

50-329/330 OM, OL

Exhibits from  
10/7-8/80 Deposition  
of  
DARL HOOD

21 Exhibits

AX 2520212108

Consumer's Ex # 1  
For Id.  
10/7/80 MEV.  
(H.C.D.)

To: Miller  
Jensen  
H.C.D.

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

Before the Atomic Safety and Licensing Board

_____ )	
In the Matter of )	
CONSUMERS POWER COMPANY )	Docket Nos. 50-329-OL
(Midland Plant, Units 1 and 2) )	50-330-CL
_____ )	50-329-CM
_____ )	50-330-CM

AMENDED NOTICE OF DEPOSITION

To: Each person named in the attached Certificate of Service.

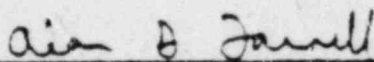
PLEASE TAKE NOTICE THAT Consumers Power Company shall take the deposition on oral examination of the following named persons at the times, dates and locations indicated.

9:00 a.m.	Oct. 7, 1980	Maryland Natl. Bk. Bldg. 7735 Old Georgetown Rd. Bethesda, Md. 21102	Darl Hood, NRC Staff
1:00 p.m.	Oct. 8, 1980	Maryland Natl. Bk. Bldg. 7735 Old Georgetown Rd. Bethesda, Md. 21102	Lyman Meller, NRC Staff
1:00 p.m.	Oct. 9, 1980	Maryland Natl. Bk. Bldg. 7735 Old Georgetown Rd. Bethesda, Md. 21102	Joseph Kane, NRC Staff
10:00 a.m.	Oct. 14, 1980	Patrick McNamara Bldg. 477 Michigan Ave., 7th Fl. Detroit, Mich. 48226	James W. Simpson Corps of Engrs.
10:00 a.m.	Oct. 15, 1980	Patrick McNamara Bldg. 477 Michigan Ave., 7th Fl. Detroit, Mich. 48226	William Lawhead, Corps of Engrs.
10:00 a.m.	Oct. 17, 1980	Patrick McNamara Bldg. 477 Michigan Ave., 7th Fl. Detroit, Mich. 48226	Ron Erickson, Corps of Engrs.

Each deponent is requested to make available, one business day prior to his deposition, the documents described in Appendix A of the Notice of Deposition dated September 22, 1980.

The subject matter of the depositions shall be all matters relating to the issues set forth in the Licensing Board's Order of December 6, 1979, Order Modifying Construction Permits and the agreed to contentions of intervenors Stamiris and Warren and the contentions of Intervenor Marshall and Sinclair.

Sincerely,

  
\_\_\_\_\_  
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Counsel for Consumers Power Company

ISKAM, LINCOLN & BEALE  
One First National Plaza  
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UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

Before the Atomic Safety and Licensing Board

_____ )	
In the Matter of )	
CONSUMERS POWER COMPANY )	Socket Nos. 50-329-OL
(Midland Plant, Units 1 and 2) )	50-330-OL
_____ )	50-329-OM
_____ )	50-330-OM

CERTIFICATE OF SERVICE

I, Alan S. Farnell, hereby certify that a copy of Consumers Power Company's Aireded Notice of Deposition was served upon all persons shown in the attached service list by deposit in the United States mail, first class, this 1st day of October, 1980.

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Alan S. Farnell

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COMPLAINANTS  
E-10 307d  
11/4

SECRET

PERSONAL DATA

Name: Fred Carl G.  
Address: 14 Brighton Drive, Middletown, MD 21106  
Telephone: (301) 706-1171  
Birth: November 24, 1928 Weight: 175" Height: 5'10" lbs.  
Marital Status: Married, 1 child Health: Excellent

EDUCATION

Bachelor of Science, Nuclear Engineering, 1950  
North Carolina State University, Raleigh, North Carolina

EMPLOYMENT & OCCUPATIONS

Member of the Department of a Laboratory Fuel Release in Shell  
Labor presented at the American Nuclear Society, Annual Meeting,  
June 19, 1970, San Diego, California

Involved in development of safety and test technical specifications  
for reactor operations from 1950 to 1952 and 1953 to 1954.

Member of the preparation of nuclear steam supply system vendor's portion  
of the following Preliminary and Final Safety Analysis Reports (PSAR & FSAR):

- |                              |                       |
|------------------------------|-----------------------|
| Electric Plant 2 PSAR & FSAR | Secret 5010           |
| Marble Hill 1 PSAR & FSAR    | Secrets 5010 & 5013   |
| Thomas 1 PSAR 1954 & FSAR    | Secrets 5010-33-38-40 |
| Denore 1954 1 & FSAR         | Secrets 5010-33-38-40 |

Assisted in preparation of Institution Engineering Standard Safety Analysis  
Report, Secret 5010-33-38-40

Member of the design team related to the Preliminary Design of the Standard  
Reactor Plant (SRP), W. K. Kellogg, November, 1970.

MEMBERSHIP

American Nuclear Society  
Health Physics Society

ACTIVITIES

Member of the Army Signal Corps, 1948-1950  
Active Service - February, 1949 to February, 1950 - Honorable Discharge

MEMBERSHIP IN RELIGIOUS ACTIVITIES

Member of Administrative Board and Trustee for United Methodist Church,  
North Canton, OH 1970-1975

EXPERIENCE

August, 1976 - Present

COMPANY: U. S. Nuclear Regulatory Commission  
Washington, DC

POSITION: Licensing Project Manager  
Light Water Reactors, GS-14

SECURITY CLEARANCE: L

JOB DESCRIPTION:

This position within the Division of Project Management of the Office of Nuclear Reactor Regulation provides the planning and coordination of radiological safety reviews of applications for licenses and authorizations to construct or operate light water nuclear power plants. This middle management position coordinates technical support from individuals from approximately twenty-four technical branches of the Office of Nuclear Reactor Regulation assigned to the review of the Applicant's Safety Analysis Report. The position coordinates preparation of the results of the review into a safety evaluation report and provides support of its content during meetings with the Advisory Committee on Reactor Safeguards and during public hearings associated with the licensing process.

I have served in this position for the following projects:

Westinghouse Reference Safety Analysis Report RSDAF-414, Docket No. STN 50-572, from tendering of application in October, 1976 to issuance of preliminary design approval in November, 1978;

Midland Plant, Units 1 & 2, Docket Nos. 50-329 and 50-330, from tendering of operating license application in August, 1977 to present;

Catawaba Nuclear Station, Units 1 & 2, Docket Nos. 50-413 and 50-414, from February, 1977 to November, 1977, and from October, 1979 to present; and

River Bend Station, Units 1 & 2, Docket Nos. 50-458 and 50-459, from August, 1978 to present.

•

June, 1969 to August, 1976

COMPANY: Combustion Engineering, Inc.  
Nuclear Power Systems Division  
Windsor, Connecticut

POSITIONS: (1) Assistant Project Manager for Duke Power Project  
(2) Safety and Licensing Project Engineer

JOB DESCRIPTION:

After March, 1973, I was Assistant Project Manager for the Duke Power Project. This position provided assistance in directing all efforts by C-E to design, fabricate, purchase and license the nuclear steam supply systems, reactor core, and associated auxiliary systems for Cherokee Units 1, 2 & 3 and Thomas L. Perkins Units 1, 2 & 3. The position assured that all aspects of the contracts were met and that safe and reliable systems were provided to the required schedule and at a reasonable profit to C-E. I assisted Duke Power

## Combustion Engineering Inc. Job Description Continued :

in preparing the Preliminary Safety Analysis Report (PSAR) and provided for all C-E Licensing support for these units. I also provided coordination of all other nuclear plants referencing the C-E Standard Safety Analysis Report to assure compatibility with C-E standard reference design.

Until March, 1973, I was a Project Engineer in C-E's Safety and Licensing Department and was responsible for Licensing of nuclear power plants. I coordinated the preparation of the Millstone Unit 2 PSAR and PDR and the Calvert Cliffs Units 1 & 2 PSAR and interfaced with NRC, the utility, architect engineer and all C-E functional departments on licensing support matters. I ensured that NRC criteria, standards, and guides were incorporated into the nuclear steam supply system design.

August, 1966 - June, 1969

COMPANY: Martin Marietta Corporation  
Nuclear Division, Nuclear Safety Unit  
Baltimore, Maryland  
Division subsequently purchased by Isotopes, Inc., a subsidiary of Teledyne Corp., Towson, Maryland

POSITION: Engineer, Nuclear Safety and Radiation Analysis

SECURITY CLEARANCE: DOD - Secret  
AEC - 2

JOB DESCRIPTION:

The purpose of this position was to perform hazard evaluations for nuclear power sources applied in space missions. My primary duty was to determine public exposure to radiation for malfunctions occurring during the intended mission. I also determined means by which the hazard potential for nuclear space systems could be mitigated to the extent that nuclear safety criteria were met. I conducted research with regards to the development of suitable criteria for permissible exposure levels and their probabilities, taking into account the dependence of acceptable risk on the benefit to be derived.

My primary assignment was with the STAP 29 (Systems for Nuclear Auxiliary Power) project. My evaluations of this nuclear power source included the formulation and application of computerized models for the transport of fuel released at high altitudes, in deep ocean and in shallow waters. I derived models for these release areas to incorporate the activity into human food chains and determined the expected ingestion dose, the number of people involved and the exposure probabilities. Inhalation dose was determined for radioactive fallout from the high-altitude release.

February, 1965 - August, 1966

COMPANY: Electric Boat Division of General Dynamics  
Groton, Connecticut

POSITION: Engineer, Nuclear Quality Control

SECURITY CLEARANCE: Confidential (DOD)

JOB DESCRIPTION:

The purpose of this position was to provide control of quality for naval reactor systems, components, and shielding during the construction of submarines by this shipyard.



## Electric Boat Division of General Dynamics Job Description Continued:

My primary area of responsibility was shielding. Duties included establishing procedures for the inspection of fabrication and installation of lead and polyethylene shielding, and resolving problems in complying with these or other shielding procedures.

The position required a knowledge of nuclear theory, GIN systems design, Bureau of Ships contract and design requirements, non-destructive testing techniques, and quality control requirements.

November, 1963 - February, 1965

COMPANY: George C. Marshall Space Flight Center  
National Aeronautics and Space Administration  
Huntsville, Alabama

POSITION: Aeronautical Engineer - Nuclear Propulsion and Power

SECURITY CLEARANCE: Secret (DOB)

GRADE: Although I served in the grade of Second and First Lieutenant, civilian equivalent for the level of work performed was a GS-11. (Upon request of NASA, special orders from the Army released me to this civilian agency.)

## JOB DESCRIPTION:

The purpose of this position was to provide nuclear systems performance and application studies for NASA.

My duties were to perform theoretical investigations of the nature and magnitude of the nuclear radiation environment, shielding systems, and safety systems associated with nuclear space vehicles. This included analysis of the radiation environment arising from nuclear propulsion and power sources and natural space radiation sources encountered in typical space missions, analysis and design of shielding and safety systems for biological and vehicle protection, evaluation of special facility and operational requirements, and overall nuclear engineering and vehicle design integration problems.

As a nuclear engineering specialist, I performed technical supervision of study contracts with industry and provided technical advice and consultation to other working groups and organizations, in addition to performing independent study activity in my specialty.

April, 1963 - November, 1963

COMPANY: U. S. Army Ordnance Guided Missile School  
Redstone Arsenal, Alabama

POSITION: Chief, Advanced Circuits Unit

SUPERVISORY RESPONSIBILITY: Instructors - 23  
Students - 100 every 3 weeks

SECURITY CLEARANCE: Secret (DOB) RANK: Second Lieutenant

## JOB DESCRIPTION:

As Chief of the Advanced Circuits Unit under the Missile Components Division, I was in charge of the training of military personnel assigned to missile systems and specialties. This training included electronic systems for communications, tracking, guidance and control as used in army defense missiles.

U. S. Army Ordnance Guided Missile School Job Description Form

Duties included overall responsibility for the operation of the unit, including unit administration, supervision and control. Program of instruction to include the newer missiles and rapid technology, assigned weekly schedules of instruction, evaluated this and other units, and as time allowed, conducted classes.

Instructors over whom I had direct supervision numbered 100, three civilian contractors, and eighteen military personnel.

Area of accountability for this position covered several thousand dollars in equipment and supplies.

February, 1963 - April, 1963

POSITION: Student at the U.S. Army Signal Officer Course, Fort Gordon, Georgia  
RANK: Second Lieutenant, U. S. Army

JOB DESCRIPTION:

Training received in this position included familiarization and tracking equipment and systems employed by the U.S. Army in electronics, nuclear and electronic warfare, leadership, personnel and basic military subjects.

AUGUST, 1962 - February, 1963

COMPANY: Norfolk Naval Shipyard  
Portsmouth, Virginia  
POSITION: Marine Engineer, Ordnance and Special Design Division  
SECURITY CLEARANCE: Confidential GRADE: GS-7

JOB DESCRIPTION:

This position provided engineering services for ordnance weapon components and systems for all classes of naval vessels in this shipyard.

Duties included the conception and development of design and construction plans for ordnance and special weapons equipment. Detail and arrangement plans were prepared for new designs and to existing systems and equipment.

I specifically prepared the plans for modernization of ballistic missile carriers, giving these vessels the capability of storing Asroc and Subroc missiles and special depth charges. I performed stress calculations for this work and prepared material specifications and initiated material requests for purchase of special material. I also prepared preliminary reports and data sheets covering investigations and tests.

Attachment 1

Courses Completed for BSN North Carolina State University

I. Mathematics

MA 488	History of Mathematics
MA 502	Theory of Equations
MA 501	Numerical Analysis
MA 485	Introduction to Determinants and Matrices
MA 501	Differential Equations
MA 411	Introduction to Applied Mathematics
MA 201, 202	Analytical Geometry and Calculus
MA 122	Mathematics of Finance and Elementary Statistics
MA 101, 102	Mathematics for Engineers
MA 2	Review Algebra
Entrance	Solid Geometry

II. Physics and Nuclear Engineering

PV 300	Introduction to Nuclear Reactor Theory
PV 320	Physical Measurements in Radioactivity
PV 318	Radiation Hazards and Protection
PV 404	Optics
PV 428	Astronomy and Astrophysics
PV 403	Electricity and Magnetism
PE 418	Introduction to Nuclear Engineering
PE, EE 320	Elements of Electrical Engineering
PV 410	Nuclear Physics
PV 407	Introduction to Modern Physics
PV 201, 202	General Physics
PV 100	Introduction to Engineering

III. Engineering Mechanics

EM 420	Fluid Mechanics
EM 301	Engineering Thermodynamics
EM 342	Mechanical Dynamics
EM 343	Strength of Materials
EM 341	Statics
EM 101, 102	Engineering Graphics

IV. Other

EN 101, 102	Composition
EN 200, 206	Reading for Discovery
EN 101	General Inorganic Chemistry
EN 102	General and Qualitative Chemistry
EN 206	The Economic Process
EN 206	Modern Western World
EN 301, 302	Contemporary Civilization
EN 401, 402	Contemporary Issues
EN 101, 102	Military Science
EN 201, 202	
EN 301, 302	
EN 401, 402	
EN 101	Marriage and Family Living
EN 101	Physical Education

Attachment 2

ADDITIONAL COURSES COMPLETED

U. S. Nuclear Regulatory Commission

- Nuclear Plant Reliability Data System (12 hours) 1/76
- Interpersonal Skills for Managers (32 hours) 12/75
- Boiling Water Reactor (BWR) Systems Video Training Tapes (12 hours)
- BWR Systems I (1 week) 8/75
- Rapid Reading (20 hours) 4/75
- Nuclear Power Reactor Safety, MIT 9/75
- Part I: Thermal Power Reactors (1 week)
- Part II: General Safety Issues (1 week)
- BWR Nuclear Systems Lecture (4 hours) 7/75
- Probabilistic Safety and Reliability Analysis Techniques (48 hours) 9/79

12/79

Combustion Engineering, Windsor, Connecticut

- Principles of Management - American Management Association (24 hours)
- Introduction to Nuclear Power - NUS Corp. Video Tape Engineering Course (50 hours)
- Control Room Simulator Training (1 week)
- Introduction to Environmental Protection (24 hours)
- German (52 hours)
- Effective Writing (12 hours)

Martin Marietta, Middle River, Maryland

- IBM 360/44 Computer Programming (24 hours)
- IBM 1130 Computer Programming and Operation (24 hours)

Electric Boat, Groton, Connecticut

- Non-destructive Testing to NavShips 250-1500-1 (40 hours)
- Liquid Penetration Testing (40 hours)
- BWR Reactor Plant Fundamentals Training Program (72 hours)
- Reliability Engineering (24 hours)
- Management Improvement Seminar (32 hours)

Marshall Space Flight Center, Huntsville, Alabama

- PART III Computer Programming (40 hours)
- PART IV Computer Programming (40 hours)
- Scientific Data System Series 300 Computer Programming and Operation (40 hours)

United States Army

- U. S. Army Signal Officers Orientation Course (9 weeks)
- Methods of Instruction (30 hours)

Folk Naval Shipyard, Portsmouth, Virginia

- Marine Engineering Orientation Conference (24 hours)





*Comments*  
*Ex 23 In 76*  
*11/7/80 MEH*  
*(HCOO)*

UNITED STATES  
NUCLEAR REGULATORY COMMISSION

ANNOUNCEMENT NO. 84

DATE: July 31, 1980

TO: All NRC Employees

SUBJECT: NRC STRUCTURAL ORGANIZATION CHART

Attached is a revised structural organization chart for NRC, dated July 1980. Additional copies of this chart may be obtained from the Distribution Services Branch, Extension 27333, in Room 042 of the Phillips Building.

*for* *Norman J. Bennett*  
Norman J. Bennett, Director  
Office of Management and  
Program Analysis

Attached:  
NRC Organization Chart

*Comments*  
*Dep Ex = 3*  
*in 10.*







UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON D. C. 20555

53

FEB 4 1980

Docket Nos.: 50-329/330

APPLICANT: CONSUMER POWER COMPANY  
FACILITY: MIDLAND PLANT, UNITS 1 & 2  
SUBJECT: SUMMARY OF JANUARY 16, 1980 MEETING ON SUPPLEMENTAL REQUESTS REGARDING PLANT FILL

On January 16, 1980 the NRC staff and its consultants from the U.S. Corps of Engineers met with Consumer Power Company and Bechtel Corporation in Bethesda, Maryland. Attendees are listed in Enclosure 1. The principal purpose of this meeting was to discuss the status of the staff's supplemental requests for additional information regarding plant fill settlement and effects. These requests were issued November 19, 1979. Earlier requests issued March 21, 1979 were discussed to a lesser extent. Enclosure 2 is the meeting agenda.

The staff's requests of March 21 and November 19, 1979 were issued on the basis of Section 50.54(f) to 10 CFR 51, which is applicable to construction permits by virtue of Section 50.55(c). The staff's 50.54f position requiring modification of the Midland construction permits was subsequently issued December 6, 1979. Consequently, it was recognized that any replies outstanding after December 6, 1979 were no longer needed in the 50.54(f) context, but that replies should be submitted nevertheless since the December 6 order states that the absence of certain information prevents the staff from reaching essential conclusions. It was suggested that the replies be submitted in the normal "Q-1, Q-2" context typically associated with the radiological safety reviews of nuclear power plants. The applicant also reported that the December 6 order, its subsequent request for hearing, and FSAR Amendment 72 provides the basis for concluding its 50.55(e) reports regarding this matter, as further reporting would be by FSAR amendments and by hearing documents, as may be appropriate. The applicant acknowledged its intent to further update the FSAR to reflect appropriate changes associated with the soils settlement matter at an appropriate point in the future. In the interim, those FSAR sections which are subject to change will be flagged.

Staff comments based upon review of the applicants reply to questions 16 through 20 were provided as a handout (Enclosure 3 hereto). These comments relate to mechanical engineering effects of the soil settlement

8002200343



FEB 4 1980

which are being reviewed with the assistance of a staff's consultant, Energy Technology Engineering Center.

The proposed responses to questions 24 through 35, 4 and 14 were summarized by the applicant and Bechtel. Since these responses will be submitted on the docket within two to three weeks, no summary of these presentations is provided in this report. The response to questions 25 and 26 involve seismic analyses which require additional time to complete prior to submittal of a final reply. Copies of the vugraph slides used during these presentations are maintained by the staff's Licensing Project Manager and are available upon request.

*Darl Hood*

Darl S. Hood, Project Manager  
Light Water Reactors Branch #4  
Division of Project Management

Enclosures:  
As stated

cc: See next page

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Lansing, Michigan 48909

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Midland, Michigan 48640

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Consumers Power Company  
212 West Michigan Avenue  
Jackson, Michigan 49201

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Energy Technology Engineering Center  
Canoga Park, California 91304

Mr. William Lawhead  
U. S. Corps of Engineers  
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477 Michigan Avenue  
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Detroit, Michigan 48226

ENCLOSURE 1  
LIST OF ATTENDEES

JANUARY 16, 1980

<u>Name</u>	<u>Organization</u>
Darl Hood	DPW/NRR
Joe Kubinski	CCE Detroit Dist.
William Paris, Jr.	Bechtel-Geotech
Jo Wayzeck	Bechtel - Geo Tech
S. S. Afifi	Bechtel
W. R. Ferris	Bechtel
Morothwell	Bechtel
K. Wiedner	Bechtel
Gil Keeley	Consumers Power
T. C. Cooke	Consumers Power
F. Schauer	NRC-SEB
J. J. Zabritski	Consumers Power Co.
S. Lo	Bechtel
T. E. Johnson	Bechtel
John F. Horton	CCE NC Division Chicago
James W. Simpson	Army Corps NCO Chicago
William Lawhead	U. S. Army CCE, Detroit
R. E. Lipinski	NRC-SEB
Gene Gallagher	NRC Region III:IE
Ross Landsman	NRC Region III:IE
Daniel M. Gillen	NRC - YMSS
A. J. Cappucci	NRC/DSS/MEB
R. O. Bosnak	NRC/DSS/MEB
H. L. Brammer	NRC/DSE/MEB

ENCLOSURE 2

MEETING WITH MR. JIM WATKINS, JR.  
January 16, 1966

Agenda

- I. INTRODUCTION: Gil Keeley  
Purpose of meeting; background, etc.
- II. WORK ACTIVITIES UPDATE: Jim Wanzek  
Summary of work activities and settlement surveys for all University I structures and facilities founded partially or totally on fill.
- III. LO OFF 50.9-1'S REQUESTS  
Presentation of info. material related to:
  - Question #1 - Civil Engineering and Civil Structural
  - Supplemental Questions #7, 11, 13 and 15 - Civil Engineering
  - Supplemental Question #24 - Development
  - Question #25 - Civil Structural
  - Supplemental Questions #27, 29, 31 and 34 - Civil Structural
  - Supplemental Questions #35 and 36 - Geologic Analysis
- IV. FORMAT AND SCHEDULE OF FUTURE REQUESTS (51.55-1, 50.94-1, 50.95-1)

} A\*if-

} Ted Johnson

ATTENDEES:

Geotech:

G Keeley  
T Johnson  
J Lee  
\* Paris  
V Rothwell  
J Wanzek  
K Winkler  
\* Ferris

Computer Room:

J J. Anderson  
T J. Locke  
J. C. Sackittski

ENCLOSURE 3

COMMENTS ON 50.54(f) RESPONSES FOR MIDLAND (MEB)

1. GENERAL

A review of the Response to Questions 16-20 of the subject document indicates that the applicant proposes to impose the 3.0  $S_e$  criterion of subparagraph NC-3652.3(b) of the ASME B&PVQ, Section III and the 5% radial deformation limit of the AWWA. Additional criteria which address buckling of the piping should be imposed since neither of the two proposed criteria are based on this failure mode. Additionally, criteria compliance analyses should be based on maximum expected differential settlement over the life of the plant.

2. RESPONSE TO QUESTION 16, PAGE 16-1

The response addresses stresses based on representative pipes being profiled, i.e. on current local settlements. The response should be modified to include settlements over the life of the plant.

3. RESPONSE TO QUESTION 17, PAGE 17-1, PARA. 1

If all Seismic Category I piping is not to be profiled, criteria for selection of piping to be profiled should be documented.

4. RESPONSE TO QUESTION 17, PAGE 17-2, PARA. 2

The calculation assumes that the curvature is constant over the length of pipe. In general, this condition will not be met. Criteria for changes in curvature should be addressed.

5. RESPONSE TO QUESTION 17, PAGE 17-3, PARA. 2

If the settlement stresses are based on current profiles only, the analysis should be extended to include settlements over the life of the plant and effects of change in curvature (See item 3).

6. RESPONSE TO QUESTION 17

The question regarding measures to be taken to alleviate conditions if settlement stresses approach code allowables or cannot be determined has not been addressed.

7. RESPONSE TO QUESTION 18, PAGE 18-1, PARA. 2 & 3

It is not clear that most of the anticipated differential settlement will occur by the time of final closure (Para. 2). Provisions for effects of settlements occurring after final closure should be specified. The evaluations of Para. 3 addresses this issue partially.

8. RESPONSE TO QUESTION 18, PAGE 18-2, PARA. 2 & 3

Criteria for assessment of the flexibility of piping to accommodate more than the expected differential settlement should be specified.

9. RESPONSE TO QUESTION 19, PAGES 19-1 TO 19-3

The disposition of this response will be delayed pending receipt and review of evaluations based on the prebid program (See last paragraph on Page 19-3).

10. RESPONSE TO QUESTION 20

The first paragraph of the response is acceptable. However, the remainder of the response requires clarification.



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20545

Docket Nos. 50-329  
and 50-330

*REC'D DM/*

*cc: GSK  
JJZ  
MGR  
DeLoatch*

*7/18/79 Meeting*

APPLICANT: Consumers Power Company  
FACILITY: Midland Plant, Units 1 & 2  
SUBJECT: SUMMARY OF JULY 18, 1979 MEETING ON SOIL DEFICIENCIES AT THE  
MIDLAND PLANT SITE

On July 18, 1979, the NRC staff met in Bethesda, Maryland with Consumers Power Company and the Bechtel Corporation to discuss deficiencies in the fill used at the site for Midland Plant, Units 1 & 2. Also present were representatives of the ACRS staff. Meeting attendees are listed in Enclosure 1.

In response to NRC requests, the applicant has documented in detail the presentations given during this meeting. The presentations are contained in S. H. Howell's letter to J. S. Keppler dated August 10, 1979. In view of the August 10, 1979 letter, no summary of the presentations is contained herein. Rather, additional discussion consisting of comments and questions given during and following the presentations are summarized.

During the presentation regarding remedial work in progress or planned (item 3 of the presentations), the staff noted that underground piping from the borated water storage tanks and service water lines pass under railroad tracks, and that these and other piping are subject to loads due to construction cranes and other traffic. The staff requested the applicant to describe the design features and other measures which assure that such piping is not subjected to excessive loads. The applicant will respond at a later date.

The applicant noted that it is performing laboratory investigations of the stainless steel piping removed from the condensate storage tank. This underground piping was found to be heavily corroded. It was noted that the injection piping from B&ST is of the same composition and is also unconnected from electro-chemical attack. The test-pits in the tank farm area which are being dug to investigate the effect of the air discharged from underground pneumatic lines was also described. Results will be reported shortly.

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The staff noted that the response to its 10 CFR 50.54 requests for acceptance criteria for remedial actions (e.g., questions 4, 6, etc.) had not resulted in identification of criteria in advance of the remedial action. Rather the reply notes that the criteria will be determined during or after the remedial action. The staff stated that this approach by the applicant does not provide for timely staff feedback at the outset, but rather the staff must await results of the program to determine what acceptance criteria were used and if they are acceptable. Thus, the remedial action is being conducted entirely at the applicant's own risk.

The applicant's presentation of the permanent site dewatering system (presentation item 3.3) noted that the system is not designed to seismic Category I requirements, but that the monitoring aspects of the system are safety grade. The NRC staff noted that acceptance criteria for the dewatering system are given in the Standard Review Plan (Section 2.4.13, Revision 1) and requested that the applicant address Branch Technical Position -WB/GSS 1, "Safety Related Permanent Dewatering Systems", Revision 1, attached thereto. The applicant will respond in the near future. The quality assurance plan for implementing the dewatering system will also be provided in future reports.

Bechtel described the structural and seismic analytical investigations being performed or planned for the affected structures (item 4 of the presentations). The staff noted that further review of the acceleration (g) value used for site design has been impacted by staff manpower restructuring for the TM-2 investigations and that use of outside contractors for the Midland seismic review is presently being considered. The staff also noted that its present loads combinations and design criteria for S&S and differential settlement, and with the treatment of cracks in structural walls. The staff will further document these and other positions at a later date.

Bechtel reported (item 7 of the presentations) the results of its investigations into the cause of insufficient compaction of the plant area fill, and identified five causes considered to be the most probable. The applicant noted its agreement with the Bechtel findings. Bechtel noted that personnel were not included as a most probable cause because its review of qualifications and experience of both Bechtel and US testing personnel had shown presence of sufficient education, experience, and training to carry out the tasks assigned. The NRC staff noted that it disagrees with Bechtel's finding that personnel qualification was not a probable cause, and stated that further review of the basis for this Bechtel finding will be needed.


Staff comments regarding the QA/QC aspects (presentation item 3) were based upon the applicant's 10 CFR 50.54(f) responses to question 1 by letter of April 24, 1979:



Oct 13 1978

- (1) The applicant's response to item 3.1 of Appendix I (page I-3) states its conclusion that "Specifications C-210 and C-211 provide sufficient criteria by which to ensure that the fill is adequately placed to prevent excessive settlement." The staff noted its disagreement with this statement. The staff noted, for example, that its I&E investigations show that the specifications did not require qualification of equipment used to compact material, the lift thicknesses permitted were excessive for adequate compaction, the moisture control was unclear and the compactive effort to develop 95% of compaction was internally in conflict with Specification C-210.
- (2) The applicant's response to item 3.2 of Appendix I (page I-3) noted that letters, T&Es, telecons, and memoranda are often used to clarify the intent of the specifications, and that "it is possible" that in some situations the clarification provided through such methods may have modified the specification without formally changing the wording of the specifications. The staff commented that a more positive statement appears to be warranted based upon the findings of I&E. Numerous examples where telecons and memoranda were used to change the requirements of the specifications without revising the controlled document "use" was cited in I&E Inspection Report No. 50-123/78-23 and 50-120/78-23. I&E found that not only did these memoranda change the requirements of the specifications, but in some instances, conflicted with previous engineering directives.
- (3) The staff noted that its review of QA aspects was continuing and that further requests for information would be issued.

At the conclusion of the presentations, the WEC staff noted that the information presented was significant to the present review, and requested that the applicant document and submit its presentations, including copies of the stenograph slides used.

  
Carl Hood, Project Manager  
Light Water Reactors Branch No. 4  
Division of Project Management

Enclosure:  
As stated

cc: See next page

Consumers Power Company

ccs:

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Mr. Don van Pelt, Chief  
Division of Radiological Health  
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P. O. Box 33035  
Lansing, Michigan 48909

Vertical stamp or text on the right edge of the page, possibly a date or reference number, which is mostly illegible due to the quality of the scan.

ENCLOSURE 1

ATTENDEES

July 18, 1979

Consumers Power Company

G. S. Keeley  
D. E. Horn  
T. Thiruvengadam  
T. C. Cooke

NRC:YRR

D. S. Hood  
D. M. Gillen  
R. E. Lipinski  
J. Gilray  
F. Schauer  
L. Heller  
L. S. Rubenstein

NRC:OELD

R. Hoerfling

NRC:IE

D. W. Hayes  
G. Gallagher  
J. B. Henderson

ACRS

D. Zukor  
P. Tam

Bechtel\*

T. E. Johnson (BPC)  
P. A. Martinez (BPC)  
K. Wiedner (BPC)  
D. Riat (AA)  
W. R. Ferris (SF)  
H. Wani (AA)  
A. B. Arnold (SF)  
B. Dhar (AA)  
F. J. Hsiu (AA)  
S. S. Afifi (AA)  
G. Richardson (BPC)  
A. J. Soos (BPC)  
J. R. Davie (G)

Bechtel Consultants

R. B. Peck  
R. Loughney  
C. H. Gould

\* BPC = Bechtel Power Corporation  
AA = Ann Arbor, Michigan  
SF = San Francisco, Calif.  
G = Gettysburg, Md.

Dad

I've got to go by  
the pool

Because of the lack of  
attention to detail relative to  
the many instances of poor  
performance of various projects  
& poor implementation of procedures  
I conclude that there is a  
major problem that the

people problem (communication  
By the fact they have not shared  
information (participation & involvement  
action) & will question & challenge things  
in this area.  
S. Barber

Consumers Sub 7.1.8  
10/15/80 CHCC

D Hood  
PLT 116-A



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

January 21, 1980

TO: G. Fiorelli, Chief, Reactor Construction and  
Engineering Support Branch

THRU: D. W. Hayes, Chief, Engineering Support Section 1

FROM: E. J. Gallagher

SUBJECT: MEETING WITH CONSUMERS POWER COMPANY ON JANUARY 16, 1980  
REGARDING MIDLAND UNITS 1 AND 2 PLANT FILL

A meeting was held on January 16, 1980 with Consumers Power Company and Bechtel regarding the Midland plant fill settlement issue. The main purpose was to discuss the licensee's response to the supplemental 10 CFR 50.54(f) questions 24 through 35 issues on November 19, 1979. Attached are the presentation materials distributed during the meeting.

The following observations were made during the meeting:

1. Significant safety issues regarding the suitability of the Midland foundation material remain unresolved, as has been the situation since October 1978.
2. Since transfer of lead responsibility from IE to NRR was made on November 17, 1978, no progress has been made in the technical review of the outstanding plant fill safety issue.
3. Since the Corps of Engineers has been contacted by NRR to review the issues, in October 1979, no progress has been made regarding a technical review.
4. Since the NRC order of December 6, 1979 to Consumers Power Company was issued, work has been permitted to continue due to the wording of the order. That is, if a hearing was requested by the licensee the order would not be effective until a date specified following a hearing. The licensee has requested a hearing; therefore, the order is ineffective and work continues in the light of significant safety issues and unsuitable material as foundation for the safety-related structures and components.

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G. Fiorelli

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5. Consumers Power Company and Bechtel are proceeding with construction of remedial measures on the foundations of the plant without any review by the NRC staff and without any committal by NRR as to the feasibility or suitability of the proposed actions.

→ In view of the above, I believe that measures should be taken to preclude further construction of the remedial measures on the plant until a technical review of the suitability is complete.

*E. J. Gallager*

E. J. Gallager  
Reactor Inspector

Enclosure: As Stated

cc w/o encl:  
J. G. Keppler  
D. W. Hayes  
R. C. Knop  
T. E. Vandell  
R. B. Landsman ✓



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20540

JAN 12 1979

DOCKET NOS. 50-329  
50-330

APPLICANT: Consumers Power Company

FACILITY: Midland Plant, Units 1 & 2

SUBJECT: SUMMARY OF DECEMBER 4, 1978 MEETING ON STRUCTURAL  
SETTLEMENTS

On December 4, 1978, the NRC staff met in Midland, Michigan with Consumers Power Company (CPCO), Bechtel Associates, and consultants in geotechnical engineering to discuss excessive settlement of the Diesel Generator (DG) Building and pedestals, and settlement of other seismic Category I structures. These technical discussions followed a site tour on December 3, 1978 during which the NRC staff observed each of these structures. Attendees for the tour and technical discussions are listed in Enclosure 1. Enclosure 2 is the agenda used during the technical discussion.

1. Background

Pursuant to 10 CFR 50.55(e), CPCO notified Region III of the Office of Inspection and Enforcement (ISE) on September 7, 1978, that settlement of the Midland DG Building foundation and generator pedestals was greater than expected and that a soils boring program had been started to determine the cause and extent of the problem. An interim status report was provided ISE by CPCO's letter of September 29, 1978. ISE conducted inspections on this matter on October 24-27, 1978 and issued inspection report number 50-329/78-12; 50-330/78-12.

2. History

The Bechtel representative identified the Category I structures and the type of material supporting the structure.

- a. Containment - Glacial Till
- b. Borated Water Storage Tank - Plant Fill
- c. Diesel Generator Building and Pedestal - Plant Fill
- d. Auxiliary Building - Part Glacial Till & Part Plant Fill
- e. Service Water Intake - Glacial Till (Completed portion only)  
- Plant Fill (Shell portion yet to be constructed)

10-10-78

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JAN 11 1978

The settlement monitoring program began in June 1976, to date the measured settlements are as follows:

Containment - 1/4" to 5.8" over last 1-1/2 years

Auxiliary Building - Approximately 1.8" (central portion)

Service water Pump house - 0 to 1.8"

Diesel Generator Building - 3 to 4" since footing was poured October 1977 and walls in Spring 1978.

The four electrical duct banks rising into the DG Building, and which extend downward into the glacial till, were cut loose to remove the settlement restriction on the north side of the DG Building. When the duct banks were cut loose, settlement on the order of 2" occurred on the north side of the DG Building at a rapid rate. The east wall exhibited rapid settlement (1/8" in one week), but the west wall showed very little subsequent settlement. This indicates that the east wall was being held up by the duct pedestal.

### 3. Soils Exploration

Bechtel discussed the soil exploration program, including the boring program and laboratory testing of the foundation materials. The conclusion that was made by Bechtel is that the material varies across the site in strength properties, i.e., unconfined compressive strength from 200 PSF to 4000 PSF and shear strength from 100 PSF to 2000 PSF. The soils classification ranged from O1 to M1.

Bechtel also discussed possible causes based on input from a consultant, Dr. R. Peck. Some of these causes were:

- 1) Variable quality of material used in the plant fill, however, the quality control records do not indicate the variation.
- 2) Fill may have been placed on the dry side of optimum moisture, and then when the water table rose inundating the fill, the material may have become "soft."
- 3) Initial fill may have been placed satisfactorily but after installing pipe trenches and duct banks, the fill may have been disturbed.



JAN 10 1979

4. Consultants Perspective

Mr. R. B. Peck stated the following:

- a. The compacted fill is composed mainly of glacial till and was excavated from the cooling pond area.
- b. Evidence exists from the Dutch cone curve that the looser and softer areas are limited to local zones or lenses.
- c. Water content is higher than at the time the fill was placed. Settlement of the till has been occurring since original placement of fill, accelerated by increased moisture content resulting from filling of the discharge cooling pond. Soil settlement is occurring under its own weight and the added weight of the building is believed to be insignificant.
- d. The DG Building would probably not have settled as much if the material had not been so wet (moisture content is high).
- e. Bearing capacity is not a problem for the footings.
- f. Short of removing all the fill above the hard glacial till, a 'preload' program would be the best approach. The preload purpose would be to consolidate the fill materials.
- g. The settlement with the preload would tend to be rapid (a few weeks to a few months).
- h. The preload is a necessary first step even though other measures might be necessary.
- i. The main unknown is what might happen to the rate of settlement as the water table rises and saturates the fill.
- j. Preloading would occur in early 1979 and the sand used as the surcharge would be removed in mid-1979.

Mr. C. J. Dinneloff of Solisberg, Jordan, Dinneloff & Associates described the instrumentation program to monitor the settlement of the foundation material and structures during the preload. The purpose of the instrumentation is to determine if the surcharge is doing its job of consolidation and if it is causing any harm to the structures or utility lines under and around the building.

JAN 10 1979

-4-

a. Instrumentation for the structure will include optical survey measurements as well as monitoring of cracks using electrical devices. Four locations for the electrical devices have been chosen; two on the exterior of the east wall of the DG Building and two on the west wall of bay number four in the DG Building. A mapping of cracks will be developed.

b. Foundation monitoring will include devices to measure settlement and pore water pressure. A total of 60 anchors will be installed (20 groups of 3 at different elevations). A total of 40 piezometers are to be installed to measure the pore water pressure.

The consultants indicated that 6" settlement would not be a surprise and that up to as much as 18" could occur. The preload will be made up of 15 to 20 feet of sand piled in and around the DG Building. No more than a 5-foot differential in the sand level between bays could be permitted.

The NRC questioned the effect of settlement and preloading on the condensate lines located under the DG Building. Fixed points for the piping, such as the Turbine Building wall, are also of interest for the potential of cantilever effects. Bechtel explained that the 20-inch condensate lines are encased in 24-inch lines surrounded by concrete and resting in well compacted sand. Instrumentation will be included to monitor the condensate lines. The possibility of cutting the lines loose at the DG Building and the Turbine Building is also being studied. The condensate lines have no safety-related function for the Midland design.

The NRC also expressed concern for the effect of settlement on the fuel oil lines under the building. CPCO stated that re-routing of lines can be readily accommodated if necessary. This matter is also under review.

The NRC Resident Inspector asked for a list of the equipment, with a discussion of the compacting capability and limitations of each, used for compacting the fill for the DG Building from elevation 618 to 628 feet. Bechtel will provide this information.

5. Program Status

Bechtel summarized the activities completed, in progress, and planned for the future:

JAN 12 1979

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Activities Completed

- (1) Boring program
- (2) Isolation of the electrical duct banks on the north side of the DG Building

b. Activities in Progress (or soon to be initiated)

- (1) Foundation settlement monitoring program
- (2) Preload instrumentation program
- (3) Actual preload of the structure and foundation
- (4) Filling the cooling pond to maximum elevation (Elevation 627)
- (5) Complete construction of the rest of the DG Building structure

c. Activities Planned

- (1) After removal of the surcharge, assure contact between footings and soil foundation material
- (2) Verify utilities and structure integrity

6. Project Schedule

Bechtel presented the following project schedule information:

- Construction is 58% completed as of November 1978
- Engineering is 30% complete
- Structural concrete is 97% complete
- Fuel load target date is November 1980
- Earliest requirement for one diesel generator is January 1980
- Current completion date for one diesel generator is January 1980
- Latest date for one diesel generator is June 1980

JAN 10 1979

-6-

Bechtel emphasized that the installed instrumentation will show when the preload surcharge may be removed and therefore the present schedule is somewhat tentative. Most settlement is predicted to occur rapidly as the area is being preloaded and frequent readings will be taken during this period and used as a basis for further projections. The rate of settlement will decrease thereafter and the total settlement is expected to be reached within a few months.

CPCO stated that if necessary, temporary diesels could be used during preoperational testing prior to fuel loading and that this matter is presently under study.

7. Response to Open Items in NRC Inspection Report

Bechtel addressed the open items included in NRC inspection report Nos. 50-329/78-11 and 50-330/78-12. CPCO stated that a written response would be sent to I&E Region III to resolve the conflict between the FSAR and site implementing procedures:

- a. Conflict between FSAR Table 2.5-17 and Table 2.5-18 regarding the description of fill material and what was actually used in the random fill: Bechtel stated that this conflict was an oversight and that an FSAR amendment would be issued. The NRC staff stated that any such amendment should address both the previous and the adjusted entries such that the basis for the previous staff review is not obscured in the documentation.
- b. Conflict between FSAR Table 2.5-21 and Bechtel Specification C-210 regarding number of passes for compaction: Bechtel stated that FSAR Table 2.5-21 is for the embankments for the cooling pond sikes.
- c. FSAR Section 3.8.5.5 regarding expected settlement: Bechtel stated that 2-inch indicated in the FSAR was a mistake and that the FSAR would be amended to correct this mistake.
- d. Conflict between FSAR Figure 2.5-47 and project drawing regarding foundation elevation: Bechtel stated the elevations in the FSAR was also a mistake and would be corrected.
- e. Conflict in Bechtel Specification C-210 regarding compactive effort: Bechtel stated that Field Change Request C-302 dated 10/31/78 clarified this conflict and permitted the "Bechtel Modified Protector" using 20,000 ft-lbs compactive effort rather than the ASTM standard of 56,000 ft-lbs.

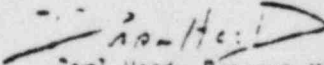
JAN 13 1978

- f. Conflict between James & Moore recommendation regarding lift thickness of 6 to 8 inches and the Bechtel specification permitting up to 12 inches: Bechtel stated that the greater depth permitted by their specification should not matter because of performance qualification tests. However, the NRC was then informed that the test qualifications performed were for Zone 1 clay only, and that no test qualifications on the random fill material using 12 inches was performed to qualify such lift thicknesses. Dr. Peck stated that the thicker the layer, the more differences in compaction through the thickness of the layer would occur.
- g. Tolerance of  $\pm 2\%$  in moisture content permitted in Bechtel Specification C-210: Bechtel stated that this tolerance is in line with industry practice.  
  
Dr. Peck was asked his view on this  $\pm 2\%$  tolerance. He stated that the important question is " $\pm 2\%$  of what material." Since the material used in the fill was variable, the  $\pm 2\%$  tolerance could cause a problem if the material is not consistent.
- h. Cracks in the building structure: Bechtel stated that all cracks greater than the ACI 318-71 limit would be identified and repaired after the preload program.
- i. FSAR question 362.2: Bechtel stated that the answer had been sent to NRC via FSAR revision 15 in November 1976.

CPCO stated that the reply to the inspection report is in process, and that the reply will include copies of all data, slides, and drawings presented during this meeting.

In concluding remarks, CPCO stated its intent to proceed with the preloading program as described during the meeting.

In its closing comments, the NRC staff stated that the proposed solution is at the risk of the applicant and that NRC intends to review and evaluate this matter in accordance with the original compaction requirements as set forth in the commitments in the FSAR. The staff also stated that while attention to remedial action is important, determination of the exact cause is also quite important for verifying the adequacy of the remedial action, assessing the extent of the matter relative to other structures, and in precluding repetition of such matters in the future.

  
Carl Hood, Project Manager  
Light Water Reactors Branch 4  
Division of Project Management

Enclosures:  
As stated



ENCLOSURE 1

JAN 10 1979

ATTENDEES DECEMBER 4, 1978 MEETING

- P. A. Martinez, Bechtel
- K. A. Fischer, Bechtel
- S. C. Afifi, Bechtel
- R. W. Peck, Bechtel Consultant
- K. A. Ferris, Bechtel
- M. O. Rothwell, Bechtel
- D. W. Miller, CPO - Project
- C. V. Betts, Bechtel
- K. C. Barclay, Bechtel
- A. J. Soos, Bechtel
- D. L. Richardson, Bechtel
- D. M. Tom, CPO - QA
- A. A. Bird, CPO-QA
- R. M. Wheeler, CPO - PMO
- C. A. Hunt, CPO - Engineering Services
- D. E. Sibbald, CPO Project
- John Dunicliff, Bechtel Consultant
- Austin Marshall, Bechtel - Geotech
- Y. K. Lin, Bechtel - Geotech
- B. C. McDonnell, Bechtel - Geotech
- P. J. Jhan, Bechtel
- N. Swanberg, Bechtel
- Carl Hood, NRC PM
- Gene Gallagher, NRC Region III (ISE)
- Daniel Gillen, NRC/NRR Geosciences
- Lyman Hillen, NRC/NRR Geosciences
- Ronald Cook, NRC Resident Inspector

\*Present during both the 12/3/78 site tour and the 12/4/78 meeting.

Enclosure 2

SUBJECT: CFCo Midland Plant Units 1 & 2  
Diesel Generator Building

IPN 1-2 379

Meeting with NRC at Midland

DATE: December 4, 1978

AGENDA

- I. Introduction by CFCo
- II. History by Bechtel (N. Swanberg)
  - a. Plant description
  - b. Settlement monitoring program
  - c. Brief history of site fill placement
  - d. Settlement of Category 1 structure
  - e. Settlement of diesel generator building and pedestals
  - f. Review settlement data and drawings (SK-C-620, 623)
  - g. Consultants
- III. Soil Exploration by Bechtel (S. Afifi)
  - a. Soil borings
  - b. Dutch cone penetrations
  - c. Laboratory tests
  - d. Possible causes
- IV. Consultant's Recommendation by Dr. R.B. Peck and C.J. Dunnickiff
  - a. Preload
  - b. Instrumentation
- V. Status report by Bechtel (B.C. McConnell)
  - a. Activities completed
  - b. Activities in progress
  - c. Activities planned for future
    - 1) Corrective action
    - 2) FSAR conformance
- VI. Schedule by Bechtel (P. Martinez)
  - a. Overall project
  - b. Impact on project schedule
  - c. Schedule for remedial measures



VII. Responses to open items in NRC Inspector's report dated 11/17/78 by Bechtel (B. Darr)

JAN 12 1979

- a. Responses to Gallagher's concerns:
- 1) Conflict between FSAR Table 2.5-14 and Table 2.5-10 regarding fill material description
  - 2) Conflict between FSAR Table 2.5-21 and Specification C-210 regarding required number of passes for compaction
  - 3) FSAR Section 3.2.5.5 - expected settlement
  - 4) Conflict between FSAR Figure 2.5-47 and project drawing regarding foundation elevation
  - 5) Conflict in Specification C-210 regarding compactive effort in test method
  - 6) Conflict between consultant's recommendation and Specification C-210 regarding lift thickness
  - 7)  $\pm 2\%$  tolerance in moisture content permitted in Specification C-210
  - 8) Cracks in the building structure
- b. FSAR Question 362.2 (Section 2.5.4.5.1)

VIII.

Closing Comments by CFCO



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

MAR 31 1980

Docket Nos.: 50-329/330

APPLICANT: Consumers Power Company

FACILITY: Midland Plant, Units 1 & 2

SUBJECT: SUMMARY OF FEBRUARY 27 & 28, 1980 MEETING AND SITE TOUR WITH CONSULTANTS TO REVIEW SOIL SETTLEMENT

SHH 27 780

JWS  
GSK  
TCC  
DMB  
B...  
W...  
Y...  
S...  
04/15/80

On February 27 and 28, 1980, the NRC staff and three organizations recently acquired to support the staff safety review of geotechnical and interfacing matters, met with Consumers Power Company (the applicant), Bechtel and Bechtel consultants at the site for Midland Plant, Units 1 & 2. The three organizations supporting the staff review are the U. S. Army Corps of Engineers, Energy Technology Engineering Center, and U. S. Naval Surface Weapons Center. The purpose of the visit was to review and observe site backfill deficiencies and effects. This was the initial visit for the staff's consultants and the meeting was held to assist these consultants with their review of existing documentation on the background, remedial work and present status of this matter. Meeting attendees are listed in Enclosure 1.

The information reviewed at this meeting is contained in Amendment 72 to the Midland FSA, December 19, 1979, for which referenced material is forwarded in two volumes by the applicant's letter of February 11, 1980. One of the volumes entitled "10 CFR 50.55(e), Interim Reports, Settlement of Diesel Generator Foundations and Building," consists of the 10 CFR 50.50(e) reports sent by the applicant to the staff's Office of Inspection and Enforcement from November 7, 1978 through September 5, 1979. The other volume, entitled "Responses to NRC Requests Regarding Plant Fill," consists of the applicant's 10 CFR 50.54(f) responses to the Office of Nuclear Reactor Regulation submitted April 24, 1979 through November 13, 1979. These documents represent the applicant's reports upon which the staff's order of December 6, 1979 requiring modification of the construction permits is based. The meeting also included a preview of information to be contained in Revision 5 to the applicant's responses in the latter volume intended for submittal about the end of February, 1980. Revision 5 will include responses to the staff's supplemental requests of November 19, 1979. Only information not contained in these documents is included in this meeting summary.

In opening remarks, Mr. G. Keeley announced that Consumers Power Company has elected to defer all remedial work on inadequately supported structures until acceptance of the proposed work is received from the staff. This action is

APR 8 1980

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MAR 31 1980

voluntary on the applicant's part since the effective date for the staff's December 6, 1979 order is to be established by the Hearing Board pursuant to 10 CFR 2.204. The basis for this decision was said to be to preclude potential loss of revenue associated with expenditures for which staff approval has not been granted. The staff observed that this was a prudent decision, particularly in view of the significant slip in construction completion projected by Bechtel and currently under review by the applicant and due to other causes, principally the TMI-2 accident.

Presentations were also given by Bechtel consultants. Mr. C. H. Gould described the procedure for placement of caissons beneath the electrical penetration area (i.e., wing walls) of the Auxiliary Building and beneath the Feedwater Isolation Valve Pit area. Mr. M. T. Davisson described the procedure for placement of piles to support the northern portion of the Service Water Building. Dr. A. J. Hendon, Jr. reviewed the preloading program completed for the Diesel Generator Building and discussed why the preload option was elected in lieu of other possible corrective alternatives. Dr. R. B. Peck summarized the recommendations of the Bechtel consultants and emphasized that the preloading option is considered to eliminate the need for any further testing or measurements as a basis for establishing confidence for future settlement potential of the Diesel Generator Building. A summary of these discussions by the Bechtel consultants will be submitted as an amendment to the FSAR.

During the meeting, references were made to certain information and reports which have not been made available to the NRR staff, although some of these have been examined by I&E through the audit mechanism. Examples include:

1. Some of the figures listed in the drawing summary for the interim reports to MCAR #24 which are not included with the compilation of reports forwarded by the applicant's letter of February 11, 1980, even after noted figure replacements and redundancy are taken into account.
2. Installation details of each piezometer used to monitor pore water pressures during the preload program (e.g., type and actual elevations of installed piezometers, backfill materials and zone thickness).
3. Reports, meeting summaries, or other written communications with or by consultants recommending or supporting remedial measures for structures and utilities located upon or in questionable soils.
4. Reports of the evaluation (e.g., bases, procedure, execution and results) of the initial qualification and subsequent requalification of compaction equipment.
5. The report "Tank Farm Investigation: Midland Units 1 & 2," issued October, 1979.

March 31 1980

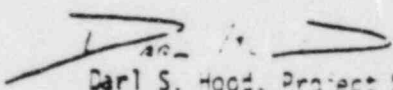
The staff noted that such documents as above are needed by its consultants for their independent assessment of the adequacy of the proposed remedial measures and requested that these be made publicly available. The applicant indicated a reluctance to this end, and noted that these were available through the I&E audit mechanism. The staff will issue a formal request for these documents. The staff also noted that the boring logs provided in Appendix 2A of the FSR did not reflect those borings associated with piezometer installation; the applicant replied that these would be added.

Site tours were provided in groups based upon the following engineering disciplines: (1) Geotechnical, (2) Structural, (3) Mechanical, and (4) Hydrologic.

During the tour the Corps noted that except for the use of temporary blocks, the service water pipe would otherwise be in direct contact with the base of the penetration through the northern wall of the Service Water Building. It is postulated that this results from the more rapid settlement of the buried pipe relative to the building's cantilevered settlement. The Corps emphasized that special attention should be given this area to avoid stressing the pipe at the penetration, particularly during pile driving and after attachment of the piles to the structure.

The staff noted that the presentation by Mr. C. H. Gould included the specification of some quantitative criteria to be applied during the remedial action for the Auxiliary Building. The staff asked if similar criteria were specified by the other Bechtel consultants, but was advised that these other criteria were more of a qualitative, subjective nature.

The staff also requested the applicant to submit a description of the services to be performed by consultants R. B. Peck, A. J. Hendron, Jr., C. H. Gould and M. T. Davison through the completion of construction on the remaining remedial fixes. This description should identify the extent of continued involvement of the consultants in overseeing construction operations and in evaluating the effectiveness of completed fixes for which they have provided major design input.

  
Carl S. Hood, Project Manager  
Light Water Reactors Branch No. 4  
Division of Project Management

Enclosures:

1. Attendees
2. Agenda

cc w/enclosures:  
see next page.

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Consumers Power Company

ccs (continued):  
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ENCLOSURE 1

ATTENDEES

Consumer Power

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T. Thiruvengadam  
U. E. Horn

MRC

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J. Kane  
A. Cappucci  
F. Rinaldi  
R. Gonzales  
D. Hood  
G. Gallinger  
R. Cook

US Navy Weapons Center

P. Huang  
J. Matra

Bechtel

Harris Burke  
Sherif Afifi  
Don Riat  
Bimal Dhar  
Bill Paris  
Julius Rott  
Jim Wanzeck  
Karl Wiedner  
John Rutgers  
Lynn Curtis  
Al Boos  
Chuck McConnel  
Walter Ferris  
US Corp of Engineers

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J. Grundstrom  
W. Otto  
W. Lawhead  
P. Hadala  
J. Simpson  
J. Norton  
R. Erickson

Consultants

R. B. Peck  
A. J. Hendron, Jr.  
C. H. Gould  
M. T. Davisson

ETEC

W. P. Chen  
J. Brammer







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

December 6, 1979

Docket Nos. 50-329  
50-330

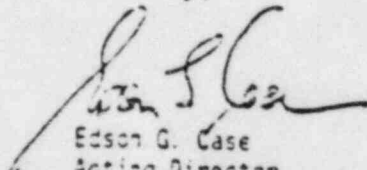
Consumers Power Company  
ATTN: Mr. Stephen H. Howell  
Vice President  
1945 West Parnall Road  
Jackson, MI 49201

Gentlemen:

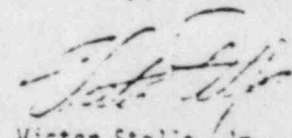
This letter transmits to you an Order Modifying Construction Permits No. CPPR-81 and No. CPPR-82. This action is being taken as a result of findings by inspectors from Region III, Office of Inspection and Enforcement made during the period of October 1978 to January 1979, and the conclusions of the NRC staff after reviewing responses to the 10 CFR 50.54(f) request of March 21, 1979, regarding the proposed remedial work under and around safety-related structures and systems at the site, some of which is currently underway. The Order pertains to the problems associated with the soil foundation materials at the site.

As part of the Order there are two Notices of Violation. The first Notice of Violation is Appendix A which contains information concerning four infractions with several examples, all of which relate to the soil foundation problems. The second Notice of Violation, Appendix B, contains information concerning an item of noncompliance which was determined to be a material false statement. Actions that Consumers Power Company may take as a result of this Order are described in the Order.

Sincerely,

  
Edson G. Case  
Acting Director  
Office of Nuclear Reactor  
Regulation

Sincerely,

  
Victor Stello, Jr.  
Director  
Office of Inspection  
and Enforcement

Enclosures:

1. Order Modifying Construction Permits, CPPR-81 and CPPR-82
2. Appendix A
3. Appendix B

CERTIFIED MAIL  
RETURN RECEIPT REQUESTED

7912270004

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

In the Matter of )

CONSUMERS POWER COMPANY )  
(Midland Nuclear Power Plant, )  
Units 1 and 2) )

Docket No. 50-309  
50-307

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 and October 1, 1982, for Unit 2 and Unit 1 respectively.

II

On August 20, 1978, the Licensee informed the NRC Resident Inspector at the Midland site that unusual settlement of the Diesel Generator Building had occurred. The Licensee reported the matter under 10 CFR 50.55(e) of the Commission's regulations by telephone 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 1978 notification, inspectors from the Region III, Office of Inspection and Enforcement, conducted an investigation over the period of October 1978 through January 1979. This investigation revealed a breakdown in quality assurance related to soil construction activities under and around safety-related structures and systems in that (1) certain design and construction specifications related to foundation-type material properties

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and compaction requirements were not followed, (2) 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; (3) there was a lack of control and supervision of plant fill placement activities which 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; 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 50-309/78-12, 50-330/78-12 (November 14, 1978) and 50-309/78-20, 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 resulting from 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 controlled compacted cohesive fill as stated in the FSAR.

As a result of questions raised during the NRC investigation of the Diesel Generator Building settlement, additional information was necessary to evaluate

the impact on plant safety caused by soil deficiencies under and around safety-related structures and systems in and on plant site, and the licensee's related quality assurance program. On March 22, 1979, the Director, Office of Nuclear Reactor Regulation, formally requested under 10 CFR 50.104, of the Commission's regulations information concerning these matters to determine whether action should be taken to modify, suspend or revoke the construction permit. 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, August 10, 1979, September 10, 1979, and November 11, 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 evaluate the technical adequacy and proper implementation of the proposed action. The information provided by the licensee fails to provide such criteria. Therefore, based on a review of the information provided by the licensee in response to the Staff questions, 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 resolved. Without the resolution of these issues the Staff does not 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.

III

Under the Atomic Energy Act of 1954, as amended, and the Commission's regulations, activities authorized by 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 have concluded that the quality assurance deficiencies involving the settlement of the Diesel Generator Building and soil activities at the Midland site, the false statement in the PSR, and the unresolved safety issue concerning the adequacy of the remedial action to correct the deficiencies in the soil construction under and around safety-related structures and systems are adequate bases to refuse to grant a construction permit and that, therefore, suspension of certain activities under Construction Permits No. CRRR-81 and No. CRRR-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, subject to Part V of this Order, Construction Permits No. CRRR-81 and No. CRRR-82 be modified as follows:

- 1) Pending the submission of an amendment to the application seeking approval of the remedial actions associated with the soil activities for safety-related structures and systems founded in and on plant fill material and the issuance of an amendment to Construction Permits No. CRRR-81 and

and No. CRR-82 authorizing the remedial action, the following activities are prohibited:

- (a) any placing, compacting, or excavating soil materials under or around safety related structures and systems;
- (b) physical implementation of remedial action for correction of soil-related problems under and around these structures and systems, including but not limited to:

- (i) dewatering systems
- (ii) underpinning of service water building
- (iii) removal and replacement of fill beneath the feedwater isolation valve pit area
- (iv) placing caissons at the ends of the auxiliary building electrical penetration areas
- (v) compaction and loading activities;

- (c) construction work in soil materials under or around safety-related structures and systems such as field installation of conduits and piping.

- (2) Paragraph (1) above shall not apply to any exploring, 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

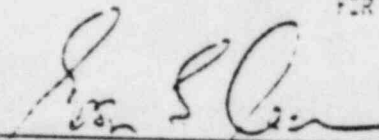
The Licensee or any person whose interest is affected by this Order may within 20 days of the date of this Order request a hearing with respect to all or any part of this Order. In the event a hearing is requested, the issues to be considered will be:


(1) whether the facts set forth in Part II of this Order are correct;  
and

(2) whether this Order should be sustained.

This Order will become effective on the expiration of the period during which a hearing may be requested, or in the event a hearing is requested, on the date specified in an Order made following the hearing.

FOR THE NUCLEAR REGULATORY COMMISSION

  
Edwin J. Case, Acting Director  
Office of Nuclear Reactor  
Regulation

  
Victor Ste. Jo, Jr., Director  
Office of Inspection  
and Enforcement

Attachments:  
1. Appendix A  
2. Appendix B

Dated at Bethesda, Maryland,  
this 6th day of December, 1979.

Appendix ANOTICE OF VIOLATION

Consumers Power Company

Docket No. 50-309  
Docket No. 50-310

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. CRR-81 and No. CRR-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 NBSI 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 bonded water storage tanks were performed on the assumption of uniform wet 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 2.5-37, 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 2.5-49. However, FSAR, Table 2.5-16, indicates an index of compressibility of the same plant fill to be 0.003.
- e. FSAR, Amendment 3, indicates that if filling and backfilling operations are discontinued during periods of cold weather, all frozen soil would be removed or recompact 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. FSAR 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 10.7.2 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.

CPC's Topical Report CPC-1-A, Policy No. 5, Section 2.0 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 5 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-213, 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-502 as well as PS&R, Amendment 3 (James and Moore Report, page 16)

- 3. 10 CFR 50, Appendix B, Criterion K 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 2-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 19, 1976, did not provide for inspection hold points to verify that soil work was satisfactorily accomplished according to documented instructions.

4. In QP 51, Appendix B, Criterion VI 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.

QPC Technical Report QP-174, Policy No. 19, Section 1.1 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 conditions adverse to quality were promptly corrected to preclude repetition. For example:

1. As of January 25, 1973, 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 Q-210 was identified in Quality Action Request SD-40, dated July 21, 1972.
2. 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. QPCs QF-13, QF-32, QF-66, QF-147, QF-174, QF-172 and QF-139 contain numerous examples of repeated nonconformances in the same areas of plant fill construction.

APPENDIX E  
NOTICE OF VIOLATION

Insurers Plant Company

Ticket No. 11-109  
Ticket No. 11-110

This refers to the investigation conducted by the Office of Inspection and Enforcement at the Insurers Nuclear Plant, Units 1 and 2, located at 12000th St., at the intersection of Jackson, Michigan, and at Bechtel Construction, Inc., 12000th St., Michigan, of activities authorized by NRC license No. COP-51 and No. COP-52.

During this investigation conducted on various dates between December 22, 1976 and January 25, 1979, the following apparent item of noncompliance was identified:

The Michigan Final Safety Analysis Report (MFSAR) contains the following:

Section 2.5-4.3.3, (1) states "Asphalt and brick" were placed according to Table 2-5-11.

Table 2-5-11, Minimum Subgrade Driveway, contains the following:

<u>Structure</u>	<u>Soil (1)</u> <u>Designation</u>	<u>Soil</u> <u>Type</u>	<u>Construction Criteria</u>	
			<u>Density</u>	<u>ASTM Designation</u>
Support of structures	1	Clay	95%	ASTM D 1557-66T (modified) **

- (1) For soil designation see Table 2-5-10.
- (2) The method was not tried to get 20,000 foot-pounds of compactive energy per cubic foot of soil.

Footnote 2.5-4.3.3, Bracing Subgrade, states: "Table 2-5-11 shows the contact area beneath footings subject to static and static cyclic loading, the foundation elevation, and the type of supporting bed used for individual unit structures."

Table 2-5-14, Summary of Contact Stresses and Ultimate Bearing Capacity for Footings and Supporting Bed and Category I and II Structures, contains, in part, the following:

<u>Unit</u>	<u>Supporting Bed</u>
Diesel Generator Building	Controlled compacted cohesive #11

Appendix B

2 -

This information is false in that materials other than controlled substances  
conceive pills were used to support the level generation and the  
data presented concerning the supporting soils influenced the start review of  
the file.

Continuation of NRC  
101/10 (10/1/79)



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

AUG 9 1979

MEMORANDUM FOR: File

FROM: Dan S. Hood, Project Manager, Light Water Reactors Branch  
No. 2, DM

SUBJECT: NRR COMMENTS REGARDING ENFORCEMENT ACTION ON MIDLAND SOIL  
DEFICIENCIES

An April 3, 1979 memorandum from J. Keppeler to W. Thornburg identified five statements from the FSAR regarding the backfill deficiency at the Midland site which I&E considered to be false, and requested a determination as to the materiality of these statements. Following receipt of this memorandum by NRR on May 7, 1979, it was distributed to technical review branches for review and a meeting was held August 1 to provide NRR comments. Meeting attendees, listed by Enclosure 1, included both I&E and CE&D. A summary of the NRR comments as to the materiality of the five same-numbered statements of the Keppeler memo is given in Enclosure 2.

CE&D defined "materiality" of FSAR statements. This definition served as the basis for judgments in the meeting. A statement was deemed to be "material" if, notwithstanding the fact that it was detected by the I&E investigation, it would or could have an influence upon a safety conclusion of the NRR staff (i.e., if it could have resulted in an improper finding or less probing analysis by the staff). The technical significance and willfulness of any such false statement is relevant to selection of the specific enforcement action deemed to be appropriate.

It was noted that some of the technical reviewers had not yet completed review of some of the relevant background material, and therefore only preliminary comments could be given at the meeting. A subsequent meeting on or about August 2, 1979 was scheduled to confirm or modify these preliminary comments.

Dan S. Hood, Project Manager  
Light Water Reactors Branch No. 2  
Division of Project Management

Enclosures:  
As stated

cc: See next page

~~8106090704~~

cc: All Attendees

G. Sower  
L. Ribenstein  
S. Varga  
D. Vassallo  
W. Cinstead  
H. Tromburg  
J. Keppeler  
W. Hesse  
C. Skovholt  
J. Murray





ENCLOSURE 2

NRR COMMENTS ON APRIL 2, 1979 KEPPLER MEMORANDUM

1. This statement is considered by NRR to be material; the fact that the #1 sand fill is of the wrong type (random fill versus structural fill) and was not sufficiently compacted is viewed by NRR as the core of the settlement problem. Other findings in the report appear to be subparts of contributors to this central problem and NRR suggested consideration be given to combining all five findings.
2. NRR stated that the difference between use of 3.0 C/P and 4.0 C/P for the load density for the Diesel Generator Building calculation would not on its own influence a safety conclusion by the NRR staff, and therefore, was not considered to be "material". Rather, the finding is viewed as an indicator of poor QA performance.
3. NRR stated that the difference between use of 0.001 and 0.003 for the index of compressibility for the Diesel Generator Building calculation would not on its own influence a safety conclusion by the NRR staff, and therefore, was not considered to be "material". Rather, the finding is viewed as an indicator of poor QA performance.
4. NRR recognizes the statements in FSAR sections 3.8.4.10.3.5 and 3.8.4.1.2 regarding the type of mat for the Diesel Generator Building to be inconsistent. However they are not false insofar as they reflect what was actually done. In its review, NRR interpreted the use of 41 points to represent a mat foundation, whereas FSAR section 3.8.4.1.2 accurately identified the building to have continuous footings. The improper calculation is viewed by NRR as an indicator of poor QA performance.
5. This statement is considered to be a subpart of statement 1. It also appears to be relevant to poor QA performance.

Comments to the  
10/1/79 (100)



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

SEP 17 1979

Docket No. 50-309 100

MEMORANDUM FOR: George C. Iwen, Acting Executive Officer for Case Support, IE  
FROM: Harold D. Tromburg, Director, Division of Reactor Inspection, IE  
SUBJECT: COMMENTS ON NEEDED ACTION ON MIDLAND ENFORCEMENT

IEI transmitted an enforcement package to be dated April 3, 1979. The package was sent to AOCG as directed by J. Davis's memorandum of 4/10/79.

IEI provided comments on the enforcement package in a memorandum dated June 13, 1979 (see Enclosure 1) to AOCG for coordination. We have no position in writing from NRR on the package. Since that date, there have been several meetings (3/1, 3/3 and 3/16) which addressed, at least in part, the questions concerning further action on the enforcement package. The meetings were attended by personnel from NRR, ELD and IE. The elements necessary to make a finding on a material false statement were examined.

- a. Is the statement false?
- b. Is the statement material?
- c. Under what circumstances or in what frame of mind was the statement made (willful, negligent, careless or disregard)?

As a result of these meetings and the subsequent discussions by the NRR representatives, we are of the opinion that the enforcement action should be taken on item 1 of the package as a material false statement in that the use of the word "fill" was not the type stated in the PSAR as having "random vs engineered structural fill". The NRR conclusions on the items were that the statements were not material and indicated "poor performance" on the part of the licensee.

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

SEP 17 1973

Further, it is our opinion that the fact that there are four clear instances of conflicting statements in the RIII vs what was actually done, is evidence of improper internal coordination and failure on the part of the licensee to assure that accurate information was being provided to the NRC. These constitute sufficient facts to take a finding that the material false statement was made in carelessness or disregard of the facts. This would make the material false statement subject to a civil penalty vs actions allowed under the Administrative Procedures Act for the "secret change."

We strongly recommend that NCCS advise RIII to prepare the enforcement package in this manner and that we proceed quickly on this matter. We understand that there is a reluctance by some in the NRC against finalizing an action on material false statements while the bigger questions of the CA program and work being done at the site as corrective actions which are not yet approved by the NRC are being considered for action. In our opinion, the two matters are distinct and it should proceed with the initiation of enforcement action on the false statement.

If you have any questions, please contact us.

*Harold G. Thornburg*  
 Harold G. Thornburg  
 Director  
 Division of Reactor  
 Construction Inspection, I&E

cc: S. W. Reimann, IE  
 J. S. Kessler, RIII  
 T. W. Brockert, IE  
 D. Reed, WRR  
 C. E. Norrillus, RIII



Continued from 10/13/79 (1400)

D. H. ...

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

OCT 04 1979

Socket Nos. 50-329  
50-330

MEMORANDUM FOR: James B. Keiffer, Director, Region III  
FROM: George S. Gower, Acting Executive Officer for Operations Support, IS  
SUBJECT: ENFORCEMENT ACTION RELATED TO WILAND DIESEL GENERATOR BUILDING AND PLANT FILL AREAS (A/E) REGION III

This refers to your memorandum to W. J. Thornburg dated April 3, 1979. You requested that five items be reviewed to determine whether or not they involved material false statements.

Based on several meetings between IS, A/E, and ISD, the information in Attachment 1 of your letter is considered a "material" false statement. Items 2, 3, 4, and 5 are not considered material false statements; these four items should be treated as items of noncompliance as you presented in Attachment 2. The Headquarters review is summarized in a memorandum from W. J. Thornburg dated September 27, 1979; a copy is enclosed.

A proposed civil penalty package should be prepared and forwarded to A/E for action. We recommend following the format use in the 10/13/79 case. The letter to the licensee would have three appendices. Appendix A would be a Notice of Violation related to the material false statement. Appendix B would be a Notice of Proposed Imposition of Civil Penalties. Appendix C would be another Notice of Violation specifying the four infractions found during the Region III investigation. Based on the information presented, we do not believe that the four infractions to be included in Appendix C meet the civil penalty criteria and, therefore, would not carry monetary penalties.

We understand that you plan to have a meeting at Headquarters in the near future to discuss other actions that may be taken with regard to the Wiland facility.

This memorandum closes Action Item #3046741.

*H.C. Gower*  
George S. Gower, Acting Executive Officer  
for Operations Support  
Office of Inspection and Enforcement

Enclosure:  
(See next page)

James G. Kepler

- 2 -

OCT 04 1973

Enclosure:  
Memo from R. Thompson  
dated 9/27/73

cc w/enclosure:  
R. Thompson, IE  
G. W. Reardon, POC  
G. S. Hood, NRR  
T. W. Brockett, AOS



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

*Enclosure Ex 1416  
10/3/80 (itrs)*

JUN 13 1979

Socket No. 50-329/330

MEMORANDUM FOR: Dudley Thompson, Executive Officer for Operations Support, IE

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

SUBJECT: COMMENTS ON RII: ENFORCEMENT PACKAGE ON MIDLAND SETTLEMENT PROBLEMS DATED APRIL 3, 1979

We have reviewed the above referenced package which under J. Davis's memorandum of March 21, 1979 was forwarded to X003 as the responsible coordinating group within IE. These comments are provided to be consistent with this memorandum and the follow-up memorandum you provided to your enforcement personnel also on March 21, 1979.

In summary, it is our opinion that four of the five false statements identified by the Region will probably be substantiated to be material false statements and that they were made in careless disregard of the facts. Therefore, it would follow that there would probably be four instances of a material false statement each of which would have a civil penalty of \$5,000 imposed for it. The fifth item is not, in our opinion, a material false statement.

The enclosure presents our detailed recommendations on this matter. If you have questions please contact us.

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

Enclosure:  
Comments on Midland  
Enforcement Package

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

*7908070022*

COMMENTS ON MIDLAND ENFORCEMENT PACKAGE TRANSMITTED TO THORNBERG  
FROM KEPPLER, DATED 4/3/79

1. The material false statement items (probably 4) should be put into an Appendix A entitled, "Notice of violation," and will be those items with a civil penalty. An Appendix B entitled, "Notice of Proposed Imposition of Civil Penalties" should be prepared. The other items of noncompliance should be addressed in an Appendix C, "Notice of Violation."
2. All statements quoted from the SAR in the citations should be clearly identified by amendment number and/or revision number and date.
3. A check of Statement 1 regarding fill and backfill placement shows it is apparently from the original version of the FSAR. Revision 1, 11/22/77 has a different statement and is the current version. Some of the other statements referenced have been revised now after the investigation. This must be reexamined. If the statements quoted in the RII draft can be utilized in an enforcement action then we judge the statement to be a material false statement. In reaching this conclusion we note that there is a need to quote or provide a copy of the text from construction drawings C-45 stating that Zone 2 material is to be used as Class I fill if the citation is to be properly supported.
4. Statement #2 can probably be classed as a material false statement if the results of the interview with the cognizant engineer and/or the calculation sheet prove that 3.0 ksf was used in the settlement calculations.
5. Statement #3 is viewed to be a material false statement, but there is a need to fully document what was actually done in the execution of the calculations. Again a copy of the calculation sheet and/or a statement of the cognizant engineer is needed to properly support the finding.
6. Statement #4 can probably be classed as a material false statement if the results of the interview and/or the calculations are provided to support the finding.
7. Statement #5 is judged to not be a material false statement. This is due to the fact that the statement quoted is written as a predicted future value for settlement.
8. For those statements which will become material false statements with a civil penalty, remove them from the draft Appendix A and move the remainder to the new Appendix C.
9. All statements judged to be material false statements must be examined to see in what "state of mind" or in what circumstances the licensee made the statement. This is relevant to the question of "civil penalty" vs. "second chance." In our judgment these instances appear to be situations of "careless disregard" of the facts which would warrant civil penalty.

JUN 18 1979

cc w/enclosure:  
J. G. Keppler, R111  
D. W. Hayes, R111  
T. W. Brockett, X005  
G. W. Reinuth, R01  
R. E. Shewmaker, R01

JUN 18 1979



Consolidated to #151K  
10/1/79 (mcc)

MIDLAND SOIL SETTLEMENT QA CONCERN

1. 50.54(f) sent to Consumers Power Company in March 1979. At that time IE recommended to NRR that a show cause be issued to stop construction. It was agreed (NRR/IE) that 50.54(f) would be sufficient.
2. General question of QA adequacy of Utility/IE was discussed internally by IE/NRR on August 16. IE was to ask region to make a finding as to adequacy of QA implementation. Special consideration was to be given soils settlement matter in relation to the reports of QA deficiencies in other areas.
3. Latest response to 10 CFR 50.54(f) follow-on questions regarding QA of plant fill received on 11/13/79. (Tentative QA Branch position suggests response still unsatisfactory.)
4. Review of Midland Soils Settlement submittals given to Corps of Engineers at end of October. (Tour of site made by Corps of Engineers & NRR staff November 14.)
5. To date, Utilities replies to 50.54(f) have not described acceptance criteria for remedial action, prior to such action. Applicant views the remedial actions as "proof tests" which preclude need for such criteria. Staff decision as to acceptability of remedial action must await completion of the program, and applicant must proceed entirely at his risk.
6. In a meeting on November 28, IE developed a new position:
  - a. Overall QA performance acceptable because it identifies QA deficiencies;
  - b. IE now raises question as to the acceptability of the design fix and draws the conclusion that the modification constitutes a departure from the principal architectural and engineering criteria;
  - c. IE suggests Stello/Denton meeting ASAP to develop a decision for enforcement actions relative to applicant's failure to comply with design approved by CP.

Consolidated File to  
10/1/79

21.74504

AUG 24 1979

MEMO TO FILE

FROM: D. Hood, Project Manager, Light Water Reactors Branch No. 4, ORN

SUBJECT: INTERNAL MEETING ON STATUS OF MIDLAND SOILS SETTLEMENT

On August 16, 1979, members of NRC, I&E Headquarters and ORN met to discuss the status of the staff's review of the soils settlement matter at the Midland site. The purpose was to determine the status of the staff's decision pursuant to 10 CFR 50.54f (which is applicable to construction permits by 10 CFR 50.55(e)). The principal background documents to date are listed in Enclosure 1. Meeting attendees are listed in Enclosure 2.

Mr. Knight reported that the principal technical solutions proposed by the applicant for the major structures appears to be basically sound such that, properly implemented, they can be expected to provide for adequate structural foundation support. He notes, however, that certain details of the applicant's reply were not sufficient and further information will be required from the applicant. For example, the details of the applicant's load combination calculations and stress limits applicable to differential settlement, NRC's need for a more quantitative assessment to determine that nozzle loads transmitted from settled pipes to the attached valves, pumps, tanks, etc will remain within ASME Code allowables, and a more thorough monitoring program to follow actual performance during operation. These findings and further requests are being documented and will be completed in late August.

Messrs Haass and Gilray of QAB noted that some instances of poor performance in QA areas revealed in the I&E investigation report indicates that additional QA measures beyond those typically imposed by the NRC may be warranted. QAB's review is in its final stages of documentation and should be completed before the end of August.

AUG 24 1979

Mr. Thompson noted ISE is continuing its review of the performance aspects of the QA program and considering the staff's settlement matter in relation to the records of QA deficiencies in other areas. Mr. Thompson anticipates that ISE will reach its conclusions by mid-September 1979.

ISE referenced a Memorandum and Order from HQ dated August 2, 1979 which asks for clarification of the staff's position regarding consideration of the closed generator existing settlement issue. The closed source settlement from the staff's response whether the staff simply prefers not to take a partial ISE or whether there are other considerations making early consideration of this issue impractical or intractable. Mr. Orstedt will prepare a reply clarifying the staff's ISE schedule and explaining why isolation of the closed existing issue is not practical.

Mr. Rubenstein described the approach which DPM will take in arriving at an IAC position on the technical qualification findings for the SER. The approach is that defined in a W. Haass memo dated 12/16/78, which calls for inputs from OAB, ISE, DOR and DPM.

Mr. Cassano emphasized the need for timely decisions to be reached by the staff and for similar status meetings in the near future.

AA-17-1  
D. HOOD

ENCLOSURE 1

BACKGROUND DOCUMENTATION

Background Documentation relevant to NRR's 10 CFR 50.64, f) requests dated March 21, 1979 include the following: The applicant's reply dated April 24, 1979, was received May 31, 1979 (revision 1), and July 9, 1979 (revision 2). Further information was supplied by the applicant during meetings attended by both I&E and NRR on March 6 and July 18, 1979. In addition, certain information was requested by NRR technical branches as part of the FSAR review prior to issuance of the 10 CFR 50.64, f) requests and are replied to through FSAR amendments. Site visits by NRR staff to observe settlement were made March 6 and June 7, 1979, and December 3, 1978. NRR participation with I&E results from a Transfer of Less Responsibility which was distributed to technical review branches as part of a technical assistance request dated November 27, 1978.

Background documentation directed to I&E includes a 50.65, e) notification by the applicant dated September 29, 1978, for which six interim reports have been issued to date (November 7, 1978; December 21, 1978; January 6, 1979; February 23, 1979; April 30, 1979; and June 25, 1979). I&E has conducted a preliminary investigation and has documented its summary findings, along with the applicant's discussion of these findings, in a letter to the applicant dated March 16, 1979. Enforcement actions due to potential material-false statements in the FSAR as may be applicable to some of these I&E findings are presently under internal review, assisted by NRR staff as appropriate.

ENCLOSURE 2

ATTENDEES

J. Knight  
J. Skynole  
W. Mass  
L. Vassallo  
S. Varga  
L. Rubenstein  
L. Wood  
J. Thompson  
A. Greenaker  
P. Backman  
M. Chiswick  
C. J. Friedman  
C. J. Gifford  
C. J. Sussman

Agenda - Oct 1, 1980

Opening Remarks	Leer
Background	Heiler
DG Bldg	Kane
SW Structure	Singh
Aux Bldg	Singh
Cooling Pond Dike	{ Kane Blums
Retaining Walls	{ Singh Otto
Summary of Corps of Eng review on recent submittals of additional explorations	{ Singh Otto
Statement by Corps on importance of the requested borings & testing on the safety review	{ Simpson Otto
Concluding Remarks	Leer

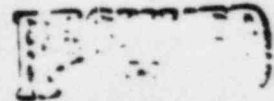
- Items -  
1. Patten  
2. Hood  
3. Colman  
4. Knight  
5. Cappuccini



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

August 27, 1980

Cocket Nos. 50-329  
and 50-330



SEP 02 1980  
MIDLAND DISTRICT  
MANAGER

Mr. J. W. Cook  
Vice President  
Consumers Power Company  
1945 West Parrall Road  
Jackson, Michigan 49201

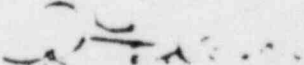
Dear Mr. Cook:

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION REGARDING DEWATERING  
OF MIDLAND SITE

Amendment No. 74 to your application dated February 29, 1980, provided information regarding a permanent dewatering system proposed for the Midland site in response to Request No. 24 from Mr. L. Rubenstein's letter of November 19, 1979. The review by the hydrologic section of our hydrologic and geotechnical Engineering Branch indicates the need for further information regarding that response as identified in Enclosure 1. This information is in addition to related requests contained in our letter of August 4, 1980.

We would appreciate your reply to Enclosure 1 at your earliest opportunity. Should you need clarification of these requests for additional information, please contact us.

Sincerely,

  
Robert L. Tedesco, Assistant Director  
for Licensing  
Division of Licensing

Enclosure:  
Request for Additional  
Information

cc w/ encl:  
see next page

~~8609120197~~

August 27, 1980

Mr. J. W. Cook  
Vice President  
Consumers Power Company  
1920 West Barnhill Road  
Jackson, Michigan 49201

cc: Michael T. Miller, Esq.  
Isnan, Lincoln & Beale  
Suite 4000  
First National Plaza  
Chicago, Illinois 60603

Lido L. Bach, Esq.  
Managing Attorney  
Consumers Power Company  
612 West Michigan Avenue  
Jackson, Michigan 49201

Mr. Paul A. Penny, Secretary  
Consumers Power Company  
612 West Michigan Avenue  
Jackson, Michigan 49201

Wynon W. Cherry, Esq.  
1 IBM Plaza  
Chicago, Illinois 60611

Ms. Mary Sinclair  
5111 Summit Drive  
Midland, Michigan 48640

Frank J. Kelley, Esq.  
Attorney General  
State of Michigan Environmental  
Protection Division  
100 Law Building  
Lansing, Michigan 48913

Mr. Wendell Marshall  
Route 10  
Midland, Michigan 48640

Grant J. Merritt, Esq.  
Thompson, Nielsen, Klovenskamp & James  
444 IDS Center  
80 South Eighth Street  
Minneapolis, Minnesota 55402



cc: Mr. J. W. Cook  
Mr. J. W. Cook  
Mr. J. W. Cook

Mr. J. W. Cook  
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Mr. J. W. Cook  
Mr. J. W. Cook  
Mr. J. W. Cook  
Mr. J. W. Cook

Receipt

August 27, 1980

Faint, illegible text, possibly a list or receipt details.

--- August 27, 1990

cc: Mr. William A. Truesdale  
2045 West Road  
Cincinnati, Michigan 45202

Mr. Terry S. Miller  
1115 Meridian Drive  
Bay City, Michigan 49702

SUPPLEMENTAL REQUESTS REGARDING PLANT FILL

49. Your response to our Request 24 states that if the dewatering system should fail, more than 90 days would occur before groundwater levels would rise to elevation 610 feet, the groundwater elevation at which liquefaction would become a problem. We are concerned that this water level rise might occur over a period considerably less than 90 days in view of the following apparent discrepancies in equations and input parameters:

- a. The error function solution to the partial differential equation describing unsteady groundwater flow which you used to determine permeability, appears to be incorrect; the correct form should have a 4 in the denominator, instead of a 2 as you have shown. The correct equation is:

$$h = H \left( 1 - \operatorname{erf} \frac{x}{\sqrt{4K\bar{h}t/n_e}} \right)$$

where:

$h$  = water level rise at  $X=0$

$H$  = water head at  $X=0$

$\bar{h}$  = average depth of water

$\operatorname{erf}$  = error function

$K$  = permeability

$X$  = distance

$t$  = time

$n_e$  = effective porosity

- b. In the above equation since  $\bar{h}$  is the average depth, its value should lie between  $h$  and  $H$ . In applying this equation to compute a permeability  $K$  of 11 feet per second and a corresponding rebound time of 90 days, you used 0.1 foot for  $h$ , 1.6 feet for  $H$ , but 20 feet for  $\bar{h}$ . Use of a smaller value of  $\bar{h}$  (somewhere between 0.1 and 1.6 feet) would result in a higher permeability and a rebound time considerably shorter than 90 days.
- c. Your value for  $x$  in the above equation is 325 feet, which you say is the shortest distance between the critical area and the recharge source, i.e., the distance between the southeast corner of the diesel generator building and the southwest corner of the circulating water intake structure. However, Figure 24-1 shows this distance to be about 240 feet. Use of this smaller value for  $x$  will also result in a rebound time shorter than the 90 days which you have computed.
- (1) Please justify or correct the above apparent discrepancies and, if appropriate, provide revised analyses to better define the rebound time to be expected following a prolonged dewatering system failure. A more conservative analysis might involve utilizing the recovery data from the appropriate pump tests, i.e.,  $K = 31$  fps.
- (2) In determining rebound time, it is our position that you should also postulate failure of non-Seismic Category I piping at critical locations. This should include the circulating water conduits.

(3) Demonstrate that there remains adequate time to install and implement a back-up dewatering system to prevent groundwater from rising above elevation 610 feet.

50. Your Response to Request 24 concludes that there is groundwater recharge from the cooling pond in the area of the intake and pump structures because pumping tests at well PD-15A resulted in very little drawdown at observation wells SW-1, SW-4 and RR-1. However, for several indicated reasons, you also concluded that there is very little recharge in the area of the discharge structure and one of these reasons is that there is very little drawdown at observation wells PD-3 and PD-20B as shown by Figure 24-14. These appear to be contradictory conclusions (i.e., how can very little drawdown indicate recharge at one location and no recharge at another nearby location?). Provide additional information to support and clarify your conclusion that there is negligible recharge in the area of the circulating water discharge structure. (Also see related Request 47(2)).

51. Your response to Request 24 regarding the area well dewatering system concludes that 22 wells pumping at an average rate of 5 gpm would be needed to remove groundwater stored within the backfill and natural sands. Two more wells are provided for infiltration and pipe leakage. You have not demonstrated whether 24 wells would also be a sufficient number to maintain the area groundwater at the desired elevation following removal of the groundwater already in storage. Provide

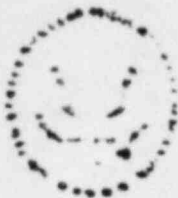
additional information to demonstrate that 24 wells will maintain groundwater levels below elevation 610 feet and provide the design basis used for this determination. Additionally, justify your use of 14 percent for an average Significant Field Coefficient.

52. Your response to Request 24 discusses the source of groundwater which you have determined from pumping tests in the vicinity of the Service Water Pump Structure and the Circulating Water Intake and Discharge Structures. However, no tests appear to have been conducted to determine if Dow Chemical's Tertiary Water Treatment Pond, shown on FSAR Figure 2.1-14 and located just west of the nuclear plant, represents a potential source of groundwater. We are aware of your conclusion that inflow of groundwater from outside the plant area is precluded by the cooling pond dike which encompasses the nuclear plant site; however, you have provided no information to support this conclusion with respect to the Dow pond. Also lacking is information on the details of your West Plant Dike shown on FSAR Figure 2.5-46. Provide information to demonstrate whether the Dow pond is or will be a source of groundwater at your plant site. As a minimum, include the following:
- (1) Provide a general description of the Dow pond (size, depth, capacity, purpose, contents, sealing method, etc.). Specify maximum elevation of the water in the Dow pond with relationship to the groundwater levels below the plant. Include a sketch showing distances and elevations of the Dow pond relative to the West Plant Dike.

- (2) Provide details on your West Plant Dike. Compare the West Plant Dike to your cooling pond dike, including any similarity in their quality of construction and their source of construction materials. It appears that plant excavation extended to the area where the West Plant Dike is located. Discuss whether and how excavation for the plant affected construction of the West Plant Dike.
  - (3) Provide as-built drawings of the West Plant Dike.
  - (4) Provide the results of any tests conducted to reach a conclusion on the effect of the Dow pond on the groundwater beneath the plant.
  - (5) If the Dow pond is a potential source of groundwater, provide analyses of the chemistry of this water (both present and future) and describe its effects on the dewatering system and other underground components (piping, tanks, etc.). Identify any agreements or plans you have to monitor and control the contents or influence of the Dow pond during plant operation.
  - (6) Provide groundwater elevations in the warehouse area which is located between the Dow pond and the West Plant Dike.
53. Your discussion of the interceptor well system design in response to Request 24 assumed that seepage would flow into a 400 foot slot located 150 feet from the cooling pond. You assumed that part of this slot would be ineffective because the intake and pump structures would cut off part of the seepage from the cooling pond. To account for this cut off, you assumed that the slot would be located 450 feet from the cooling pond instead of 150 feet. This assumption reduced the quantity of inflow to the slot.



Figures 24-9 and 24-10 indicate that 5 to 10 feet of natural sand exists below the intake and pump structures (See Request 47(3)). Consequently, these structures may not cut off or reduce the seepage from the cooling pond. You should therefore recalculate total groundwater inflow without any reduction for the structures and recalculate the number of interceptor wells required. Reposition and space wells accordingly. Alternately, provide additional information to support your conclusion that the structures serve as positive cut offs.



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20540

See...  
12/15/79

JAN 1 1980

Letter Nos. 89-103 100

MEMORANDUM FOR: Roger Fontana, Assistant Director for Investigation, IIC  
FROM: Harold D. Thornburg, Director, Division of Reactor Construction  
Inspection, IIC  
SUBJECT: Investigation pertinent to the winding stage of work on the  
INSPECTOR GENERAL, INCLUDING THE MATTER OF FALSE STATEMENT  
CONCERNING THE

We are enclosing several documents which present the facts and issues involved  
in the winding stage and failure of problems that were identified during extensive  
inspections conducted in the winding stage of the... The... of  
... have been a joint IIC and... effort which  
... the Order to Modify the License on December 3, 1979.

Part of the efforts involved in these problems was the... given to  
several... which were being reviewed as possible material false statements.

Enclosure 1 is a listing of the pertinent documents that relate to this matter.  
Those noted with an asterisk reflect what we consider to be the key documents  
you may want to focus on first to define what the issues were. If you need  
additional information on this matter, please contact us.

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

- Enclosures:  
1. Documents on List in the Winding  
and Foundation Problems  
2. Attachments listed on Enclosure 1

CONTACT: R. E. Newmeyer, IIC  
89-1031

4. Torture

12

12

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MEMORANDUM FOR  
THE DIRECTOR  
FEDERAL BUREAU OF INVESTIGATION

1. 12 179 00 00 et records. (Note: Little drawings are not included here due to reproduction problems. They are on file in 121.)

- a. Internal Record with letter dated 9/23/78
- b. Internal Record #1 with letter dated 11/7/78
- c. Letter dated 12/1/78
- d. Internal Record #1 with letter dated 1/1/79
- e. Internal Record #2 with letter dated 1/22/79
- f. Internal Record #3 with letter dated 4/10/79
- g. Internal Record #4 with letter dated 6/10/79
- h. Letter dated 5/1/79 with enclosure
- i. Internal Record #7 with letter dated 9/1/79
- j. Internal Record #8 with letter dated 11/2/79

2. Transfer of Joint Responsibility to WRA dated 11/11/78

3. Board Notifications

- a. Memo Kessler to Vassallo, 11/1/78
- b. Memo Thornburg to Kessler, 11/2/78
- c. Memo Kessler to Vassallo, 11/13/78
- d. Memo Vassallo to Engelhardt, 11/13/78
- e. Memo Kessler to Thornburg, 4/20/79
- f. Memo Thornburg to Kessler, 5/14/79
- g. Memo Kessler to Vassallo, 5/17/79
- h. Memo Vassallo to Christensen, 5/29/79
- i. Memo Thornburg to Kessler, 5/5/79

4. 12 Inspection Reports

- a. 12-11, 11/17/78
- b. 12-11, 11/21/78
- c. 12-14, 11/30/78
- d. 12-15, 1/22/79
- e. 12-15, 1/23/79
- f. 12-15, 1/16/79
- g. 12-15, 4/9/79
- h. 12-15, 4/27/79
- i. 12-15, 5/3/79
- j. 12-15, 6/5/79
- k. 12-15, 6/30/79
- l. 12-15, 8/22/79
- m. 12-15, 7/3/79
- n. 12-15, 10/1/79

5. Enforcement Actions

- a. Memo Kessler to Thornburg, 2/15/79
- b. Bill Position Paper, 2/23/79
- c. Memo Kessler to Thornburg, 3/12/79

6. Letter from Kessler to Howell of Consumers Power Company, 1/15/79
7. Memo Kessler to Thornburg, 2/3/79
8. Memo Thornburg to Thomson, 5/11/79
9. Memo Kessler to Fife, 4/3/79
10. Memo Thornburg to Gower, 3/27/79
11. Memo Gower to Kessler, 10/4/79
12. Memo Kessler to Thornburg, 10/29/79

5. 10 CFR 50.54(f) Request and Responses (Note: Large drawings are not included here due to reproduction problems. They are on file in 22.)

- a. Letter Denton to Howell of Consumers Power Company, 3/21/79
- b. Letter Howell to Denton, 4/24/79
- c. Letter Howell to Denton, 5/27/79
- d. Letter Howell to Denton, 7/9/79
- e. Letter Rubenstein to Howell, 8/29/79
- f. Letter Rubenstein to Howell, 9/11/79
- g. Letter Howell to Denton, 9/11/79
- h. Letter Howell to Denton, 11/13/79
- i. Letter Rubenstein to Howell, 11/19/79

7. Related VRR Correspondence

- a. Memo Rubenstein to Knight, 3/27/79
- b. VRR Summary from 7/13/79, dated 10/16/79
- c. VRR Summary from 9/5/79, dated 10/16/79
- d. VRR Summary from 11/14/79, dated 12/1/79

8. Order

- a. Order to Modify the Construction Permit, 12/6/79
- b. Submittal of Amendment #72, 12/19/79 per the Order
- c. Request for hearing by Consumers Power, 12/26/79



UNITED STATES  
 FEDERAL REGULATORY COMMISSION  
 WASHINGTON, D.C.  
 DIVISION OF ENFORCEMENT

April 3, 1979

TO: Mr. E. J. Tompkins, Director, Division of Enforcement, II

FROM: James J. Keppeler, Director

SUBJECT: ENFORCEMENT ACTION RE: WISCONSIN BROADCASTING BOARD  
 LICENSE AND TRANSMITTER AREA

As you are aware, we have sent to Consumers Power Company our two meetings held with them and a report of the investigation of the causes of the closed generator pulling settlement. This report to you dated March 22, 1979, summarized the findings and concerns resulting from this investigation.

In view of WBB's involvement in the technical issues in this case, the need for a determination as to the materiality of the statements we consider to be false, we are not in a position at this time to recommend specific enforcement action which should be taken.

Attached to this communication are the specific FCC statements which serve as the basis for our conclusion that they are false. Also attached is a copy of our letter dated March 22, 1979, which transmitted the report to the licensee and a draft Notice of Violation setting forth the items of noncompliance based on the investigation. The draft Notice of Violation includes all of the FCC records described in Attachment 1 as examples of noncompliance with the provisions of 47 CFR 1.60, Appendix B. If it is determined that any of the matters constitute material false statements, we assume that they will be created separately, and removed as examples of noncompliance with this criteria.

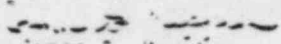
~~8106090700~~

Harold G. Thompson

- 2 -

April 3, 1979

We request that the items of correspondence be given technical and legal review and that a determination be made of the materiality of FOIA exceptions so that upon resolution of the technical issues, we will be in a position to move more promptly toward taking enforcement action.

  
James C. Keppeler  
Director

Attachments:

1. FOIA Request
2. FOIA Request
3. See also 100-100000  
Investigation Report

cc w attachments:

1. Thompson, H

Material Test Statements

1. Statement

Section 2.5.4.5.3, 1111, 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>	<u>Zone (1)</u> <u>Designation</u>	<u>Soil</u> <u>Type</u>	<u>Compaction Criteria</u>	
			<u>Percent</u>	<u>ASTM Compaction</u>
Support of structures		Clay	95	ASTM D 1556-61 (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 2.5.4.11.1, 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.

Finding

Construction Drawing C-45, Class I fill material areas, specifies the foundation material for Class I structures to be Zone I material which is identified in 75AR Table 2.5-10, Gradation Ranges for Fill Material, as Random Fill and is described as "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.



2. Statement

Section 2.5.4.11.2.1, Plans Layout and Loads, states: "The building loads superimposed by the structures on undisturbed soil of compacted fill are given in the soil pressure plan, Figure 2.5-7."

Figure 2.5-7, Soil Pressure Diagram Category 2 and 3 Structures, shows the superimposed load density for the Diesel Generator Building to be 2.0 KBT (200 lbs. per sq. ft.).

Finding

It was ascertained through a review of the settlement calculations and an interview of the individual who performed these calculations that 2.0 KBT was used.

3. Statement

Section 2.5.4.11.2.3, Soil Parameters, states: "The soil compressibility parameters used in the settlement calculation are presented together with soil profile in Table 2.5-16."

Table 2.5-16, Idealized Soil Profile and Parameters for Elastic Half-space Settlement and Heave Analysis, contains the following:

Layer	Idealized Soil Type	Elevation Interval (ft)	Thickness (ft)	Average $C_{c(1)}$
A	F411 (C)	634-609	25	0.003
B	F411 (C)	609-603	6	0.003

NOTE: Final groundwater table is taken at elevation 627.

(1) Values were estimated from the mathematical relationship between Young's Modulus and Compression and rebound indexes and averaged with those obtained from consolidation tests. Young's Modulus was estimated from empirical relationship with shear strength.

Finding

It was ascertained through a review of the settlement calculations for the Diesel Generator Building and an interview with the individual who performed these calculations that an index of compressibility of 0.001 not 0.003, was used for the elevation interval 600-604.

Statement

Section 1.8.3.1.3.5, Analysis, states: "For settlement computations, a total of 41 settlement points are established on a grid and at selected structure locations as shown in Figure 2.5-48. . . . To account for possible time-dependent relationships, the estimated total settlements at each of the 41 points were obtained respectively by adding 33% of the calculated settlement values of loading Case A to the calculated ultimate settlement values of loading Case B. These values are presented in Figure 2.5-48."

Section 1.8.4.1.1, Diesel Generator Building, states: "The walls are supported by continuous floorings with bases at elevation 605'-0". Each diesel generator rests on a 6'-6" thick reinforced concrete pedestal which is not structurally connected to the building foundation for purposes of vibration isolation."

Finding

It was ascertained through a review of the settlement calculations for the Diesel Generator Building and an interview with the individual who performed these calculations that the data in Figure 2.5-48 regarding the Diesel Generator Building are based on calculations performed on the erroneous assumption that the Diesel Generator Building was constructed on a mat foundation.

Statement

Section 1.8.5.5, Structural Acceptance Criteria, states: "Settlements of shallow spread footings founded on compacted fills are estimated to be on the order of 1/8 inch or less. These settlements are essentially elastic and occur as the loads are applied."

Testing

It was ascertained through an interview with the individual who wrote this section of the report that the above statement was taken from the OASIS and OASIS report submitted as part of the report. He assured the statement was valid for inclusion in the report. He said there was no other trace to support the statement.

(NOTE: In this report the licensee has subsequently stated this statement " . . . is not applicable to the actual configurations and contents of the code, generated, tracking and has been eliminated from the report in Revision 10.")

Appendix A

NOTICE OF VIOLATION

Consumers Power  
Company

Docket No. 10-319  
Docket No. 10-320

Based on the results of an NRC investigation conducted on December 11-13, 18-20, 1978, and January 4-5, 7-11, 11-23, 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 coordinates 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."

CPD is committed to AASHTO (MS-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 basis were included in drawings and specifications nor did they provide for the identification and control of design interfaces. As a result, several inconsistencies were identified in the license application and in other design basis documents. Specific examples are set forth below:

- a. Construction Drawing C-5 (Class 1 fill material areas) specifies the foundation material for Class 1 structures to be Zone 2 material, defined as any material free of lumps, organic or other deleterious material with no restrictions on gradation while PSAR Tables 2.5-9 and 2.5-10 indicate the foundation material for support of Class 1 structures to be controlled compacted cohesive (clay) material.

Appendix A

NOTICE OF VIOLATION

Consumers Power  
Company

Docket No. 10-129  
Docket No. 10-130

Based on the results of an NRC investigation conducted on December 11-13, 13-15, 1978, and January 4-5, 7-11, 11-13, 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 coordinates 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."

- b. The FSAR is internally inconsistent in that FSAR Figure 2.5-3 indicates settlement of the Diesel Generator Building to be on the order of 1" while FSAR Section 3.3.3.3 structural acceptance criteria indicates settlements on shallow spread footings founded on compacted fill to be on the order of .2" or less. The Diesel Generator Building is supported by a continuous shallow spread footing.
- c. The design settlement calculations for the diesel generator and associated water storage tanks were performed on the assumption of uniform mat foundations while these foundations were designed and constructed as spread footing foundations.
- d. The settlement calculations for the Diesel Generator Building indicate a load intensity of 3000 PSF while the FSAR, Figure 2.5-7, shows a load intensity of 4000 PSF, as actually constructed.
- e. The settlement calculations for the diesel generator building were based on an index of compressibility of the plant fill between elevations 603 and 604 of 0.001. These settlement

- b. The FSAR is internally inconsistent in that FSAR Figure 2.5-6 indicates settlement of the Diesel Generator Building to be on the order of 2" while FSAR Section 2.5.6.3 structural acceptance criteria indicates settlements on shallow spread footings founded on compacted fill to be on the order of .2" or less. The Diesel Generator Building is supported by a continuous shallow spread footing.
- c. The design settlement calculations for the diesel generator and covered water storage tanks were performed on the assumption of uniform mat foundations while these foundations were designed and constructed as spread footing foundations.
- d. The settlement calculations for the Diesel Generator Building indicate a load intensity of 3000 PSF while the FSAR, Figure 2.5-7, shows a load intensity of 4000 PSF, as actually constructed.
- e. The settlement calculations for the diesel generator building were based on an index of compressibility of the plant fill between elevations 603 and 604 of 0.001. These settlement



values were shown in TSOB Figure 2.5-4d. However, TSOB, Table 2.5-12, indicates an index of compressibility of the same plant soil to be 0.00.

5. TSOB, Amendment 3, indicated that if filling and backfilling operations are discontinued during periods of cold weather, all frozen soil shall be removed or recompacted prior to the resumption of operations. Bechtel specification C-110 does not specifically include instructions for removal of frozen/ thawed compacted material upon resumption of work after winter periods.
  6. TSOB Amendment 3 indicates that cohesionless soil (sand) would be compacted to 85% relative density according to ASTM D-2922. However, Bechtel specification C-110, Section 13.7.1 required cohesionless soil to be compacted to not less than 95% 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.
- CPCs 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 instruction, procedures, specifications . . . these documents provide qualitative and quantitative acceptance criteria for determining important activities have been satisfactorily accomplished.

QFC is committed to ASTM D692 (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 3 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 instruction and procedures, in that:
  - (i) The compaction criteria used for fill material was 10,000 ft-lbs (Bechtel modified proctor test) rather than a

Manufacturing, construction, installation, inspection, testing . . . are documented in instruction, procedures, specifications . . . these documents provide qualitative and quantitative acceptance criteria for determining important activities have been satisfactorily accomplished.

QC is covered in ASCE 900.2 (1971), Section 4 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 instruction 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 Bestrel 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 Bestrel Specification C-301 as well as 2652, Amendment 3 (James and Moore Report, page 16).

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

UPCo Topical Report UFG-1-A Policy No. 10, Section 1.1, 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."

APC is committed to ANSI Z39.2 (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 01.11 the program for inspection of completed work issued on October 18, 1976, did not provide for inspection hold points to verify that work was satisfactorily accomplished according to documented instructions.

- 4. 10 CFR 50, Appendix B, Criterion IV 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.

APC Topical Report APC-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, that 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-110 was identified in Quality Action Request SP-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. CFCo QF-29, QF-32, 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.

Call from (London) [unclear] (Pentagon)  
[unclear] called to report [unclear] [unclear] [unclear]  
[unclear] [unclear] [unclear] [unclear] [unclear] [unclear] [unclear] [unclear]  
[unclear] [unclear] [unclear] [unclear] [unclear] [unclear] [unclear] [unclear]  
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12/2/80 [unclear] [unclear] [unclear] [unclear]

12/2/80

Substantive [unclear] [unclear] (517) 373-3003 of the  
[unclear] Dept of Postal Review and their  
[unclear] [unclear] [unclear] [unclear] [unclear] [unclear] [unclear] [unclear]  
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6.2  
5.1

Mechan Note 10/11/80

A brief RVDL & Hight on results of additional tests  
comp ground by CFC by Vol. 8

Y. Hane - It is questionable whether secondary consolidation  
of DG fill has been achieved. Even for pressure  
apparent not to have dissipated. After surcharge  
removed, pressure level appears to be controlled  
by ground level. Data COE reported will help resolve  
this.

Bring data for DG Bldg in interpreted by appraisal from  
BUST area. Not sufficient indicator of DG area

One thing said as a comment of 3 reports 1st yr.  
COE says this is an unworkable practice.

H. Hight - If the caisson group load test should fail, access  
necessary for further construction is prohibited.  
What would you do then? Other alternatives foreclosed.

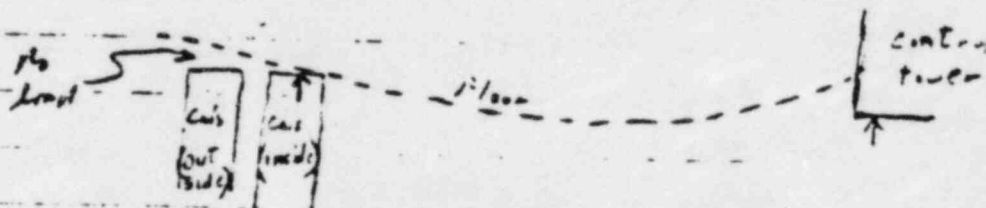
CFC has not provided design info of the caisson  
opt, like diaphragms.

— Caisson & cut Ties are support steel, panel area, in a bridge fashion.  
How to justify bearing capacity of soils under caisson Ties which  
now (but not before) is to have to support part of the steel  
penetration area also. Cut Ties originally designed to be  
self supporting



# FINAL

Might concern that only the innermost row of  
columns will be effective in carrying the load after  
settling of soils under elect. generation can lead to  
settling of the floor. Could also cause structural damage.



Data provided for this Bldg. to date is not the type needed.  
Need bearing capacity & shear strengths for 5 to 10 feet  
into the till. Davis & Marx hole is at much greater  
distances into till.

Prod - Being required at highest dist. sections. Concern - stability.  
of them - the SCR at CP show there was clear  
safety concern when we moved the CP - slope  
stability - contribute to safety factor. Has  
the applicant delivered on those commitments?

Reason for NW dist. being - great concern.

W. Davis - away from the emergency pad, the dike has to be  
designed to OOE to meet GDC-44. A dike design  
has which would cause reliance upon the emergency  
mass of water for an earthquake equal to OOE or  
less, would not be an acceptable design. Has the  
applicant delivered on its OOE commitment?

CONFIDENTIAL

No beam near the SW side structure, all drainage pipe  
broken, no glass cooling by emergency pond.

Plan - all data on piles (density) is below elevation  
615. No data above this.

Hydraulic fracture of a pile failed is not a valid  
concern if right type of log is taken. Use casing.  
Pr. Park has been involved in rock recommendations.

Smith - retaining wall - is non-reinforced wall still valid  
in view of location of diaphragm tank? Will  
soil slide if wall taken out by SSE?

Smith - New information summary - 114 additional borings  
in Rev 8. Mostly in Tank farm area - too far  
away for other areas of interest. However, 6 of the  
stand-penetration tests (SPTs) compared with the  
SPT requested for 30. We can wait these 6.  
However, still need all the rest of the request.

Wingon - Without the data requested, COE can not issue a  
favorable report.

Plan - It is assumed to pre-load a structure after being built. Usually  
done prior to starting construction. The program provides further  
differential settlement and stresses in the structure. Applicant  
will have to show S&C that these stresses are acceptable.

Vollmer - told her to draft a reply, changing original  
but retaining the 13 SPTs previously requested.  
He will handle further about the date change.