the week of November 6, 1978. This information is planned to be presented to the NRC some time thereafter.

3. Review of FSAR Commitments Versus Site Implementing Procedures

The inspector found the following discrepancies between commitments in the FSAR and the requirements in applicable site implementing specifications, procedures and drawings:

- a. FSAR Table 2.5-14 (Summary of Foundations Supporting Seismic Category I and II Structures) identifies the supporting soil material under the diesel generator building as being, "controlled compacted cohesive soils." In addition, FSAR Table 2.5-9 (Minimum Compaction Criteria) identifies soil type and function. Under "support of structures" the soil type is identified as clay which is a cohesive soil.

However, construction detail drawings C-109 R2 and C-117 R6 identify the material in this area as "zone 2" material. Zone 2 material is identified in FSAR Table 2.5-10 as "Random Fill," described as any material free of organic or other deleterious material. In the field a variety of material has been used for the diesel generator building, e.g. sands, clay, silty sand, clayey sand and lean concrete. A review of the records indicate sands have been used between elevations 594' to 608', areas of elevation 611' to 613' and areas between 616' and 628'. Lean concrete was permitted to be used indiscriminately throughout. This indicates the extent of the variability of the material used under the diesel generator building foundation.

- b. FSAR Table 2.5-21 (Summary of Compaction Requirements) identifies "random fill" to require a compaction effort of a minimum of 4 passes with specified equipment. This requirement of 4 passes was not an imposed criteria in Bechtel specification C-210 R6 nor was it an inspection requirement of Bechtel Quality Control Instruction for Backfill, C-1.02. In addition, FSAR section 2.5.4.5.3 (fill) states, "the four passes were required for each substitute roller."

Discussion with QC field personnel indicated that documentary evidence was not available to determine that the required number of passes were performed. However, it was commented that at times more than 4 passes were required in order to attain the minimum compaction.



- c. FSAR Section 3.8.5.5 states, that "settlements of shallow spread footings founded on compacted fill are estimated to be on the order of 1/2 inch or less." The site survey program has identified settlements in the diesel generator foundation and building to range from 0.55 inches to 2.30 inches and in excess of 3.0 inches for the diesel generator pedestal, as of September 1978.
- d. FSAR Figure 2.5-47 indicates the foundation of the diesel generator building is at elevation 634'; however, design drawing C-1001(Q) R5 indicates the spread footing and pedestal are at elevation 628' and locally lowered to elevation 625' in the sump areas. Since the ground water elevation will be raised to 627', a hydrostatic pressure will reduce the net effective structure load on the foundation material. This should be reflected in table accompanying FSAR figure 2.5-47.

4. Review of Specifications for Site Soils Activities

The inspector reviewed the following procedures and specifications for installation and testing of site soil materials:

- a. Bechtel Specification C-210, Revision 6, dated April 25, 1978, Sections 12 and 13, Plant Area Backfill Requirements.
- b. Bechtel Specification C-211, Revision 4, dated September 21, 1977, Structural Backfill.
- c. Bechtel QC Instruction for Compacted Backfill, C-1.02, Revision 1.

An apparent conflict was identified during review of the specifications. Specification C-210, Section 13.7.1 requires all cohesive backfill in the plant area to be compacted to not less than 95% maximum density, as determined by ASTM D-1557, Method D which requires an effective compactive effort of 56,000 ft-lbs of energy per cubic foot of soil. However, Section 13.4 (testing) of the specification requires testing of materials placed in the plant area to be performed in accordance with tests listed in Section 12.4. This section, in particular Section 12.4.5.1 (cohesive soils), requires lab maximum densities to be determined using ASTM D-1557, Method D provided a compactive energy equal to 20,000 foot pounds per cubic foot is applied (Bechtel Modified Proctor Density). To date, the Bechtel modified proctor density for determining maximum proctor density versus optimum moisture content has been utilized, as committed to in FSAR Table 2.5-9. Furthermore, Bechtel Quality Control Instruction C-1.02, Section 2.4 (testing) references the

applicable inspection criteria, including both Sections 13.7 and 12.4 of specification C-210 which includes the discrepancy described above.

As a result of this conflict, the actual in-place compaction would be less using the Bechtel modified proctor than using the standard ASTM D-1557, Method D. This is due to the fact that the compactive energy exerted using the Bechtel modified method is less than that using the standard ASTM method (i.e. 20,000 ft-lbs versus 56,000 ft-lbs of energy).

During a review of the specifications, the inspector was informed that Bechtel had contracted Dames and Moore to perform the original site soils and backfill study, as documented in a report dated March 15, 1969. On page 16 of this report the compaction criteria for support of structures is recommended to be 100% of the maximum density using a compactive effort of 20,000 ft-lbs (similar to Bechtel Modified Proctor Density). However, this 100% of maximum density using 20,000 ft-lbs of compactive effort corresponds to 95% compaction using the standard ASTM D-1557, Method D. As previously described, specification C-210 did not incorporate the Dames and Moore recommendation.

Furthermore, Dames and Moore report (page 15) states that, "all fill and backfill materials should be placed at or near optimum moisture content in nearly horizontal lifts approximately 6 to 8 inches in loose thickness." This recommendation was not adopted by Bechtel, in that specification C-210, Section 12.5.3 permits an uncompacted lift thickness of 12 inches.

A further review of specification C-210, Section 12.6 (moisture control) indicates that zone 2 material, known as "random fill", was permitted to have a moisture content tolerance of "not more than 2 percentage points below optimum moisture and not more than 2 percentage points above optimum moisture." A review of the moisture-density curves for the material (random fill) placed in the diesel generator area indicates steep, sloped moisture-density curves, and therefore, a  $\pm 2\%$  range for moisture control can significantly effect the in-place density of the material used.

5. Review of NRC Question No. 362.2 on FSAR Section 2.5.4.5.1

This question concerns whether a natural sand layer near elevation 600', as identified in FSAR Figure 2.5-21, had been removed during construction or if the sand tested out to be greater than 75% relative density. The licensee had not responded to this question as of the date of this inspection.

An internal Consumers Power Company memorandum from B. H. Peck to J. L. Corley indicates that a review of records had not yielded any verification that the sands were removed or that tests were performed to confirm the in-place density of the natural sands. The current boring program will also be used as a data base for confirming the in-place condition of the natural sand layer identified in FSAR Section 2.5.4.5.1. The licensee informed the inspector that the results of this survey will provide the basis for their answer to NRC Question No. 362.2.

6. Cracks in Concrete Structural Wall and Footing in the Diesel Generator Building

The inspector observed the structural concrete crack that has developed in the east exterior wall and footing of the diesel generator building. The crack was observed by representatives of Bechtel Geotech and Consumers Power Company.

As of September 22, 1978, the settlement along the east side of the building, as measured by the survey data program, ranges from 0.55" to 2.48", a differential settlement of 1.93 inches. The crack is expected to have been induced due to flexure caused by the differential settlement. Discussions with Bechtel design staff personnel at the site indicate that the crack is being evaluated along with the settlement survey and will continue to be monitored during preload of the structure.

ACI 318-71 (Commentary) Section 10.6.4 limits flexural cracks to 0.013 inches (13 mils) when exposed to the outside elements. The crack was observed to be larger than the ACI limit for flexure. The licensee is committed to this standard in FSAR Section 3.8.6.2.

7. Observation of Soil Testing in Compacted Fill Areas

The inspector observed U.S. Testing Lab personnel performing the following soil tests:

- a. Lab Test ASTM D-1557-66T, Moisture-Density Relations of Soils, Method D, which determines the moisture-density relation by compacting cohesive soil in a standard mold in 5 layers with a 10 pound weight dropping 18 inches, 56 times in each layer. The density per cubic foot is calculated for given moisture conditions. This information yields a curve which indicates the maximum lab density (proctor density) at an optimum moisture content. This value is then compared to the in-place field dry density to yield the percent (%) compaction.

- b. Field Test ASTM D-1556-64, Density of Soils In-place by Sand Cone Method, which determines the in-place field dry density for the soil which is compared to the maximum lab density, determined as described above in paragraph (a) (proctor density), to yield the % compaction.

The above tests were observed to be performed in accordance with the applicable test standards.

#### 8. Diesel Generator Building and Pedestal Foundation Details

The diesel generator building is founded on approximately 35 feet of compacted fill with its foundation support provided by a 10 foot wide, 2'-6" thick spread footing supporting the structure above. The footing and walls are cast-in-place reinforced concrete. The diesel generator pedestal is independent of the surrounding structure and consists of a 6'-6" thick mass reinforced concrete pedestal to support and distribute the load of the diesel generator.

Passing underneath the diesel generator building in the north-south direction are two condensate water lines (non-safety related) and a series of four electrical duct banks (safety-related) that run under the building and project vertically becoming an integral part of the structure in each of the four diesel generator bays. Bechtel design staff personnel indicated that the condensate lines and duct banks have influenced the differential settlement in local areas of the structure.

Of significance is that the original ground water level prior to plant construction was approximately at elevation 601'. Subsequent to construction of the cooling water pond, the ground water table has risen to elevation 622', and it is planned to be raised to its maximum elevation of 627'. This increased ground water level has stabilized in the compacted fill beneath the diesel generator building at elevation 622'. The licensee is evaluating the effects of this increase in ground water level on the 35 feet of compacted fill material in the plant fill area.

#### Exit Interview

The inspector met with site staff representatives (denoted in Persons Contacted) at the conclusion of the inspection on October 27, 1978. The inspector summarized the purpose and findings of the inspection. The licensee acknowledged the findings reported herein.

In summary, the licensee has reported the deficiency and had initiated an extensive soils testing investigation of the foundation materials. The final results of these tests are scheduled to be complete by

November 6, 1978 and are to be presented to the NRC staff shortly thereafter. The deficiency reported in the 50.55(e) report will be reviewed after the proposed resolution to the settlement of the plant structures has been established. Additionally, this matter has been referred to IE Headquarters for evaluation.

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. Reirmuth

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



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:

*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

NOV 22 1978

Docket No. 50-329  
Docket No. 50-330

Consumers Power Company  
ATTN: Mr. Stephen H. Howell  
Vice President  
1945 West Parnall Road  
Jackson, MI 49201

Gentlemen:

Thank you for your interix report dated November 7, 1978, pursuant to 10 CFR 50.55(e) regarding settlement of diesel generator foundations and building. We will review your final report on this matter upon receipt.

Your cooperation with us is appreciated.

Sincerely,

R. F. Heishman, Chief  
Reactor Construction and  
Engineering Support Branch

cc: Central Files  
Reproduction Unit NRC 20b  
PDR  
Local PDR  
NSIC  
TIC  
Ronald Callen, Michigan Public  
Service Commission  
Dr. Wayne E. North  
Myron M. Cherry, Chicago

Protocol for Accompaniment on NRC Inspections

Persons who accompany on inspections, conducted by the Nuclear Regulatory Commission, Office of Inspection and Enforcement, do so under the following terms and conditions:

1. Persons accompanying on NRC inspections are present during the inspection as observers, not as participants. Specific approval for the accompaniment must be obtained from the Office of Inspection and Enforcement prior to an observer accompanying an NRC inspector.
2. Accompaniment is to observe typical NRC inspection activities and techniques and is not an inspection by the observer of the NRC nor of the licensee. Hence, accompaniment is limited to no more than two observers on any single inspection and to not more than ten percent of NRC inspections at any licensed facility.
3. Observers accompanying on NRC inspections shall not, in any manner, interfere with the orderly conduct of the inspection. NRC inspectors are authorized to refuse to permit continued accompaniment by any individual whose conduct interferes with a fair and orderly inspection or whose conduct does not follow the terms and conditions included within this protocol.
4. Observers accompanying on NRC inspections must stay physically present with an NRC inspector throughout the course of the inspection.
5. Observers accompanying on NRC inspections may be present during any discussion by the NRC inspector with the licensee with regard to inspection of matters covered by the accompaniment. This includes the discussion with licensee management at the conclusion of the inspection.
6. Observers receiving information of a proprietary or physical security nature shall safeguard such information such that it is not disclosed to unauthorized persons.
7. Observers accompanying on NRC inspections do so at their own risk. The Nuclear Regulatory Commission will accept no responsibility for injuries and exposure to harmful substances which may be received during the inspection and will assume no liability of any kind for action to or by the accompanying individual. Observers accompanying on NRC inspections agree to waive all claims of liability against the Commission.

Protocol for Accompaniment  
on NRC Inspections

- 2 -

8. The NRC will not make arrangements for the persons accompanying the NRC inspector to gain access to the licensee's facility but will inform the licensee that the NRC has no objection to the specific individuals accompanying the NRC inspectors as observers. Specific arrangements to gain access to the licensees' facilities must be made directly by the accompanying individual.

\_\_\_\_\_  
Signature of Accompanying Individual

\_\_\_\_\_  
Date

LAW OFFICES  
MYRON M. CHERRY  
ONE IBM PLAZA  
CHICAGO, ILLINOIS 60611  
13121 865-1177

November 20, 1978

Mr. J. G. Keppler, Regional Director  
Office of Inspection and Enforcement  
U. S. Nuclear Regulatory Commission  
Region III  
799 Roosevelt Road  
Glen Ellyn, Illinois 60137

Re: CONSUMERS POWER COMPANY  
(Midland Plant, Units 1 and 2)  
Docket Nos. 50-329 and 50-330  
(Operating Licenses Proceeding)

Dear Mr. Keppler:

I have received from Mr. Olmstead of the Nuclear Regulatory Commission a copy of a letter and report from Consumers-Bechtel to you, which were attached as enclosures to my copy of his November 16th letter to the Licensing Board. The report from Bechtel-Consumers is dated September 22, 1978 and accompanied your cover memorandum to Mr. Thornberg dated November, 1978. At page 2 of your November 1, 1978 letter to Mr. Thornberg you state:

"In our view, this deficiency [that is, the deficiency in connection with the diesel generator building settlement] has the potential for affecting the design adequacy of several safety related structures at the Midland site."

In view of the seriousness of this statement and the enormous sums of money which Consumers continues to spend, I should like a more full explanation, including a submission or a listing of all memorandums, communications, letters and reviews, whether formal or informal, which form the basis for the Region III's conclusions made by you. Please also tell me how you justify continued construction, in view of this serious breach of quality control, unless, of course,

2 1978

Mr. J. G. Keppler  
November 20, 1978  
page two

you are content to permit "magic" to ensure safety. I am most concerned over what appears to be a cavalier attitude towards construction. Can it be that your organization (whether intentionally or otherwise and whether conscious or unconscious) is affected by the amounts of money Consumers has spent so that you blind your eyes to reality. If so, you do a disservice not only to the people of the United States but also to the utilities who unfortunately take advantage of such lax enforcement. Do we need a serious accident before enforcement, in your mind at least, equals the importance of monetary investment?

Also attached with your letter to Mr. Thornberg of November 1 were communications sent to you from Consumers Power Company, in particular a letter from Howell dated September 29, 1978 and a September 22, 1978 Interim Report No. 1, apparently issued by Mr. Martinez of Bechtel to Mr. Keeley of Consumers Power Company.

In connection with the last mentioned report, page 3 has a significant deletion whereby Consumers Power or Bechtel apparently deleted information submitted regarding what you labeled as a serious safety problem, i.e. the diesel building settlement. The report states:

"This portion of the Bechtel Report is deleted because it contains a premature discussion of possible corrective action options."

In view of the lackluster performance at Consumers' Midland site, the history of the defects and bad workmanship at the Palisades site, and the overall shenanigans of Consumers (including the allegations of dishonesty), I am surprised and astounded that Region III compliance would permit Consumers or Bechtel to delete information on a serious safety issue without even a whimper being heard from the Nuclear Regulatory Commission.

Please let me know whether you plan to follow up with Consumers and obtain the information which they have withheld. It simply is incredible that this issue has to be raised by me (or anyone outside of the NRC) and was not followed up on by anyone at the NRC.



Mr. J. G. Keppler  
November 20, 1978  
page three

I also wish to inform you that my lines of communication have reported to me that the resident inspector currently on the Midland site may not be doing his job and may, in fact, have been co-opted by Midland personnel. Before I take any action, I would like you to make your own investigation to determine whether this person should be replaced and whether the resident inspector operation is working.

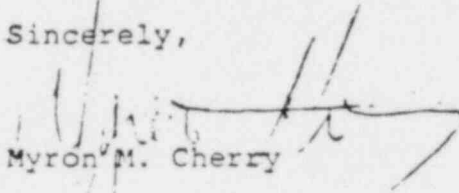
I am requesting all of the information in this letter on an immediate timeframe. If it is necessary for me to make a Freedom of Information Act request or take other steps to secure the information, please let me know immediately.

In view of all of these situations I should also like to request advance notice of any inspection which Region III intends to make at the Midland plant, so that either I or a representative on my behalf can make arrangements to be in attendance. If any inspection is to be surprise in nature, I will pledge my confidence to maintain the confidentiality of any such unannounced on-site visitation and inspection. I would appreciate sufficient advance notice to permit me to arrange my schedule so as to conform with any upcoming inspection (or to permit making arrangements for the attendance on my behalf, of a representative). Please let me know at your earliest convenience whether such arrangements will be made.

I realize this is a harsh and direct letter. But these problems at Midland have been repetitive so long that I can no longer believe that anyone takes them seriously. If you and others at the NRC worry about what shutting down Midland will do to the development of nuclear power more than what eventually will occur throughout the U.S. nuclear industry, if Consumers becomes the example to follow, then such persons should resign and join the industry, letting others more concerned with good government replace them.

I don't mind my principles losing in an honest adjudication. I have no respect, however, when I or my clients' interest cannot get a fair deal.

Sincerely,

  
Myron M. Cherry

MMC/ay

## DETAILS

### Persons Contacted

- D. Miller, Site Manager
- T. Cooke, Project Superintendent
- \*J. Corley, Project QA Superintendent
- B. Marguglio, Manager, Quality Assurance
- W. Bird, Section Head, Quality Engineering
- \*L. Dreisbach, Bechtel Corporation Project Field QA Engineer
- \*R. Shope, B&W Project Engineer

Numerous other principal staff and personnel were contacted during the reporting period.

\*denotes those present at the exit interview.

### Inspection Areas

#### 1. Site Tours

At periodic intervals generalized tours of the facility were performed by the Resident Inspector. These tours covered essentially all areas of the site. The tours were intended to assess the cleanliness of the site; construction activities in progress; storage condition of equipment and piping used in site construction; and the potential for fire or other hazards which might have a dilaterious affect on personnel and equipment. It was noted during these tours that temporary lay down areas for safety related piping were starting to deteriorate. This was brought to the licensee's attention and immediate steps were taken to upgrade the temporary lay down areas.

#### 2. Steam Generator and Reactor Vessel Hold Down Bolting

Open (Item No. 329/78-13-02; 330/78-13-02) - The procedure for setting the reactor vessel and steam generator hold down bolts has not yet been completely finalized and accepted. However, the licensee indicated that tensioners may be used to establish the required bolting preload.

#### 3. Auxiliary Piping System Field Welding and Fabrication

Field fabrication of piping being installed in the Auxiliary building was examined. This included witnessing weld preperation, fit up and welding of piping joints in the decay heat removal and make up feed systems and other system joints welded in the auxiliary building. It

appeared that controlled rod withdrawals were being made per procedure Nos. WFMC-1 and FIW-1.120. The licensee is determining the need to establish the times of subsequent rod withdrawals made during a given shift against a given authorization for rod withdrawal (W-6 or WR-6 Form).

4. L. P. Turbine Damage

The licensee has informed the inspector that the latest estimate of shipping the L. P. turbines damaged in a train derailment, is mid-year 1979. At this time there is no known impact on overall plant scheduling.

5. 50.55(e) Item

Settlement of Diesel Generator Foundations and Structure

Open (Item No. 329/78-13-03; 330/78-13-03) - The licensee has kept the Resident Inspector informed of exploratory activities associated with evaluations pertaining to the settling of the diesel generator building foundations and structures. Approximately 100 core borings have been or will be extracted from various locations around the site and diesel building for further evaluation by an independent laboratory. Relative soil density measurements have been taken at three locations to further enhance the evaluations pertinent to the diesel building settlement. An escalated survey program has been put into affect to monitor the rate of settlement.

6. Unit 2 Reactor Coolant System Piping

The inspector witnessed the lowering into place and some of the fitting of the cold leg reactor coolant piping attached to the Unit 2 - "B" steam generator. The inspector examined fit up of other portions of the Unit 2 reactor coolant piping which is presently being installed. The inspector witnessed B&W Construction Company QC perform an examination of the Weld preparation for the Unit 2 reactor coolant system hot leg piping for the B-steam generator.

7. Core Flood Line Unit 2

The inspector witnessed welding operations of Field Weld Number 14 on spool 2CCA-21-S-611-1-2 for the core flood system of Unit 2 located at the 606 foot elevation and examined weld preparations on adjacent piping. No deviations or items of noncompliance were observed.

8. B&W Construction Company NDE

The Resident Inspector assisted K. Ward, Reactor Inspector, RIII in the evaluation of procedures intended for NDE use by B&W Construction Company. The licensee also has an active NDE procedure review program.

9. Inplace Storage of Electrical Equipment

Inplace storage of electrical equipment in proximity to the control room was examined during the reporting period. The equipment appeared to be properly protected from weathering conditions.

10. Licensee Meeting

The Resident Inspector met at various times with licensee principal staff members from the corporate QA group and the Operations Group located onsite. These meetings were for the exchange of information which may assist the licensee in developing their programs to meet future regulatory requirements and to alert the licensee to events at other sites which may have an affect on the Midland Plant.

Exit Interview

The Resident Inspector attended the Exit Interview conducted by I. Yin and K. Ward, RIII Reactor Inspectors on September 15 and September 28, 1978, respectively.

The Resident Inspector met with licensee representatives (denoted under Persons Contacted) on September 20, 1978. The inspector summarized the scope and findings of the inspection effort to date. The licensee acknowledged the findings reported herein.