

December 29, 1980

MEMO TO: Samuel J. Chilk
Secretary

FROM: Thomas R. Gibbon *TRG*
Legal Assistant
to Commissioner Bradford

SUBJECT: POSSIBLE EX PARTE CONTACT IN MIDLAND PROCEEDING, DOCKET #
50-3290M AND # 50-3300M

On July 30, 1980, I had extensive discussions with James G. Keppler, Director of Region III, and other Region III personnel on general NRC enforcement issues. During the course of these general discussions, we touched briefly upon the Midland case. I have recently reviewed my notes of these conversations and have now realized that the Midland conversation could be considered an ex parte contact. Accordingly, I request that pursuant to 10 CFR 2.780, you serve a copy of this memo and the attached summary of discussion upon all the parties in the Midland proceeding and also place these documents in the PDR. With regard to the summary of the discussion, Mr. Keppler notes that while there are some technical inaccuracies, the substance of the discussion is portrayed correctly.

Attachment:
As stated

cc: James G. Keppler

Kepler also stated that the Commissioners needed to express
in one form or another the philosophy that once something is found
wrong at the construction site, construction will stop in that
area until the item was resolved. He gave the example of Midland
where it was found that the diesel generator building had settled
excessively. They also found that there was no Q/A program or
any substance related to the basic foundation of the site. He
said there really wasn't a Q/A program in this area. In response
to this, the NRC issued an order which said that this should
be remedied or work would be stopped in 30 days. The company
requested a hearing and, therefore, stayed the order. Midland
is continuing work today which will make resolution of the
settlement problem much more difficult. Kepler said that the
staff had not yet made up their minds on whether the fix proposed
by Midland is acceptable. Therefore, the project continues to
be built and the problem gets worse. He wanted the work stopped
until the problem is solved.

*Draft of
Mon. 12/3/79
AM*

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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

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}
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}

Docket No. 50-329
50-330

ORDER MODIFYING CONSTRUCTION PERMITS

I

The Consumers Power Company (the Licensee) is a holder of Construction Permits No. CPPR-81 and No. CPPR-82 which authorize the construction of two pressurized water reactors in Midland, Michigan. The construction permits expire on _____.

II

On August 22, 1978, the Licensee informed the NRC Resident Inspector at the Midland site that unusual settlement of the Diesel Generator Building had been detected. The Licensee reported the matter under 10 CFR 50.55(e) of the Commission's regulations telephonically on September 7, 1978. This notification was followed by a series of interim reports dated September 29, 1978, November 7, 1978, December 21, 1978, January 5, 1979, February 23, 1979, April 3, 1979, June 25, 1979, August 10, 1979, September 5, 1979, and November 2, 1979.

Following the September notification, inspectors from Region II, Office of Inspection and Enforcement, conducted an investigation over the period of October, 1978 through March, 1979. This investigation found a breakdown in the quality assurance related to soil construction activities in that (1) a lack of control and supervision of plant fill activities contributed to inadequate compaction of foundation material; (2) corrective action regarding nonconformances related to plant fill was insufficient or inadequate as evidenced by repeated deviations from specification requirements; (3) certain design bases and construction specifications

*Look up 50-329 2-17-81
at*

related to foundation-type, material properties and compaction requirements were not followed; (4) there was a lack of clear direction and support between the contractor's engineering office and construction site as well as within the contractor's engineering office; and (5) the FSAR contains inconsistent, incorrect, and unsupported statements with respect to foundation type, soil properties and settlement values. The details of these findings are described in the inspection reports 50-329/78-12, 50-330/78-12 (November 14, 1978) and 50-329/78-20, 50-330/78-20 (March 19, 1979) which were sent to the Licensee on November 17, 1978 and March 22, 1979 respectively.

The items of noncompliance arising out of the NRC investigation are described in Appendix A to this Order. In addition as described in Appendix B to this Order a Material False Statement was made in the FSAR in that the FSAR falsely stated that "All fill and backfill were placed according to Table 2.5-9." This statement is material in that this portion of the FSAR would have been found unacceptable without further Staff analysis and questions if the Staff had known that Category I structures had been placed in fact on random fill rather than the controlled compacted cohesive fill stated to have occurred in the FSAR.

As a result of the questions raised during the NRC investigation of the Diesel Generator Building settlement, additional information was necessary to evaluate the impact of plant safety caused by soil conditions under and surrounding structures in and on plant fill and the Licensee's quality assurance program. On March 21, 1979, the Director, Office of Nuclear Reactor Regulation, formally requested under 10 CFR 50.54(f) of the Commission's regulations information concerning these matters to determine whether action should be taken to modify, suspend or revoke the construction permits. Additional information was requested by the Staff in letters dated

September 11, 1979 and November 19, 1979. The Licensee responded to these letters, under oath, in letters dated April 24, 1979, May 31, 1979, July 9, 1979, September 13, 1979, and November 13, 1979. The Licensee has not yet responded to the November 19, 1979 requests.

After reviewing material provided by the Licensee in response to the Staff questions arising out of its investigation, the Staff cannot conclude at this time that the safety issues associated with remedial action taken or planned to be taken by the Licensee to correct the soil deficiencies will be acceptable. Without the resolution of these issues the Staff does not have reasonable assurance that the Midland facility can be constructed and operated without undue risk to the health and safety of the public.

III

Under the Atomic Energy Act of 1954, as amended, and the Commission's regulations, activities under construction permits or portions thereof may be suspended should the Commission find information which would warrant the Commission to refuse to grant a construction permit on an original application. I find that the quality assurance deficiencies surrounding the settlement of the Diesel Generator Building and the soil activities at the Midland site, the false statement in the FSAR, and the unresolved safety issue concerning the adequacy of the remedial action to correct the deficiencies in the soil work are adequate bases to refuse to grant a construction permit and that, therefore, suspension of certain activities under Construction Permits No. CPPR-81 and No. CPPR-82 is warranted until the safety issues are resolved.

IV

Accordingly, pursuant to the Atomic Energy Act of 1954, as amended, and the Commission's regulations in 10 CFR Parts 2 and 50, IT IS HEREBY ORDERED THAT subject to Part V of the Order Construction Permits No. CPPR-81 and No. CPPR-82 be modified as follows:

- (1) The Licensee shall submit an amendment application seeking approval of the remedial actions associated with the soil activities for Category 1, pipes, buildings and other structures in and on plant fill material.
- (2) Pending the issuance of the amendment of Construction Permits No. CPPR-81 and CPPR-82 approving the remedial action, Construction Permits No. CPPR-81 and CPPR-82 are modified to prohibit, after the date of this Order (added to make the suspension retroactive if the hearing is dragged out such that the Licensee is building at its own risk during the hearing);
 - (a) any placing, compaction, or excavating safety-related soils, *see Appendix 1, Summary Report*
 - (b) all construction work related to the Diesel Generator Building and the tank farm areas, ~~(and other Class I structures on plant fill)~~;
 - (c) physical implementation of remedial action for correction of soil-related problems including but not limited to:
 - (i) dewatering systems
 - (ii) underpinning of service water building
 - (iii) caissons in valve pit area
 - (iv) compaction and loading activities *see Appendix 1, Summary Report*
 - (d) ^{fill} construction work in ~~safety-related soils~~ such as field installation of conduits and piping *see Appendix 1, Summary Report*
- (3) Paragraph (2) above shall not apply to any ^{LOV}expir~~ation~~, sampling, or testing of soil samples associated with determining actual soil properties

on site which has the approval of the Director of Region III,
Office of Inspection and Enforcement,

V

The Licensee or any interested person may within 20 days of the date of this Order request an hearing with respect to all or any part of this amendment. This amendment will become effective on the expiration of the period during which the Licensee may request a hearing, or in the event a hearing is requested, on the date specified in an Order made followin the hearing.

VI

In the event a hearing is requested, the issues to be considered at such hearing shall be:

- (1) whether the facts set forth in Part II and III of this Order are true; and
- (2) whether this Order should be sustained.

FOR THE NUCLEAR REGULATORY COMMISSION

Victor Stello, Jr., Director
Office of Inspection and Enforcement

Attachments:

Appendix A
Appendix B

Dated at Bethesda, Maryland,
this ____ day of December, 1979.

APPENDIX ANOTICE OF VIOLATION

Consumers Power Company

Docket No. 50-329

Docket No. 50-330

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. CPPER-81 and No. CPPER-82.

Based on the results of the investigation conducted during the period December 11, 1978 through January 25, 1979, it appears that certain of your activities were not conducted in full compliance with NRC requirements as noted below. These items are infractions.

1. 10 CFR 50, Appendix B, Criterion III requires, in part, that measures shall be established and executed to assure that regulatory requirements and the design basis as specified in the license application for structures are correctly translated into specifications, drawings, procedures and instructions. Also, it provides that measures shall be established for the identification and control of design interfaces and for coordination among participating design organizations.

Check T7P09
 And AGAINST license
 statement since March
 when he got a - report.
 See evidence to March 15, 79
 letter to Keppel to Howell

CPCo Topical Report CPC-1-A policy No. 3, Section 3.4 states, in part, "the assigned lead design group or organization (i.e., the NSSS supplier A&E supplier, or CPCo) assure that designs and materials are suitable and that they comply with design criteria and regulatory requirements."

CPCo is committed to ANSI N45.2 (1971), Section 4.1, which states, in part, "measures shall be established and documented to assure that the applicable specified design requirements, such as a design basis, regulatory requirements . . . are correctly translated into specifications, drawings, procedures, or instructions."

Contrary to the above, measures did not assure that design bases were included in drawings and specifications nor did they provide for the identification and control of design interfaces. As a result, inconsistencies were identified in the license application and in other design basis documents as set forth below:

- a. The FSAR is internally inconsistent in that FSAR Figure 2.5-4B indicates settlement of the Diesel Generator Building to be on the order of 3" while FSAR Section 3.8.5.5 (structural acceptance criteria) indicates settlements on shallow spread footings

Appendix A

founded on compacted fill to be on the order of 1/2" or less. The Diesel Generator Building is supported by a continuous shallow spread footing.

- b. The design settlement calculations for the diesel generator and berated water storage tanks were performed on the assumption of uniform mat foundations while these foundations were designed and constructed as spread footing foundations.
- c. The settlement calculations for the Diesel Generator Building indicated a load intensity of 3000 PSF while the FSAR, Figure 2.5-47, shows a load intensity of 4000 PSF, as actually constructed.
- d. The settlement calculations for the Diesel Generator Building were based on an index of compressibility of the plant fill between elevations 603 and 634 of 0.001. These settlement values were shown in FSAR Figure 2.5-48. However, FSAR, Table 2.5-16, indicates an index of compressibility of the same plant fill to be 0.003.
- e. PSAR, Amendment 3, indicated that if filling and backfilling operations are discontinued during periods of cold weather, all

frozen soil would be removed or recompacted prior to the resumption of operations. Bechtel specification C-210 does not specifically include instructions for removal of frozen/ thawed compacted material upon resumption of work after winter periods.

- f. PSAR Amendment 3 indicates that cohesionless soil (sand) would be compacted to 85% relative density according to ASTM D-2049. However, Bechtel specification C-210, Section 13.7.2 required cohesionless soil to be compacted to not less than 80% relative density.

See also the notes on spec. inputs in the PSAR

2. 10 CFR 50, Appendix B, Criterion V requires, in part, that activities affecting quality shall be prescribed and accomplished in accordance with documented instructions, procedures or drawings.

CPCo Topical Report CPC-1-A Policy No. 5, Section 1.0 states, in part, that, "Instructions for controlling and performing activities affecting quality of equipment or operation during design, construction and operations phase of the nuclear power plant such as procurement manufacturing, construction, installation, inspection, testing . . . are documented in instructions, procedures, specifications . . . these documents provide qualitative and quantitative acceptance criteria for determining important activities have been satisfactorily accomplished.

CPCo is committed to ANSI N45.2 (1971), Section 6 which states, in part, "activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings."

- a. Contrary to the above, instructions provided to field construction for substituting lean concrete for Zone 2 material did not address the differing foundation properties which would result in differential settlement of the Diesel Generator Building.
- b. Also, contrary to the above, certain activities were not accomplished according to instructions and procedures, in that:
 - (1) The compaction criteria used for fill material was 20,000 ft-lbs (Bechtel modified proctor test) rather than a compactive energy of 56,000 ft-lbs as specified in Bechtel Specification C-210, Section 13.7.
 - (2) Soils activities were not accomplished under the continuous supervision of a qualified soils engineer who would perform in-place density tests in the compacted fill to verify that all materials are placed and compacted in accordance

with specification criteria. This is required by Bechtel Specification C-501 as well as PSAR, Amendment 3 (Dames and Moore Report, page 16).

3. 10 CFR 50, Appendix B, Criterion X requires, in part, that a program for inspection of activities affecting quality shall be established and executed to verify conformance with the documented instructions, procedures and drawings for accomplishing the activity.

CPCo Topical Report CPC 1-A Policy No. 10, Section 3.1, states, in part, that "work activities are accomplished according to approved procedures or instructions which include inspection hold points beyond which work does not proceed until the inspection is complete or written consent for bypassing the inspection has been received from the organization authorized to perform the inspections."

CPCo is committed to ANSI N45.2 (1971), which states, in part, "A program for inspection of activities affecting quality shall be established and executed by or for the organization performing the activity to verify conformance to the documented instructions, procedures, and drawings for accomplishing the activity."

Contrary to the above, Quality Control Instruction C-1.02, the program for inspection of compacted backfill issued on October 18, 1976, did not provide for inspection hold points to verify that soil work was satisfactorily accomplished according to documented instructions.

4. 10 CFR 50, Appendix B, Criterion XVI requires, in part, that measures shall be established to assure that conditions adverse to quality such as failures, deficiencies, defective material and nonconformances are promptly identified and corrected. In case of significant conditions adverse to quality, measures shall assure that corrective action is taken to preclude repetition.

CPCo Topical Report CPC-1-A Policy No. 16, Section 1.0 states, in part, "corrective action is that action taken to correct and preclude recurrence of significant conditions adverse to the quality of items or operations. Corrective action includes an evaluation of the conditions that led to a nonconformance, the disposition of the nonconformance and completion of the actions necessary to prevent or reduce the possibility of recurrence."

Contrary to the above, measures did not assure that soils conditions of adverse quality were promptly corrected to preclude repetition. For example:

Appendix B

NOTICE OF VIOLATION

Consumers Power Company

Docket No. 50-329

Docket No. 50-330

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:

Appendix B

- 2 -

<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 1557-66T (2) (modified)

(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."

This information is false, in that materials other than controlled compacted cohesive fill-clay were used to support the diesel generator building and material presented concerning the supporting soils influenced the staff review of the FSAR.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

Mark Up of
Version 1 going
to Version 2

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

Docket No. 50-329
50-330

ORDER MODIFYING CONSTRUCTION PERMITS

I

The Consumers Power Company (the Licensee) is a holder of Construction Permits No. CPPR-81 and No. CPPR-82 which authorize the construction of two pressurized water reactors in Midland, Michigan. The construction permits expire on October 1, 1981 ~~for~~ and October 1, 1982, ~~that~~ for Unit 2 and Unit 1 respectively.

On August 22, 1978, the Licensee informed the NRC Resident Inspector at the Midland site that unusual settlement of the Diesel Generator Building had been detected. The Licensee reported the matter under 10 CFR 50.55(e) of the Commission's regulations telephonically on September 7, 1978. This notification was followed by a series of interim reports dated September 29, 1978, November 7, 1978, December 21, 1978, January 5, 1979, February 23, 1979, April 3, 1979, June 25, 1979, August 10, 1979, September 5, 1979, and November 2, 1979.

Following the September notification, inspectors from Region III, Office of Inspection and Enforcement, conducted an investigation over the period of October, 1978 through March, 1979. This investigation found a breakdown in the quality assurance related to soil construction activities in that (2) a lack of control and supervision of plant fill activities contributed to inadequate compaction of foundation material; (4) corrective action regarding nonconformances related to plant fill was insufficient or inadequate as evidenced by repeated deviations from specification requirements; (1) certain design bases and construction specifications

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related to foundation-type, material properties and compaction requirements were not followed; (4) there was a lack of clear direction and support between the contractor's engineering office and construction site as well as within the contractor's engineering office; and (5) the FSAR contains inconsistent, incorrect, and unsupported statements with respect to foundation type, soil properties and settlement values. The details of these findings are described in the inspection reports 50-329/78-12, 50-330/78-12 (November 14, 1978) and 50-329/78-20, 50-330/78-20 (March 19, 1979) which were sent to the Licensee on November 17, 1978 and March 22, 1979 respectively.

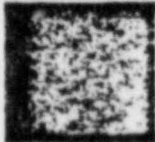
The items of noncompliance arising out of the NRC investigation are described in Appendix A to this Order. In addition as described in Appendix B to this Order a Material False Statement was made in the FSAR in that the FSAR falsely stated that "All fill and backfill were placed according to Table 2.5-9." This statement is material in that this portion of the FSAR would have been found unacceptable without further Staff analysis and questions if the Staff had known that Category I structures had been placed in fact on random fill rather than the controlled compacted cohesive fill stated to have occurred in the FSAR.

As a result of the questions raised during the NRC investigation of the Diesel Generator Building settlement, additional information was necessary to evaluate the impact of plant safety caused by soil conditions under and surrounding structures in and on plant fill and the Licensee's quality assurance program. On March 21, 1979, the Director, Office of Nuclear Reactor Regulation, formally requested under 10 CFR 50.54(f) of the Commission's regulations information concerning these matters to determine whether action should be taken to modify, suspend or revoke the construction permits. Additional information was requested by the Staff in letters dated

September 11, 1979 and November 19, 1979. The Licensee responded to these letters, under oath, in letters dated April 24, 1979, May 31, 1979, July 9, 1979, September 13, 1979, and November 13, 1979. The Licensee has not yet responded to the November 19, 1979 requests.

Several of the Staff's requests were directed to the determination and justification of acceptance criteria to be applied to various remedial measures taken and proposed by the licensee. Such criteria, coupled with the details of the remedial action are necessary for the Staff to judge the technical adequacy and proper implementation of the proposed action. The information provided by the licensee fails to provide such criteria.

Therefore, after ~~the~~ ^{the} material provided by the Licensee in response to the Staff questions arising out of its investigation, the Staff cannot conclude at this time that the safety issues associated with remedial action taken or planned to be taken by the Licensee to correct the soil deficiencies will be acceptable. Without the resolution of these issues the Staff does not have reasonable assurance that the ~~affected portions of the~~ ^{will} Midland facility ~~will~~ be constructed and operated without undue risk to the health and safety of the public.



Act

III

Under the Atomic Energy Act of 1954, as amended, and the Commission's regulations, activities under construction permits or portions thereof may be suspended should the Commission find information which would warrant the Commission to refuse to grant a construction permit on an original application. We find that the quality assurance deficiencies surrounding the settlement of the Diesel Generator Building and the soil activities at the Midland site, the false statement in the FSAR, and the unresolved safety issue concerning the adequacy of the remedial action to correct the deficiencies in the soil work are adequate bases to refuse to grant a construction permit and that, therefore, suspension of certain activities under Construction Permits No. CPPR-81 and No. CPPR-82 is warranted until the related safety issues are resolved.

IV

Accordingly, pursuant to the Atomic Energy Act of 1954, as amended, and the Commission's regulations in 10 CFR Parts 2 and 50, IT IS HEREBY ORDERED THAT the Construction Permits No. CPPR-81 and No. CPPR-82 be modified as follows:

- (1) The Licensee shall submit an amendment application seeking approval of the remedial actions associated with the soil activities for Category 1 pipes, buildings and other structures in and on plant fill material.
- (2) Pending the issuance of the amendment of Construction Permits No. CPPR-81 and CPPR-82 approving the remedial action, Construction Permits No. CPPR-81 and CPPR-82 are modified to prohibit, after the date of this Order ~~added to make the suspension retroactive if the hearing is dragged out such that the Licensee is building at its own risk during the~~

~~hearing;~~ *soil materials beneath*
 (a) any placing, compaction, or excavating ~~safety~~ *at immediate surrounding safety related*
~~related soils, structures and systems;~~

~~(b) all construction work related to the Diesel Generator Building and the tank farm areas; ~~and other class B structures on plant fills~~~~

- (b) ~~physical implementation of remedial action for correction of soil-related problems including but not limited to:~~
 - (i) dewatering systems
 - (ii) underpinning of service water building
 - (iii) caissons in valve pit area
 - (iv) compaction and loading activities

(c) ~~construction work in safety-related soils such as field~~ *soil materials beneath or*
 installation of conduits and piping *for*

(3) Paragraph (2) above shall not apply to any ~~exp~~ *for* ~~iration~~, sampling, or testing of soil samples associated with determining actual soil properties

on site which has the approval of the Director of Region III,
Office of Inspection and Enforcement,

V

The Licensee or any interested person may within 20 days of the date of this Order request an hearing with respect to all or any part of this amendment. This amendment will become effective on the expiration of the period during which the Licensee may request a hearing, or in the event a hearing is requested, on the date specified in an Order made following the hearing.

VI

In the event a hearing is requested, the issues to be considered at such hearing shall be:

- (1) whether the facts set forth in Part II ~~of this Order~~ of this Order are true; and
- (2) whether this Order should be sustained.

← | FOR THE NUCLEAR REGULATORY COMMISSION | ←

*Harold R Denton, Director
Office of Nuclear Reactor Regulation*

Victor Stello, Jr., Director
Office of Inspection and Enforcement

Attachments:

- Appendix A
- Appendix B

Dated at Bethesda, Maryland,
this ____ day of December, 1979.

~~DRAFT~~

~~Forwarded To: Thornburg~~

APPENDIX A
~~APPENDIX A~~

NOTICE OF VIOLATION

Consumers Power Company

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

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.

Based on the results of the investigation conducted during the period December 11, 1978 through January 25, 1979, it appears that certain of your activities were not conducted in full compliance with NRC requirements as noted below. These items are infractions.

1. 10 CFR 50, Appendix B, Criterion III requires, in part, that measures shall be established and executed to assure that regulatory requirements and the design basis as specified in the license application for structures are correctly translated into specifications, drawings, procedures and instructions. Also, it provides that measures shall be established for the identification and control of design interfaces and for coordination among participating design organizations.

CPCo Topical Report CPC-1-A, Policy No. 3, Section 3.4 states, in part, "the assigned lead design group or organization (i.e., the NSSS supplier, A&E supplier, or CPCo) assure that designs and materials are suitable and that they comply with design criteria and regulatory requirements."

CPCo is committed to ANSI N45.2 (1971), Section 4.1, which states, in part, "measures shall be established and documented to assure that the applicable specified design requirements, such as a design basis, regulatory requirements . . . are correctly translated into specifications, drawings, procedures, or instructions."

Contrary to the above, measures did not assure that design bases were included in drawings and specifications nor did they provide for the identification and control of design interfaces. As a result, inconsistencies were identified in the license application and in other design basis documents. Specific examples are set forth below:

- a. The FSAR is internally inconsistent in that FSAR Figure 2.5-4B indicates settlement of the Diesel Generator Building to be on the order of 3" while FSAR Section 3.8.5.5 (structural acceptance criteria) indicates settlements on shallow spread footings

founded on compacted fill to be on the order of 1/2" or less. The Diesel Generator Building is supported by a continuous shallow spread footing.

- b. The design settlement calculations for the diesel generator and borated water storage tanks were performed on the assumption of uniform mat foundations while these foundations were designed and constructed as spread footing foundations.
- c. The settlement calculations for the Diesel Generator Building indicated a load intensity of 3000 PSF while the FSAR, Figure 2.5-47, shows a load intensity of 4000 PSF, as actually constructed.
- d. The settlement calculations for the Diesel Generator Building were based on an index of compressibility of the plant fill between elevations 603 and 634 of 0.001. These settlement values were shown in FSAR Figure 2.5-48. However, FSAR, Table 2.5-16, indicates an index of compressibility of the same plant fill to be 0.003.
- e. PSAR, Amendment 3, indicated that if filling and backfilling operations are discontinued during periods of cold weather, all

frozen soil would be removed or recompacted prior to the resumption of operations. Bechtel specification C-210 does not specifically include instructions for removal of frozen/ thawed compacted material upon resumption of work after winter periods.

- f. PSAR Amendment 3 indicates that cohesionless soil (sand) would be compacted to 85% relative density according to ASTM D-2049. However, Bechtel specification C-210, Section 13.7.2 required cohesionless soil to be compacted to not less than 80% relative density.

- 2. 10 CFR 50, Appendix B, Criterion V requires, in part, that activities affecting quality shall be prescribed and accomplished in accordance with documented instructions, procedures or drawings.

CPCo Topical Report CPC-1-A, Policy No. 5, Section 1.0 states, in part, that, "Instructions for controlling and performing activities affecting quality of equipment or operation during design, construction and operations phase of the nuclear power plant such as procurement manufacturing, construction, installation, inspection, testing . . . are documented in instructions, procedures, specifications . . . these documents provide qualitative and quantitative acceptance criteria for determining important activities have been satisfactorily accomplished."

CPCo is committed to ANSI N45.2 (1971), Section 6 which states, in part, "activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings."

- a. Contrary to the above, instructions provided to field construction for substituting lean concrete for Zone 2 material did not address the differing foundation properties which would result in differential settlement of the Diesel Generator Building.
- b. Also, contrary to the above, certain activities were not accomplished according to instructions and procedures, in that:
 - (1) The compaction criteria used for fill material was 20,000 ft-lbs (Bechtel modified proctor test) rather than a compactive energy of 56,000 ft-lbs as specified in Bechtel Specification C-210, Section 13.7.
 - (2) Soils activities were not accomplished under the continuous supervision of a qualified soils engineer who would perform in-place density tests in the compacted fill to verify that all materials are placed and compacted in accordance

with specification criteria. This is required by Bechtel Specification C-501 as well as PSAR, Amendment 3 (Dames and Moore Report, page 16).

3. 10 CFR 50, Appendix B, Criterion X requires, in part, that a program for inspection of activities affecting quality shall be established and executed to verify conformance with the documented instructions, procedures and drawings for accomplishing the activity.

CPCo Topical Report CPC 1-A, Policy No. 10, Section 3.1, states, in part, that "work activities are accomplished according to approved procedures or instructions which include inspection hold points beyond which work does not proceed until the inspection is complete or written consent for bypassing the inspection has been received from the organization authorized to perform the inspections."

CPCo is committed to ANSI N45.2 (1971), which states, in part, "A program for inspection of activities affecting quality shall be established and executed by or for the organization performing the activity to verify conformance to the documented instructions, procedures, and drawings for accomplishing the activity."

Contrary to the above, Quality Control Instruction C-1.02, the program for inspection of compacted backfill issued on October 18, 1976, did not provide for inspection hold points to verify that soil work was satisfactorily accomplished according to documented instructions.

4. 10 CFR 50, Appendix B, Criterion XVI requires, in part, that measures shall be established to assure that conditions adverse to quality such as failures, deficiencies, defective material and nonconformances are promptly identified and corrected. In case of significant conditions adverse to quality, measures shall assure that corrective action is taken to preclude repetition.

CPCo Topical Report CPC-1-A, Policy No. 16, Section 1.0 states, in part, "corrective action is that action taken to correct and preclude recurrence of significant conditions adverse to the quality of items or operations. Corrective action includes an evaluation of the conditions that led to a nonconformance, the disposition of the nonconformance and completion of the actions necessary to prevent or reduce the possibility of recurrence."

Contrary to the above, measures did not assure that soils conditions of adverse quality were promptly corrected to preclude repetition. For example:

- a. As of January 25, 1979, moisture control in fill material had not been established nor adequate direction given to implement this specification requirement. The finding that the field was not performing moisture control tests as required by specification C-210 was identified in Quality Action Request SD-40, dated July 22, 1977.

- b. Corrective action regarding nonconformance reports related to plant fill was insufficient or inadequate to preclude repetition as evidenced by repeated deviations from specification requirements. For example, nonconformance reports No. CPCo QF-29, QF-52, QF-68, QF-147, QF-174, QF-172 and QF-199 contain numerous examples of repeated nonconformances in the same areas of plant fill construction.

APPENDIX B
Appendix A

NOTICE OF VIOLATION

Consumers Power Company

Docket No. 50-329

Docket No. 50-330

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 1557-66T (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."

This information is false, in that materials other than controlled compacted cohesive fill-clay were used to support the diesel generator building and material presented concerning the supporting soils influenced the staff review of the FSAP.

"Any material free of humus, organic or other deleterious material." It was ascertained that materials other than "clay" or "controlled compacted cohesive fill" were used for support of structures.