

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

MATERIAL FACTS AS TO WHICH THERE  
EXIST GENUINE ISSUES TO BE HEARD

1. The standard under which a construction permit can be denied is not met by the facts set forth in the Staff's Motion describing the alleged quality deficiencies involving the Midland settlement problems.
2. The Staff's Motion inaccurately states the standard under which the Commission may refuse to grant a construction permit (and hence justify the suspension of a construction permit).
3. The Staff's Motion and its supporting affidavits imply that Gallagher, Gilray or someone else at the NRC reviewed Consumers Power's

response to question 23 prior to the issuance of the December 6, 1979 Order. The inference presented is that one of the bases of the Order was this review and a decision upon the review, that the response was inadequate.

- a. These affidavits also present a contrary inference that neither Gilray Gallagher nor anyone else at the NRC reviewed Consumers Power's response to question 23 prior to their issuance of the December 6, 1979 Order.
  - b. The deposition testimony of Gilray, Gallagher and others contradict the implications in the affidavits that either of them or anyone else at the NRC reviewed Consumers Power's Response to question 23 prior to the issuance of the December 6, 1979 Order.
4. There are material disputed facts as to the necessity for changes in the Midland quality assurance program and its implementation before construction could continue.
  5. There are disputed material facts concerning whether the actions taken by Consumers Power prior to December 6, 1979 were adequate to correct any quality assurance deficiencies to permit construction to continue.
  6. The conclusion in Gilray's affidavit which states that Consumers Power's response to question 23 is still "not satisfactory," implying that the Midland quality assurance program implementation is inadequate contradicts statements in his deposition.
  7. There are disputed material facts as to whether any of the alleged deficiencies were uncorrectable.

A.1. Staff Allegation. The Staff alleges that there existed no material fact as to which a genuine issue is to be heard concerning:

- "1. Inconsistencies between construction specifications and consultant reports which ex-



isted between 1973 through the substantial reduction in soils construction during 1978-1979 without correction."

Consumers Power's Response. This is inaccurate. Among other things, as Consumers Power's answer to 50.54(f) question 23 (Consumers Power Response, Attachment 6) demonstrates, as of December 6, 1979:

1. A possible quality assurance deficiency had been identified in the possible interpretation problems resulting when the Dames & Moore Consulting Report containing specification information conflicting with that in the PSAR was attached to the PSAR. As Consumers Power response to question 23 notes the information contained in the consultant report was subject to being misconstrued as a [construction] commitment. Therefore, the Staff description of this problem is even initially incorrect: one consulting report was involved -- Dames & Moore's -- not several as the Staff's list of Material Facts states.
2. Immediate corrective action was taken to remedy the problem in the soils area. The Dames & Moore report was reviewed, its recommendations identified and dispositioned.
3. By December 1, 1979 Engineering Department Procedure 4.22 was revised to preclude repetition of similar deficiencies.
4. Action was initiated to insure that no other inconsistencies existed between the construction specifications in the SAR and other consultant reports. Consultant Reports were not attached to the SAR but portions of them were extracted and incorporated into the SAR text. A program was instituted to re-review the FSAR commitments to assure that the commitments were adequately reflected in project design documents. (Part 2 of Consumers Power response to question 23 more fully describes this.)

A.2. Staff Allegation. The Staff alleges that there exists no material fact as to which a genuine issue is to be heard concerning:

- "2. Lack of formal revisions of specifications to reflect clarification of specification requirements which existed from as early as June 1974 through the substantial reduction in soils construction during 1978-79 without correction."

Consumers Power's Response. This is inaccurate. Among other things, as Consumers Power's answer to 50.54(f) question 23 (Consumers Power Response, Attachment 6, (Q 23 pp. 23-8-11) demonstrates, as of December 6, 1979:

1. A possible quality assurance deficiency has been identified in a conflict that existed between sections of Specification C-210 relating to a laboratory standard. As Consumers Power's response to question 23 notes, interoffice memoranda, memoranda, telexes, TWX's etc. were used to clarify the intent of the specifications. These clarifications may have been interpreted by the user as modifying the specifications without formally changing wording.
2. On April 3 and 12, 1979 the Midland Project Engineering Group Supervisors were re-instructed concerning the procedurally correct method of implementing specification changes. Engineering Department Project Instruction 4.49.1 was revised to prohibit interoffice memoranda, telexes, etc. from changing the requirements of a specification.
3. In late 1977 a review of the references, tolerances and clarity of the specifications was undertaken by Bechtel and Consumers Power. This study resulted in revisions of several specifications.

4. In addition, Bechtel and Consumers Power performed a dimensional tolerance study to evaluate drawing and specification tolerances and clarity. Concluding in early 1978, this study preceded the majority of the mechanical and electrical installations. A review of the remaining construction specifications was completed by June of 1979. [Response to Q. 23 p. 23-80 and Question 1, Appendix 1, Sections D.2.b-c, Page I-8].
5. A review of interoffice memoranda, telexes, etc. was planned to determine if any had informally modified a specification requirement. If such a possible modification affected completed or future work, a formal change would be issued and remedial action taken. This was planned for all specifications applying to construction of Q-Listed items. A similar project was planned for the procurement of Q-listed items.
6. A specific review of the FSAR and specification requirements for the qualification of electrical and mechanical components was made part of the corrective action relating to Consumers Power 50.55(e) report on component qualifications. [Response to Q 23, Part 3, Q. 23 p. 23-80 and Question 1, Appendix I, Section D.2.C., Page I-8).

A.3. Staff Allegation. The Staff alleges that there exists no material fact as to which a genuine issue is to be heard concerning:

- "3. Inconsistencies of design basis within the FSAR relating to diesel generator fill material and settlement values...from late 1977 until FSAR revision 18 dated February 28, 1979."

Consumers Power's Response. This is inaccurate. Among other things, as Consumers Power's answer to 50.54(f) question 23 (Consumers Power Response, Attachment 6, (Q 23 pp. 23-10-13) demonstrates, as of December 6, 1979:

1. A possible quality assurance deficiency had been identified involving an inconsistency within the FSAR relating to diesel generator building fill material and settlement. As Consumers Power's response to question 23 stated, when the FSAR was prepared the major backfill operations were already completed. Hence, Subsections 2.5.4 and 3.8.5 relating to settlement values were not subjected to any further review. Because these two subsections were prepared by two different organizations neither was aware of the inconsistency. The same situation explains the inconsistency between subsection 2.5.4 and the project design drawing (7220-C-45) relating to the fill material.
2. As of February 28, 1979 FSAR Revision 18 corrected these inconsistencies.
3. A study was completed by November, 1979 which examined procedure and practices for the preparation and control of the FSAR; any necessary procedural changes would be made.
4. By November, 1979 action was initiated to preclude any future inconsistencies by revising Engineering Department Project Instruction 4.1.1 to state that all specification changes, not just "major changes" will be reviewed for consistency with the FSAR.
5. By November 1979 a final review and update of the PSAR Commitment List was begun. Before November 1979 a review of FSAR sections was initiated. (This is described more fully in the Response to Question 23, Part (2), pp. 23-41-45).
6. To verify the effectiveness of the FSAR review an audit was done once during the FSAR review and another planned after its completion. [Response to Question 23, Part (3), p. 23-88a and Question 23, Part (2), Section 5.0, p. 48].

A.4. Staff Allegation. The Staff alleges that there exists no material fact as to which a genuine issue is

to be heard concerning:

- "4. Inconsistencies between the settlement calculations and the original design basis of the diesel generator building which existed from March 1977 until it was identified during an NRC investigation in 1978."

Consumers Power's Response. This is inaccurate. Among other things, as Consumers Power's answer to 50.54(f) question 23 (Consumers Power Response, Attachment 6, (Q 23 pp. 23-12-13) demonstrates, as of December 6, 1979:

1. A possible quality assurance deficiency had been identified in that the final diesel generator building design configuration (as described in the FSAR) differed from the preliminary information. The reason for this is that the initial settlement calculations were performed by Geotechnical Services based on preliminary information from Project Engineering. It was subsequently determined that the change in foundation design would have an insignificant effect on the settlement calculation.
2. As of November 1979 Consumers Power planned to revise settlement calculations after the completion of the diesel generator building surcharge operation.
3. On April 12, 1979 an interoffice memorandum was issued to alert personnel of the need to revise or annotate calculations to reflect current design status. Geotechnical Services Procedure FP-6437 was being revised to require that calculations be annotated to reflect current design status. Engineering Department Procedure 4.37 was similarly revised.
4. Action was taken to determine if this was an isolated case. Quality Assurance audits of Geotechnical Services done in February and August 1979 determined it was. Quality Engineering surveys and Quality Assurance monitorings were planned to verify future coordination of design documents by Geotechnical Services and Project Engineering.



A.5. Staff Allegation. The Staff alleges that there exists no material fact as to which a genuine issue is to be heard concerning:

- "5. Inadequate design coordination in the design of the duct bank."

Consumers Power's Response. This is inaccurate. Among other things, as Consumers Power's answer to 50.54(f) question 23 (Consumers Power Response, Attachment 6, (Q 23 pp. 23-14-16) demonstrates, as of December 6, 1979:

1. A possible quality assurance deficiency had been identified in the four vertical duct banks that were designed and constructed without sufficient clearance to allow for relative vertical movement between the duct banks and the building footings.
2. By November, 1979, provisions were made to allow independent vertical movement between the diesel generator building and the duct banks. Bechtel Project Engineering reviewed 44 similar buried electrical duct banks. The review found nonsafety related transformer pads experiencing differential settlement which may have been exaggerated by the duct bank interface. However, settlement was not completely restricted.
3. Modification of Civil/Structural Design Criteria 7220-C-501 was begun by November, 1979 to require that a duct bank penetration shall be designed to eliminate the possibility of a nonspecific size duct interacting with the structure. At the same time the civil standard detail drawings were being revised to show horizontal and vertical clearance requirements for duct bank penetrations.
4. By November, 1979 Bechtel Quality Assurance had completed audits in the area of design coordination which indicate there was no generic problem.

A.6. Staff Allegation. The Staff alleges that there exists no material fact as to which a genuine issue is to be heard concerning:

- "6. Insufficient compactive effort used in backfill operation which existed from the inception of the plant fill operation in 1974 through the substantial reduction in soils construction in 1978-79."

Consumers Power's Response. This is inaccurate. Among other things, as Consumers Power's answer to 50.54(f) question 23 (Consumers Power Response, Attachment 6, (Q 23 pp. 23-17-18) demonstrates, as of December 6, 1979:

1. A possible quality assurance deficiency had been identified in the insufficient compactive effort used in the backfill operation. As Consumers Power's response to question 23 notes, the reason for this was that there were no field control documents or procedures to define requirements for the qualification of soils compaction equipment. There were no control documents to govern the requirement for control measures pertaining to soils placement and compaction. Reliance was put on in-place test results or upon their evaluations for evaluating compaction equipment.
2. By November 1979 remedial action had been taken to qualify compaction equipment then in use and Construction had been notified of the parameters governing the use of this equipment. In addition, Project Quality Control Instruction C-1.02 was revised to include verification of the use of qualified equipment and compliance with qualified procedures.
3. Action was taken to establish responsibility for soil placement and compaction. Field instructions were being revised to establish requirements for demonstrating equipment capability, including responsibility for

equipment approval and providing records identifying this capability. The Quality Assurance Department planned to issue a Nuclear Quality Assurance Manual amendment to clarify the measures for qualifying equipment under specified conditions. The Engineering Department planned to clarify specifications and Construction planned to prepare procedures (governing the soils compaction equipment) to implement the requirements of this manual.

4. By November, 1979 a review had determined that no other equipment requiring qualification had not yet been qualified.

A.7. Staff Allegation. The Staff alleges that there exists no material fact as to which a genuine issue is to be heard concerning:

- "7. Insufficient technical direction in the field which existed from 1974 through the substantial reduction in soils construction in 1978-79."

Consumers Power's Response. This is inaccurate. Among other things, as Consumers Power's answer to 50.54(f) question 23 (Consumers Power Response, Attachment 6, (Q 23 pp. 23-19-20) demonstrates, as of December 6, 1979:

1. A possible quality assurance deficiency had been identified in the insufficient technical direction in the field. As Consumers Power's response to question 23 notes, filling operations were performed under the technical supervision of a qualified Soils Engineer. However, technical direction and supervision were not properly deployed to overcome the lack of documented instructions and procedural controls.
2. Remedial action was taken by November, 1979. One fulltime and one part-time onsite Geotechnical Soils Engineer were assigned to provide technical direction and monitor the process.

3. By November, 1979 Field Instruction FIC 1.100 established responsibilities for performing soils placement and compaction.
4. In addition, Field Procedure FPG-3.000, concerning the duties and responsibilities of Field Engineers and Field Craft Supervision, was reviewed for clarity and completed. [Response to Question 23, Part (3), p. 23-80, and Question 1, Appendix I, Section 0.2, p. I-11].
5. By November, 1979 Consumers Power planned a review of design documents, instructions, and procedures for those activities which require in-process controls.
6. In addition, Consumers Power confirmed its overinspection for soils placement, utilizing a specific overinspection plan. [Response to Question 23, Part (3), p. 23-89 and Question I, Appendix I, Section C.2.b., p. I-11; and Section C.1.c., p. I-16].

A.8. Staff Allegation. The Staff alleges that there exists no material fact as to which a genuine issue is to be heard concerning:

- "8. Inadequate quality control inspection of placement of fill which existed from 1974 through the substantial reduction in soils construction in 1978-79."

Consumers Power's Response. This is inaccurate. Among other things as Consumers Power's answer to 50.54(f) question 23 (Consumers Power Response, Attachment 6, (Q 23 pp. 23-21-22) demonstrates, as of December 6, 1979:

1. A possible quality assurance deficiency had been identified with respect to inadequate Quality Control inspection of the placement of fill. As Consumers Power's response to question 23 outlines, this was caused by the lack of sufficient specificity in Control Document SF/PSP/G-6.1's requirements for the preparation of inspection instructions.

2. Remedial action was taken before November, 1979. PQCI C-1.02 was revised to incorporate the specific characteristics to be verified by Quality Control. An in-depth soils investigation program was instituted to provide verification of the acceptability of the soils or identify any nonconformance requiring further remedial action.
3. The control document was being revised to provide requirements for inspection planning specificity and for the utilization of scientific sampling rather than percentage sampling.
4. A review of QCIs in use was planned to ascertain that provisions have been included consistent with the revised control document.
5. Consumers Power had an ongoing overinspection program in the soils area. [Response to Question 23, Part (3), p. 23-89, and Question 1, Appendix I, Section C.2.b, p. I-11; and Section C.1.c p. I-16].
6. In addition, there were ongoing reviews to clarify the following areas: field procedures, QCIs, the adequacy of construction and the Bechtel inspection process, onsite subcontractor QA manuals, and the "surveillance" mode. (These are described more fully in the Response to Question 23, Part (3), p. 23-90, and Question 1, Appendix A, Section D.5.b-e, p. I-19].

A.9. Staff Allegation. The Staff alleges that there exists no material fact as to which a genuine issue is to be heard concerning:

- "9. Inadequate soil moisture testing which existed from 1974 through the substantial reduction in soils construction in 1978-79."

Consumers Power's Response. This is inaccurate. Among other things, as Consumers Power's answer to 50.54(f) question 23 (Consumers Power Response, Attachment



6, (Q 23 pp. 23-23-25) demonstrates, as of December 6, 1979:

1. A possible quality assurance deficiency had been identified in inadequate soil moisture testing. As Consumers Power's response to question 23 described the reason for this was that a control document did not require sufficient specificity for establishing an inspection program and for the preparation of inspection instructions.
2. Remedial action was completed by November, 1979. The specifications were revised to provide more definitive requirements for soil moisture testing, verification of soil moisture content and responsibility for performing soils placement and compaction.
3. Revisions were planned to provide requirements for inspection planning specificity and for the utilization of scientific sampling rather than percentage sampling. Engineering Department Project Instructions were revised to provide controlled and uniform interpretation of specification requirements. By April, 1979, Midland Project Engineering Group Supervisors were reinstructed concerning the procedurally correct methods of implementing specification changes.
4. A commitment to take generic corrective actions was made. Review of QCIs was planned to ascertain that provisions have been included consistent with the revised control document. A review of interoffice memoranda, telexes, etc. relating to specifications for construction and selected procurements of Q-Listed items was initiated to ensure that no informal clarifications modified a specification requirement.

A.10. Staff Allegation. The Staff alleges that there exists no material fact as to which a genuine issue is to be heard concerning:

- "10. Incorrect soil test results which existed from 1975 through the substantial reduction in soils construction in 1978-79."

Consumers Power's Response. This is inaccurate. Among other things, as Consumers Power's answer to 50.54(f) question 23 (Consumers Power Response, Attachment 6, (Q 23 pp. 23-26-28) demonstrates, as of December 6, 1979:

1. A possible quality assurance deficiency had been identified in the incorrect soil test results. Consumers Power's response to question 23 noted that surveillance and test report reviews did not identify these errors and inconsistencies.
2. Remedial actions were taken by November, 1979. Geotechnical Services completed an investigation in order to identify the type of testing errors made. Based on this, the requirements for the control of testing were adjusted and a specification change was issued. More stringent requirements for in-process inspection of U.S. Testing's soil testing activities were instituted. An in-depth soils investigation program provided verification of the acceptability of the soils and identified any nonconformances requiring further remedial action.
3. Guidelines for the surveillance of testing operations were being developed to be included in the Field Instructions for the onsite Soils Engineer.
4. By November, 1979 action was taken to require U.S. Testing to demonstrate that testing procedures, equipment, and personnel used for quality verification testing (for other than NDE and soils) were, and are, capable of providing accurate test results. Plans were made to sample U.S. Testing's test reports (for other than NDE and soils) to ascertain that results evidence conformance to testing requirements.
5. An evaluation of Quality Control Instructions was planned to ensure that the documentation characteristics to be inspected (i.e., surveillance and review callouts) are clearly specified. This included necessary revision

to QCIs. [Response to Question 23, Part (3), p. 23-82 and Question 1, Appendix I, Section D.3.a, Page I-18 and Section D.1, p. I-18].

6. Consumers Power planned to perform over-inspection of the U.S. Testing soils testing activities and reports, utilizing a specific plan. [Response to Question 23, Part (3), p. 23-89, and Question 1, Appendix I, Section C.3.c, p. I-17].

A.11. Staff Allegation. The Staff alleges that there exists no material fact as to which a genuine issue is to be heard concerning:

- "11. Inadequate subcontractor test procedure which existed from 1974 through the substantial reduction in soils construction in 1978-79."

Consumers Power's Response. This is inaccurate. Among other things, as Consumers Power's answer to 50.54(f) question 23 (Consumers Power Response, Attachment 6, (Q 23 pp. 23-29-31) demonstrates, as of December 6, 1979:

1. A possible quality assurance deficiency was identified in inadequate subcontractor test procedures.
2. By November, 1979 Geotechnical Services had completed an investigation which included an in-depth review of testing performed by U.S. Testing and the test results. Based on this, the requirements for the control of testing were adjusted and a specification change was issued. One full-time and one part-time onsite Geotechnical Soils Engineer was assigned to review U.S. Testing's procedures and monitor their implementation.
3. Bechtel completed an in-depth audit of U.S. Testing operations in 1979. [Response to Question 23, Part (3), p. 23-81 and Question 1, Appendix I, Section C.4.b, p. I-18; and Section D.3.C, p. I-18].

4. Field Instruction FIC 1.100 was prepared by November, 1979 and established responsibility for performing surveillance of testing operations.
5. By November, 1979 Consumers Power made a commitment to review design documents, instructions, and procedures for those activities requiring in-process controls to assess the adequacy of existing procedural controls and technical direction. Plans were made to require U.S. Testing to demonstrate that testing procedures, equipment, and personnel used for quality verification testing (for other than NDE and soils) were, and are, capable of providing accurate test results.
6. During May and August of 1977, a review of all QCI's were performed jointly by Consumers Power and Bechtel. [Response to Question 1, Appendix I, Section D.5.a. p. I-19]. In 1978 CPCo implemented an overinspection plan to independently verify the adequacy of construction and the Bechtel inspection process with the exception of civil activities. [Response to Question 23, Part (3), p. 23-90 and Question 1, Appendix I, Section D.5.c, p. I-19]. Consumers Power, also, reviewed onsite subcontractor QA manuals and covers their work in the audit process. [Response to Question 23, Part (3), p. 23-90 and Question 1, Appendix I, Section D.5.d, p. I-9].

A.12. Staff Allegation. The Staff alleges that on December 6, 1979, there exists no material fact as to which a genuine issue is to be heard concerning:

- "12. Inadequate corrective action for repetitive nonconforming conditions which existed from 1974 through the substantial reduction in soils construction in 1978-79."

Consumers Power's Response. This is inaccurate. Among other things, as Consumers Power's answer to 50 54(f) question 23 (Consumers Power Response, Attachment

6, (Q 23 pp. 23-32-33) demonstrates, as of December 6, 1979:

1. A possible quality assurance deficiency was identified in inadequate corrective action for repetitive nonconforming conditions. As Consumers Power's response to question 23 explains the conditions under which non-conformances are considered to be repetitive were not adequately defined in the control documents.
2. Control documents were being revised to provide an improved definition of implementing requirements for identifying repetitive nonconforming conditions.
3. In 1979 an in-depth training session was given to Midland QA Engineers covering the settlement problem and methods to identify similar conditions in the future. [Response to Question 23, Part (3), p. 23-81 and Question 1, Appendix I, Section D.1.b., p. I-22].
4. In 1979 an in-depth review of the Bechtel trend program data was undertaken by Bechtel QA management to ensure the identification of any other similar areas that were not analyzed in sufficient depth in the past reviews. [Response to Question 23, Part (3), p. 23-82 and Question 1, Appendix I, Section D.1.a, p. I-22).
5. Plans were made to have the Quality Assurance Department to review nonconformance reports to identify any repetitive nonconforming conditions pertaining to product type or activity, or pertaining to nonconformance cause.

A.13. Staff Allegation. The Staff alleges that there exists no material fact as to which a genuine issue is to be heard concerning:

- "13. Inadequate quality assurance auditing and monitoring of the plant fill work activities which existed from 1974 through the substantial reduction in soils construction in 1978-79."



Consumers Power's Response. This is inaccurate. Among other things, as Consumers Power's answer to 50.54(f) question 23 (Consumers Power Response, Attachment 6, (Q 23 pp. 23-34-35) demonstrates, as of December 6, 1979:

1. An alleged possible quality assurance deficiency was identified in inadequate quality assurance auditing and of monitoring of plant fill work activities. As Consumers Power's response to question 23 noted Quality Assurance auditing and monitoring was oriented more toward evaluating the degree of compliance with established procedures rather than toward the assessment of policy and procedural adequacy or toward the assessment of product quality.
2. Consumers Power planned to revise the Quality Assurance audit and monitoring program to emphasize the need for evaluating policy and procedural adequacy and assessment of product quality. A specialized audit training program was planned to develop and implement guidance for this.
3. In addition, an in-depth training session was given to all Consumers Power and Bechtel QA Engineers and Auditors to increase their awareness of the settlement problem and to discuss auditing and monitoring techniques to increase audit effectiveness. [Response to Question 23, Part (3), p. 23-82 and Question 1, Appendix I, Section D.2, p. I-22).

B. Staff Allegation. The Staff alleges that there exists no material fact as to which a genuine issue is to be heard concerning:

- "B. This quality assurance breakdown cause [sic] compaction of the soils at the Midland site."

Consumers Power's Response. This is inaccurate. As Consumer's Power Response in Opposition to the

NRC Staff's Motion for Summary Disposition sets out:

1. There are material disputed facts as to whether a quality assurance "breakdown" occurred at Midland.
2. There are material disputed facts as to whether any quality assurance deficiencies "caused" inadequate soils compaction at Midland.

C. Staff Allegation. The staff alleges that there exists no material fact as to which a genuine issue is to be argued concerning:

- "C. Inadequate compaction at the Midland site caused settlement problems at numerous safety related structures."

Consumers Power's Response. This is inaccurate. As Consumer's Power Response in Opposition to the NRC Staff's Motion for Summary Disposition sets out:

1. The Staff has not sustained its burden in proving that inadequate soils compaction is material to the quality assurance portion of the December 6, 1979 Order.

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

\_\_\_\_\_  
In the Matter of )  
 )  
 )

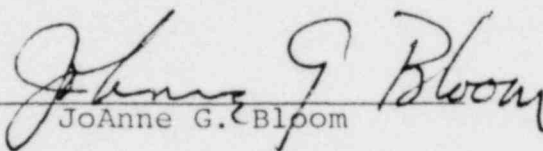
CONSUMERS POWER COMPANY )

(Midland Plant, Units 1 and 2) )  
 )  
\_\_\_\_\_ )

Docket Nos. 50-329 OM & OL  
50-330 OM & OL

CERTIFICATE OF SERVICE

I, JoAnne G. Bloom, hereby certify that a copy of Consumers Power Company Response In Opposition To The NRC Staff's Motion For Summary Disposition On The Issue Of Quality Assurance was served upon all persons shown in the attached service list by deposit in the United States mail, first class, this 25th day of May, 1981. In addition, a copy was sent by American Airlines Priority Package Service to Judges Bechhoefer, Cowan and Decker.

  
\_\_\_\_\_  
JoAnne G. Bloom

SERVICE LIST

Frank J. Kelley, Esq.  
Attorney General of the  
State of Michigan  
Stewart H. Freeman, Esq.  
Assistant Attorney General  
Gregory T. Taylor, Esq.  
Assistant Attorney General  
Environmental Protection Div.  
720 Law Building  
Lansing, Michigan 48913

Myron M. Cherry, Esq.  
One IBM Plaza  
Suite 4001  
Chicago, Illinois 60611

Mr. Wendell H. Marshall  
RFD 10  
Midland, Michigan 48640

Charles Bechhoefer, Esq.  
Atomic Safety & Licensing Bd. Pnl.  
U.S. Nuclear Regulatory Com.  
Washington, D.C. 20555

Dr. Frederick P. Cowan  
6152 N. Verde Trail  
Apt. B-125  
Boca Raton, Florida 33433

Admin. Judge Ralph S. Decker  
Route No. 4, box 190D  
Cambridge, Maryland 21613

Carroll E. Mahaney  
Babcock & Wilcox  
P. O. Box 1260  
Lynchburg, Virginia 24505

James E. Brunner, Esq.  
Consumers Power Company  
212 West Michigan Avenue  
Jackson, Michigan 49201

Steve Galdler, Esq.  
2120 Carter Avenue  
St. Paul, Minnesota 55108

Atomic Safety & Licensing Appeal Pnl.  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Mr. C. R. Stephens  
Chief, Docketing & Service Section  
Office of the Secretary  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Ms. Mary Sinclair  
5711 Summerset Street  
Midland, Michigan 48640

William D. Paton, Esq.  
Counsel for the NRC Staff  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Atomic Safety & Licensing Bd. Panel  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Barbara Stamiris  
5795 North River Road  
Route 3  
Freeland, Michigan 48623

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

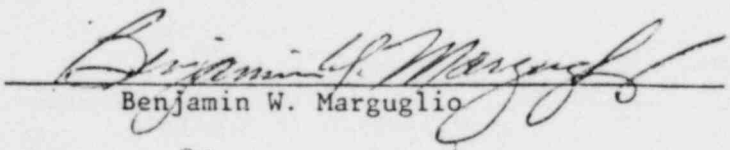
In the Matter of  
CONSUMERS POWER COMPANY  
(Midland, Units 1 and 2

Docket Nos. 50-329-OM  
50-330-OM  
50-329-OL  
50-330-OL

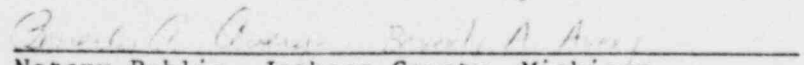
STATE OF MICHIGAN)  
                                  )ss  
COUNTY OF JACKSON)

AFFIDAVIT OF BENJAMIN W. MARGUGLIO

My name is Benjamin W. Marguglio. I am employed by Consumers Power Company as Director of Environmental Services and Quality Assurance. From January, 1977 to March, 1980, I was employed by Consumers Power Company as the Director of Quality Assurance-Projects, Engineering and Construction. My duties as Director of Quality Assurance-Projects, Engineering and Construction included overseeing the preparation of Consumers Power Company's Response to 10 CFR 50.54 f Question 23 Regarding Plant Fill. According to a sworn statement of Consumers' Vice President Stephen H. Howell, which is attached hereto, that Response in its original form was filed on November 13, 1979. The original Response was revised in later submittals to the NRC by Consumers. Based upon information, knowledge and belief as of November 13, 1979, the original Response to 10 CFR Question 23 Regarding Plant Fill was true and correct at the time it was filed.

  
Benjamin W. Marguglio

Subscribed and sworn to before me this 23rd day of May, 1981,

  
Notary Public, Jackson County, Michigan  
My Commission Expires: January 16, 1985





CONSUMERS  
POWER  
COMPANY

Stephen H. Howell  
Senior Vice President

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

Howe-293-79  
November 13, 1979

US Nuclear Regulatory Commission  
ATT: Mr. Harold R. Denton  
Office of Nuclear Reactor Regulation  
Washington, DC 20555

MIDLAND PROJECT-  
DOCKET NO. 50-329 and 50-330  
RESPONSE TO 10 CFR 50.54 REQUEST ON PLANT FILL -  
FILE: 0485.16 UFI 71\*01 SERIAL: 7914

Enclosed are ten (10) copies of Revision 4 to Consumers Power Company's response to April 24, 1979 to your 10 CFR 50.54(f) request dated March 21, 1979.

Revision 4 provides a complete response to question 23 transmitted by Mr. L. S. Rubenstein's Request for Additional Quality Assurance Information dated September 11, 1979. This response includes much of the same information that was presented to the NRC staff on September 5, 1979 except that additional information has been added to be responsive to staff requests made by the NRC during that meeting.

The two additional Quality Assurance Branch questions transmitted by Mr. L. S. Rubenstein's letter of September 11, 1979 are being handled as part of the normal operating license review and will be provided in the next planned FSAR revision in January 1980.

Consumers Power Company

By Stephen H. Howell  
Stephen H. Howell, Sr Vice President

Sworn and subscribed to before me on this 10th day of November 1979.

Betty L. Bishop  
Notary Public, Jackson County, Michigan  
My commission expires September 21, 1982

CC: JGKeppeler (w/4 att)  
NRC, Region III  
WLawhead (w/att)  
Corps of Engineers

DUP OF  
791115/284


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

STATE OF MICHIGAN )  
 ) SS  
COUNTY OF JACKSON )

AFWIDAVIT OF THOMAS C. COOKE

Thomas C. Cooke, being duly sworn, deposes and says that he is employed by Consumers Power Company as Construction Superintendent for the Midland Project, and that the records of Consumers Power Company show that soils placement activities for the purpose of providing support for the designated structures, and for the purpose of constructing the project dike, occurred during the time periods shown on the schedule attached hereto as Appendix I. Affiant further says that the records of Consumers Power Company show that no Q-list soils placement activities for the purpose of providing support for the designated structures occurred after the completion dates shown.

er the completion dates shown.

  
\_\_\_\_\_  
Thomas C. Cooke

Subscribed and sworn to before me this 20th day of May, 1981.

Catherine M. Carlin  
Catherine M. Carlin  
Notary Public, Bay County, MI  
My Commission Expires: 11-16-81

MIDLAND PROJECT

Selected Soils Placement Activity\*

	<u>Starting Date</u>	<u>Completion Date</u>
<u>Q-List Soils Placement</u>		
<u>Structure</u>		
Auxiliary Building electrical penetration area	December 1974	November 1976
Tank Farm Area (Borated Water Storage Tanks)	September 1975	August 1976
Service Water Structure Cantilever Section	November 1976	June 1977
Diesel Generator Building	October 1975	October 1977
<u>Non-Q-List Soils Placement</u>		
Dike	July 1969	October 1975

\* "Q-list soils placement" shown is soils placement for support of the structure only.

LIST OF ATTACHMENTS

1. Letter from James Keppler to Myron Cherry, dated December 14, 1978.
2. Shewmaker Deposition Exhibit 21: Notes of February 6, 1979 meeting.
3. Shewmaker Deposition Transcript, pages 53, 60, 78, 107-108.
4. Shewmaker Deposition Exhibit 13: Notes of November 28, 1979 meeting.
5. Hood deposition Exhibit 15.
6. Consumers Response to 50.54(f) Question 23, Revision 4.
7. Gallagher Deposition Transcript, page 68.
8. Gilray Deposition Transcript, pages 34, 47-50.
9. Shewmaker Deposition Exhibit 14.
10. Hood Deposition Exhibits 14 and 19.
11. Fiorelli Deposition Transcript, pages 13-22.
12. Thornburg Deposition Transcript, pages 32-35.
13. Keppler Deposition Transcript, page 22.
14. Hood Deposition Exhibit 8.

CPL DEP. EX. NO. 6  
FOR ID. AS OF 1/6/51  
(Kappler)



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

DEC 14 378

SHW JAN 11 '79

CC MM - 1413

JLB

BWM

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

Dear Mr. Cherry:

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

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

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

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

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

Sincerely,

*James G. Kappler*  
James G. Kappler  
Director

DUP of

7812280198



Myron M. Cherry

- 2 -

DEC 14 378

Enclosure:

Information Requested by

Myron Cherry w/attachments

cc w/enclosure and Incoming  
Letter

J. G. Davis, IE

H. D. Thornburg, IE

W. J. Olmstead, ELD

R. Fortuna, OIA

R. S. Boyd, NRR

PDR

Local PDR

ENCLOSURE 1

1. Requested Information

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

Summary Response

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

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

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

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

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

2. Requested Information

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

Summary Response

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

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

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

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

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

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

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



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

3. Requested Information

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

Summary Response

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

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

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

4. Requested Information

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



Summary Response

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

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

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

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

ATTACHMENT 1

Docket No. 50-329

Docket No. 50-330

CORRESPONDENCE RELATED TO DIESEL GENERATOR BUILDING SETTLEMENT

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

ATTACHMENT 2

Protocol for Accompaniment on NRC Inspections

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

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

Protocol for Accompaniment  
on NRC Inspections

- 2 -

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

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

\_\_\_\_\_  
Date



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

January 15, 1979

PN - Zimmer?  
PN - McGuire?  
SHEWMAKER

MEMORANDUM FOR: G. W. Reinmuth, Assistant Director, Division of Reactor Construction Inspection, IE

FROM: J. B. Henderson, Division of Reactor Construction Inspection, IE

SUBJECT: MEETING IN PREPARATION FOR MIDLAND HEARING

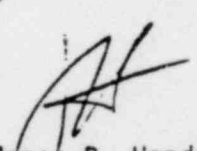
DATE: February 6, 1979

TIME: 9:00 AM

LOCATION: East/West Towers, Room 322B

PURPOSE: To discuss the current status of Midland 1, 2 inspection and IE input to the hearing.

PARTICIPANTS: S. Varga, NRR  
D. Hood, NRR  
W. Haass, NRR  
J. Keppler, RIII  
R. Heishman, RIII  
D. Hayes, RIII  
R. Cook, RIII  
T. Vandel, RIII  
W. Olmstead, ELD  
R. Shewmaker, IE ✓

  
James B. Henderson  
Division of Reactor  
Construction Inspection  
Office of Inspection and Enforcement

SUMMARY REPORT

Attachment 2

FOR TOMORROW'S MTG  
dup of 7904250466  
IS ATTACHED  
Shewmaker dep EX 21  
1-19-81 WVB



Midland Mtg 2/6/79

Midland being up coming

QA will be a major item per Myron Cherry

Our position has been:

- 1) things haven't been that much different there
- 2) QA program is still intact
- 3) totally error free construction is not required
- 4) QA performance on Palisades & Big Rock - Pt
- 5) FSAR statements - false or not

The grading report just issued - Consumer's Power  
look poor as a result of Palisades

Cherry's contention will try to use comparisons;  
that NRC audit approach is not sufficient  
when you have non-responsive utility and  
one that has poor QA performance; how  
have Big Rock and Palisades been run.

Olmos's approach - QA problems ended with the  
show cause proceedings

Olmos wants to be sure the QA story is  
consistent from the NRC reflecting back on the

testimony,

Kaplan & Kieby in  
the slow case

2/

Papers on Resident Inspection Program development will  
be asked for by Cherry

NRREG-410 A Tasks for SWR's will all be undertaken  
by Cherry

1 memorandum makes no reference to a show-cause order?

2 A Yes, I agree to that.

3 Q Okay.

4 What, if anything, took place between the February  
5 6th meeting and the April 3rd memorandum, to your knowledge,  
6 which caused Mr. Keppler to drop the idea of a show-cause  
7 order as an enforcement action?

8 A There was a meeting held with NRR, with repre-  
9 sentatives from the Office of the Executive Legal Director.  
10 Certain other options were examined at that time. The sugges-  
11 tion was made that one of the mechanisms that we had avail-  
12 able to get a licensee to respond was the 50.54(f) provisions.

13 As a result of that meeting which involved high-  
14 level management in both NRR and I&E, the decision was made  
15 to put out a 50.54(f) request. And I believe that was issued  
16 March the 21st, or something in the middle of March of '79,  
17 and basically with the commitment that we would examine the  
18 submittals made by the licensee as a result of that request  
19 and decide on any future or further action that would have  
20 to be taken and that could include some other enforcement.

21 Q All right, sir.

22 I take it that you are in fact the author of what

1           A           I think by the date of 3/9/79 that decision to go  
2 with a 50.54(f) had already been made and we were in the  
3 process of coming up with specific questions that we wanted the  
4 licensee to respond to.

5           Q           All right.

6                       Were you present when that decision was made at  
7 the NRC to go with the 50.54(f)?

8           A           Yes.

9           Q           By whom was the decision made?

10          A           I believe it was a joint decision between  
11 Mr. Case and Mr. Vassallo.

12          Q           Was there anybody who disagreed with that deci-  
13 sion?

14          A           I don't believe so.

15          Q           The two pages that are attached to the first page  
16 of Exhibit 6, are these your suggested questions to be in-  
17 cluded in the 50.54(f)?

18          A           No, they're not.

19          Q           By whom were these questions prepared?

20          A           Those were prepared out in Region III.

21          Q           Do you know the individual there who was respon-  
22 sible for them?

1           Q       Mr. Shewmaker, can you describe for us what the  
2       Quality Assurance Branch position is on the overall quality  
3       assurance program at Midland as far as you know?

4           A       I think that their position was that there were  
5       some minor items that they wanted to see added in the way of  
6       a QA program to try and correct the kinds of problems that  
7       I&E had identified. But I don't think that they found any  
8       major defects in the program as such.

9           Q       When was that decision communicated to you,  
10       approximately?

11          A       I would say some time in November of '79.

12          Q       Do you recall the items that you characterized as  
13       minor that were to be added to the program?

14          A       No, I do not.

15          Q       All right.

16                   Do you recall what I&E's position was with respect  
17       to the performance aspects of the quality assurance program?

18          A       I think there were some submittals or a submittal  
19       from Region III some time in -- after this meeting of August  
20       the 16th.

21          Q       All right, sir.

22                   You think it's contained in a document?



1 Mr. Thornburg. Is that correct?

2 A That's correct.

3 Q And was that statement made in response to  
4 Mr. Hood's comment that NRR's problem is the QA on the fixer?

5 A I think that was sort of a restatement as to what  
6 the burning issue was as far as Thornburg. He was concerned  
7 about continuation of what the program was for the future.

8 Again we talked a little bit about this, but again  
9 it's this idea of separating the bigger QA question from the  
10 question of the false statements and the soils issue.

11 Q Well, when Mr. Hood was saying that, in effect,  
12 NRR's problem is the QA on the fixes, he wasn't referring to  
13 any programmatic problems, was he, that is, the matters that  
14 Mr. Gilray and Mr. Haas--

15 A I don't believe so. I think the reference there  
16 is implementation of the program.

17 Q Mr. Olmstead gave everybody a few words of wisdom,  
18 did he not, about what your responsibilities would be when  
19 you testified? Is that correct?

20 A That's correct.

21 Q And then Mr. Keppler, what-- Did he give his  
22 definition of the quality assurance breakdown?

1           A       Yes.

2           Q       And did he say that there had not been such a  
3       quality assurance breakdown at the Midland site with respect  
4       to the soils issue? Is that right?

5           A       That's correct.

6           Q       All right.

7                   Now at the top of page 2 there are the words  
8       "Fermi, Zimmer and Midland are all in the same class." Does  
9       that mean with respect to quality assurance performance?

10          A       This is looking at it from a standpoint of how  
11       many NCRs a specific plant might have, trying to compare it  
12       in a numbers game. Region III wouldn't make any distinction  
13       in those plants.

14          Q       All right.

15                   Then it says: "What about NCRs total in last  
16       year? Increasing? Decreasing?"

17                   Was that a question somebody asked at the meeting?

18          A       This was something that I wrote down as one way  
19       you might look at what's happening at the site. I don't think  
20       it came up for discussion.

21          Q       I see.

22                   These are your notes to yourself; right?

11/28/79

Olmstead, Murray, Lieberman, Brackett, Lewinter, Grant, Hood,  
Thornburg, Norcini, Fiorelli, Knap, Kippeler, Rindell

1. Question of whether what is being done now as fixes on the current problems are adequate; Hood indicated that the acceptability would probably not be known until the fix is complete

Hood - the proposed fixes are such that if they are implemented properly they should be adequate; NLR's problem is the QA on the fixes; question of how close they are to the bottom line of acceptance criteria

2. Thornburg - the question to be resolved is whether the QA program is functioning now
3. Olmstead - reminder that IE will be on the stand on QA and whether the licensee is technically competent to go to operational QA program

4. Kippeler - QA breakdown - a major item not caught in the QA system; one that comes up by an occurrence, NLR finding, allegation etc.

Ferris, Zimmerman & Millard are all in the same class.

What about NCR's - total in last year increasing or decreasing  
Keggle's question about RIII's definition of Act breaker?

Is the QA program effective?

Do we need any enforcement action?

Do we need any further action by the licensee?

---

RIII Draft of CP sent in Oct '79

Bailly case:

Finding against change in principle arch. & engg criteria



Consumers Ex #1512  
10/8/80 (Hood)

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/AE 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, 15 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.



RESPONSE TO QUESTION 23

i

Revision 4  
11/79

# RESPONSE TO NRC QUESTION 23 [50.54(f)]

## TABLE OF CONTENTS

<u>Section</u>	<u>RESPONSE TO QUESTION 23, PART (1)</u>	<u>Page</u>
1.0	NRC QUESTION	1
2.0	INTRODUCTION	2
2.1	General	2
2.2	Definitions	4
3.0	DISCUSSION AND EVALUATION	6
3.1	Category I, Item 1	6
3.2	Category I, Item 2	8
3.3	Category I, Item 3	10
3.4	Category I, Item 4	12
3.5	Category I, Item 5	14
3.6	Category II, Item 1	17
3.7	Category II, Item 2	19
3.8	Category III, Item 1	21
3.9	Category III, Item 2	23
3.10	Category III, Item 3	26
3.11	Category III, Item 4	29
3.12	Category IV, Item 1	32
3.13	Category IV, Item 2	34
	<u>RESPONSE TO QUESTION 23, PART (2)</u>	
1.0	NRC QUESTION	36
2.0	RESPONSE TO PART (2)a	37
3.0	RESPONSE TO PART (2)b	39
3.1	Review of the PSAR Commitment List	39
3.2	Rereview of the FSAR	41
3.2.1	Organization	41
3.2.2	Rereview Procedure	42
3.2.3	Processing Resulting Changes	45
3.3	Review of Engineering Department Procedure 4.22	46
4.0	RESPONSE TO PART (2)c	47
5.0	RESPONSE TO PART (2)d	48

Table of Contents (continued)

<u>Section</u>		<u>Page</u>
Attachment 23-1	FSAR - SOILS VERSUS OTHER AREAS	
Attachment 23-2	FSAR REVIEW FLOWCHART	
Attachment 23-3	FSAR REVIEW DOCUMENTATION FORM, MIDLAND PROJECT, AND EXPLANATION OF FORM	
	<u>RESPONSE TO QUESTION 23, PART (3)</u>	
1.0	NRC QUESTION	49
2.0	INTRODUCTION	50
3.0	DIFFERENCES BETWEEN SOILS WORK AND OTHER WORK	51
4.0	QUALITY ASSURANCE PROGRAM IMPROVEMENTS	52
4.1	Listing and Chronology of Improvements in General	52
4.2	Specifics of Selected Improvements	57
4.2.1	Review of Specifications	
4.2.2	Bechtel QC and CPCo QA Review of Quality Control Instructions	59
4.2.3	CPCo QA Review and Approval of Bechtel QC Administrative Procedures	60
4.2.4	Bechtel Resident Engineers	61
4.2.5	Bechtel Monitoring Program Improvements	63
4.2.6	Quality Assurance Engineering Staffing Levels	64
4.2.7	Bechtel Quality Assurance Management Audits	65
4.2.8	Bechtel Quality Trend Program Supplementary Guidelines	66
4.2.9	Bechtel Topical Report, BQ-TOP-1A	67
4.2.10	CPCo QA Inspection of Stored Materials	70
4.2.11	CPCo Biennial QA Audits	71
4.2.12	CPCo QA Overview	72

Table of Contents (continued)

Section

5.0	ACTION ITEM FOLLOW-UP	75
	<u>RESPONSE TO QUESTION 23, PART (4)</u>	
1.0	NRC QUESTION	91
2.0	ASSESSMENT	92

RESPONSE TO QUESTION 23, PART (1)

Revision 4  
11/79



RESPONSE TO QUESTION 23, PART (1) [50.54(f)]

SECTION 1.0, NRC QUESTION

SUPPLEMENTAL REQUEST FOR ADDITIONAL SOILS SETTLEMENT INFORMATION

23. We have reviewed your response to question 1 of our March 21, 1979 letter, "10 CFR 50.54 Request Regarding Plant Fill," including related amendments or supplements in your letters dated May 31, July 9, and August 10, 1979. We find that the information provided is not sufficient for completion of our review. Accordingly, provide the following additional information:
- (1) Your response to question 1a does not provide sufficient information relative to the root causes of the 13 deficiencies. In order to determine the acceptability of corrective actions for the 13 deficiencies considering the possibility that these deficiencies are of a generic nature that could affect other areas of the facility, a more complete understanding of the root cause of each deficiency is necessary. Accordingly, provide a clearer description of the root causes of each of the 13 deficiencies, including a detailed discussion of the conditions that existed to allow these deficiencies and the changes that have been made to preclude the recurrence of such deficiencies. In this regard, if contributing causes are inadequate procedures, inspections, specification call outs, design reviews, audits, and/or technical direction, a clear and detailed description is necessary as to what allowed these conditions to exist and why.

RESPONSE TO QUESTION 23, PART (1) [50.54(f)]

SECTION 2.0, INTRODUCTION

2.1 General

Subsections 3.1 through 3.13 of this Response to Question 23, Part (1) provide information supplementing our Responses to the NRC 10 CFR 50.54(f) Request Regarding Plant Fill for Midland Plant Units 1 and 2, Consumers Power Company Docket Numbers 50-329 and 50-330, transmitted from CPCo (S.H. Howell) to the NRR (H.R. Denton) on April 24, 1979 and our presentation to the Staff given on July 18, 1979, in Bethesda, Maryland, and documented via our transmittal from CPCo (S.H. Howell) to I&E (J.G. Keppler) on August 10, 1979. This introduction provides the rationale for determining the root cause of each of the 13 deficiencies identified through the investigations by the NRC, CPCo, and Bechtel; comments concerning the significance of the 13 deficiencies; and an explanation of the format used in addressing each deficiency.

In arriving at the root cause, the following factors were considered.

- a. The purpose of the quality assurance program is to provide confidence that quality-related activities are performed in a controlled manner such that the product conforms to the FSAR and design requirements.
- b. The control measures applicable to the performance of the quality-related tasks are to provide sufficient direction and methodology to supplement the capability of the assigned personnel.
- c. Personnel assigned the responsibility of performing the quality-related tasks are to have the required capability, knowledge, and skill (when supplemented by specifications, drawings, procedures, instructions, and the prescribed control measures) to satisfactorily perform their assigned responsibilities.

RESPONSE TO QUESTION 23, PART (1) [50.54(f)]

- d. As the quality assurance program develops and is implemented, revisions or corrections will be necessary to:
1. Achieve the optimum balance or relationship between personnel capabilities and the prescribed control measures
  2. Accommodate unique or unplanned events
  3. Incorporate related experience and state-of-the-art improvements

The 13 deficiencies identified through investigations by Bechtel, CPCo, and the NRC are each addressed with the same intensive effort, irrespective of their contribution to the cause of the settlement. The relative contribution that each deficiency made to the settlement can be qualitatively derived from Sections 7.0 (Cause Investigation) and 8.0 (Quality Assurance and Quality Control Aspects) of the documentation transmitted on August 10, 1979. Essentially, this documentation pointed out that the most probable causes of the settlement were as follows:

- a. In some cases, lift thickness exceed the capability of the equipment being used. This was shown by the lift thickness/compactive effort tests conducted to qualify compaction equipment prior to resuming soils work. This indicates that the equipment was not adequately qualified.
- b. Reliance on soil test results, or on the evaluation of the test results, provided a common mode failure mechanism because:
  1. Construction relied on test results, or on the evaluation of the test results, from inprogress placements for qualification of equipment during the work.
  2. Quality Control depended on the results, or on the evaluation of the results, of in-place soils tests for acceptance of the work. Associated with this principal reliance, surveillance type inspection procedures were applied to other soils work activity in the power block at least part of the time.

Therefore, deficiencies most closely associated with these two probable causes would bear the most significant contribution to settlement.

RESPONSE TO QUESTION 23, PART (1) [50.54(f)]

2.2 Definitions

The following information is provided to achieve a common understanding of the terms used and information included in Part (1) of this Response to Question 23.

Title: This identifies the information as being in response to the applicable part of Question 23 under 10 CFR 50.54(f), transmitted from the NRR (L.S. Rubenstein) to CPCo (S.H. Howell) on September 11, 1979.

Deficiency Description: This provides a restatement of the reported deficiency as originally stated in the CPCo response referenced below.

I&E Report Reference: This identifies the pages of Inspection Report 78-20 which bear upon the reported deficiency.

CPCo Response Reference: This identifies the portion of the CPCo (S.H. Howell) letter to the NRR (H.R. Denton), Serial Howe-121-79, Appendix I, dated April 24, 1979, which provided the original response.

Discussion: This provides background information relative to the reported deficiency as it relates to the implementation of the Quality Assurance Program.

Quality Assurance Program Criterion: This identifies, by title, the Quality Assurance Program criterion, listed in Appendix B to 10 CFR 50, which is applicable to the reported deficiency and the identified root cause.

Program Element: This identifies the program element, governed by the criterion, which is applicable to the reported deficiency and the identified root cause.

Quality Assurance Program Policy: This identifies the Nuclear Quality Assurance Manual, Job 7220 section and number which define the related Quality Assurance Program Policy. The Manual identifies requirements and assigns responsibility for developing and implementing control measures for performing related quality assurance activities.

Control Document: This identifies the current control document developed and implemented by the organizations assigned the responsibility for performing the quality assurance activities under their cognizance.

RESPONSE TO QUESTION 23, PART (1) [50.54(f)]

Instructions, Procedures, and Drawings: This identifies the instructions, procedures, and drawings which are prepared to supplement the control documents when it is necessary to provide more specific direction and methodology. This information is provided only when this level of subtler document is pertinent to the deficiency being discussed.

Root Cause: This identifies the root cause, for the reported deficiency described under "Discussion."

Remedial Action (Soils): This describes the actions taken or to be taken as a result of the reported deficiency which are needed to assure that prior and future soil placements conforms to the quality requirements defined in the FSAR and design documents.

Corrective Action (Programmatic): This describes the actions taken or to be taken to correct the root cause in the policies, procedures, and instructions in order to prevent recurrence of a similar type of deficiency.

Corrective Action (Generic): This describes the actions taken or to be taken when root causes are potentially generic to work other than soils work. The actions are to assure that the same deficiencies do not exist or, if found to exist on completed work, are investigated to the extent necessary to assure that the work conforms to quality requirements defined in the FSAR and design documents and that the work quality is evidenced in the quality records.

In view of your comments during our presentation to the NRC Staff on September 5, 1979 in Bethesda, Maryland, during which we presented some of this information, please note the added emphasis that we have placed on communicating both the programmatic and generic corrective actions.



RESPONSE TO QUESTION 23, PART (1) [50.54(f)]

SECTION 3.0, DISCUSSION AND EVALUATION

3.1 Category I, Item 1

Deficiency Description: Inconsistency between specifications and the Dames & Moore Report

ISE Report Reference: Pages 9, 10, 16, and 17

CPCo Response Reference: Category I, Item 1

Discussion: A number of consultant reports were added to the PSAR as appendixes. The reports contained considerable and sometimes conflicting information. The information contained in the consultant reports was subject to being misconstrued as commitments. The personnel who reviewed and provided input for the PSAR did not provide documented disposition of the Dames & Moore Report recommendations to identify those recommendations which were PSAR commitments and those which were not.

Quality Assurance Program Criterion: Design control

Program Element: Design input

Quality Assurance Program Policy: Nuclear Quality Assurance Manual, Section II, Number 2, "Design Control Procedure" (April 1978); and Section II, Number 4, "Design Criteria" (March 1974)

Control Document: Engineering Department Procedure 4.22, Revision 1, "Preparation and Control of SAR" (June 1974)

Root Cause: During the preparation and early revisions of the PSAR there were no procedural requirements or methods for documenting the disposition of consultant recommendations in the PSAR.

Remedial Action (Soils): The Dames & Moore Report was reviewed and recommendations were identified and dispositioned. Dames & Moore recommendations which were included in the FSAR were unaffected by this review and no revisions to the FSAR were necessary as a result of this review. However, as a result of other activities, changes were made in design and construction documents which relate to some subjects covered in the Dames & Moore Report.

RESPONSE TO QUESTION 23, PART (1) [50.54(f)]

Corrective Action (Programmatic): Engineering will revise Engineering Department Procedure 4.22 by December 1, 1979, to clarify that Engineering personnel preparing the FSAR will follow the requirements of Regulatory Guide 1.70, Revision 2, "Standard Format and Content of Safety Analysis Reports for Nuclear Power Plants" (September 1975). Specifically, Regulatory Guide 1.70 (Pages iv and v of the Introduction) requires that such consultant reports only be referenced with the applicable commitments and supporting information included in the text (third paragraph, Page v). Such a requirement would preclude repetition of this circumstance.

Corrective Action (Generic): Consultant reports other than Dames & Moore were considered in accordance with the guidelines provided in NRC Regulatory Guide 1.70, Revision 2. Consultant reports were not attached to the FSAR, but portions of consultant reports were extracted and incorporated into the FSAR text itself. Those portions incorporated into the FSAR become commitments. Therefore, disposition of recommendations in consulting reports has been adequately accounted for in the preparation of the FSAR.

Verification that those portions of consultant reports determined to be commitments and incorporated into the FSAR have been adequately reflected in project design documents is being accomplished via the FSAR rereview program described in the response to Question 23, Part (2).

The two Bechtel QA audit findings reported in our April 24, 1979, response (Paragraph D.1, Page I-8) have been closed out. The results of this audit are being utilized in the FSAR control system study committed to in Subsection 3.3 of this response to Part (1).

RESPONSE TO QUESTION 23, PART (1) [50.54(f)]

3.2 Category I, Item 2

Deficiency Description: Lack of formal revisions of specifications to reflect clarification of specification requirements

I&E Report Reference: Pages 9 through 14

CPCo Response Reference: Category I, Item 2

Discussion: Interoffice memoranda, memoranda, telexes, TWXs, etc were often used to clarify the intent of the specifications. It is possible that in some situations the clarifications provided through these methods were interpreted by the user as modifying the specification without formally changing the wording of the specification.

Quality Assurance Program Criterion: Design control

Program Element: Design change control

Quality Assurance Program Policy: Nuclear Quality Assurance Manual, Section II, Number 5, "Design Process and Change Control" (June 1977)

Control Document: Engineering Department Project Instruction 4.49.1, Revision 3, "Specification Change Notice" (May 1979)

Root Cause: Prior to Revision 2 (May 4, 1979), Engineering Department Project Instruction 4.49.1 did not address the use of interoffice memoranda, memoranda, telexes, TWXs, etc which might be interpreted by the user as modifying the requirements of the specification.

Remedial Action (Soils): Applicable Specifications 7220-C-210 and 7220-C-211 were revised to incorporate interpretations that affected specification requirements. The acceptability of the completed work was independently determined by a subsequent subsurface investigation program.

Corrective Actions (Programmatic):

1. On April 3, 1979, Midland Project Engineering Group Supervisors in all disciplines were reinstructed that the only procedurally correct methods of implementing specification changes are through the use of specification revisions or Specification Change Notices. This was followed by an interoffice memorandum from the Project Engineer to all Engineering Group Supervisors on April 12, 1979.

RESPONSE TO QUESTION 23, PART (1) [50.54(f)]

2. Engineering Department Project Instruction 4.49.1 was revised in Revision 2 to state, "Under no circumstances will interoffice memoranda, memoranda, telexes, TWXs, etc be used to change the requirements of a specification."

Corrective Action (Generic): A review of interoffice memoranda, memoranda, telexes, TWXs, and other correspondence relating to specifications for construction and selected procurements of Q-Listed items will be initiated.

The purpose of the review will be to identify any clarifications which might reasonably have been interpreted as modifying a specification requirement and for which the specification itself was not formally changed. An evaluation will be made to determine the effect on the technical acceptability, safety implications of the potential specification modification, and any work that has been or may be affected. If it is determined that the interpretation may have affected any completed work or future work, a formal change will be issued and remedial action necessary for product quality will be taken in accordance with approved procedures.

The foregoing procedure will be followed for all specifications applying to construction of Q-Listed items.

For specifications concerning the procurement of Q-Listed items, the foregoing procedure will be implemented on a random sampling basis. The sample size has been established and the specification selection has been made.

Review and acceptance criteria for the specifications will be defined by November 30, 1979.

The review of construction and selected procurement specifications is scheduled to be completed by October 1980.

If the acceptance criteria are not met, the review will be expanded to include other specifications for Q-Listed items. At that time, a revised completion date will be established.



RESPONSE TO QUESTION 23, PART (1) [50.54(f)]

3.3 Category I, Item 3

Deficiency Description: Inconsistency of information within the FSAR relating to diesel generator building fill material and settlement

I&E Report Reference: Pages 6 through 8

CPCo Response Reference: Category I, Item 3

Discussion: When the FSAR was prepared and reviewed, the major backfill operations were complete. There were no known inconsistencies or recent design document changes related to FSAR Subsections 2.5.4 and 3.8.5; therefore, these subsections were essentially inactive and were not subject to any further review. The inconsistencies within the FSAR and between the FSAR and design documents were not detected. The inconsistency between Subsections 2.5.4 and 3.8.5 with respect to the settlement values resulted because the two subsections were prepared by separate organizations (Geotechnical Services and Civil Engineering), neither of which were aware of the multiple display of similar information in the opposite subsection. The inconsistency between FSAR Subsection 2.5.4 and the project design drawing (Drawing 7220-C-45) with respect to the fill material resulted because at the time of FSAR preparation the Geotechnical Services personnel preparing the FSAR were unaware, in this case, of the status of the design drawing prepared by Civil Engineering.

Quality Assurance Program Criterion: Design control

Program Element: Design input

Quality Assurance Program Policy: Nuclear Quality Assurance Manual, Section II, Number 4, "Design Criteria" (March 1974)

Control Documents: Engineering Department Procedure 4.22, Revision 1, "Preparation and Control of Safety Analysis Reports" (June 1974); Engineering Department Project Instruction 4.25.1, Revision 6, "Design Interface Control (Internal)" (September 1979); and Engineering Department Project Instruction 4.1.1, Revision 0, "Preparation of the Design Requirements Verification Checklist" (July 1974)

Root Cause: The control document did not provide sufficient procedural control for preparation and review of the FSAR.



RESPONSE TO QUESTION 23, PART (1) [50.54(f)]

Remedial Action (Soils): The inconsistencies between FSAR Subsections 2.5.4 and 3.8.5 have been corrected via FSAR Revision 18 (February 28, 1979). The same revision also corrected the inconsistency between FSAh Subsection 2.5.4 and Design Drawing C-45.

Corrective Actions (Programmatic):

1. A study was completed which examined current procedures and practices for the preparation and control of the FSAR in view of these experiences. Procedural changes will be initiated by the revision of or addition to the Engineering Department Procedures. This action is scheduled to be completed by January 31, 1980.
2. To preclude any future inconsistencies between the FSAR and specifications, Engineering Department Project Instruction 4.1.1 will be revised to state that all specification changes, rather than just "major changes," will be reviewed for consistency with the FSAR. This action is scheduled to be completed by December 1, 1979.

Corrective Action (Generic): FSAR sections are being rereviewed as discussed in the Response to Question 23, Part (2).

RESPONSE TO QUESTION 23, PART (1) [50.54(f)]

3.4 Category I, Item 4

Deficiency Description: Inconsistency between basis for settlement calculations for diesel generator building and design basis

I&E Report Reference: Pages 20 and 21

CPCo Response Reference: Category I, Item 4

Discussion: The initial settlement calculations were performed by Geotechnical Services based on preliminary information provided by Project Engineering. The final diesel generator building foundation design configuration (as described in the FSAR) was different from the preliminary information. The originator of the final design configuration did not interface with Geotechnical Services to verify impact on final settlement calculations. It was subsequently determined that the change in foundation design would have an insignificant effect on the calculation. However, no changes or notations to the original calculations were made, thus resulting in an inconsistency between the basis for settlement calculations and design basis.

Quality Assurance Program Criterion: Design control

Program Element: Design coordination

Quality Assurance Program Policy: Nuclear Quality Assurance Manual, Section II, Number 2, "Design Control Procedures" (April 1978); Section II, Number 9, "Design Interface" (March 1974); and Section II, Number 10, "Speciality Group Design Control" (June 1977)

Control Documents: Engineering Department Procedure 4.22, Revision 1, "Preparation and Control of Safety Analysis Reports" (June 1974); Engineering Department Project Instruction 4.25.1, Revision 6, "Design Interface Control (Internal)" (September 1979); Procedure FP-6437-1, "Design Calculations" (January 1979); and Engineering Department Procedure 4.37, Revision 2, "Design Calculations" (May 1976).

Root Causes:

1. Diesel generator building foundation design changes initiated by Project Engineering were not coordinated with Geotechnical Services, as required by the control documents.

RESPONSE TO QUESTION 23, PART (1) [50.54(f)]

2. Geotechnical Procedure FP-6437 did not require that the calculations show evidence of any evaluations for changes to input data, even when considered to be of no significance to the results.

Remedial Action (Soils): Settlement calculations will be revised after the completion of the diesel generator building surcharge operation. At that time, the design drawing will be coordinated with Geotechnical Services and any changes or notations needed to reflect design changes will be made.

Corrective Actions (Programmatic):

1. An interoffice memorandum dated April 12, 1979, was issued by Geotechnical Services to alert personnel of the need to revise or annotate calculations to reflect current design status.
2. In view of the above, Geotechnical Services will revise Procedure FP-6437 by December 31, 1979, to require that calculations be annotated to reflect current design status.
3. Engineering Department Procedure 4.37 will also be revised by December 31, 1979, to require that calculations be annotated to reflect current design status.

Corrective Action (Generic): This is considered an isolated case and not generic based on Quality Assurance audits of Geotechnical Services conducted in February and August 1979. The results of these audits indicate that this area is effectively controlled. Quality Engineering surveys and Quality Assurance monitorings will verify future coordination of design documents by Geotechnical Services and Project Engineering.

RESPONSE TO QUESTION 23, PART (1) [50.54(f)]

3.5 Category I, Item 5

Deficiency Description: Inadequate design coordination in the design of the duct bank

I&E Report Reference: Pages 23 and 24

CPCo Response Reference: Category I, Item 5

Discussion: Four vertical duct banks were designed and constructed without sufficient clearance to allow for relative vertical movement between the duct banks and the building footings. Civil Drawings 7220-C-1001 and 7220-C-1002 (which show the footing requirements) were coordinated with Electrical Drawing 7220-E-502 (which shows the duct bank stub-up location and dimensions), as required by Engineering Department Procedure 4.46 and Engineering Department Project Instruction 4.25.1. Drawing 7220-E-502 refers to Drawing 7220-E-543, which shows a minimum size for the underground duct bank some distance away from the stub-up. Neither electrical nor civil drawings show how or where to accomplish the transition from the stub-up size to the underground duct size, nor do they show firm definition of duct size. The transition and final size of each duct were established by the Field Engineers during construction. The civil design was based on the stub-up dimensions shown in Drawing 7220-E-502, and did not acknowledge that the duct bank size under the slab and/or footing was to be determined by Field Engineering.

Quality Assurance Program Criterion: Instructions, procedures, and drawings

Program Element: Preparation of drawings

Quality Assurance Program Policy: Nuclear Quality Assurance Manual, Section II, Number 2, "Design Control Procedures" (April 1978); and Section II, Number 9, "Design Interface" (March 1974)

Control Documents: Engineering Department Procedure 4.46, Revision 3, "Project Drawings" (May 1976) and Engineering Department Project Instruction 4.25.1, Revision 6, "Design Interface Control (Internal)" (September 1979)

Instructions, Procedures, and Drawings: Electrical Standard Detail Drawings and Civil Standard Detail Drawings

RESPONSE TO QUESTION 23, PART (1) [50.54(f)]

Root Cause: Failure of the drawings to provide Construction with the information necessary to prevent interference.

Remedial Actions (Soils):

1. Provisions were made to allow independent vertical movement between the diesel generator building and the duct banks.
2. Bechtel Project Engineering has reviewed the design drawings for cases where ducts interface with structures to determine the possibility of the duct being enlarged over the design requirements and the effect this enlargement may have upon the structures' behavior. Forty-four individual or groups of similar buried electrical duct banks were reviewed. The terminations of each case were reviewed, resulting in the identification of 23 questionable vertical interfaces. Based on geometry, depth of vertical leg, and whether sufficient details were available on the design drawing, 11 cases were identified for detailed investigation. Additional information was obtained from the jobsite to define how the interface was constructed and whether any unusual behavior existed.

The review concluded that several nonsafety-related transformer pads experiencing differential settlement may be exaggerated by the duct bank interface. However, in no case except the diesel generator building has settlement been completely restricted or do details, geometry, or subgrade conditions indicate that settlement would be completely restricted.

Corrective Actions (Programmatic):

1. Civil/Structural Design Criteria 7220-C-501 will be modified to contain the requirement that a duct bank penetration shall be designed to eliminate the possibility of the nonspecific size duct interacting with the structures. This action is scheduled to be completed by December 31, 1979.
2. The civil standard detail drawings will be revised to include a detail showing horizontal and vertical clearance requirements for duct bank penetrations. The detail will address any mud mat restrictions. This action is scheduled to be completed by December 31, 1979.



RESPONSE TO QUESTION 23, PART (1) [50.54(f)]

Corrective Action (Generic): This condition is not considered generic, but rather an anomaly unique to electrical duct banks. The uniqueness arises from the practice of not pinpointing the size or location of the duct bank on the drawings and leaving it to be established during construction.

3.6 Category II, Item 1

Deficiency Description: Insufficient compactive effort used in backfill operation

I&E Report Reference: Not applicable

CPCo Response Reference: Category II, Item 1

Discussion: Specifications 7220-C-210 and 7220-C-211 specified requirements for selection and approval of compaction equipment on the basis of demonstration. The equipment was used on the basis of achieving either satisfactory in-place test results or satisfactory evaluation of the test results. There were no field control documents or procedures to define requirements for the qualification of soils compaction equipment. There were no control documents to govern the requirements for control measures pertaining to soils placement and compaction. Construction and Quality Control relied on in-place soil test results, or on the evaluation of these results, to determine the acceptability of placement and compaction activities. These soil test results or their evaluations were in error in numerous cases.

Quality Assurance Program Criterion: Instructions, procedures, and drawings

Program Element: Preparation of instructions, procedures, and drawings

Quality Assurance Program Policy: Nuclear Quality Assurance Manual, Section IV, Number 1, "Construction Site Quality Program" (April 1978); and Section V, Number 13, "Procedure Control" (June 1977)

Control Document: Field Procedure FPG-1.000, "Initiating and Processing Field Procedures, Instructions, and Specifications" (January 1979)

Instructions, Procedures, and Drawings: Field Instruction FIC 1.100, Revision 0, "Q-Listed Soils Placement Job Responsibilities Matrix" (July 1979)

Root Causes:

1. Reliance was placed on in-place test results, or on the evaluation of the test results, for evaluating compaction equipment. Satisfactory soil test results, or evaluations of test results, implied that adequate compactive effort was obtained and equipment capability and fill placement methods were not questioned. (Incorrect soils test results are addressed in Subsection 3.10.)

RESPONSE TO QUESTION 23, PART (1) [50.54(f)]

2. The Quality Assurance Program requirement to establish responsibility for measures to control the placement and compaction of soils and the qualification of construction equipment was not adequately implemented.

Remedial Actions (Soils):

1. Compaction equipment currently in use has been qualified and Construction has been notified of the parameters governing the use of the equipment.
2. Project Quality Control Instruction (PQCI) C-1.02 was revised to include verification of the use of qualified equipment and compliance with qualified procedures.

Corrective Actions (Programmatic):

1. Field Instruction FIC 1.100, "Q-Listed Soils Placement Job Responsibilities Matrix," has been prepared and establishes responsibilities for performing soils placement and compaction.
2. Field Instruction 1.100 will be supplemented by establishing requirements for demonstrating equipment capability, including responsibility for equipment approval, and providing records identifying this capability. This action will be completed by November 15, 1979.
3. Quality Assurance will issue a Nuclear Quality Assurance Manual amendment to clarify the requirement that procedures include measures for qualifying equipment under specified conditions. This action is scheduled to be completed by December 14, 1979.
4. Engineering and Construction will revise or prepare procedures governing the placement and compaction of soils and implementing the requirements of the Nuclear Quality Assurance Manual as stated in Corrective Action Item 1 (above). This is scheduled to be completed by January 31, 1980.

Corrective Action (Generic): Construction specifications, instructions, and procedures were reviewed to identify any other equipment requiring qualification which had not yet been qualified. No such equipment was identified.

RESPONSE TO QUESTION 23, PART (1) [50.54(f)]

3.7 Category II, Item 2

Deficiency Description: Insufficient technical direction in the field

I&E Report Reference: Pages 24 through 26

CPCo Response Reference: Category II, Item 2

Discussion: The Dames & Moore Report and Civil/Structural Design Criteria 7220-C-501 state, in part, "Filling operations shall be performed under the technical supervision of a qualified Soils Engineer...." The technical direction and supervision were provided by Field Engineers and Supervisors who were assigned the responsibility for soils placement. The technical direction and supervision provided were not properly deployed to overcome the lack of documented instructions and procedural controls. Reliance on test results, or on the evaluations of test results, did not identify the need for additional direction and supervision.

Field Procedure FPG 3.000, "Job Responsibilities of Field Engineers, Superintendents, and Field Subcontract Engineers," was not intended to provide instructions for the performance of specific tasks and functions.

Quality Assurance Program Criterion: Instructions, procedures, and drawings

Program Element: Preparation of instructions, procedures, and drawings

Quality Assurance Program Policy: Nuclear Quality Assurance Manual, Section IV, Number 1, "Construction Site Quality Program" (April 1978); and Section V, Number 13, "Procedure Control" (June 1977)

Control Document: Field Procedure FPG 3.000, "Job Responsibilities of Field Engineers, Superintendents, and Field Subcontract Engineers" (October 1977)

Instructions, Procedures, and Drawings: None

Root Cause: Reliance on test results, or on the evaluations of test results, and surveillance by Quality Control instead of providing sufficient technical direction through documented instructions and procedural controls. (Incorrect Soil Test Results are addressed in Subsection 3.10).

RESPONSE TO QUESTION 23, PART (1) [50.54(f)]

Remedial Action (Soils): One fulltime and one parttime onsite Geotechnical Soils Engineer have been assigned. These engineers provide technical direction and monitoring of the process.

Corrective Action (Programmatic): Field Instruction FIC 1.100, "Q-Listed Soils Placement Job Responsibilities Matrix," has been prepared and establishes responsibilities for performing soils placement and compaction.

Corrective Action (Generic): Design documents, instructions, and procedures for those activities requiring inprocess controls will be reviewed to assess the adequacy of existing procedural controls and technical direction. Engineering review is scheduled for completion by December 31, 1979, and Field Engineering and Quality Control review is scheduled for completion by January 31, 1980. Any revisions required will be completed by March 14, 1980.



RESPONSE TO QUESTION 23, PART (1) [50.54(f)]

3.8 Category III, Item 1

Deficiency Description: Inadequate Quality Control inspection of placement of fill

I&E Report Reference: Pages 25 through 29

CPCo Response Reference: Category III, Item 1

Discussion: The Nuclear Quality Assurance Manual requires that Construction Quality Control Procedures "define the method for indirect control by monitoring of processing methods, equipment, and personnel, when inspection of processed items is impossible or disadvantageous." Control Document SF/PSP G-6.1, "Quality Control Inspection Plans," does not adequately include or reference this requirement in the instructions for preparation of Quality Control Instructions. Quality Control Instruction PQCI C-1.02 did not adequately satisfy this requirement. The inspection of soils was accomplished by "surveillance," and did not require verification of the controls specified in Specifications 7220-C-210 and 7220-C-211. Soil test results, or the evaluations of soil test results, were used as the basis for quality verification.

Quality Assurance Program Criterion: Inspection instructions, procedures, and drawings

Program Element: Establishment of an inspection program, documented instructions and procedures for accomplishing the inspection activity, and the preparation of instructions and procedures

Quality Assurance Program Policy: Nuclear Quality Assurance Manual, Section IV, Number 5, "Field Inspection and Test" (June 1977)

Control Document: SF/PSP G-6.1, Revision 4, "Quality Control Inspection Plans" (January 1978)

Instructions, Procedures, and Drawings: PQCI C-1.02, Revision 4, "Compacted Backfill" (July 1979)

Root Causes:

1. Control Document SP/PSP G-6.1 does not include sufficient specificity in its requirements for the preparation of inspection instructions.

RESPONSE TO QUESTION 23, PART (1) [50.54(f)]

2. Too much reliance was placed on the Quality Control Inspector's ability, without sufficiently specific inspection instructions.
3. Reliance was placed on soil test results, or on the evaluation of soil test results, which were in error in numerous cases. (Incorrect Soil Test Results are addressed in Subsection 3.10.)

Remedial Actions (Soils):

1. PQCI C-1.02 has been revised to incorporate the specific characteristics to be verified by Quality Control.
2. An in-depth soils investigation program, which was implemented as described in our prior transmittals, provides verification of the acceptability of the soils or identifies any nonconformances requiring further remedial action.

Corrective Action (Programmatic, Control Document SF/PSP G-6.1 will be revised to provide requirements for inspection planning specificity and for the utilization of scientific sampling rather than percentage sampling. This action is scheduled to be completed by January 24, 1980.

Corrective Actions (Generic)

1. QCIs in use will be reviewed to ascertain that provisions have been included consistent with the revised control document. This action and any required revisions are scheduled to be completed by March 8, 1980.
2. The impact of Corrective Action Item 1 (above) on completed work will be evaluated, and appropriate actions will be taken as necessary. This action is scheduled to be completed by May 23, 1980.

RESPONSE TO QUESTION 23, PART (1) [50.54(f)]

3.9 Category III, Item 2

Deficiency Description: Inadequate soil moisture testing

I&E Report Reference: Pages 14 through 16

CPCo Response Reference: Category III, Item 2

Discussion: Prior to 1978, moisture content was controlled by tests performed after compaction. Few or no tests were performed on the fill during compaction, as required by Specification 7220-C-210, Section 12.6. "During compaction" was interpreted by personnel in the field as the entire process of placing, compacting, and testing. The moisture content was measured during the density test, which was performed immediately after compaction. Reconditioning was done after testing.

Quality Assurance Program Criterion: Inspection instructions, procedures, and drawings

Program Element: Establishment of an inspection program, the documented instructions and procedures for accomplishing the inspection activity, and the preparation of instructions and procedures

Quality Assurance Program Policy: Nuclear Quality Assurance Manual, Section IV, Number 5, "Field Inspection and Test" (June 1977)

Control Document: SF/PSP G-6.1, Revision 4, "Quality Control Inspection Plans" (January 1978)

Instructions, Procedures, and Drawings: PQCI, C-1.02, Revision 4, "Compacted Backfill" (July 1979)

Root Causes:

1. Control Document, SF/PSP G-6.1 does not require sufficient specificity for establishing an inspection program and for the preparation of inspection instructions.
2. Reliance was placed on the informal incorrect interpretations of the specification relative to moisture testing. This is discussed in Subsection 3.2.
3. Reliance was placed on Quality Control surveillances of moisture testing.

RESPONSE TO QUESTION 23, PART (1) [50.54(f)]

4. Reliance was placed on the incorrect results of the density tests, or on the incorrect evaluation of the results, to the exclusion of the moisture test results. (Incorrect Soil Test Results are addressed in Subsection 3.10).

Remedial Actions (Soils):

1. The specifications were revised to provide more definitive requirements for soil moisture testing.
2. PQCI C-1.02 was revised to provide specific inspection requirements for verifying soil moisture content, rather than surveillance.
3. Field instruction FIC 1.000, "Q-Listed Soils Placement Job Responsibility Matrix," has been prepared, and establishes responsibilities for performing soils placement and compaction.

Corrective Actions (Programmatic):

1. Control Document SF/PSP G-6.1 will be revised to provide requirements for inspection planning specificity and for the utilization of scientific sampling rather than percentage sampling. This action is scheduled to be completed by January 24, 1980.
2. Engineering Department Project Instruction 4.49.1, Revision 3 now states, "Under no circumstances will interoffice memoranda, memoranda, telexes, TWXs, etc be used to change the requirements of a specification." This will provide controlled and uniform interpretation of specification requirements.
3. On April 3, 1979, Midland Project Engineering Group Supervisors in all disciplines were reinstructed that the only procedurally correct methods of implementing specification changes are through the use of specification revisions or Specification Change Notices. This was followed by an interoffice memorandum from the Project Engineer to all Engineering Group Supervisors on April 12, 1979.



RESPONSE TO QUESTION 23, PART (1) [50.54(f)]

Corrective Actions (Generic):

1. QCIs in use will be reviewed to ascertain that provisions have been included consistent with the revised control document. This action and any required revisions are scheduled to be completed by March 8, 1980.
2. The impact of Corrective Action Item 1 (above) on completed work will be evaluated, and appropriate actions will be taken as necessary. This action is scheduled to be completed by May 23, 1980.
3. A review of interoffice memoranda, memoranda, telexes, TWXs, and other correspondence relating to specifications for construction and selected procurements of Q-Listed items will be initiated.

The purpose of the review will be to identify any clarifications which might reasonably have been interpreted as modifying a specification requirement and for which the specification itself was not formally changed. An evaluation will be made to determine the effect on the technical acceptability, safety implications of the potential specification modification, and any work that has been or may be affected. If it is determined that the interpretation may have affected any completed or future work, a formal change will be issued and remedial action necessary for product quality will be taken in accordance with approved procedures.

The foregoing procedure will be followed for all specifications applying to construction for Q-Listed items.

For specifications concerning the procurement of Q-Listed items, the foregoing procedure will be implemented on a random sampling basis. The sample size has been established and the specification selection has been made. Review and acceptance criteria for the specifications will be defined by November 30, 1979.

The review of construction and selected procurement specifications is scheduled to be completed by October 1980.

If the acceptance criteria are not met, the review will be expanded to include other specifications for Q-Listed items. At that time, a revised completion date will be established.



RESPONSE TO QUESTION 23, PART (1) 150.54(f)

3.10 Category III, Item 3

Deficiency Description: Incorrect soil test results

I&E Report Reference: Not applicable

CPCo Response Reference: Category III, Item 3

Discussion: A review of soils test reports indicates that some test reports contain errors and inconsistencies in data. Surveillance and test report reviews did not identify these errors and inconsistencies. The Quality Control surveillance and review included steps to verify that the test results were reported as either percent compaction or relative density, as appropriate; that specification requirements for compaction and moisture content were within specified limits; and that the report form was properly completed and contained the required data and authorized signature. This was in accordance with the requirements of Quality Control Instruction 7220-SC-1.05, "Material Testing Laboratories," which includes instructions for monitoring the performance of verification testing performed by the testing laboratory.

Quality Assurance Program Criterion: Control of purchased material, equipment, and services (subcontractors)

Program Element: Surveillance of the subcontractor's performance

Quality Assurance Program Policy: Nuclear Quality Assurance Manual, Section IV, Number 11, "Field Subcontractor Control" (June 1977); and Section IV, Number 5, "Field Inspection and Test" (June 1977)

Control Document: SF/PSP G-9.1, Revision 1, "Control of Subcontractor Work" (July 1977)

Instructions, Procedures, and Drawings: Quality Control Instructions 7220-SC-1.05, "Material Testing Services" (October 1977)

Root Cause: Technical procedures available to control the testing were inadequate, and the technical direction of the testing operations did not avoid or detect the incorrect soil test results.

RESPONSE TO QUESTION 23, PART (1) [50.54(f)]

Remedial Actions (Soils):

1. Geotechnical Services has completed an investigation which includes an in-depth review of testing performed by U.S. Testing and the reported test results. The purpose of this investigation was to identify the type of testing errors which were made in order to facilitate analysis by U.S. Testing and to accomplish Programmatic Corrective Action (below) and Remedial Action Item 2 (below).
2. Based on Item 1 above, the requirements for the control of testing were adjusted, requiring the Testing Subcontractor to check all field density tests for cohesive material against a zero-air-voids curve. A specification change has been issued. Selection of proctor curves will no longer be a problem because each field density test will be accompanied by a separate laboratory standard which will provide a direct comparison. This was directed by a letter to U.S. Testing and reflected in Specification Change Notice C-208-9004, dated April 13, 1979.
3. PQCI-SC-1.05 was revised to add more stringent requirements for in-process inspection of U.S. Testing's soil testing activities.
4. An in-depth soils investigation program which was implemented as described in our prior transmittals, provides verification of the acceptability of the soils or identifies any nonconformances requiring further remedial action. This action is identical to Remedial Action Item 2 in Subsection 3.8.

Corrective Action (Programmatic): Guidelines for surveillance of testing operations will be developed and included in Field Instructions for the onsite Soils Engineer. Engineering/ Geotechnical Services will develop the guidelines by November 30, 1979, and Field Engineering will prepare the instructions by December 31, 1979.

Corrective Actions (Generic):

1. U.S. Testing will be required to demonstrate to the cognizant Engineering Representative that testing procedures, equipment, and personnel used

RESPONSE TO QUESTION 23, PART (1) [50.54(f)]

for quality verification testing (for other than NDE and soils) were, and are, capable of providing accurate test results in accordance with the requirements of applicable design documents. This action is scheduled to be completed by May 1, 1980.

2. A sampling of U.S. Testing's test reports (for other than NDE and soils) will be reviewed by the cognizant Engineering Representative to ascertain that results evidence conformance to testing requirements and design document limits. This action is scheduled to be completed by May 1, 1980.

RESPONSE TO QUESTION 23, PART (1) [50.54(f)]

3.11 Category III, Item 4

Deficiency Description: Inadequate subcontractor test procedures

I&E Report Reference: Not applicable

CPCo Response Reference: Category III, Item 4

Discussion: The procedures used for soils testing did not cover the following activities:

1. Developing and updating the family of proctor curves;
2. Visually selecting the proper proctor curves;
3. Developing additional proctor curves for changing materials occurring between normal frequency curves; and
4. Using alternative methods of determining the proper laboratory maximum density where visual comparison is not adequate.

Bechtel Specification 7220-G-22, Revision 1 (June 22, 1973) is an attachment to Specification 7220-C-208 and specifies the requirements for instructions, procedures, and drawings. These technical procedures were not prepared.

Quality Assurance Program Criterion: Control of purchased material, equipment, and services (subcontractor)

Program Element: Control of supplier-generated (subcontractor-generated) documents

Quality Assurance Program Policy: Nuclear Quality Assurance Manual, Section III, Number 9, "Supplier Document Review" (June 1977); and Section IV, Number 11, "Field Subcontractor Control" (June 1977)

Control Document: SF/PSP G-9.1, Revision 1, "Control of Subcontractor Work" (July 1977)

Instructions, Procedures, and Drawings: Quality Control Instructions 7220/SC-1.05, "Material Testing Services" (October 1977)

RESPONSE TO QUESTION 23, PART (1) [50.54(f)]

Root Cause: Adequate technical procedures for control of the testing were not prepared.

Remedial Actions (Soils):

1. Geotechnical Services has completed an investigation which includes an in-depth review of testing performed by U.S. Testing and the reported test results. The purpose of this investigation was to identify the type of testing errors which were made in order to facilitate analysis by U.S. Testing and accomplish Remedial Action Item 2.
2. Based on Item 1 above, the requirements for the control of testing were adjusted requiring the Testing Subcontractor to check all field density tests for cohesive material against a zero-air-voids curve. A specification change has been issued. Selection of proctor curves will no longer be a problem because each field density test will be accompanied by a separate laboratory standard which will provide a direct comparison. This was directed by a letter to U.S. Testing and reflected in Specification Change Notice C-208-9004, dated April 13, 1979.
3. One full-time and one part-time onsite Geotechnical Soils Engineer have been assigned. These engineers will review U.S. Testing's procedures and monitor their implementation.

Corrective Action (Programmatic): Field Instruction FIC 1.100, "Q-Listed Soils Placement Job Responsibilities Matrix," has been prepared and establishes responsibilities for performing surveillance of testing operations.

Corrective Actions (Generic):

1. Design documents, instructions, and procedures for those activities requiring inprocess controls will be reviewed to assess the adequacy of existing procedural controls and technical direction. Engineering review is scheduled for completion by December 31, 1979, and Field Engineering and Quality Control review is scheduled for completion by January 31, 1980. Any revisions required will be completed by March 14, 1980.



RESPONSE TO QUESTION 23, PART (1) [50.54(f)]

2. U.S. Testing will be required to demonstrate to the cognizant Engineering Representative that testing procedures, equipment, and personnel used for quality verification testing (for other than NDE and soils) were, and are, capable of providing accurate test results in accordance with the requirements of applicable design documents. This action is scheduled to be completed by May 1, 1980.
3. A sampling of U.S. Testing's test reports (for other than NDE and soils) will be reviewed by the cognizant Engineering Representative to ascertain that results evidence conformance to testing requirements and design document limits. This action is scheduled to be completed by May 1, 1980.

RESPONSE TO QUESTION 23, PART (1) [50.54(f)]

3.12 Category IV, Item 1

Deficiency Description: Inadequate corrective action for repetitive nonconforming conditions

I&E Report Reference: Pages 17 through 20

CPCo Response Reference: Category IV, Item 1

Discussion: There were nonconformances reported which are considered to be repetitive. These include, but are not limited to: CPCo Nonconformance Reports QF-29, QF-52, QF-68, QF-120, QF-130, QF-147, QF-172, QF-174, QF-199, and QF-203; CPCo Audit Findings F-77-21 and F-77-32; and Bechtel Nonconformance Reports 421, 686, 698, and 1005.

The Nuclear Quality Assurance Manual, Section V, Number 10, states in Subparagraph 2.5.b, "Nonconformances which, due to their repetition or impact (potential or actual) upon quality, should be brought to management's attention for special action."

Quality Assurance Department Procedure C-101, Revision 1, "Project Quality Assurance Trend Analysis" (July 1977) states in Paragraph 1.0, "This procedure provides a mechanism for identifying quality trends and initiating corrective action to prevent recurrence...." The reviews made in accordance with this procedure did not identify the significance of the repetitive nature of the nonconformances and the need for special action beyond that for the individual reports.

Control Document SF/PSP G-3.2 defines the requirements for review of Management Corrective Action Requests (MCARs).

Quality Assurance Program Criterion: Corrective action

Program Element: Actions pertaining to significant conditions adverse to quality

Quality Assurance Program Policy: Nuclear Quality Assurance Manual, Section V, Number 10, "Management Corrective Action" (March 1979)

Control Documents: SF/PSP G-3.2, Revision 1, "Control of Nonconforming Items" (September 1979) and QADP C-101, Revision 1, "Project Quality Assurance Trend Analysis" (July 1977)

RESPONSE TO QUESTION 23, PART (1) [50.54(f)]

Root Causes:

1. The conditions under which nonconformances are considered to be repetitive are not adequately defined in the control documents.
2. The trending activity did not provide timely responses to repetitive product nonconforming conditions.

Remedial Action (Soils): Not applicable

Corrective Action (Programmatic): Control documents are in the process of being revised to provide an improved definition of implementing requirements for identifying repetitive non-conforming conditions. This action is scheduled to be completed by January 24, 1980.

Corrective Action (Generic): Consistent with the intent of the programmatic change above, Quality Assurance will review nonconformance reports which are open, or will become open between this time and January 23, 1980. This review will be to identify any repetitive nonconforming conditions pertaining to product type or activity, or pertaining to nonconformance cause. This action is scheduled to be completed by January 24, 1980.

RESPONSE TO QUESTION 23, PART (1) [50.54(f)]

3.13 Category IV, Item 2

Deficiency Description: Bechtel Quality Assurance auditing and monitoring did not identify the problems relating to the settlement. This lack of identification of problems by the auditing and monitoring contributed to a conclusion that soils operations were adequately controlled.

I&E Report Reference: Pages 17 through 20

CPCo Response Reference: Category IV, Item 2

Discussion: Quality Assurance auditing and monitoring is aimed at evaluating the adequacy of policies and procedures and evaluating the degree of compliance with the policies and procedures. It is not a quality verification activity, although it may identify deficiencies in the performance of quality-related activities that could result in unsatisfactory product quality. In the case of soils operations, Quality Assurance auditing and monitoring found that quality-related activities were being performed as planned, quality verification activities (primarily soil testing) were being performed, and the soil test results, or their evaluation, provided evidence of compliance with the established standards. The auditing and monitoring did not identify the policy and procedure inadequacies.

Quality Assurance Program Criterion: Auditing

Program Element: Auditing

Quality Assurance Program Policy: Nuclear Quality Assurance Manual, Section VI, Number 1, "Quality Audit System" (March 1979)

Control Documents: Quality Assurance Department Procedure, Section C, Number 1, "Project Quality Monitoring" (September 1977); and Section C, Number 5, "Project Quality Audits" (September 1977)

Root Cause: Quality Assurance audit and monitoring was oriented more toward evaluating the degree of compliance with established procedures rather than toward the assessment of policy and procedural adequacy or toward the assessment of product quality.

Revision 4  
11/79

RESPONSE TO QUESTION 23, PART (1) [50.54(f)]

Corrective Action (Generic): The Quality Assurance audit and monitoring program will be revised to emphasize and increase attention to the need for evaluating policy and procedural adequacy and assessment of product quality. A specialized audit training program will be developed and implemented to ensure guidance for this revised approach. These actions will be accomplished by December 31, 1979.



RESPONSE TO QUESTION 23, PART (2)

Revision 4  
11/79

RESPONSE TO NRC QUESTION 23, PART (2) [50.54(f)]

SECTION 1.0, NRC QUESTION

SUPPLEMENTAL REQUEST FOR ADDITIONAL SOILS SETTLEMENT INFORMATION

23. We have reviewed your response to question 1 of our March 21, 1979 letter, "10 CFR 50.54 Request Regarding Plant Fill," including related amendments or supplements in your letters dated May 31, July 9, and August 10, 1979. We find that the information provided is not sufficient for completion of our review. Accordingly, provide the following additional information:

(2) Regarding your response to question 1b:

- a. The first seven paragraphs do not provide sufficient information to assure that contradictions do not continue to exist in the PSAR, FSAR, design documents, implementing procedures, and as-built conditions since the controls described in these seven paragraphs were in effect prior to the I&E findings reported in J. Keppler's letter of March 15, 1979. Modify your response to clearly describe the control revisions you have instituted to preclude design contradictions.
- b. Items 1, 2, and 3 of the eighth paragraph describe the review and update of the PSAR commitment list, the review of the inactive sections of the FSAR, and the review of procedure EDP 4.22, "Preparation and Control of Safety Analysis Reports," without describing the extent of the review process or the qualifications of personnel involved in the review. Accordingly, describe what each of these reviews entails, including the extent to which these reviews are verified, approved, and documented. Identify the organizational unit that is, or will be, involved in these reviews and the qualifications of the involved personnel.
- c. Item 2 of the eighth paragraph states that a review of the remaining sections of the FSAR is not necessary, "... because of the ongoing review process described above." Describe your rationale for not reviewing these remaining sections of the FSAR when it appears that the original review of the FSAR was performed prior to issuance of the March 15, 1979 letter providing the I&E findings and prior to any corrective actions resulting therefrom.
- d. Describe the extent of the audit to which you have committed in item 4 of the eighth paragraph.

RESPONSE TO QUESTION 23, PART (2) [50.54(f)]

SECTION 2.0, RESPONSE TO PART (2)a

Mr. J. Keppler's letter of March 15, 1979 described inconsistencies in the FSAR which occurred at the time of origination of the FSAR.

Paragraphs 1 and 2 of the CPCo response to Question 1, Part b dated April 24, 1979, describe the procedures used to prepare the FSAR. Paragraph 3 of that response provides a brief history of the preparation of the FSAR. Paragraphs 4, 5, and 6 describe the procedures and activities undertaken, subsequent to the submittal of the FSAR, to update the FSAR to include missing information, reflect design changes, and resolve identified inconsistencies between the FSAR and project design documents. Paragraph 7 explains why the inconsistencies created in FSAR Section 2.5 and Subsection 3.8.5 at the time of preparation of the FSAR were not initially identified and corrected by the implementation of the original procedures.

The following supplements the response to Question 1, Part b, and describes the control revisions instituted since submittal of the FSAR to preclude design contradictions.

When the FSAR was docketed in November 1977, it became the prime licensing document superseding the design commitments contained in the PSAR. Therefore, it is not valid to compare a PSAR commitment to a current design document, implementing procedure, or as-built condition. It is valid to compare these design documents against the licensing commitments contained in the FSAR. PSAR design commitments were incorporated into the FSAR when the FSAR was written. Attachment 1-1 to the Question 1, Part b response shows that the following documents were considered as input in the preparation of each FSAR subsection:

1. Regulatory Guide 1.70, Revision 2
2. NRC Standard Review Plans and Branch Technical Positions
3. DRL Safety Evaluation

RESPONSE TO QUESTION 23, PART 2 [50.54(f)]

4. Midland PSAR
5. Unincorporated SAR Change Notices
6. Regulatory Guides and Results of Regulatory Guide Review Program
7. Supplemental Environmental Report
8. Final Environmental Report
9. Design Documents
10. BESSAR

Attachment 23-1 compares the soils area to other areas with respect to the preparation, initial review, and rereview of the FSAR. The root cause of the inconsistencies that occurred in the soils area are addressed in Part (1), Subsection 3.3 of this response. Mitigating circumstances that contributed to the inconsistencies were the change in level of detail required in licensing documents, the multiple display of technical information contained in the FSAR, and the lack of change or question activity in the soils area.

Additional inconsistencies (other than the soils area) that may exist in the FSAR are being corrected by the total rereview program that has been undertaken as described in Parts (2)b and c of this response. An additional benefit of the FSAR rereview program is that an education process is occurring within all design disciplines, making them more aware of the level of design detail contained in the FSAR.

Control document revisions that have been instituted to preclude design contradictions are described in Part (1), Subsection 3.3.

RESPONSE TO QUESTION 23, PART (2) [50.54(f)]

SECTION 3.0, RESPONSE TO PART (2)b

3.1 Review of the PSAR Commitment List

Original PSAR commitments are contained in the PSAR Commitment List. This List includes the PSAR section, a statement of the commitment, the PSAR page containing the commitment, the revision number of that PSAR page, the company responsible for the commitment, the status of the commitment, and the commitment disposition document. Each PSAR commitment is either attached to an FSAR section for review or, if not applicable to any specific section, distributed for review as an individual rereview package so that all PSAR commitments are included in the FSAR rereview program. The review of the PSAR Commitment List items is described in the sequence of the rereview program activities discussed in this response. As part of the rereview program, the PSAR Commitment List will be updated by completing the columns titled "Status" and "Disposition Document" to ensure that they contain current information.

Our April 24, 1979, response to Question 1, part b, stated, "To assure that the PSAR design commitments were properly dispositioned through incorporation into a project design document or the FSAR, a final review and update of the PSAR Commitment List will be completed by January 1, 1980." It was determined that a review of the PSAR Commitment List, in lieu of reviewing the PSAR itself, was sufficient for this purpose for the following reasons.

- a. When the PSAR Commitment List was prepared, the following steps were taken:
  1. Initial preparation by an engineer in the Mechanical discipline; (The Mechanical discipline at that time was responsible for the preparation of the SAR.)
  2. Complete review of the Commitment List versus the PSAR commitments by the Project SAR Coordinator;
  3. Review of the Commitment List by the Nuclear Group Leader, Mechanical Group Supervisor (Licensing Engineer), and Project Engineer.



RESPONSE TO QUESTION 23, PART (2) [50.54(f)]

These reviews were documented by reviewers initials each time the List was revised and reissued. Thus, the PSAR Commitment List received the same level of review as other project "design documents."

- b. The PSAR and related documents were used in the preparation of the FSAR. There are existing documentation forms for the preparation of the FSAR sections that identify the PSAR sections reviewed in preparing that FSAR section. Thus, the PSAR Commitment List was not the primary document used in the preparation of the FSAR. Significant changes that have been made in plant design since the issuance of the construction permit are identified in FSAR Table 1.3-2.
- c. The FSAR is a complete document which does not rely on the PSAR previously submitted. Therefore, a rereview of the FSAR against project design documents is sufficient in itself to ensure that areas of contradiction do not exist.

RESPONSE TO QUESTION 23, PART (2) [50.54(f)]

3.2 Rereview of the FSAR

3.2.1 Organization

Personnel and organizations participating in the FSAR rereview program are as follows:

- a. The FSAR rereview program involves various disciplines within the organizations of CPCo, B&W, and Bechtel.
- b. Each company has developed or utilizes existing procedures for the conduct of this rereview as follows:

<u>Company</u>	<u>Procedure No.</u>	<u>Procedure Title</u>
CPCo	MPPM-19	"Conduct of Final Safety Analysis Report Review Program"; Revision 0
Bechtel	IOM, R.L. Castleberry to File LF 9.0, June 1979	"FSAR Review Procedure - Midland Project"
B&W	NPG-0414-13	"Processing Contract Engineering Licensing Documents," Revision 3

- c. The rereview program is managed by the Bechtel Licensing Group (composed of engineers), which distributes the applicable rereview documents to various disciplines within Bechtel and also forwards applicable rereview documents to CPCo and B&W. These rereview packages are reviewed by engineers within these organizations having cognizance in the subject matter of the rereview package, and these rereview results are evaluated by supervisory engineers, as described in the sequence of rereview activities and rereview documentation given in this response.
- d. The engineers, as well as the cognizant supervisory engineers in all three organizations, involved in this rereview are the same engineers currently involved in design activities.

RESPONSE TO QUESTION 23, PART (2) 150.54(f)1

3.2.2 Rereview Procedure

The FSAR rereview process, as summarized in Attachment 23-2, is more fully described in the following sequence of activities.

- a. The Bechtel Licensing Group prepares an FSAR rereview package for each subsection or group of consecutive subsections addressing the same subject, including FSAR NRC questions pertaining to that subsection and associated PSAR commitments from the PSAR Commitment List. Also PSAR commitments which are not specifically related to any FSAR section are distributed as separate rereview packages. Prior to distributing the rereview packages, the Bechtel Licensing Group completes Blocks 1 through 7 on the documentation form shown in Attachment 23-3.
- b. After receiving an FSAR rereview package, the Primary Rereviewer establishes which documents (e.g., P&IDs, flow diagrams, single-line meter and relay diagrams, control logic diagrams, and various other documents in which licensing commitments are contained) the package must be rereviewed against and notes these in Block 8 of Attachment 23-3.
- c. The Primary Rereviewer then systematically rereviews each document noted in Block 8 and indicates whether any conflicts exist between the document and the FSAR section. The rereviewer makes any corrections arising from a conflict and notes these in the resolution column of Block 8. The rereviewer also rereviews the package for consistency of cross-referenced FSAR sections, figures, and tables, chapter references, NRC questions, and PSAR commitments and makes appropriate corrections. Following this, the Primary Rereviewer indicates any required interface review by a check in Block 11. The Primary Rereviewer and the Group Supervisor (or other specified individuals, depending upon the company procedure) then sign the form in Block 9.
- d. The signature of the Group Supervisor indicates agreement with the quality and quantity of the review by the Primary Rereviewer. The Supervisor checks to ensure that the applicable documents are included in the review package and that all applicable interface rereviews have been designated. The rereview package is then transmitted to the Bechtel Licensing Group.

RESPONSE TO QUESTION 23, PART (2) [50.54(f)]

- e. The Bechtel Licensing Group makes a copy of the original rereview package to correspond to each interface rereview designated in Block 11 of Attachment 23-3. Prior to distributing the interface rereview packages, the Bechtel Licensing Group completes Block 10 on the documentation form to signify the date scheduled for the completion of the interface rereview. The original rereview package is retained in the Licensing Group files.
- f. After receiving an FSAR rereview package for interface rereview, the Interface Rereviewer determines which, if any, additional documents the package must be reviewed against and adds those to the list in Block 8 of Attachment 23-3 beneath those listed by the Primary Rereviewer. The Interface Rereviewer then systematically rereviews each of the documents added to Block 8 to determine if any conflicts exist between these documents and the FSAR section. For his areas of responsibility, the Interface Rereviewer also rereviews the package for consistency with cross-referenced FSAR sections, figures, tables, chapter references, NRC questions, and PSAR commitments. Following completion of the rereview, the Interface Rereviewer and Group Supervisor (or other specified individuals, depending upon the company procedure) then initial the form in Block 11. The interface rereview package is then transmitted to the Bechtel Licensing Group.
- g. The Bechtel Licensing Group forwards the original rereview package and all interface rereview packages with comments to the Primary Rereviewer. Prior to distributing the packages for resolution of comments, the Bechtel Licensing Group completes Block 12 on the documentation form to schedule the completion of the resolutions.
- h. After receiving the original rereview package and all interface rereview packages with comments, the Primary Rereviewer resolves all interface comments which have outstanding questions with the respective Interface Rereviewer. The Primary Rereviewer clearly indicates whether an interface comment is to be incorporated into an FSAR change. The Primary Rereviewer is responsible for determining if any recent changes to the FSAR affect any of the comments. The Primary Rereviewer indicates in

RESPONSE TO QUESTION 23, PART (2) [50.54(f)]

Block 13 of Attachment 23-3 if an FSAR change is required for the package and then signs, along with the Group Supervisor (or other specified individuals, depending upon the company procedure), in Block 13 to indicate completion of the rereview. The entire package is then transmitted to the Bechtel Licensing Group.

- i. Upon completion of the resolution of comments by the Primary Rereviewer, the Bechtel Licensing Group initiates an FSAR change (if required) in accordance with Engineering Department Project Instruction 4.23.1. They obtain final approval (following review) from CPCo, B&W (if required), and Bechtel and then prepare the input for FSAR revision typing, printing, and distribution.
- j. The original rereview packages and interface rereview packages are retained in the Bechtel Licensing Group files.
- k. Changes to the FSAR identified during the rereview process are incorporated into the FSAR during future revisions. Changes to design documents identified during the rereview process are identified in the "Resolution" column of Attachment 23-3 and are tracked by the Bechtel Licensing Group in accordance with the rereview procedure until a change to the design document has been executed.



RESPONSE TO QUESTION 23, PART (2) [50.54(f)]

3.2.3 Processing Resulting Changes

- a. The revised design documents are routed to Field Engineers in accordance with the requirements of FPD-1.000, "Design Document and Correspondence Control." The Field Engineers, in accordance with FIG-3.200, "Field Engineer Responsibilities," are required to review the design documents and their resultant effect on construction with respect to 1) interferences and conflicts, 2) incorporation of change addenda, 3) correlation of references and interfacing documents, 4) clear, concise, and adequate details and notes, 5) technical clarity, 6) legibility, 7) changes affecting completed work and current construction planning, 8) other pertinent features. Any deficiencies or discrepancies are resolved.
- b. In accordance with Project Special Provision G-6.1, "Quality Control Inspection Plans," changes in design documents will be reflected in revisions to the activity descriptions, inspection criteria, supplementary records, and inspection activity codes in the Project Quality Control Instructions and Inspection Records.
- c. Open Inspection Records which are affected by revisions to Project Quality Control Instructions will be revised to incorporate the changes. These revisions will be controlled by a revision to the Quality Control Inspection Record number.
- d. A design document change which physically affects completed work will require the initiation of a new Inspection Record. The new Inspection Record will be developed to cover the inspection of the work required to accomplish the design change. Each new Inspection Record will be identified with the number of the record for the original work plus an alpha suffix (a, b, c, etc). Each new Inspection Record, when it is completed, will be attached to the original Inspection Record. The new Inspection Record will specify the design change that brought about the additional inspection work.
- e. Design changes to completed work are addressed in Project Special Provision G-3.2, "Control of Nonconforming Items." Completed work which has been inspected and found to be satisfactory is classified as conforming.

RESPONSE TO QUESTION 23, PART 2 [50.54(f)]

3.3 Review of Engineering Department Procedure 4.22

The following sequence of events took place relative to the review of Engineering Department Procedure 4.22, "Preparation and Control of SAR."

- a. Review of Engineering Department Procedure 4.22 was by the Project Quality Engineering, and included coordination with the Project SAR Coordinator.
- b. Primary consideration was given as to whether the originator of a SAR section had sufficient guidelines in which to prepare a SAR section.
- c. The results of the review were affirmative; the engineer had sufficient direction in the procedure. This was documented in an IOM dated July 23, 1979, R.L. Castleberry to L.A. Dreisbach.
- d. Subsequent to the completion of Item c, above, it was decided during a series of meetings to revise Engineering Department Procedure 4.22 for clarification. (The requirements of Regulatory Guide 1.70, "Standard Format and Content of Safety Analysis Reports for Nuclear Power Plants," were moved from Section 2.0, "Scope" to Section 5.0, "Engineering and Administrative effort." This revision is to be completed by December 1, 1979.)

RESPONSE TO QUESTION 23, PART (2) [50.54(f)]

SECTION 4.0, RESPONSE TO PART (2)c

The FSAR rereview program has been extended from the original plan to include the entire FSAR, with certain exceptions as follows:

- a. Appendixes such as 2A, 2B, and 2C contain only test data for which a rereview would be meaningless.
- b. Security Plan which is currently under review and will be completely revised when it is submitted.
- c. Technical Specifications (Chapter 16) which will be extensively reviewed prior to NRC final review 6 months to 1 year prior to the issuance of an operating license.
- d. Fire Protection Evaluation Report which will be completely reviewed and revised upon receipt of fire protection questions from the NRC.
- e. Site Emergency Plan which was extensively revised in Revision 18 (February 1979) to the FSAR and will be revised as necessary to meet new, additional requirements.

The entire rereview program will be completed by July 1980, with all resulting revisions to the FSAR made by the July 1980 amendment.

RESPONSE TO QUESTION 23, PART (2) [50.54(f)]

SECTION 5.0, RESPONSE TO PART (2)d

The purpose of the audit committed to in Item 4 of the eighth paragraph of Question 1, Part b, is to verify the effectiveness of the rereview. The audit will cover two aspects as follows:

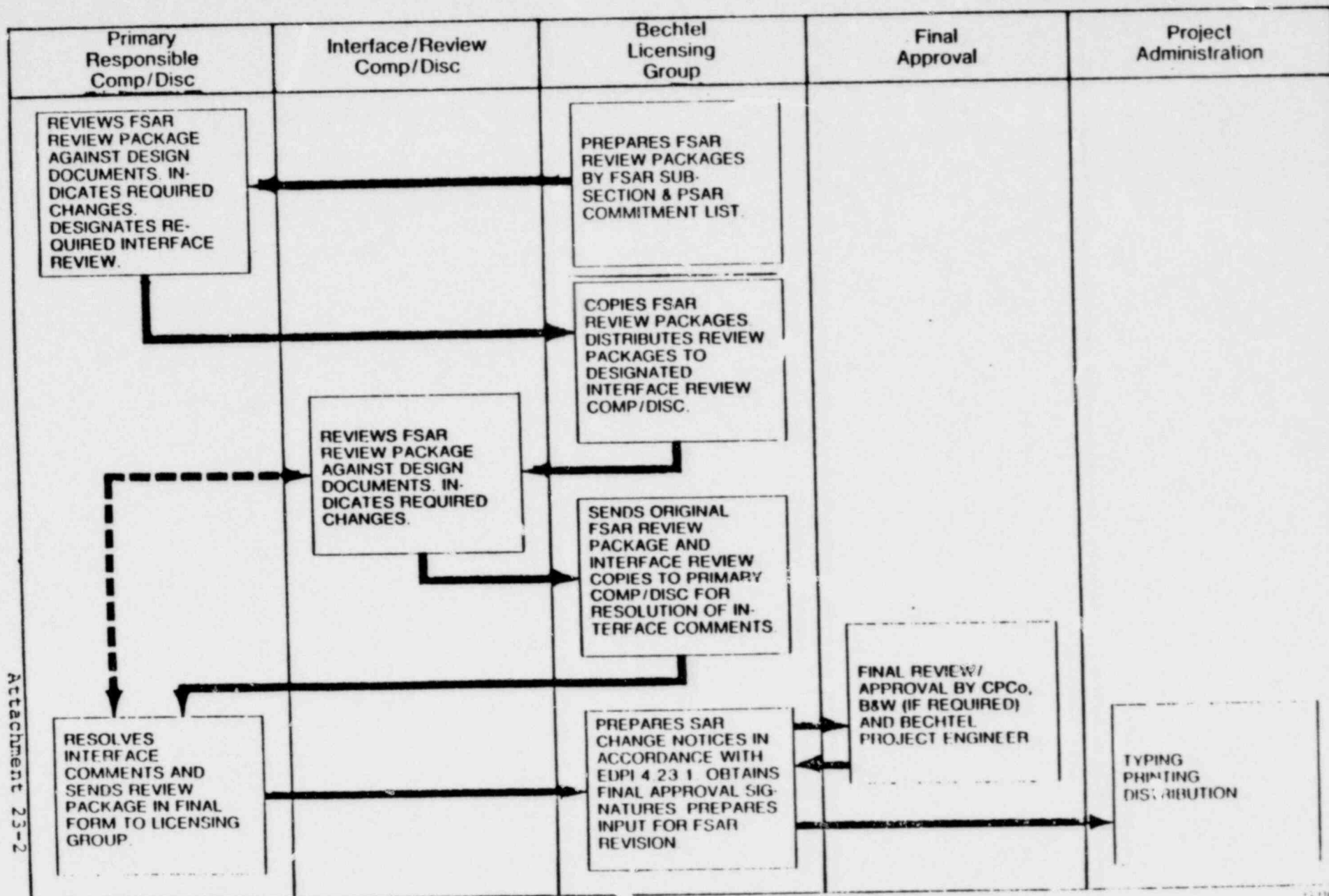
- a. Degree of compliance with rereview procedures.
- b. Technical correctness of rereview dispositions.

The audit committed to in our response to Question 1, Part b and described in the preceding paragraphs will be conducted once during the course of the FSAR rereview (commencing January 1, 1980) and again after completion of the rereview (August 1, 1980).

An audit plan will be prepared consistent with the CP&Co, Bechtel, and B&W policies and procedures governing audits. Bechtel will serve as the audit team leader. The audit team will comprise personnel from each of the three organizations.

# FSAR REVIEW FLOW CHART

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





**FSAR REVIEW DOCUMENTATION FORM**  
**MIDLAND PROJECT**  
**JOB 7220**

1. REVIEW LOG NO. \_\_\_\_\_

2. COMPANY ☐ CPCo ☐ BECHTEL ☐ B&W

3. PRIMARY REVIEW DISCIPLINE \_\_\_\_\_

4. FSAR SUBSECTION \_\_\_\_\_

5. NRC OBJECTIONS \_\_\_\_\_

6. FSAR COMMITMENT LIST ITEMS \_\_\_\_\_

**8. PHASE I: DESIGN DOCUMENT REVIEW**

7. RETURN TO BECHTEL LICENSING BY \_\_\_\_\_

DESIGN DOCUMENT	CONFLICT	RESOLUTION
_____	YES / NO	_____
_____	YES / NO	_____
_____	YES / NO	_____
_____	YES / NO	_____
_____	YES / NO	_____
_____	YES / NO	_____
_____	YES / NO	_____
_____	YES / NO	_____
_____	YES / NO	_____
_____	YES / NO	_____
_____	YES / NO	_____
_____	YES / NO	_____
_____	YES / NO	_____
_____	YES / NO	_____

**9. INITIAL REVIEW APPROVAL (INDICATE REQUIRED INTERFACE REVIEW IN BLOCK 11.)**

\_\_\_\_\_  
 (PRIMARY REVIEWER) (DATE) (SUPERVISOR) (DATE)

**11. PHASE II: INTERFACE REVIEW**

10. RETURN TO BECHTEL LICENSING BY \_\_\_\_\_

☐ BECHTEL

**BECHTEL DISCIPLINE INTERFACE REVIEW**

ARCH \_\_\_\_\_ ☐ PLANT DSN \_\_\_\_\_  
 CIVIL \_\_\_\_\_ ☐ PQAE \_\_\_\_\_  
 CONTROL SYS \_\_\_\_\_ ☐ STRESS \_\_\_\_\_  
 ELEC \_\_\_\_\_ ☐ OTHER \_\_\_\_\_  
☐ MECH NUCLEAR \_\_\_\_\_

**INTERFACING STAFF REVIEW:**

☐ ARCH \_\_\_\_\_ ☐ M & OS \_\_\_\_\_  
☐ CIVIL \_\_\_\_\_ ☐ MECH \_\_\_\_\_  
☐ CONTROL SYSTEM \_\_\_\_\_ ☐ NUCLEAR \_\_\_\_\_  
☐ ELEC \_\_\_\_\_ ☐ PLANT DSN \_\_\_\_\_  
☐ GEOTECH \_\_\_\_\_ ☐ STRESS \_\_\_\_\_

☐ CPCo

☐ B & W

**13. PHASE III: RESOLUTION OF COMMENTS**

12. RETURN TO BECHTEL LICENSING BY \_\_\_\_\_

FSAR CHANGE REQUIRED YES / NO

All Interface Comments Resolved. Licensing Group is Authorized To Initiate A FSAR Change Without Additional Interface Review

\_\_\_\_\_  
 (PRIMARY REVIEWER) (DATE) (SUPERVISOR) (DATE)

RESPONSE TO QUESTION 23, PART (2) [50.54(f)]

ATTACHMENT 1 TO ATTACHMENT 23-3

The form illustrated in Attachment 23-3 is used to document the various phases and steps of the rereview of the Midland plant FSAR. Thirteen numbered blocks are completed for each rereview package.

- a. The first block, "Review Log No," identifies each rereview package by a unique number assigned by the Bechtel Licensing Group.
- b. The second block, "Company," designates the primary rereview company for the rereview package as assigned by the Bechtel Licensing Group.
- c. The third block, "Primary Review Discipline," is used to designate the discipline assigned primary rereview responsibility by the Bechtel Licensing Group.
- d. The fourth block, "FSAR Subsection," is completed by the Bechtel Licensing Group to designate the FSAR subsections included in the rereview package.
- e. The fifth block, "NRC Questions," is completed by the Bechtel Licensing Group to indicate any FSAR phase NRC questions pertaining to the subsections identified in Block 4 included in the rereview package.
- f. The sixth block, "PSAR Commitment List Items," is completed by the Bechtel Licensing Group to indicate any PSAR Commitment List items pertaining to the subsections identified in Block 4 included in the rereview package.
- g. The seventh block, "Return to Bechtel Licensing by," is completed by the Bechtel Licensing Group to indicate the date when the completed Phase rereview package is to be received by the Bechtel Licensing Group.
- h. The eighth block, "Phase I: Design Document Review," is completed by the Primary Rereviewer to indicate all documents against which the rereview package is rereviewed, to indicate whether conflicts exist between the rereview FSAR section and the other documents, and to indicate the necessary resolution of any conflict, as appropriate. For NRC Questions and PSAR Commitment List items, the Primary Rereviewer verifies that no conflicts exist with the FSAR text, and that the FSAR text corresponds to the commitments in the FSAR questions and PSAR Commitment List and is complete and correct.

RESPONSE TO QUESTION 23, PART (2) [50.54(f)]

- i. The ninth block, "Initial Review Approval," is completed by the Primary Rereviewer and the Group Supervisor (or by other specified individuals, depending upon the company procedure). Prior to signing for rereview approval, the Primary Rereviewer designates all required interface rereview by checking the appropriate boxes in Block 11. The signature by the Group Supervisor indicates agreement with the quantity and quality of the review by the Primary Rereviewer. The Supervisor checks to ensure that the documents used by the Primary Rereviewer cover all applicable interfaces. The rereview package is then returned to Bechtel Licensing.
- j. The tenth block, "Return to Bechtel Licensing by," is completed by the Bechtel Licensing Group to indicate the date when the completed Phase II rereview package is to be received by the Bechtel Licensing Group following an interface rereview.
- k. The eleventh block, "Phase II: Interface Review," is completed by the individual performing the interface rereview as designated by the Primary Rereviewer (see Block 9 above). If additional documents are used by the Interface Rereviewer, these documents are listed in Block 8 in accordance with the procedures described therefor. Following satisfactory completion of the interface rereview, the Primary Reviewer and the Group Supervisor or other specified individuals (depending upon the company procedures) initial this block. The Supervisor's initials indicate approval of the rereview performed by the Interface Rereviewer as discussed under Block 9, above. The interface rereview package is then returned to the Bechtel Licensing Group.
- l. The twelfth block, "Return to Bechtel Licensing by," is completed by the Bechtel Licensing Group to indicate the date when the completed Phase II rereview package is to be received by the Bechtel Licensing Group following resolution of the comments.
- m. The thirteen block, "Phase III: Resolution of Comments," is completed by the Primary Rereviewer following the resolution of all interface comments resulting from the interface review. The Primary Rereviewer indicates whether each interface comment is to be incorporated into the FSAR. The Primary Rereviewer indicates whether an FSAR change is required by designating "yes" or "no" and, following resolution of all interface comments, signs the form along with the Group Supervisor or

RESPONSE TO QUESTION 23, PART (2) [50.54(f)]

other specified individuals (depending upon the company procedures) to indicate completion of the rereview package. The Supervisor's signature indicates approval of the resolution of comments by the Primary Rereviewer consistent with the original rereview discussed under Block 9, above.

Attachment 23-3  
Revision 4  
11/79

RESPONSE TO QUESTION 23, PART (3)

Revision 4  
11/79



RESPONSE TO QUESTION 23, PART (3) [50.54(f)]

SECTION 2.0, INTRODUCTION

In Subpart a of Part (3) of the question, it was requested that we provide our rationale for our confidence that quality assurance deficiencies do not (or will not ) exist in other areas.

Our confidence stems from three factors, as follows:

- a. The recognition of the differences between soils and other work, as described in Section 3.0.
- b. The fact that, from the outset, a Quality Assurance implementation.

Subsection 4.1 provides a list of Quality Assurance Program improvements. Subsection 4.2 provides more detail as to the extent and results of selected improvements as requested in Subpart b of Part (3) of the question.

- c. The programmatic and generic corrective actions which have been taken, or will be taken, as described in our response to Parts (1) and (2) of the question and as summarized in Section 5.0.

RESPONSE TO QUESTION 23, PART (3) [50.54(f)]

SECTION 3.0, DIFFERENCES BETWEEN SOILS WORK AND OTHER WORK

Prior to 1977, the major site construction activities were in the civil and structural areas. The major specific activities were soils, rebar and embeds, concrete, cadwelding, structural steel erection, and liner plate erection. In 1977, electrical and mechanical installation activities became significant.

Soils and concrete are similar bulk installation activities which rely, in large part, upon the tests at a given point representative of the quantity of material placed. Additional confidence in the quality of the concrete is achieved through several factors that are not available to soils work. Concrete work is more scientific than soils placement and compaction and the variables of concrete work are more quantifiable and measurable. The physical testing of concrete (cylinder breaks) provides acceptable or unacceptable results on a short-term basis. With soils, the only verification, subsequent to the initial acceptance test, is the long-term monitoring program for settlement of structures supported in the fill.

The inspection and controls for the construction activities for cadwelding, rebar, and embeds provide high confidence in the quality of these items. Rebar has had a 100% overinspection by CPCo QA from April 1976 to September 1978 and embeds have had a 100% overinspection by CPCo QA from June 1972 to September 1978.

Structural steel erection and other civil activities, including welding and liner plate erection, are activities for which there are characteristics accessible to inspection and reinspection, allowing for independent subsequent verifications of the quality of these items.

The above is also true of most aspects of mechanical and electrical construction activities. The major improvements with regard to specifications and QCIs were made prior to significant construction activities in the Mechanical and Electrical disciplines.

These systems will be subject to overinspections and walkdown inspections by CPCo QA at the time of turnover, which will provide additional detailed evaluation of these systems. Subsequent to the construction acceptance, a system verification is accomplished through the checkout and preoperational testing activities.

4.1 History and Chronology of Improvements, In General

1970

1. CPCo QA Program as presented in the Midland Plant PSAR was approved by the AEC Staff in the Safety Evaluation Report.

1973

1. The Bechtel Quality Control Organization at the site was reorganized to be independent of the Bechtel Construction Organization at the site.
2. The CPCo Quality Assurance organization was formed with a staff of five persons.

1974

1. The review and approval by CPCo Quality Assurance of Bechtel Quality Control administrative procedures and inspection instructions was initiated.
2. The number of CPCo Quality Assurance professional personnel overseeing the Bechtel Quality Assurance Program was increased from five to six.
3. The CPCo Quality Assurance program policies and procedures were significantly improved.

1975

1. CPCo Quality Assurance inspection of stored materials was instituted.
2. The number of CPCo Quality Assurance professional personnel overseeing the Bechtel Quality Assurance Program was increased from six to seven.

1976

1. Bechtel quality trending was instituted.
2. The CPCo Quality Assurance Program (Topical Report) was approved by NRC.
3. CPCo Quality Assurance overinspection of rebar installation was instituted.
4. The Bechtel Quality Control Notices Manual was prepared specifically for the Midland Project and the Bechtel Field Inspection Manual was phased out.
5. Major biennial audits of the Quality Assurance Program, utilizing outside consultants, were initiated by CPCo Quality Assurance.

RESPONSE TO QUESTION 23, PART (3) [50.54(f)]

6. The number of CPCo Quality Assurance professional personnel (excluding auditors) overseeing the Bechtel Quality Assurance Program was increased from seven to nine.
7. Bechtel Resident Engineering was established at the jobsite.

1977

1. CPCo Quality Assurance overinspection of embeds was instituted.
2. CPCo Quality Assurance Program Procedures dealing with nonconformance reporting, audit, and personnel certification were significantly improved.
3. CPCo Quality Assurance Program Procedures dealing with reporting to NRC and turnover were originated.
4. The Bechtel quality trending activity was significantly improved.
5. CPCo Quality Assurance was reorganized to form the Quality Assurance Engineering Section and the Inspection, Examination and Test Verification Section, the latter having emphasis on hardware evaluation.
6. The following five additional Regulatory Guides were implemented: 1.38, dealing with the quality requirements for packaging, shipping, receiving, storage, and handling; 1.39, dealing with housekeeping; 1.55, dealing with concrete placement for Category I structures; 1.58, dealing with the qualification of inspection, examination and testing personnel; and 1.84, dealing with the quality assurance requirements for the installation, inspection, and testing of structural concrete and structural steel.
7. An extensive training activity was implemented for CPCo Quality Assurance personnel.
8. CPCo Quality Assurance became the overinspection organization for Q-listed pressure tests.

RESPONSE TO QUESTION 23, PART (3)[50.54(f)]

9. NRC implemented an "increased inspection" program.
10. The number of CPCo Quality Assurance professional personnel (excluding auditors) overseeing the Bechtel Quality Assurance Program was increased from nine to twenty-two.
11. Bechtel and CPCo reviewed specifications to improve specificity.
12. Bechtel QC and CPCo QA reviewed Quality Control Instructions (QCIs) to improve inspection callouts in the QCIs.
13. The Bechtel monitoring activity was improved to conduct more product-related monitors.
14. Bechtel QA management audits were increased from one to two per year.

1978

1. CPCo Quality Assurance overinspection of all other areas, in addition to the civil area, was instituted.
2. Approximately 30 CPCo Quality Assurance overinspection plans were prepared and implemented.
3. One hundred percent CPCo Quality Assurance review of supplier radiographs being received with new deliveries was instituted.
4. The ASME Code Stamp Authorizations were extended to Bechtel for another three years.
5. Fifteen CPCo Quality Assurance Department Procedures were completed, revised or originated dealing with department procedures; organization; personnel training, qualification and certification; processing procurement documents; source and receiving inspection planning and inspections; nonconformance reporting, corrective actions and statusing; periodic reporting; review of quality-related regulations, codes, standards, specifications, and other external documents; procurement quality assurance requirements; inspection stamp control;



RESPONSE TO QUESTION 23, PART (3) [50.54(f)]

qualification and certification of quality assurance audit team leaders; qualification and certification of quality assurance audit team members; qualification, training and certification of inspection and test personnel; analysis and resolution of significant quality problems; overinspection and primary inspection.

6. The primary responsibility for the overview of the B&W NSSS installation was given to CPCo Quality Assurance.
7. The number of CPCo Quality Assurance audits performed was doubled from the previous year.
8. Resident inspection was instituted by NRC.
9. The number of CPCo Quality Assurance professional personnel (excluding auditors) overseeing the Bechtel Quality Assurance Program was increased from twenty-two to twenty-three.

1979

1. The rereview of qualification test data for Bechtel procured items was completed.
2. The rereview of qualification test data for B&W procured items was initiated.
3. The rereview of quality documentation for B&W procured items was completed.
4. The rereview of quality documentation for Bechtel procured items was initiated.
5. "Surveillance" was eliminated as a Bechtel final inspection technique.
6. Nonscientific sampling was eliminated (with minor exceptions) as a Bechtel final inspection technique.
7. ASME Code Stamp Authorizations were granted for B&W site installation work.
8. A CPCo Quality Assurance Program Procedure was originated and implemented for processing NRC Bulletins, Circulars, and Information Notices.

RESPONSE TO QUESTION 23, PART (3)[50.54(f)]

9. CPCo Quality Assurance Department Procedures were originated and implemented dealing with turnover, forms, requests for information, and oral communications.
10. "Midterm Inspection" was performed by NRC.
11. LCVIP Inspection of the Bechtel Ann Arbor Office was performed by Region IV.
12. Review and revision of the CPCo Quality Assurance Program Procedures was completed by the Senior Vice President and his staff.
13. The number of CPCo Quality Assurance professional personnel (excluding auditors) overseeing the Bechtel Quality Assurance Program was increased from twenty-three to twenty-six.

RESPONSE TO QUESTION 23, PART (3)[50.54(f)]

4.2 Specifics of Selected Improvements:

4.2.1 Review of Specifications

In September 1977, a review of specifications was initiated by Bechtel Engineering and CPCo Quality Assurance. This review was performed in association with the review of Quality Control Instructions (QCIs) as described in Subsection 4.2.2.

The specifications reviewed were selected specifications for Q-listed equipment and activities. Reviewers (Quality Assurance Engineers, Quality Engineers, and cognizant discipline engineers) were to determine any areas where the specifications lacked clarity, conflicted with other project criteria, or lacked necessary criteria, including dimensions or tolerances.

A total of 50 specifications, as follows, were reviewed by CPCo Quality Assurance, and 23 of these 50 specifications were also reviewed by Bechtel Project Engineering: 5 architectural, 25 civil, 11 mechanical, 1 control systems, and 8 general specifications. At that time, there was a total of 189 Q-listed specifications issued for use on the Midland project.

As a result of this review, specification revisions were made in 12 instances to provide specific tolerances or further clarity, or correction of editorial comment.

A review of those specifications being used for construction and not included in the reviews described above was initiated on May 8, 1979, and was completed by Project Engineering on July 13, 1979, resulting in revision to three specifications.

In addition to the above specification reviews, the Bechtel Chief Engineering Staff, and CPCo QA, performed a dimensional tolerancing review of a portion of the containment spray system from November 2 to December 13, 1977. This was a review to determine if there were any problems associated with tolerancing for specified quantitative parameters (dimensions, pressure, temperature, chemical content, etc). As a result of the dimensional tolerancing review, there were 8 revisions to specifications to provide tolerances or more clarity.

RESPONSE TO QUESTION 23, PART (3)[50.54(f)]

In March 1978, 95 Field Change Requests (FCRs) issued in January 1978 were reviewed to determine whether project personnel were demonstrating a concern for specificity. Eleven FCRs provided positive demonstration of project concern for specificity and improved awareness in this area.

An example of revisions that were made as a result of these specificity reviews is provided by the following comment and response.

Comment: It should be noted here that Specification 7220-C-42 is incomplete in that the tolerances required for fabrication are not included in this specification. Blank spaces have been inserted in the specification where these tolerances are to be inserted at a later date.

Response: The current revision of Specification 7220-C-42 is Revision 2, dated July 21, 1978, "issued for purchase." This revision is now complete and up-to-date.

This review resulted in some project specifications being revised and emphasized the need for specificity to a broad spectrum of project personnel.

The specification changes were processed utilizing the change control system described in the response to Part 2 to ensure consideration of impact on completed work.

RESPONSE TO QUESTION 23, PART (3) [50.54(f)]

4.2.2 Bechtel QC and CPCo QA Review of Quality Control Instructions

From April 1977 to August 1977, a review of all issued Quality Control Instructions (QCIs) was conducted jointly by Bechtel Quality Control (QC) and CPCo Quality Assurance. The purpose of this review was to improve the specificity of the inspection callouts in the QCIs. 52 QCIs were reviewed in their entirety, resulting in all QCIs being revised to incorporate agreed upon changes. As a result of this QCI review, it was considered necessary to revise SF/PSP G-6.1 "Quality Control Inspection Plan". This revision added requirements to provide improved clarity of inspection callouts.

As committed by the April 24, 1979, response to Question 1, Part a, Section D, Page I-18, a further review of the QCIs was completed by Bechtel in June 1979 to identify those QCIs which call for "Surveillances" and which call for supplementary records documentation reviews. As a result of this identification, revisions were initiated: (a) to require the utilization of "Inspection" activity for inspections of record, and to limit the utilization of "Surveillance" for defect prevention activity only and (b) to clarify the "Review" activity of supplementary records. As of October 1979, 7 identified QCIs have been revised to incorporate this criteria, 17 identified QCIs have been reviewed and found acceptable and 26 identified QCIs are in the review stage with completion scheduled for December 1979.

The following additional actions are planned as described in Part (1) Subsection 3.8.

- A. SF/PSP G-6.1, "Quality Control Inspection Plans," will be revised to provide requirements for inspection planning specificity and for the utilization of scientific sampling rather than percentage sampling. This action is scheduled to be completed by January 24, 1980.
- B. QCIs in use will be reviewed to ascertain that provisions have been included consistent with the revised control document. This action and any required revisions are scheduled to be completed by March 8, 1980.
- C. The impact of B (above) on completed work will be evaluated, and appropriate actions will be taken as necessary. This action is scheduled to be completed by May 23, 1980.



RESPONSE TO QUESTION 23, PART (3)[50.54(f)]

4.2.3 CPCo QA Review and Approval of Bechtel QC Administrative Procedures

Since January 1974 CPCo QA has reviewed and approved the administrative procedures in the Bechtel Field Inspection Manual and Quality Control Notices Manual. The controlling documents have varied, but all have been CPCo QA department procedures or Midland Project QA Procedures. This activity is continuing today.

RESPONSE TO QUESTION 23, PART (3)[50.54(f)]

4.2.4 Bechtel Resident Engineers

The Resident Engineering activity, an extension of Project Engineering, was established at the Midland jobsite in 1976 to provide a closer liaison between the Ann Arbor Office Project Engineering and Project Field Engineering; to provide, as needed, interpretations of design specifications and drawings; to expedite disposition of design changes resulting from Field Change Requests, Field Change Notices and Design Change Notices; to provide approvals of construction activities as required by specifications; and to expedite resolution of design and construction problems. These Resident Engineering activities allow for in-situ determinations of the root causes of design and construction interface problems and provide for timely, hands-on solutions which are backed up by Project Engineering reviews.

The Resident Engineering activities are described in Engineering Department Project Instruction (EDPI) 2.14.2, Rev. 5. This EDPI, in addition to prescribing the boundaries of the authority of the Resident Engineers, establishes the channels for control and review of the actions of the Resident Engineers, and the follow-up activities of Ann Arbor Office Project Engineering. All Engineering Department Procedures are applicable to any design functions which may be performed by the Resident Engineers.

As their benefits became apparent and their activities increased, the Resident Engineering Group was increased to the present level of 22 persons, which includes an experienced Assistant Project Engineer. As the nature of activity shifts during the construction phase (e.g., civil work to mechanical to electrical), the mix of disciplines in the Resident Engineering Group has been shifted correspondingly.

The timeliness of Resident Engineering interpretations, responses to Field Change Requests, design changes, dispositions for Nonconformance Reports, and approvals of Field Change Notices reduces the probability of deficiencies in construction. The physical presence and availability of Resident Engineering at the site invites and encourages consultation and discussion

RESPONSE TO QUESTION 23, PART (3)[50.54(f)]

during construction. The Resident Engineers thus serve as the focal point and channel for the exchange of information between Construction and Engineering, thereby improving the level of confidence that SAR and design requirements are met.

It is the intent of the Project Management to continue the supportive and beneficial activities of the Resident Engineers at a level commensurate with the construction activities.

RESPONSE TO QUESTION 23, PART (3)[30.54(f)]

during construction. The Resident Engineers thus serve as the focal point and channel for the exchange of information between Construction and Engineering, thereby improving the level of confidence that SAR and design requirements are met.

It is the intent of the Project Management to continue the supportive and beneficial activities of the Resident Engineers at a level commensurate with the construction activities.

RESPONSE TO QUESTION 23, PART (3) [50.54(f)]

4.2.5 Bechtel Monitoring Activity Improvements

The standard monitoring activity, as described in Quality Assurance Department Procedure C-1, was amended September 15, 1977, to provide a more representative assessment of Quality Assurance Program effectiveness. The amended monitoring procedure was structured to use systematic auditing techniques to assess the conformance of a product to the essential requirements of project documents specifying quality.

The effect of the amended procedure was to increase expanded the number of design office documents (drawings, specifications, calculations, etc) that were to be monitored. It caused additional effort to be applied to completed work, as well as to inprocess work. It required preparation of a list of potential monitoring subjects to be developed from the Quality Assurance Program elements and it required the preparation of checklists which were extracted from the various project procedures and manuals.

The revised monitoring activity has enabled a more thorough assessment of the Quality Assurance Program, and permitted the early identification and correction of potential problems before they could become repetitive. The first year of activity following the amended procedure resulted in the performance of over 300 combined monitoring and project audit activities with 76 findings, as compared to the performance of approximately 100 combined monitoring and project audit activities with 42 findings performed during the previous year.



RESPONSE TO QUESTION 23, PART (3) [50.54(f)]

4.2.6 Quality Assurance Engineering Staffing Levels

The site Bechtel Quality Assurance staffing level was increased from five to eight during 1977 to 1979 to accomodate the increase in the number of aforementioned monitors and to be responsive in resolving CPCo overview findings.

RESPONSE TO QUESTION 23, PART (3) [50.54(f)]

4.2.7 Bechtel Quality Assurance Management Audits

In an effort to better assess the effectiveness of the Quality Assurance Program requirements, the number of Quality Assurance management audits was increased from one to two per year.

RESPONSE TO QUESTION 23, PART (3) [50.54(f)]

4.2.8 Bechtel Quality Trending Activity

The Bechtel quality trending activity, as described in Procedure C-101, was put into effect in July 1976 as a Quality Assurance Program improvement. Trending provides a working tool for Quality Assurance Engineering and its output is used to identify repetitive nonconformances requiring more effective corrective action. Repetitive nonconformances warranting corrective action are processed to the responsible organizations via a Quality Action Request, corrective actions are negotiated, and Quality Assurance follows up to assure the adequacy and timeliness of the actions. Publishing of quality trend data was initiated in July 1976 in the Monthly Project Quality Assurance Activity Report addressed to Bechtel and CPCo key project personnel.

In April 1978, Bechtel Quality Assurance initiated supplementary guidelines for the trending. These guidelines provided criteria for initiating graphic trend charts. Prior to this time, trends were identified and charted based upon the judgement of the reviewer.

The nonconformances for approximately 120 repetitive construction processes or portions thereof, are tracked monthly and issued to CPCo and Bechtel Quality Assurance Management. Since April 1978, 14 Quality Action Requests have been issued.

As a result of a suggestion made during the NRC's Midterm Inspection of the Midland Project in May 1979, a revision is in process to group certain construction activity and nonconformance categories to provide increased sensitivity. The revision was implemented on a trial basis in September 1979. The revised procedure is scheduled to be issued in November 1979.

RESPONSE TO QUESTION 23, PART (3)[50.54(f)]

4.2.9 Bechtel Topical Report, BO-TOP-1A

In November 1976, in order to update the QA Program from that which was committed to in the PSAR, the Bechtel QA Program was revised to incorporate the Bechtel Topical Report, which committed the project to the following ANSI Standards and Regulatory Guides: (Only those marked with an asterisk were a carry over from the PSAR.)

ANSI Standard

Regulatory Guide-Revision Date

\*N45.2-1971

1.28 - June 7, 1972

"Quality Assurance  
Program Requirements  
for Nuclear Facilities"

1.30 - August 11, 1972

N45.2.4-1972

"Installation, Inspection  
and Testing Requirements  
for Instrumentation and  
Electric Equipment During  
the Construction of Nuclear  
Power Generating Stations"

1.37 - March 16, 1973

N45.2.1-1972

"Cleaning of Fluid Systems  
and Associated Components  
During the Construction Phase  
of Nuclear Power Plants"

1.38 - March 16, 1973

N45.2.2-1972

"Packaging, Shipping,  
Receiving, Storage and  
Handling of Items for  
Nuclear Power Plants  
During the Construction  
Phase"

1.39 - March 16, 1973

N45.2.3-1973

"Housekeeping During the  
Construction Phase of  
Nuclear Power Plants"

1.54 - June 1973

N101.4-1972

"Quality Assurance for  
Protective Coatings  
Applied to Nuclear  
Facilities"

RESPONSE TO QUESTION 23, PART (3)[50.54(f)]

N/A

1.55 - June 1973

1.58 - August 1973

N45.2.6-1973

"Qualifications of  
Inspection, Examination  
and Testing Personnel  
for Nuclear Power Plants"

1.64 - Rev. 1, Feb. 1973

N45.2.11-1974

"Quality Assurance  
Requirements for the  
Design of Nuclear Power  
Plants"

1.74 - February 1974

N45.2.10-1973

"Quality Assurance  
Terms and Definitions"

1.88 - August 1974

N45.2.9-1974

"Requirements for Collection,  
Storage and Maintenance of  
Quality Assurance Records  
for Nuclear Power Plants"

1.94 - April 1975

N45.2.5-1974

"Supplementary Quality  
Assurance Requirements  
for Installation, Inspection,  
and Testing of Structural  
Concrete and Structural Steel  
During the Construction Phase  
of Nuclear Power Plants"

N/A

N45.2.8-Draft 3, Rev 4

"Supplementary Quality  
Assurance Requirements  
for Installation, Inspection  
and Testing of Mechanical  
Equipment and Systems for  
the Construction Phase of  
Nuclear Power Plants."

N/A

N45.2.12-Draft 4, Rev 1

"Requirements for Auditing  
of Quality Assurance Programs  
for Nuclear Power Plants"

Revision 4  
11/79



RESPONSE TO QUESTION 23, PART (3)[50.54(f)]

N45.2.13-Draft 3, Rev 3  
"Quality Assurance  
requirements for Control  
of Procurement of Items  
and Services for Nuclear  
Power Plants"

N/A

Examples of implementing procedures that were either originated  
or revised in response to these QA Program improvements  
were:

MED 2.13	"Project Engineering Team Organization Responsibilities"
EDPI 4.55.1	"Project Material Requisitions, Midland Project"
FPG-4.00	"Storage and Storage Maintenance of Equipment and Materials"
FPG-7.000	"Housekeeping and Cleanliness Control During Construction"
PSP-G-7.1	"Documentation, Records and Correspondence Control"

RESPONSE TO QUESTION 23, PART (3)[50.54(f)]

4.2.10 CCo QA Inspection of Stored Materials

As a result of the construction slowdown in 1975, CCo QA began the inspection of stored materials to assure that those materials were not degraded. Items inspected included NSSS components, miscellaneous mechanical and electrical equipment, cadweld materials, tendon sheathing and trumplates, reactor building liner plate, carbon steel and stainless steel pipe, rebar, and structural steel. After resumption of normal work activities, these operations were phased out with the exception of surveillance of NSSS storage which continued until August 1977. Inspection was done in accordance with Midland Project QA Procedure M-2, "Surveillance of Material During Prolonged Storage at the Midland Site." (This procedure no longer exists.)

RESPONSE TO QUESTION 23, PART (3) [50.54(f)]

4.2.11 CPCo Biennial QA Audits

CPCo Biennial Audits were instituted in 1976. Audits were performed of the CPCo Design and Construction Nuclear Quality Assurance Program.

In 1976, the Biennial Quality Assurance Audit included 24 man-days of audit effort. The audit involved 15 man-days of auditing for adequacy and implementation of the CPCo Quality Assurance Program Procedures (QAPPs) at the CPCo General Office in Jackson, Michigan; and 9 man-days of auditing for the adequacy and implementation of the CPCo QAPPs and Bechtel Nuclear Quality Assurance Manual (NQAM) at the Midland Site.

The 1978 Biennial Audit included 70 man-days of audit effort. The audit included: 20 man-days of auditing for adequacy and implementation of the CPCo QAPPs, CPCo QA Department Procedures and the Midland Testing Program Manual Procedures at the CPCo General Office in Jackson, Michigan; 20 man-days of auditing for adequacy and implementation of the Bechtel NQAM, Bechtel Field Procedures and Bechtel Q' Notices Manual at Bechtel in Ann Arbor, Michigan; 5 man-days of auditing for adequacy and implementation of CPCo Department Procedures, including the Midland Management Organization and Service Departments; and 25 man-days of auditing for implementation of these procedures by CPCo, Bechtel, and B&W at the Midland Site.

All 1976 and 1978 Biennial Audit Findings have been closed.

RESPONSE TO QUESTION 23, PART (3)[50.54(f)]

4.2.12 CPCo QA Overview

The CPCo QA overview activities started in April 1976 for rebar and in June 1977 for embeds. For all other civil, mechanical, welding, NDE, electrical, and instrumentation and controls, the overview activities started at the end of June 1978 and was fully implemented by the end of March 1979 for activities then in progress. The overview activities implemented between June 1978 and March 1979 was improved over that which was utilized in 1976 and 1977. The improvement consisted of review of Bechtel drawings, specifications, field procedures, and quality control instruction for specificity, and of CPCo QA's utilization of specific overinspection plans.

CPCo QA performed overinspection of rebar installation in accordance with Midland Project Quality Assurance Procedure M-8, "Inspection of Rebar Placement." From its inception thru December 1978, this overinspection was performed on a 100% basis for Q-listed concrete placements and, thereafter, on less than a 100% basis. Based on CPCo QA records of Bechtel's inspection results and the simplicity of the remaining concrete pours, there was sufficient confidence that 100% overinspection was no longer necessary.

CPCo QA performed overinspection of embed installation in Q-listed concrete placements in accordance with Midland Project Quality Assurance Procedure M-12, "Inspection of Embedded Items." From its inception through September 1978, this overinspection was performed on a 100% basis. Based on CPCo QA records of Bechtel's inspection results, there was sufficient confidence to warrant the discontinuance of the overinspection at that time.

With regard to mechanical activities, from November 1978 to October 19, 1979, Bechtel completed 1,382 Quality Control inspections, whereas in the same time period CPCo QA performed 57 overinspections. Bechtel inspection in the mechanical area was well underway when the CPCo QA overview activity was started; therefore, there was little opportunity for a corresponding CPCo QA overinspection. Thus, there is not a direct correlation between the 1,382 inspections completed by Bechtel from November 1978 to date and the 57 CPCo QA overinspections

RESPONSE TO QUESTION 23, PART (3)[50.54(f)]

performed during the same period. Furthermore, the most significant aspects of the mechanical work are the hydrostatic and pneumatic tests. Since October 1977, all of the hydrostatic and pneumatic tests have been witnessed by QA-PE&C. The majority of this effort is not reflected in the CPCo QA overinspection figure of 57 because CPCo Quality Assurance's overinspection of hydrostatic and pneumatic tests are accomplished as a witness point in the Bechtel procedures.

With regard to welding, from November 1978 to date, Bechtel completed 5,253 inspections, whereas in the same period CPCo QA performed 56 overinspections. The preceding discussion regarding the correlation between Bechtel inspection and CPCo overinspection equally applies to the welding area. Furthermore, for all of Class 1 and Class 2 component and piping welds, radiographic examination is required with minor exceptions and the CPCo QA review of the radiographs has been extensive as indicated below.

From June 1978 to the present, Bechtel originated 4951 field radiographs and CPCo QA has reviewed 902. For the same period, B&W originated 304 primary system field radiographs and CPCo QA has reviewed 100%. CPCo QA will continue to review 100% of B&W's field radiographs. At present, 1,045 B&W nonprimary system radiographs were made and 670 reviewed. For all other vendors, over 1,560 vendor radiographs received since December 1978 have been reviewed by CPCo QA.

The electrical area can be further categorized as indicated in the following paragraphs.

For cable tray supports, Bechtel has completed approximately 200 inspections, whereas CPCo QA has performed 13 overinspections.

For cable tray installations, Bechtel has completed approximately 200 inspections, whereas CPCo QA has performed 26 overinspections.

For conduit, junction boxes, and their supports, Bechtel has completed approximately 500 inspections, whereas CPCo QA has performed 26 overinspections.



RESPONSE TO QUESTION 23, PART (3) [50.54(f)]

For electrical penetration assemblies, Bechtel has completed 5 inspections, whereas CPCo QA has performed 1 overinspection.

For the pulling of power cables, control cables, and instrumentation cables, Bechtel has completed approximately 200 inspections, whereas CPCo QA has performed 114 corresponding overinspections (including 20 overinspections which were accomplished as part of audits). Of the 114 CPCo QA cable pulling overinspections, 14 were for instrumentation cables.

For cable terminations, Bechtel has completed approximately 200 inspections, whereas CPCo QA has performed 153 corresponding overinspections.

The higher CPCo QA emphasis on cable pulling in comparison to cable termination is attributable to the recognition that the cables essentially become inaccessible after the pulling, whereas the cable terminations are accessible and any defects are more detectable during checkout and preoperational testing.

For equipment installation, Bechtel has completed approximately 24 inspections, whereas CPCo QA has performed 24 overinspections.

For the electrical aspects of I&C, Bechtel has not completed any inspections. Nevertheless, CPCo QA has performed 14 overinspections (the same 14 cable pulling overinspections mentioned above) and 5 instrument overinspections (motor-operated valves that are already included in the 24 overinspections for electrical equipment installation mentioned above). For the mechanical aspects of I&C, the figures are included in the mechanical overinspection figures.

RESPONSE TO QUESTION 23, PART (3) [50.54(f)]

SECTION 5.0, ACTION ITEM FOLLOW-UP

In this table, the action items which provide programmatic and generic corrective actions are arrayed chronologically by scheduled completion dates.

The following abbreviations are used in the table:

NA - Not Applicable  
PE - Project Engineering  
FE - Field Engineering  
QC - Quality Control  
QA - Quality Assurance  
GT - Geotechnical Service

ACTION ITEM:

PROGRAMMATIC AND GENERIC CORRECTIVE ACTIONS  
COMMITTED TO IN THE RESPONSE TO QUESTION 1, PART (a)  
AND IN THE RESPONSE TO QUESTION 23, PARTS (1) AND (2)

<u>Action Item Number</u>	<u>Action Item Description and Reference</u>	<u>Responsible Organization</u>	<u>Scheduled Completion Date</u>	<u>Actual Completion Date</u>
1	<p>Consultant reports other than Dames &amp; Moore were considered in accordance with the guidelines provided in NRC Regulatory Guide 1.70, Revision 2. Consultant reports were not attached to the FSAR, but portions of consultant reports were extracted and incorporated into the FSAR text itself. Those portions incorporated into the FSAR become commitments. Therefore, disposition of recommendations in consulting reports has been adequately accounted for in the preparation of the FSAR.</p> <p>Verification that those portions of consultant reports determined to be commitments and incorporated into the FSAR have been adequately reflected in project design documents is being accomplished via the FSAR rereview program described in the response to Question 23, Part (2).</p> <p>The two Bechtel QA audit findings reported in our April 24, 1979, response (Paragraph D.1, Page I-8) have been closed out. The results of this audit are being utilized in the FSAR control system study committed to in Subsection 3.3 of this response to Part (1).</p> <p>(Question 1, Appendix I, Section D.1, Page I-8 Question 23, Subsection 3.1, Page 7)</p>	PE	-	Complete

23-76

Revision 4  
11/79

Action Item Number	Action Item Description and Reference	Responsible Organization	Scheduled Completion Date	Actual Completion Date
2	On April 3, 1979, Midland Project Engineering Group Supervisors in all disciplines were reinstructed that the only procedurally correct methods of implementing specification changes are through the use of specification revisions or Specification Change Notices. This was followed by an interoffice memorandum from the Project Engineer to all Engineering Group Supervisors on April 12, 1979.  (Question 23, Subsection 3.2, Page 8; and Subsection 3.9, Page 24)	PE	-	Complete
3	Engineering Department Project Instruction 4.49.1 was revised in Revision 2 to state, "Under no circumstances will interoffice memoranda, memoranda, telexes, TWXs, etc be used to change the requirements of a specification."  (Question 23, Subsection 3.2, Page 9, and Subsection 3.9, Page 24)	PE	-	Complete

23-77

Revision 4  
11/79

Action Item Number	Action Item Description and Reference	Responsible Organization	Scheduled Completion Date	Actual Completion Date
4	A review of interoffice memoranda, memoranda, telexes, TWXs, and other correspondence relating to specifications for construction and selected procurements of Q-listed items will be initiated.  The purpose of the review will be to identify any clarifications which might reasonably have been interpreted as modifying a specification requirement and for which the specification itself was not formally changed. An evaluation will be made to determine the effect on the technical acceptability, safety implications of the potential specification modification, and any work that has been or may be affected. If it is determined that the interpretation may have affected any completed work or future work, a formal change will be issued and remedial action necessary for product quality will be taken in accordance with approved procedures.  The foregoing procedure will be followed for all specifications applying to construction of Q-Listed items.  For specifications concerning the procurement of Q-Listed items, the foregoing procedure will be implemented on a random sampling basis. The sample size has been established and the specification selected has been made.	PE	-	Complete
(21)	Review and acceptance criteria for the specifications will be defined by November 30, 1979.	PE	11/30/79	
(47)	The review of construction and selected procurement specifications is scheduled to be completed by October 1980.	PE	10/80	

23-78

Revision 4  
11/79



Action Item Number	Action Item Description and Reference	Responsible Organization	Scheduled Completion Date	Actual Completion Date
4 (con't)	If the acceptance criteria are not met, the review will be expanded to include other specifications for Q-listed items. At that time, a revised completion date will be established.  (Question 23, Subsection 3.2, Page 9, and Subsection 3.9, Page 25)	PE	-	Complete
5	A study was completed which examined current current procedures and practices for the preparation and control of the FSAR in view of these experiences. Procedural changes will be initiated by the revision of or addition to the Engineering Department Procedures. This action is scheduled to be completed by January 31, 1980.  (Question 23, Subsection 3.3, Page 11)	CT	-	Complete
6	An interoffice memorandum dated April 12, 1979, was issued by Geotechnical Services to alert personnel of the need to revise or annotate calculations to reflect current design status.  (Question 23, Subsection 3.4, Page 13)	FE	-	Complete
7	Field Instruction FIC 1.100, "Q-Listed Soils Placement Job Responsibilities Matrix," has been prepared and establishes responsibilities for performing soils placement and compaction.  (Question 23, Subsection 3.6, Page 18; Subsection 3.7, Page 20; and Subsection 3.11, Page 30)			

23-79

Revision 4  
11/79

Action Item Number	Action Item Description and Reference	Responsible Organization	Scheduled Completion Date	Actual Completion Date
8	Construction specifications, instructions, and procedures were reviewed to identify any other equipment requiring qualification which had not yet been qualified. No such equipment was identified.  (Question 1, Appendix I, Section D.2.e, Page I-8 Question 23, Subsection 3.6, Page 18)	FE	-	Complete
9	A dimensional tolerance study was completed using the reactor building spray pump and ancillary system as the study mechanism.  (Question 1, Appendix I, Section D.2.b, Page I-8)	PE	-	Complete
10	Engineering reviewed specifications not previously reviewed for the specificity or tolerance studies  (Question 1, Appendix I, Section D.2.c, Page I-8)	PE	-	Complete
11	A specific review of the FSAR and specification requirements for the qualification of electrical and mechanical components has been made as part of the corrective action relating to CPCo's 50.55(e) report on component qualification.  (Question 1, Appendix, I, Section D.2.e, Page I-8)	PE	-	Complete
12	Quality Assurance will schedule yearly audits of the design calculational process for techniques and actual analysis, in each of the design disciplines.  (Question 1, Appendix I, Section D.4, Page I-8)	QA	-	Complete

23-80

Revision 4  
11/79

Action Item Number	Action Item Description and Reference	Responsible Organization	Scheduled Completion Date	Actual Completion Date
13	Audits of ITT Grinnell hanger design and CPCo relay setting calculation have been conducted.  (Question 1, Appendix I, Section D.4, Page I-8)	QA	-	Complete
14	Bechtel Project Engineering will review design drawings for cases where ducts penetrate vertically through foundations. The possibility of the duct being enlarged over the design requirements and the effect this enlargement may have upon the structure's behavior will be evaluated by June 1, 1979. Proper remedial measures will be taken if the investigation shows potential problems.  (Question 1, Appendix I, Section C.5.b, Page I-7)	PE	-	Complete
15	An in-depth audit of U.S. Testing operations, covering testing and implementation of their QA program will be conducted in late April or early May 1979, by Bechtel Project QA and Engineering.  (Question 1, Appendix I, Section C.4.b, Page I-18; and Section D.3.c, Page I-18)	QA	-	Complete
16	An in-depth training session will be given to Midland QA Engineers covering the settlement problem and methods to identify similar conditions in the future.  (Question 1, Appendix I, Section D.1.b, Page I-22)	QA	-	Complete

23-81

Revision 4  
11/79

Action Item Number	Action Item Description a. Reference	Responsible Organization	Scheduled Completion Date	Actual Completion Date
17	An in-depth training session will be given to all CPCo and Bechtel QA Engineers and Auditors to increase their awareness of the settlement problem and discuss auditing and monitoring techniques to increase audit effectiveness.  (Question 1, Appendix I, Section D.2, Page I-22)	QA	-	Complete
18	An in-depth review of the Bechtel trend program data will be undertaken by Bechtel QA management to assure the identification of any other similar areas that were not analyzed in sufficient depth in the past reviews.  (Question 1, Appendix I, Section D.1.a, Page I-22)	QA	-	Complete
19	Quality Control Instructions will be evaluated to ensure that the documentation characteristics which are to be inspected (i.e., review callouts) are clearly specified.  (Question 1, Appendix I, Section D.3.a, Page I-18)	QC	-	Complete
20	Field Instruction 1.100 will be supplemented by establishing requirements for demonstrating equipment capability, including responsibility for equipment approval, and providing records identifying this capability.  (Question 23, Subsection 3.6, Page 18)	FE	11/15/79	
21	See Action Item Number 4	PE	11/30/79	

23-82

Revision 4  
11/79

Action Item Number	Action Item Description and Reference	Responsible Organization	Scheduled Completion Date	Actual Completion Date
22	Guidelines for surveillance of testing operations will be developed and included in Field Instructions for the onsite Soils Engineer. Engineering/Geotechnical Services will develop the guidelines by November 30, 1979.  (Question 23, Subsection 3.10, Page 27)	PE/GT	11/30/79	
23	Engineering will revise Engineering Department Procedure 4.22 by December 1, 1979, to clarify that Engineering personnel preparing the FSAR will follow the requirements of Regulatory Guide 1.70, Revision 2, "Standard Format and Content of Safety Analysis Reports for Nuclear Power Plants" (September 1975). Specifically, Regulatory Guide 1.70 (Pages iv and v of the Introduction) requires that such consultant reports only be referenced with the applicable commitments and supporting information included in the text (third paragraph, Page v). Such a requirement would preclude repetition of this circumstance.  (Question 23, Subsection 3.1, Page 7)	PE	12/1/79	
24	To preclude any future inconsistencies between the FSAR and specifications, Engineering Department Project Instruction 4.1.1 will be revised to state that all specification changes, rather than just "major changes," will be reviewed for consistency with the FSAR.  (Question 23, Subsection 3.3, Page 11)	PE	12/1/79	



Action Item Number	Action Item Description and Reference	Responsible Organization	Scheduled Completion Date	Actual Completion Date
25	Quality Assurance will issue a Nuclear Quality Assurance Manual amendment to clarify the requirement that procedures include measures for qualifying equipment number specified conditions.  (Question 23, Subsection 3.6, Page 18)	QA	12/14/79	
26	In view of Action Item 6, Geotechnical Services will revise Procedure FP-6437 by December 31, 1979, to require that calculations be annotated to reflect current design status.  (Question 23, Subsection 3.4, Page 13)	GT	12/31/79	
27	Engineering Department Procedure 4.37 will also be revised by December 31, 1979, to require that calculations be annotated to reflect current design status.  (Question 23, Subsection 3.4, Page 13)	PE	12/31/79	
28	Civil/Structural Design Criteria 7220-C-501 will be modified to contain the requirements that a duct bank penetration shall be designed to eliminate the possibility of the nonspecific size duct interacting with the structures.  (Question 23, Subsection 3.5, Page 15)	PE	12/31/79	
29	The civil standard detail drawings will be revised to include a detail showing horizontal and vertical clearance requirements for duct bank penetrations. The detail will address any mud mat restrictions.  (Question 23, Subsection 3.5, Page 15)	PE	12/31/79	

23-84

Revision 4  
11/79

Action Item Number	Action Item Description and Reference	Responsible Organization	Scheduled Completion Date	Actual Completion Date
30 (39)	Engineering and Construction will revise or prepare procedures governing the placement and compaction of soils and implementing the requirements of the Nuclear Quality Assurance Manual as stated in Action Item 25  (Question 23, Subsection 3.6, Page 18)	PE	12/31/79	
31	Design documents, instructions, and procedures for those activities requiring inprocess controls will be reviewed to assess the adequacy of existing procedural controls and technical direction. Engineering review is scheduled for completion by December 31, 1979.  (Question 1, Appendix I, Section D.2, Page I-11; and Question 23, Subsection 3.7, Page 20; and Subsection 3.11, Page 30)	PE	12/31/79	
32	Guidelines for surveillance of testing operations will be developed and included in Field Instructions for the onsite Soils Engineer. Engineering/Geotechnical Services will develop the guidelines by November 30, 1979, and Field Engineering will prepare the instructions by December 31, 1979.  (Question 23, Subsection 3.10, Page 27)	PE	12/31/79	
33	The Quality Assurance audit and monitoring program will be revised to emphasize and increase attention to the need for evaluating policy and procedural adequacy and assessment of product quality. A specialized audit training program will be developed and implemented to ensure guidance for this revised approach.  (Question 23, Subsection 3.13, Page 35)	QA	12/31/79	

23-85

Revision 4  
11/79

Action Item Number	Action Item Description and Reference	Responsible Organization	Scheduled Completion Date	Actual Completion Date
34	Control Document SF/PSP G-6.1 will be revised to provide requirements for inspection planning specificity and for the utilization of scientific sampling rather than percentage sampling.  (Question 1, Appendix I, Section D.5.f, Page I-20; and Question 23, Subsection 3.8, Page 22; and Subsection 3.9, Page 24)	QC	1/24/80	
35	Control documents:			
	SF/PSP G-3.2, "Control of Nonconforming Items"	QC	1/24/80	
36	QADP C-101, "Project Quality Assurance Trend Analysis  are in the process of being revised to provide an improved definition of implementing requirements for identifying repetitive nonconforming conditions.  (Question 23, Subsection 3.12, Page 33)	QA	1/24/80	
37	Consistent with the intent of Action Item Numbers 35 and 36, Quality Assurance will review nonconformance reports which are open, or will become open between this time and January 23, 1980. This review will be to identify any repetitive nonconforming conditions pertaining to product type or activity, or pertaining to nonconformance cause.  (Question 23, Subsection 3.12, Page 33)	QA	1/24/80	

23-86

Revision 4  
11/79

Action Item Number	Action Item Description and Reference	Responsible Organization	Scheduled Completion Date	Actual Completion Date
38	A study was completed by October 31, 1979, to examine current procedures and practices for the preparation and control of the FSAR in view of these experiences. Procedural changes will be initiated by the revision of or addition to the Engineering Department Procedures.  (Question 23, Subsection 3.3, Page 11)	PE	1/31/80	
39 (30)	Engineering and Construction will revise or prepare procedures governing the placement and compaction of soils and implementing the requirements of the Nuclear Quality Assurance Manual as stated in Action Item 25.  (Question 23, Subsection 3.6, Page 18)	FE	1/31/80	
40 (31)	Design documents, instructions, and procedures for those activities requiring inprocess controls will be reviewed to assess the adequacy of existing procedural controls and technical direction. Engineering review is scheduled for completion by December 31, 1979, and Field Engineering and Quality Control review is scheduled for completion by January 31, 1980.  (Question 1, Appendix I, Section D.2, Page I-11; Question 23, Subsection 3.7, Page 20, and Subsection 3.11, Page 30)	FE & QC	1/31/80	

23-87

Revision 4  
11/79

Action Item Number	Action Item Description and Reference	Responsible Organization	Scheduled Completion Date	Actual Completion Date
41	QCIs in use will be reviewed to ascertain that provisions have been included consistent with the revised control document, SF/PSP G-6. "Quality Control Inspection Plans."  (Question 1, Appendix I, Section D.1, Page I-18; Question 23, Subsection 3.8, Page 22; and Subsection 3.9, Page 24)	QC	3/8/80	
42	Design documents, instructions, and procedures for those activities requiring inprocess controls will be reviewed to assess the adequacy of existing procedural controls and technical direction. Engineering review is scheduled for completion by December 31, 1979, and Field Engineering and Quality Control review is scheduled for completion by January 31, 1980. Any revisions required will be completed by March 14, 1980.  (Question 1, Appendix I, Section D.2, Page I-11; Question 23, Subsection 3.7, Page 20; and Subsection 3.11, Page 30)			
(31)				
(40)		PE, FE & QC	3/14/80	
43	The impact of Action Item 41 on completed work will be evaluated, and appropriate actions will be taken as necessary.  (Question 23, Subsection 3.8, Page 22; and Subsection 3.9, Page 25)	QC	5/23/80	
44	FSAR sections are being rereviewed as discussed in the Response to Question 23, Part (2).  (Question 23, Subsection 3.1, Page 7; and Subsection 3.3, Page 11)	PE	7/80	

23-88

Revision 4  
11/79



Action Item Number	Action Item Description and Reference	Responsible Organization	Scheduled Completion Date	Actual Completion Date
45	U.S. Testing will be required to demonstrate to the cognizant Engineering Representative that testing procedures, equipment, and personnel used for quality verification testing (for other than NDE and soils) were, and are, capable of providing accurate test results in accordance with the requirements of applicable design documents.  (Question 1, Appendix 1, Section D.3.b, Page I-18; Question 23, Subsection 3.10, Page 27; and Subsection 3.11, Page 31)	PE	10/1/80	
46	A sampling of U.S. Testing's test reports (for other than NDE and soils) will be reviewed by the cognizant Engineering Representative to ascertain that results evidence conformance to testing requirements and design document limits.  (Question 23, Subsection 3.10, Page 28; and Subsection 3.11, Page 31)	PE	10/1/80	
47	See Action Item Number 4	PE	10/80	
48	CPCo will implement overinspection for soils placement, utilizing a specific overinspection plan.  (Question 1, Appendix 1, Section C.2.b, Page I-11; and Section C.1.c, Page I-16)	CPCo-QA	-	Complete
49	CPCo will perform overinspection of the U.S. Testing soils testing activities and reports, utilizing a specific overinspection plan.  (Question 1, Appendix 1, Section C.3.c, Page I-17)	CPCo-QA	NA	NA

23-89

Revision 4  
11/79

Action Item Number	Action Item Description and Reference	Responsible Organization	Scheduled Completion Date	Actual Completion Date
50	CPCo Project Management and QA review field procedures (new and revised) and CPCo QA reviews QCIs (new and revised) in line with Bechtel before release.  (Question 1, Appendix I, Section D.5.b, Page I-19)	QC	NA	NA
51	In 1978, CPCo implemented an overinspection plan to independently verify the adequacy of construction and the Bechtel inspection process, with the exception of civil activities. Reinforcing steel and embeds were covered in the overinspection.  (Question 1, Appendix I, Section D.5.c, Page I-19)	CPCo-QA	NA	NA
52	CPCo reviews onsite subcontractor QA manuals and covers their work in the audit process.  (Question 1, Appendix I, Section D.5.d, Page I-19)	CPCo-QA	NA	NA
53	An ongoing effort is improving the "surveillance" mode called for in the QCIs by causing more specific accountability as to what characteristics are inspected on what specific hardware and in some cases changing "surveillance" to "inspection."  (Question 1, Appendix I, Section D.5.e, Page I-19)	QC	NA	NA

RESPONSE TO QUESTION 23, PART (4)

Revision 4  
11/79

RESPONSE TO QUESTION 23, PART (4) [50.54(f)]

SECTION 1.0, NRC QUESTION

SUPPLEMENTAL REQUEST FOR ADDITIONAL SOILS SETTLEMENT INFORMATION

23. We have reviewed your response to question 1 of our March 21, 1979 letter, "10 CFR 50.54 Request Regarding Plant Fill," including related amendments or supplements in your letters dated May 31, July 9, and August 10, 1979. We find that the information provided is not sufficient for completion of our review. Accordingly, provide the following additional information:
- (4) Considering the results of your investigation requested in our question 1c, question 1d asked that you describe your position as to the overall effectiveness of the QA program for the Midland Plant. Your overall assessment of the effectiveness of your program should be based on your revised response to our question 1c (see above question 23(3)). The results of this assessment, including a description of the scope and extent of the assessment effort and the identification and qualifications of the individuals involved in this assessment, should be reported to us.

RESPONSE TO QUESTION 23, PART 4 [50.54(f)]

SECTION 2.0 ASSESSMENT

In providing our assessment of the effectiveness of the Quality Assurance Program, first it should be noted that:

- a. There are significant differences between soils work and other work;
- b. From the outset of the project, a Quality Assurance Program has been implemented which meets regulatory requirements and national standards;
- c. The Quality Assurance Program has been improved significantly from its initial implementation;
- d. Appropriate programmatic and generic corrective actions have been or are being taken as a result of this investigation;
- e. The Quality Assurance Program has been subjected to frequent and extensive external evaluations and our responses to the findings from these evaluations have been timely and adequate; and
- f. The diesel generator building settlement was detected, at the outset of the settlement, by the Quality Assurance Program.

Based on the major points listed above (and on a number of lesser points which are not enumerated here), we are confident that the Quality Assurance Program has been and will continue to be effective.

From its complexity and extensiveness, the reader may recognize that literally thousands of hours went into the preparation of the investigative response and assessment.

The following organizations and their managers participated extensively in this investigation: Bechtel Quality Assurance, Quality Control, Project Management, Project Engineering, Engineering, and Construction; CPCo Quality Assurance, Project Management, and Project Engineering Services; and U.S. Testing Quality Assurance. In addition, there was extensive personal participation by the appropriate officers of each company.



1 assurance program via the 50.54(f) questions that  
2 are currently being reviewed.

3 Q Now, are the 50.54(f) questions with  
4 regard to QA reviewed by NRR, the answers?

5 A They will be reviewed by both NRR, as well  
6 as IE.

7 Q And is there any interfacing between NRR  
8 and IE with regard to the review of the 50.54(f)  
9 responses?

10 A Yes. We will report to them what our  
11 findings are when we review the particular questions  
12 regarding quality assurance, and they would inform  
13 us of their findings of their review as well.

14 Q Has IE performed any review to date of the  
15 responses to questions 1 and 23 of the 50.54(f)  
16 questions?

17 A Not that I am aware of.

18 Q Has anyone at NRR, to your knowledge,  
19 performed any review of the responses to questions  
20 1 and 23 of the 50.54(f) questions?

21 A I believe they are currently being  
22 reviewed by the quality assurance branch.

23 Q Who in the quality assurance branch of NRR  
24 is conducting that review, to your knowledge?

1 Q The second, corrective actions have not been  
2 sufficiently described so that one would have confidence  
3 that we would not have poor performance related to the soils  
4 area. Is that correct?

5 A Correct, and also other areas.

6 Q And finally the description was not provided with  
7 respect to the significance of stated corrective actions  
8 and how it will improve the quality of construction work at  
9 Midland. Is that correct?

10 A Yes.

11 Q All right.

12 You then went on to state you had a meeting and  
13 an inspection at Ann Arbor. If I might just use a collo-  
14 quialism, you then had a somewhat warmer feeling about the  
15 response or the substance of the quality assurance effort  
16 at Midland. Is that correct?

17 A That's correct. I'd go so far as to say that I  
18 would find it acceptable if the right information was pro-  
19 vided in Question 23. I see the implementation there, the  
20 organizational elements, and it just hasn't been properly  
21 reflected and described in the response.

22 Q Now you're scheduled to have or to receive further

1 questions and have them come in with responses. I thought  
2 it wise to express my-- There was also my review at Ann Arbor,  
3 and if they saw fit they could update this packet accordingly.

4 I said if they wanted to come in and talk it over  
5 with me, draft responses, I will go over in detail, spend  
6 time with them to update this. I think the latter is more  
7 prudent.

8 Q Okay.

9 A So I haven't detailed a series of questions.  
10 It's at this stage right now.

11 Q I see.

12 Can you tell us approximately how long ago you  
13 created these portions of Gilray Deposition Exhibit 1 that--  
14 I guess they start five pages from the back of the exhibit  
15 and the heading is "Question 23, Part 3."

16 A August and September of 1980.

17 Q All right, sir.

18 I'd like to call your attention to that page that  
19 starts with "Question 23, Part 3" under Section 2-A, the  
20 recognition of the differences between soils and other work,  
21 and then under there it says:

22 "Action: Write letters requesting A1

5 1 Heller and R. Lipinski to comment on whether suffi-  
2 cient differences exist between soils and other  
3 work."

4 A Right.

5 Q Do you know whether Mr. Lipinski is still a re-  
6 viewer for Midland?

7 A No. No. These are notes to me.

8 Q I understand that.

9 Did you ever write those letters?

10 A No, I didn't.

11 Q Did you satisfy yourself other than by writing  
12 the letters, one way or the other, with respect to the  
13 differentiation between soils and the other work?

14 A No.

15 Q So that is still an open item as far as you are  
16 concerned? Is that right?

17 A Right.

18 I have gotten verbal indicators from the technical  
19 people that indeed there is sufficient unique features to  
20 soils work that -- state of the art, for instance, that make  
21 that response valid.

22 Q All right, sir.

1 I take it that these handwritten notes were pre-  
2 pared by you prior to the time you had your Ann Arbor meeting.

3 A Yes, I suppose so. It must be.

4 Q And just so we don't have to go through this long  
5 Gilray Deposition Exhibit 3, am I correct that the portions  
6 of Gilray Exhibit Number 1 that we've been looking at are  
7 in effect your review of the responses to Question 23 and  
8 your comments on them?

9 A Right.

10 Q And in fact these are really a synthesis of your  
11 handwritten notes on Gilray Deposition Exhibit 3. Is that  
12 correct?

13 A Yes.

14 That doesn't box me in. I hope to maybe generate  
15 additional concerns. I think my review is essentially 90-  
16 some percent complete but, you know,....

17 Q What further review effort do you anticipate?

18 MR. PATON: Let me say to the witness your answers  
19 are as of today. If you develop information tomorrow that's  
20 something else.

21 THE WITNESS: My review consists of this: If  
22 Midland is going to meet with me, like on the 13th I guess of



1 March, then I'll go through this again to sharpen my pencil  
2 and make sure that indeed I have done the job right.

3 MR. MILLER: Okay.

4 BY MR. MILLER:

5 Q Do you recall how much time you spent going through  
6 that answer to Question 23 at the times that you reviewed it  
7 prior to today?

8 A A couple of weeks.

9 Q And did you have before you any of the ANSI  
10 standards or Reg. Guides to compare the answers against?

11 A I have them on my desk. But there is no need to  
12 compare these against the ANSI standards or Reg. Guides. It  
13 doesn't fit.

14 Q Why? Because the questions asked or information  
15 really go beyond the requirements of the ANSI standards?

16 A No. The ANSI standards or Reg. Guides are essen-  
17 tially commitments by the utility to me, and in preparing  
18 this they don't have to follow any guidelines that are con-  
19 tained in those ANSI standards, and there's no criteria that...

20 I don't know if I'm saying that right. There are  
21 no descriptions that I would have to match against the ANSI  
22 standards.

3/6/79  
11

Midland - meeting <sup>of 3/5/79</sup> summary from Koppeler 3/6

CP says the only problem is the Dr Bldg since it is the only one which evidenced settlement

the other 7 or 8 except for the aux bldg etc have most all of their load on them.

Question of shutdown or discontinuing further const., licensee wants another meeting to demonstrate why the mat'l under the other structures should behave differently and also be proper. No RLL commitments

RLL still feels there is a problem and no long term activities should continue & we should issue a show cause order without an immediate show-cause

One of the 3 important tables had an error; ~~omissions~~ in SAR were revealed

Spencer dep. E 14  
1.19.81 c/33



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

JUN 13 1979

Docket 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 RIII 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 X005 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

*dup of  
7908070022*

COMMENTS ON MIDLAND ENFORCEMENT PACKAGE TRANSMITTED TO THORNBURG  
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 RIII 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.

see Item 3  
pg I-4 in  
SOS 27 June 79

see pg I-4  
conclusion  
SOS 27 June 79

see pg I-4  
conclusion  
SOS 27 June 79

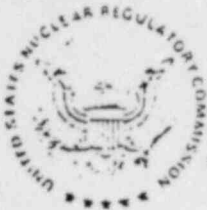
see pg I-4  
conclusion  
SOS 27 June 79

JUN 13 1979

cc w/enclosure:  
J. G. Keppler, RII  
D. W. Hayes, RIII  
T. W. Brockett, X00S  
G. W. Reinmuth, RCI  
R. E. Shewmaker, RCI

JUN 18 1979





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

April 3, 1979

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

FROM: James G. Keppler, Director

SUBJECT: ENFORCEMENT ACTION RE: MIDLAND DIESEL GENERATOR  
BUILDING AND PLANT FILL AREA

As you are aware, we have sent to Consumers Power Company a report on our two meetings held with them and a report of the investigation into the causes of the diesel generator building settlement. In my memorandum to you dated March 12, 1979, I summarized our findings and our concerns resulting from this investigation.

In view of NRR's involvement in the technical issues in this case, and the need for a determination as to the materiality of FSAR 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 memorandum are the specific FSAR statements and the basis for our conclusion that they are false. Also attached are copies of our letter dated March 22, 1979, which transmitted the Investigation report to the licensee and a draft Notice of Violation setting forth the items of noncompliance based on the investigation findings. The draft Notice of Violation includes all of the FSAR discrepancies described in Attachment 1 as examples of noncompliance with Criterion III of 10 CFR 50, Appendix B. If it is determined that any of these matters constitute material false statements, we assume they would then be treated separately, and removed as examples of noncompliance with this criteria.

dup of  
8106090700

Harold D. Thornburg

- 2 -

April 3, 1979

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

*James G. Keppler*  
James G. Keppler  
Director

Attachments:

1. FSAR False Statements
2. Draft Notice of Violation
3. Ltr dtd 2/22/79, with  
Investigation Report

cc w/attachments:  
D. Thompson, IE

Midland FSAR Statements

1. Statement

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

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

<u>"Function</u>	<u>Zone (1)</u> <u>Designation</u>	<u>Soil</u> <u>Type</u>	<u>Compaction Criteria</u>	
			<u>Degree</u>	<u>ASTM Designation</u>
Support of structures		Clay	95%	ASTM D 1557-66 <sup>(2)</sup> (modified)

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

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

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

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

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

Finding

Construction Drawing C-45, Class I fill material areas, specifies the foundation material for Class I structures to be Zone 2 material which is identified in FSAR 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 2.5.4.10.3.1, Plant Layout and Loads, states: "The building loads superimposed by the structures on undisturbed soil or compacted fill are given in the soil pressure plan, Figure 2.5-47."

Figure 2.5-47, Soil Pressure Diagram Category I and II Structures, shows the superimposed load density for the Diesel Generator Building to be 4.0 KSF (4000 lbs. per sq. ft.).

Finding

It was ascertained through a review of the settlement calculations and an interview of the individual who performed those calculations that 3.0 KSF was used.

3. Statement

Section 2.5.4.10.3.3, 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:

<u>Layer</u>	<u>Idealized Soil Type</u>	<u>Elevation Interval (ft)</u>	<u>Thickness (ft)</u>	<u>Average <math>C_c \cdot r^{(1)}</math> <math>1+e_o</math></u>
A	Fill (CL)	634-609	25	0.003
B	Fill (CL)	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 statement 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 603-634.

4. Statement

Section 2.5.4.10.3.5, 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 relationship, the estimated total settlements at each of the 41 points were obtained respectively by adding 25% 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 3.8.4.1.2, Diesel Generator Building, states: "The walls are supported by continuous footings with bases at elevation 628'-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.

5. Statement

Section 3.8.5.5, Structural Acceptance Criteria, states: "Settlements of shallow spread footings founded on compacted fills are estimated to be on the order of 1/2 inch or less. These settlements are essentially elastic and occur as the loads are applied."



Finding

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

(NOTE: In this regard the licensee has subsequently stated this statement ". . . is not applicable to the as-built configurations and conditions of the diesel generator building and has been eliminated from the FSAR in Revision 18.")

Appendix A

NOTICE OF VIOLATION

Consumers Power  
Company

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

Based on the results of an NRC investigation conducted on December 11-13, 18-20, 1978, and January 4-5, 9-11, 22-25, 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 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."

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 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-45 (Class I fill material areas) specifies the foundation material for Class I structures to be Zone 2 material, defined as any material free of humus, organic or other deleterious material with no restrictions or gradation while FSAR Tables 2.5-9 and 2.5-14 indicate the foundation material for support of Class I structures to be controlled compacted cohesive (clay) material.

- b. The FSAR is internally inconsistent in that FSAR Figure 2.5-48 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.
- c. The design settlement calculations for the diesel generator and borated water storage tanks were performed on the assumption of uniform mat foundations while these foundations were designed and constructed as spread footing foundations.
- d. The settlement calculations for the Diesel Generator Building indicate a load intensity of 3000 PSF while the FSAR, Figure 2.5-47, 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 634 of 0.001. These settlement

values were shown in FSAR Figure 2.5-48. However, FSAR, Table 2.3-16, indicates an index of compressibility of the same plant fill to be 0.003.

- f. PSAR, Amendment 3, indicated 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.
  - g. PSAR Amendment 3 indicates that cohesionless soil (sand) would be compacted to 85% relative density according to ASTM D-2049. However, Bechtel specification C-210, Section 13.7.2 required cohesionless soil to be compacted to not less than 80% relative density.
- 2. 10 CFR 50, Appendix B, Criterion V requires, in part, that activities affecting quality shall be prescribed and accomplished in accordance with documented instructions, procedures or drawings.

CPCo Topical Report CPC-1-A Policy No. 5, Section 1.0 states, in part, that, "Instructions for controlling and performing activities affecting quality of equipment or operation during design, construction and operations phase of the nuclear power plant such as procurement,



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

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

a. Contrary to the above, instructions provided to field  
construction for substituting lean concrete for Zone 2 material  
did not address the differing foundation properties which  
would result in differential settlement of the Diesel Generator  
Building.

b. Also, contrary to the above, certain activities were not accom-  
plished 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 Bechtel Specification C-210, Section 13.7.

- (2) Soils activities were not accomplished under the continuous supervision of a qualified soils engineer who would perform in-place density tests in the compacted fill to verify that all materials are placed and compacted in accordance with specification criteria. This is required by Bechtel Specification C-501 as well as PSAR, Amendment 3 (Dames and Moore Report, page 16).

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

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

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

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

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

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

conditions that led to a nonconformance, that disposition of the nonconformance and completions of the actions necessary to prevent or reduce the possibility of recurrence."

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

For example:

- a. As of January 25, 1979, moisture control in fill material had not been established nor adequate direction given to implement this specification requirement. The finding that the field was not performing moisture control tests as required by specification C-210 was identified in Quality Action Request SD-40, dated July 22, 1977.
- b. Corrective action regarding nonconformance reports related to plant fill was insufficient or inadequate to preclude repetition as evidenced by repeated deviations from specification requirements. For example, nonconformance reports No. CPCo QF-29, QF-52, QF-68, QF-147, QF-174, QF-172 and QF-199 contain numerous examples of repeated nonconformances in the same areas of plant fill construction.

1 could have attended that meeting or discussion,  
2 whatever you want to call the form in which they  
3 talked about Midland.

4 Q Have you talked with anyone subsequently  
5 that attended that meeting as to what occurred at that  
6 meeting?

7 A No, I did not.

8 Q At the first day meeting, what was I & E  
9 management's position regarding what should be done  
10 about the soils issues?

11 A Well, I don't think any definite position  
12 had been reached. As I said, we talked about options  
13 and a strong contender was in order, but the final  
14 decision had not been reached.

15 Q What was the order they were considering  
16 at that time as an option?

17 A Well, the general characterization of it  
18 was that work should not proceed until certain  
19 technical information was received by the Commission  
20 and evaluated before construction be resumed so that  
21 the fix, if you will, of the soils problem was at  
22 least acceptable by the Commission before construction  
23 be resumed, soil construction be resumed.

24 MR. JONES: Off the record.



1 (WHEREUPON, discussion was had off the  
2 record.)

3 MR. FARNELL: Would you read back the last  
4 question.

5 (WHEREUPON, the record was read by the  
6 reporter as requested.)

7 BY MR. FARNELL:

8 Q Do you recall Darl Hood stating at that  
9 meeting that the proposed fixes are such that if  
10 they are implemented properly, they should be  
11 adequate?

12 A No, I don't recall that.

13 MR. FARNELL: Can you read that question back.

14 (WHEREUPON, the record was read by the  
15 reporter as requested.)

16 BY MR. FARNELL:

17 Q Do you recall Darl Hood stating anything  
18 about the proposed fixes and their adequacy?

19 A I honestly can't remember any comments that  
20 he made with respect to the fixes. I just don't  
21 recall.

22 Q I now show you a document that has been  
23 marked as Shewmaker Deposition Exhibit No. 13. It is  
24 a set of notes, a two-page set of notes in

1 Mr. Shewmaker's handwriting dated 11/28/79.

2 I ask you if you have ever seen this  
3 document previously?

4 (WHEREUPON, the document was tendered  
5 to the witness.)

6 BY THE WITNESS:

7 A No, I don't recall seeing that.

8 BY MR. FARNELL:

9 Q Could you read this document over, and  
10 particularly the sentence with Mr. Hood's name prior  
11 to it, and see if that refreshes your recollection.  
12 You can also read the entire document.

13 A I am sorry. Did you ask me a question?

14 Q I asked you if this document refreshes your  
15 recollection concerning what Mr. Hood stated at the  
16 meeting?

17 A No, it does not.

18 Q Do these notes generally comport with your  
19 recollection of the meeting, what was said at the  
20 meeting?

21 A I guess, without acknowledging specific  
22 statements. You know, as I indicated, we talked  
23 about performance, QA, soils, enforcement options,  
24 that sort of thing, and I would say they address

1 those general topics.

2 Q Does this comport with the general  
3 substance of what you recall being said at the  
4 meeting?

5 A I guess I would say yes. My memory isn't  
6 all that great. They do address the topics that we  
7 talked about. Without recognizing specific statements  
8 that were made, they reflect the general conversation  
9 or the communications during that meeting.

10 Q You indicated that there was a discussion  
11 there that work should not proceed until certain  
12 technical information is received and evaluated?

13 A Yes.

14 Q Do you recall what technical information  
15 was felt had to be received?

16 A Not in a specific sense, but the intent  
17 was that the corrected actions in terms of the  
18 engineering that had to be done should be obtained  
19 from the licensee so that the technical evaluation  
20 could be made as to whether that would meet the  
21 various design criteria. Because the problem was  
22 a substantial problem, there was the thought that  
23 if Consumer Power proceeded with the corrective  
24 action and the corrective action was not proper and

1 acceptable by the NRC, we would be faced with a  
2 situation that would be difficult to deal with at  
3 the end point.

4 What were the engineering changes? What  
5 were the design changes? What were the basis for  
6 them? Would they withstand the seismic forces?  
7 What were these matters so that the NRC could evaluate  
8 them? In that context, the discussion with respect  
9 to the order was held, and that would prevent the  
10 continued construction work in the soils area.

11 Q You just mentioned seismic forces. Could  
12 you tell me what discussion was held regarding  
13 seismic forces?

14 A No. I am not a -- I am not qualified to  
15 talk about seismic matters as an expert. There are  
16 certain design criteria that address the ability  
17 of structures to withstand certain seismic forces.  
18 If the FSAR, in fact, described the property of the  
19 soil or design of a foundation and that design was  
20 substantially changed, what did that mean in terms of  
21 the structure's ability to sustain the seismic  
22 forces required by the criteria?

23 I don't want to get out of my area. This  
24 is a NRR concern and NRR consideration. We, in the

1 field, do not deal with those technical matters, but  
2 I am trying to give you the flavor of the discussion  
3 that occurred at that time.

4 Q Was the discussion on the seismic forces  
5 concerning the seismic criteria set forth in the  
6 FSAR?

7 A I can't answer that question. I am not  
8 knowledgeable enough to know where the criteria are  
9 established. That is something that you will want to  
10 ask the experts, so-called experts in NRR about that.  
11 I cannot comment on your question. I am just trying  
12 to give you the general concern as I understood the  
13 situation.

14 Q Did anyone at that meeting indicate that  
15 seismic criteria should be higher or more rigid than  
16 that set forth in the FSAR?

17 A I don't recall that. I mean, it may have,  
18 but I don't recall any statements to that effect.

19 Q At the time of this meeting, were you aware  
20 that the NRC had issued 50.54(f) information requests  
21 to Consumers Power?

22 A Yes.

23 Q Was anything said at that meeting regarding  
24 those requests?



1           A     I am sure something was said. I am trying  
2 to recall the context of the discussion. I think  
3 questions were asked with respect to follow-up of  
4 the information in the 50.54(f) correspondence.  
5 I think with respect to I & E, I am trying to recall  
6 now, the discussion had to do with Consumers Power's  
7 implementation of the information they had in the  
8 50.54(f). Beyond that, I have difficulty recalling,  
9 but I feel quite sure that subject was talked about.

10           Q     During that meeting, did anyone discuss  
11 the term "acceptance criteria"?

12           A     I don't recall.

13           Q     Have you heard of the term "acceptance  
14 criteria"?

15           A     Yes.

16           Q     Can you tell me what your understanding  
17 is with regard to that term?

18           A     In what context?

19           Q     In regard to the soils settlement matters?

20           A     I can't comment on the acceptance criteria  
21 with respect to the soils because I don't know what  
22 it is. I have heard of the term used in the general  
23 quality assurance/quality control field; criteria  
24 that defines the acceptability of design or the

1 acceptability of a system to function, criteria that  
2 defines the acceptability of a product quality in  
3 that general sense. I can't comment on it with  
4 respect to soils. I don't know.

5 Q During this meeting, it was brought to  
6 your attention that the NRC had retained outside  
7 consultants to look into the soils problem?

8 A That the NRC had retained consultants?

9 Q Specifically the Corps of Engineers, ETEC?

10 A I heard that, but I can't recall whether  
11 it was in the meeting I heard it or subsequent to it  
12 I heard it. I just don't recall if it was in the  
13 meeting where I heard it.

14 Q Did anyone during that meeting make the  
15 observation that the NRC had not been able yet to  
16 review all the information that Consumers Power had  
17 submitted pursuant to 50.54(f) requests?

18 A I don't recall whether that was made in  
19 the meeting or in subsequent discussions. I know  
20 that I & E had not pursued the follow-up of the  
21 information in the 50.54(f), information for which  
22 it had responsibility for follow-up, namely the  
23 QA stuff, the information of the QA. This was  
24 because basically there wasn't much soils were going

1 on and also because I think our assessment was that  
2 there wasn't a heck of a lot of it, namely because  
3 I think our assessment at the time was that  
4 Consumers Power hadn't put into effect the  
5 implementation of the information they had in the  
6 50.54(f).

7 So in that sense, I think the question you  
8 raise was whether the NRC had an opportunity to  
9 review the information in the 50.54(f) communication.  
10 I am not sure whether you understand what I said.  
11 I sort of rambled on there. We, speaking for I & E,  
12 had a chance to confirm the implementation of the  
13 information in the 50.54(f) letter that dealt with  
14 the matters that I & E normally would follow up on.  
15 I can't speak to NRR.

16 Q Is that I & E Region 3 or I & E headquarters?

17 A That would be I & E -- it would be both,  
18 but the lead would rest with I & E Region 3.

19 MR. JONES: Off the record -- can we take a  
20 five-minute break?

21 MR. ZAMARIN: Can we ask one question that  
22 follows that beforehand?

23 BY MR. FARNELL:

24 Q Apart from QA implementation, had anyone

1 within I & E, to your knowledge, made a review of  
2 the concepts, QA concepts, that Consumers Power had  
3 set forth in its response to 50.54(f) questions?

4 A Well, yes. When you talk about concepts,  
5 I am not sure what you mean, but we had reviewed the  
6 50.54(f) information, specifically Gene Gallagher, as  
7 I recall, and he had provided some input to NRR with  
8 respect to the comprehensiveness of the information.  
9 Obviously NRR reviewed the QA portion of it, and  
10 I believe that's what led to requesting Consumers  
11 Power to provide additional information on quality  
12 assurance matters.

13 I don't know if I have answered your  
14 question or not.

15 Q Do you recall what Gene Gallagher's input  
16 to NRR was?

17 A No, I don't. I am sure he had telephone  
18 conversations with people back there. He may have  
19 even had some, and I am talking now -- and I suppose  
20 he even had some questions with respect to the  
21 technical matters, the technical response that he  
22 forwarded back to NRR. The nature of them, I don't  
23 know.

24 Q Had Gene Gallagher or anyone else at I & E

1 staff as well as for Consumers Power Company -- is that  
2 right -- the issuance of the order?

3 A I didn't set out to put pressure on the staff, or  
4 I don't think we set out to put pressure on the staff  
5 necessarily but we did want the whole issue resolved.

6 Q Okay. Let's go on.

7 The next day there was a meeting at noontime,  
8 Mr. Stello, Mr. Case, and some others. Were you present at  
9 that meeting?

10 A Yes, and Mr. Keppler was also.

11 Q And what was the purpose of now including Mr. Case  
12 in the meeting?

13 A Well, as I remember, this was a jointly signed  
14 order.

15 Q Yes, sir.

16 A And you have to start discussing the matter with  
17 the other party at some point. We had all along, but I'm not  
18 sure it had been elevated to that level previously.

19 Q Now do you recall Mr. Hood or Mr. Rubenstein,  
20 who was also at that meeting, stating that that applicant --  
21 one approach, one possible approach could be that the appli-  
22 cant could proceed with the remedial work on the understanding



30 1 that it was strictly at its own risk?

2 A I don't think that that is-- That's no different  
3 than the situation that evolved when the order was issued.

4 Q Yes, sir.

5 But my question was do you recall Mr. Hood and  
6 Mr. Rubenstein--

7 A I recall someone making that statement. It may  
8 well have been one of those.

9 Q Do you recall what the response was to that comment  
10 from anyone else in the meeting?

11 A No, I don't. I recall that the statement was  
12 made.

13 Q And at that point in time of course was it the  
14 position of the I&E Branch that a suspension order should be  
15 issued?

16 A It was our position that the order that was -- you  
17 know, essentially the order that was issued should be issued.

18 Q All right.

19 Did Mr. Case disagree with that in any way?

20 A I don't believe so. We talked-- As I remember,  
21 we talked several options but he ultimately agreed to do it.

22 Q Right. He signed it.

1           A       And he signed the thing. And you don't push  
2 Mr. Case around; at least I've never been able to.

3           Q       Well, what I'm trying to determine, Mr. Thornburg,  
4 is whether or not anyone expressed the opinion that the  
5 escalated enforcement action represented by the December 6th,  
6 1979 order was not appropriate or not necessary.

7           A       I honestly don't remember anyone saying that.

8           Q       So as far as you know, everybody was together,  
9 both at the meeting on November 28th with Mr. Stello, and  
10 the meeting on November 29th with Mr. Case, with respect to  
11 the advisability of issuing this escalated enforcement action  
12 represented by the December 6th order?

13          A       Well, I didn't hear anybody make, you know, a  
14 significant disagreement that sticks in my mind. I haven't  
15 gone back and talked to the parties or anything else.

16          Q       Now on your log sheet which is Shewmaker Deposition  
17 Exhibit 17 you show December 5th-- Well, let's just carry  
18 on with it.

19                   Item number nine on that is a November 29th  
20 meeting with Mr. Lieberman. Mr. Lieberman is an attorney,  
21 is he not?

22          A       Yes, with Enforcement.

1           Q       And was that to discuss the mechanics of preparing  
2 the order?

3           A       Yes.

4           Q       Was he given the assignment to draft up the order  
5 and circulate it?

6           A       Well, I think my staff had worked with lawyers  
7 to draft the thing up, and Jim and I were going over some of  
8 the -- cleaning the thing up and doing the final writing,  
9 nearly the final writing.

10                   I see that we were still working on it the 5th and  
11 6th of December.

12           Q       Is that what the meetings on December 5th and  
13 December 6th involved?

14           A       Basically finishing the order. And you see we  
15 met with Mr. Ingraham on the 5th. I think we wrote the press  
16 release and--

17           Q       Mr. Ingraham is in the Public Information Office?

18           A       Yes.

19                   And I think on the 6th I got the signature of --  
20 the Licensing signature and the lawyers' concurrence.

21           Q       At the meeting on December 5th, was there anyone  
22 who expressed any opinion that perhaps the order ought not be

held in 197- -- was it '4 or '5?

Q I think it is '4.

MR. PATON: The decision was '4.

BY THE WITNESS:

A. (Continuing) -- there were two considerations that were involved in that hearing. The first consideration was whether or not the licensee had taken sufficient action to achieve compliance with respect to specific problems that had been identified by the NRC.

And the second issue, which was a much broader issue, was whether there was reasonable assurance that the quality assurance program would be effective in the future to assure compliance with applicable requirements.

At that hearing the staff concluded positive answers to both cases, but I left a message to the Hearing Board that if I felt the quality assurance program was inadequate in the future, I would not hesitate to shut down the project.

Now, subsequent to that hearing there were a number of problems associated with the Midland project that had, to varying degrees,



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

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 (I&E) 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 I&E by CPCO's letter of September 29, 1978. I&E 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 (Small portion yet to be constructed)

DUP of  
7901250252



JAN 12 1979

-2-

The settlement monitoring program began in June 1978; 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 C1 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 12 1979

4. Consultants Perspective

Dr. R. B. Peck stated the following:

- a. The compacted fill is comprised 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. Dunnicliff of Goldberg, Zoino, Dunnicliff & 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 12 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 would 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

-5-

a. 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 80% 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 12 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. 50-329/78-12 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 2.5-14 and Table 2.5-10 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 dikes.
- c. FSAR Section 3.8.5.5 regarding expected settlement: Bechtel stated that 1/2-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 10/31/75 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 12 1979

- f. Conflict between Dames & 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.

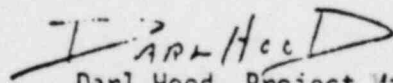
Dr. Peck was asked his view on this  $\pm 2\%$  tolerance. He stated that the important question is " $\pm 2\%$  of what material." Since the material used in the fill was variable, the  $\pm 2\%$  tolerance could cause a problem if the material is not consistent.

- 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 1978.

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 PSAR. 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.

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

Enclosures:  
As stated

Consumers Power Company

JAN 12 1979

ccs:

Michael I. Miller, Esq.  
Isham, Lincoln & Beale  
Suite 4200  
One First National Plaza  
Chicago, Illinois 60670

Judd L. Bacon, Esq.  
Consumers Power Company  
212 West Michigan Avenue  
Jackson, Michigan 49201

Mr. Paul A. Perry  
Secretary  
Consumers Power Company  
212 W. Michigan Avenue  
Jackson, Michigan 49201

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

Mary Sinclair  
5711 Summerset Drive  
Midland, Michigan 48640

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

Mr. Windell Marshall  
Route 10  
Midland, Michigan 48640

Mr. S. H. Howell  
Vice President  
Consumers Power Company  
212 West Michigan Avenue  
Jackson, Michigan 49201

ENCLOSURE 1

JAN 12 1979

ATTENDEES DECEMBER 4, 1978 MEETING

P. A. Martinez, Bechtel  
Karl Wiedner, Bechtel  
\* S. S. Afifi, Bechtel  
R. B. Peck, Bechtel Consultant  
\* W. R. Ferris, Bechtel  
M. O. Rothwell, Bechtel  
\* D. B. Miller, CPCO - Project  
\* J. P. Betts, Bechtel  
W. L. Barclay, Bechtel  
\* A. J. Boos, Bechtel  
G. L. Richardson, Bechtel  
\* D. E. Horn, CPCO - QA  
W. R. Bird, CPCO-QA  
\* R. M. Wheeler, CPCO - PMO  
\* C. A. Hunt, CPCO - Engineering Services  
D. E. Sibbald, CPCO Project  
John Dunnicliff, Bechtel Consultant  
\* Austin Marshall, Bechtel - Geotech  
\* Y. K. Lin, Bechtel - Geotech  
\* B. C. McConnel, Bechtel - Geotech  
\* B. Dhar, Bechtel  
\* N. Swanberg, Bechtel  
\* Darl Hood, NRC LPM  
\* Gene Gallagher, NRC Region III (I&E)  
\* Daniel Gillen, NRC/NRC Geosciences  
\* Lyman Hiller, 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:

CPCo Midland Plant Units 1 & 2  
Diesel Generator Building

JAN 12 1979

Meeting with NRC at Midland

DATE:

December 4, 1978

AGENDA

- I. Introduction by CPCo
- 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. Dunnicliff
  - 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. Dhar)

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 3.8.5.5 - 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 CPCo