

APPENDIX BNOTICE OF VIOLATION

Consumers Power Company

Docket No. 50-329

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This refers to the investigation conducted by the Office of Inspection and Enforcement at the Midland Nuclear Power Plant, Units 1 and 2, Midland, Michigan, at your offices in Jackson, Michigan, and at Bechtel Corporation, Ann Arbor, Michigan, of activities authorized by NRC License No. CPPR-81 and No. CPPR-82.

During this investigation conducted on various dates between December 11, 1978 and January 25, 1979, the following apparent item of noncompliance was identified.

The Midland Final Safety Analysis Report (FSAR) contains the following:

Section 2.5.4.5.3, Fill, states: "All fill and backfill were placed according to Table 2.5-9."

Table 2.5-9, Minimum Compaction Criteria, contains the following:

<u>"Function"</u>	Zone (1) <u>Designation</u>	<u>Soil Type</u>	<u>Compaction Criteria</u>	
			<u>Degree</u>	<u>ASTM Designation</u>
Support of structures		Clay	95%	ASTM D 1557-56T (modified) ⁽²⁾

(1) For zone designation see Table 2.5-10.

(2) The method was modified to get 20,000 foot-pounds of compactive energy per cubic foot of soil."

Section 2.5.4.10.1, Bearing Capacity, states: "Table 2.5-14 shows the contact stress beneath footings subject to static and static plus dynamic loadings, the foundation elevation, and the type of supporting medium for various plant structures."

Table 2.5-14, Summary of Contact Stresses and Ultimate Bearing Capacity for Mat Foundations Supporting Seismic Category I and II Structures, contains, in part; the following:

<u>"Unit"</u>	<u>Supporting Soils</u>
Diesel Generator Building	Controlled compacted cohesive fill."

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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSIONMIDLAND
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BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

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In the Matter of

CONSUMERS POWER COMPANY

(Midland Nuclear Power Plant,
Units 1 and 2)Docket Nos. 50-329
50-330ANSWER TO NOTICE OF HEARING

On December 6, 1979 the Acting Director of the Office of Nuclear Reactors Regulation and the Director of the Office of Inspection and Enforcement issued an Order Modifying Construction Permits No. CPPR-81 and No. CPPR-82 (the "Order"). On December 26, 1979 Consumers Power Company ("Licensee") filed a Request for Hearing pursuant to 10 CFR §2.204 and Part V of the Order. On March 14, 1980 the NRC issued a Notice of Hearing, appointing an Atomic Safety and Licensing Board and specifying the following issues for adjudication:

1. whether the facts set forth in Part II of the Directors' Order of December 6, 1979 are correct;
2. whether that Order should be sustained.

On April 9, 1980 Ivan W. Smith, Esq., Chairman of the Atomic Safety and Licensing Board, granted Licensee's request

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for a one week extension in time to answer the Notice of Hearing, a request that had been agreed to by William J. Olmstead, Esq., counsel for NRC staff.

Pursuant to 10 CFR §2.705, Licensee answers the Notice of Hearing as follows.

I. Licensee's position with respect to the first issue is as follows:

(a) Licensee, without admitting that the following "facts" (to the extent they are facts and not opinions, conclusions or other non-factual allegations) are "material allegation[s] of fact" under 10 CFR §2.705, responds to the "facts" set forth in Part II of the Directors' Order of December 6, 1979:

(1) Admits the facts set forth in the first paragraph of page 1 and alleges that the Licensee also reported to the NRC and its consultants in other reports, meetings, telephone conversations, letters and other communications regarding soil conditions under and around safety related structures and systems, including responses to requests made by the Staff pursuant to 10 CFR 50.54(f).

(2) In regard to the second paragraph, at pages 1-2, admits that an investigation and inspection was made by NRC Inspectors from Region III and that the NRC promulgated the referenced reports and denies the remaining allegations of

that paragraph. Licensee does not interpret the last sentence in this paragraph, referring to the "details" of the NRC's findings as described in certain inspection reports, as material allegations of facts requiring Licensee to admit or deny in this proceeding. Without restricting the generality of the foregoing and further answering that paragraph, Licensee denies that there was a "breakdown" in quality assurance, and with respect to subparagraph (5), Licensee alleges that the Staff in the July 18, 1979 meeting requested that Licensee not amend its TSAR but rather keep the Staff informed of the status of the soils work by means of 50.55(e) reports, which Licensee has done.

(3) Licensee's responses to the specific factual allegations set forth in Appendix A and Appendix B of the Directors' Order are set forth in the Appendix to this Answer.

(4) In regard to the paragraph that begins on the bottom of page 2 and continues to page 3, Licensee admits that the Director, Office of Nuclear Reactor Regulation, requested information under 10 CFR 50.54(f) and that Licensee responded to those requests. Licensee alleges that it also reported to the NRC and its consultants in meetings,

telephone conversations, letters, amendments to the construction permit and operating license and other communications regarding soil conditions under and around safety related structures and systems and remedial steps or proposed to be taken by Licensee. Licensee alleges that it has responded in a timely manner to the November 19, 1979 request.

(5) In regard to the concluding paragraph of page 3, Licensee admits the first and second sentence. Licensee denies the third and fourth sentences. Licensee alleges that the final sentence of the paragraph is not applicable since Licensee has provided the Staff information sufficient to resolve these issues. Therefore the Staff does have reasonable assurance that "the affected safety-related portions of the Midland facility will be constructed and operated without undue risk to the health and safety of the public."

(b) Licensee controverts the Staff's characterization of the facts alleged in Appendix A of the Directors' Order as constituting "infractions." Licensee also denies that the facts alleged in Appendix B constitute a "material false statement" or a "violation."

II. Licensee's position with respect to the second issue specified in the Notice of Hearing is that the Order should not be sustained, for the following reasons which constitute affirmative defenses to the Order:

(1) Licensee has provided the staff and its consultants with all the information requested regarding the soil conditions under and around safety related structures and systems, including information relating to "the adequacy of the remedial action to correct the deficiencies in the soil construction under and around safety-related structures and systems."

(2) The information Licensee has provided and the remedial actions it has taken and proposes to take including those set forth in Amendment Nos. 72, 74 and 76 to its application for construction permits and operating licenses, and technical discussions with the NRC Staff and its consultants, resolves the "safety issues associated with remedial actions related to soil deficiencies."

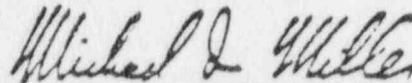
(3) The information ^{the} Licensee has provided and the remedial actions it has taken and proposes to take, including those set forth in Amendment Nos. 72, 74 and 76 to its application for construction permits and operating licenses, and technical discussions with the NRC Staff and its consultants, provides "reasonable assurance that the affected safety-related portions of the Midland facility will be constructed and operated without undue risk to the public health and safety."

(4) Licensee contends that the alleged "quality assurance deficiencies involving the settlement of the

Diesel Generator Building and soil activities at the Midland site" and the alleged "false statement in the FSAR" form neither a logical nor a legal basis upon which the order's prohibition against the enumerated activities can be sustained.

III. Licensee will appear by Counsel and present evidence.

Respectfully submitted,



Michael I. Miller
Attorney for Licensee

DATED: April 16, 1980

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APPENDIX

Licensee provides the following responses to the facts alleged in Appendix A of the Directors' Order:

Allegation 1 - Licensee admits that it is committed to ANSI N45.2 (1971). Licensee admits that a few "inconsistencies were identified in the license application and in other design basis documents." Licensee denies that in general measures established and executed were contrary to 10 CFR 50, Appendix B, Criterion III, CPCo Topical Report CPC-1-A, Policy No. 3, Section 3.4 and ANSI N45.2 (1971), Section 4.1.

(a) Licensee admits this allegation. Licensee alleges as set forth in its Response to Question 23, Part (1) [50.54(f)], Revision 4, 11/79, page 23-10 and 11, that:

When the FSAR was prepared and reviewed, the major backfill operations were complete. There were no known inconsistencies...related to FSAR Subsections 2.5.4 and 3.8.5; therefore, these subsections were essentially inactive and were not subject to any further review. The inconsistencies within the FSAR were not detected. The inconsistency between Subsections 2.5.4 and 3.8.5 with respect to the settlement values resulted because the two subsections were prepared by separate organizations (Geotechnical Services and Civil Engineering), neither of which were aware of the multiple display of similar information in the opposite subsection.

The inconsistencies between FSAR Subsections 2.5.4 and 3.8.5 have been corrected via FSAR Revision 18 (February 28, 1979).

(b) Licensee admits this allegation with respect to the diesel generator building. Licensee alleges,

as set forth in its response to NRC Preliminary Finding

9, that:

The diesel generator building spread footing foundation, which constitutes the design basis, was translated into the detail design. However, a design change to the foundation was not recognized to affect a previous settlement calculation, but this did not significantly affect settlement estimate.

Licensee denies this allegation with respect to the borated water storage tanks. Licensee's position is set forth in more detail in the following statement taken from its response to N.R.C. Preliminary Finding 9:

The borated water storage tanks are supported in part by a ring type spread footing, but most of the load is applied across the tank bottom, which is supported on fill (FSAR Figure 3.8-60). Settlement calculations discussed in FSAR Subsection 2.5.4.10.3 for the borated water storage tanks, conservatively used a uniform equivalent circular mat foundation having an applied soil pressure of 2,500 psf (FSAR Figure 2.5-47). The ring type spread footing pressure is 2,500 psf and the tank-applied pressure within the ring foundation is 2,000 psf. Because the actual pressure is 2,000 psf over most of the foundation area, this settlement estimate is conservative.

The assumptions used for the borated tank settlement calculations are appropriate for the type of design utilized.

- (c) Licensee admits this allegation.
- (d) Licensee admits that the wrong compressibility factor was used for settlement calculations, but alleges that it had a minor impact on the resultant values.
- (e) Licensee admits this allegation.

(f) Licensee admits this allegation.

Allegation 2 - Licensee admits that it is committed to ANSI N45.2 (1971) Section 6.

(a) Licensee denies that instructions provided to field construction for substituting lean concrete for Zone 2 material were contrary to 10 CFR 50, Appendix B, Criterion V, CPCo Topical Report CPC-1-A, Policy No. 5, Section 1.0 and ANSI N45.2 (1971), Section 6. Licensee denies that differential settlement of the Diesel Generator building was caused by substituting lean concrete for Zone 2 material. Licensee's position is set forth in more detail in the following statement taken from its response to NRC Preliminary Finding 11:

Drawings and specifications permit the use of Zone 2 random fill material in plant area fill. Structural backfill was placed in local excavations in accordance with Specification 7220-C-211. Lean concrete was used to replace structural backfill in confined areas as permitted by Specification 7220-C-211, Section 5.1.3 which states, "In absence of structural backfill materials described above... lean concrete, as specified in Specification 7220-C-230 may be used." Use of lean concrete in restricted areas is a normal construction practice and was controlled by the field engineer's approval after inspection of subgrade.

The diesel generator building settlement was restricted by the enlargement of the electrical duct banks. Concrete backfill was not used indiscriminately.

(b)

(1) Licensee admits this allegation.

(2) Licensee admits this allegation.

Allegation 3 - Licensee admits that it is committed to ANSI N45.2 (1971). Licensee denies that Quality Control Instruction C-1.02 is contrary to 10 C.F.R. 50, Appendix B, Criterion X, CPCo Topical Report CPC 1-A, Policy No. 10, Section 3.1 or ANSI N45.2 (1971). Licensee alleges, as stated in CPCo response to NRC Preliminary Finding 13, that:

Neither the characteristics subject to inspection or witnessing the type of inspection or witnessing were changed; the degree of inspection or witnessing was reduced by going to a surveillance (sampling) plan.

The decision to change to sampling inspection is questionable, in retrospect, recognizing that the bulk of the prior successful experience related to Canonic's activity and that a change was being made to have the activity performed by Bechtel.

The sampling (surveillance) plan was inadequate in that it did not specify conditions or criteria under which there would be increased sampling or a return to 100% inspection.

Allegation 4 - Licensee denies the general allegation that "measures did not assure that soils conditions of adverse quality were promptly corrected to preclude repetition." Licensee denies that its actions and measures were contrary to 10 CFR 50, Appendix B, Criterion XVI and CPCo Topical Report CPC-1-A, Policy No. 16, Section 1.0.

(a) Licensee denies this allegation to the extent that it is inconsistent with the following statement taken from Licensee's response to NRC Preliminary Finding 6:

Specification 7220-C-210, Section 12.6.1, states in part:

"Insofar as practicable...materials which require moisture control, shall be moisture-conditioned in the borrow areas.... The water content during compaction shall not be more than 2 percentage points below optimum moisture content and shall not be more than 2 percentage points above optimum moisture content....

...after the placement of loose material on the embankment fill, the moisture content shall be further adjusted as necessary to bring such material within the moisture content limits required for compaction."

On July 22, 1977 Bechtel QA identified in QAR SD-40 that the field did not take moisture control measurements prior to and during placement of the backfill, but rather relied on the moisture results taken from the in-place (after compaction) soil density tests to control moisture.

As shown in Attachment 1, prior to August 1, 1977, there were no moisture measurements made at the borrow area or when the loose fill was placed prior to or during compaction. Moisture measurements were made after compaction, as were density tests, and the results of both served as the acceptance criteria.

From August 1, 1977, to the cessation of fill operation with the onset of the winter 1977-1978 season, there was a change. During this time, moisture measurements were made at the borrow area, but the measurements were not compared to laboratory standards. Again, no moisture measurements were made when the loose fill was placed prior to or during compaction. Moisture measurements were made after compaction and the data were used in conjunction with the density tests, the results of which served as the acceptance criteria. For this period, the data from moisture measurements made after compaction, in conjunction with the corresponding density tests, have been reviewed again and thirteen individual moisture measurements were found to be beyond $\pm 2\%$ of optimum.

For 1978, moisture measurements were made either in the borrow area or when the loose fill was placed prior to compaction, or both, but not during compaction. These measurements were compared to laboratory standards. Also during this period, moisture measurements were made after compaction and the data were used in conjunction with the density tests, the results of which served as acceptance criteria. Subsequently, moisture measurements made after compaction were reviewed again for this period and the cases for which the post-compaction moisture data indicate measurements beyond $\pm 2\%$ of optimum have been identified.

Moisture measurements for the three periods are now considered not to have met the intent of the specification regarding the location and time of the measurements. Prior to commencing fill operations for the 1979 season, this requirement will be redefined.

Final acceptance density criteria were clearly specified and were implemented from the inception of the project.

Moisture measurements were taken as a necessary part of the final density tests.

In-process moisture control criteria were not clearly specified and were not consistently implemented. Clarifications and interpretations of the specification were made without specification changes.

Licensee further alleges that prior to 1978, "During Compaction" was interpreted by personnel in the field as the entire process of placing, compacting and testing.

(b) Licensee admits that the corrective action it initially took with regard to nonconformance reports related to plant fill did not prevent nonconformances at a later date in the area of plant fill construction.

Licensee alleges that its corrective action, including those it initially took, substantially reduced the number of nonconformances at a later date in the area of plant fill construction. Licensee's position is set forth in the pertinent portion of its response to NRC Preliminary Finding 8.

Licensee has the following response to Appendix B:

Licensee admits that the excerpts of documents cited at page 1 of Appendix B are correct. Licensee alleges, as set forth in its response to NRC Preliminary Finding 3, that:

FSAR Table 2.5-9 provides compaction criteria and zone designation both of which are design bases. Inadvertently omitted from this table was the number "2" in the column used for "Zone Designation" for the "Support of Structures." Also inadvertently omitted were the words "and sand" in the column used to designate the "Soil Type" for the "Support of Structures." FSAR Table 2.5-10 provides a definition of Zone 2 materials. These materials were used consistent with the recommendations contained in the Dames and Moore report included in the PSAR. FSAR Table 2.5-14 summarizes contact stresses, estimated bearing capacity and factors of safety for the supporting soils given in the table for each structural unit. However, some of these supporting soils specified in Table 2.5-14 were intentionally not the same as the design bases soils described (or intended to have been described) in Table 2.5-9. The supporting soils specified in 2.5-14 were those used for the conservative calculations given in that table.

FSAR Table 2.5-9 was revised to correct the inadvertent omissions and Table 2.5-14 was revised to reflect the design bases contained in the PSAR (as translated into the actual design) rather than to reflect the material used for calculational purposes.

Therefore, Licensee, denies that the excerpted information is "false."

Licensee admits that "materials other than controlled compacted cohesive fill were used to support the diesel generator building." Licensee alleges that only controlled and compacted fill was used to support the Diesel Generator Building. Licensee has no knowledge or information sufficient to form a belief as to whether "information presented concerning the supporting soils influenced the staff review of the PSAR."

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of
CONSUMERS POWER COMPANY
(Midland Nuclear Power Plant,
Units 1 and 2)

Docket Nos. 50-129
50-330

CERTIFICATE OF SERVICE

I, Alan S. Farnell, hereby certify that copies of my "Notice of Appearance" and of Applicant's "Answer to Notice of Hearing" were served upon the persons shown in the attached Service List by deposit in the United States mail, first class, this 16th day of April, 1980.

Alan S. Farnell
Alan S. Farnell

Philip S. Farnell

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EUGENE J. GALLAGHER

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

PROFESSIONAL QUALIFICATIONS

I am a Civil Engineer in the Division of Resident and Regional Reactor Inspection, Reactor Engineering Branch, Office of Inspection and Enforcement.

I received a Bachelor of Engineering Degree in Civil Engineering from Villanova University in 1973 and a Master of Science Degree in Civil/Structural Engineering from Polytechnical Institute of New York in 1974. I am a registered Professional Engineer in the States of Illinois (#37828), Florida (#29114) and Louisiana (#16376). I am a member of the American Society of Civil Engineers, American Concrete Institute and Tau Beta Pi National Engineering Honor Society.

In my present work at the NRC, I provide technical assistance in the area of civil engineering to Regional offices and resident inspectors with particular emphasis on the design and construction of reinforced and prestressed concrete structures, foundations, structural steel buildings and in structural testing and surveillance. In addition, I provide technical input for the development and interpretation of industry codes, standards and regulatory requirements relating to inspection activities.

From 1978 to 1981 I was a member of the NRC Region 3 inspection staff responsible for the inspections of civil engineering aspects of plants under construction and in operation. This included the inspection of laboratory and field testing of concrete, steel and soils materials, earth embankments and dams, material sources, piping systems and reinforced and prestressed concrete structures. In addition, a review of management controls and quality assurance programs were performed at plants under construction. I participated in approximately 90 inspections of reactor facilities.

Prior to joining the NRC Staff I was employed by EBASCO Services, Inc. in New York City from 1973 to 1978. I performed designs of reinforced concrete and steel structures, design of hydraulic and water supply systems and preparation of specifications for construction. From 1976 to 1978, I was the civil resident engineer at the Waterford 3 Nuclear Plant site responsible for providing technical assistance to construction.

During 1972 and 1973 I was employed by Valley Forge Laboratory in Devon, PA performing inspection and testing on concrete, steel and soil materials.

ADDITIONAL NRC TRAINING

Fundamentals of Inspection, NRC, February 1978 (40 hours)
BWR Fundamentals Course, NRC, March 1978 (40 hours)
Concrete Technology and Codes, Portland Cement Assoc., May 1978 (80 hours)
Quality Assurance Course, NRC, August 1978 (40 hours)
Nondestructive Examination and Codes, Rockwell Int'l., August 1978 (120 hours)
PWR Fundamentals Course, NRC, November 1978 (40 hours)
Welding Metallurgy, Ohio State University, September 1980 (80 hours)