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Exhibits from
10/23/80 Oral Deposition

of

Gilbert S Meeley,

Project Mgr of Midland Plant,
Consumers Power Company

Exhibits 1 & 2

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NRC Dep. Ex # 1
(Keeley 10-23-80)

Dec 1975

UNITED STATES OF AMERICA
ATOMIC ENERGY COMMISSION

LBP 74-71

ATOMIC SAFETY AND LICENSING BOARD

Michael L. Glaser, Chairman
Lester Kornblith, Jr., Member
Emmett A. Luebke, Member

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

Construction Permit
Nos. 31 and 32
(Show Cause)
September 25, 1974

INITIAL DECISION

Appearances

Michael I. Miller, Esq., and R. Rex Renfrow III, Esq., of Isham, Lincoln, and Besle; Judd Bacon, Esq., and Paul Koval, Esq., of Consumers Power Company; and Harold F. Reis, Esq., and J. A. Bouknight, Esq., of Newman, Reis and Askrad for Consumers Power Company

Laurence M. Scoville, Jr., Esq., P. Robert Brown, Jr., Esq., Bartholomew P. Molloy, Esq., and Richard C. Marsh, Esq., of Clark, Klein, Winter, Parsons & Prewitt for Bechtel Power Corporation and Bechtel Associates Professional Corporation

John Gerold Gleason, Esq., and Leslie F. Nuts, Esq., for The Dow Chemical Company

Myron M. Cherry, Esq., for Saginaw-Sierra Intervenor

James P. Murray, Esq., and Roy E. Kinsey, Jr., Esq., for AEC Regulatory Staff

I. INTRODUCTION AND BACKGROUND

1. On December 3, 1973, Consumers Power Co. (Consumers), by Order Show Cause, was ordered by the Atomic Energy Commission's Director

Regulation, to show cause why all activities under Construction Permit Nos. 81 and 82 for the Midland facilities, Midland Plant, Units 1 and 2, should not be suspended pending a showing by Consumers that it was in compliance with the AEC's regulations governing quality assurance, and that it would continue to comply with such regulations throughout construction. Consumers was granted construction permits Nos. 81 and 82 for the Midland Units by Initial Decision of an Atomic Safety and Licensing Board issued on December 14, 1972. This Initial Decision was ultimately affirmed by the Atomic Safety and Licensing Appeal Board (Appeal Board) after a series of decisions¹ on exceptions taken by certain of the parties to the construction permit hearing proceedings.²

2. During the review process, the Appeal Board, because of the history of the failure of Consumers and its architect-engineer, Bechtel Corp., to observe required quality assurance practices and procedures, imposed certain conditions³ on Consumers relating to Consumers' quality assurance program. These conditions, which the Appeal Board termed as a "predicate for the permits now to remain in effect," called for Consumers to file periodic reports, either with the Appeal Board or Staff, on Consumers quality assurance activities. The Appeal Board requested that, for its information, copies of all reports required to be filed with the Staff be forwarded to the Appeal Board by the Staff on a timely basis, together with any comments that the Regulatory Staff may have. The Appeal Board also indicated it desired to receive Staff comments on the report required to be filed directly with the Appeal Board, and these comments were requested to include the results of any Staff inspection of Consumers. The Appeal Board also indicated it would closely monitor the activities of Consumers and its architect-engineer, Bechtel Corp., with respect to Consumers' quality assurance program. These specific conditions were set forth in the Appeal Board's decision of March 26, 1973 (ALAB-106, *supra*).

A. The December 3, 1973, Order to Show Cause

3. The Order to Show Cause issued by the Director of Regulation specified several instances of non-compliance with quality assurance requirements. More specifically, the Order to Show Cause stated that Commission inspections had revealed Consumers' nonconformance with quality assurance program requirements involving concrete work had revealed inadequate record-keeping, and had revealed serious deficiencies associated with Cadwelding operations. Cadwelding

¹In re Consumers Power Company (Midland Plant, Units 1 and 2): ALAB-100, RA-73-2, 58 Feb. 12, 1973; ALAB-101, RA-73-2, 58 Feb. 20, 1973; ALAB-106, RA-73-3, 183 Mar. 26, 1973; ALAB-115, RA-73-4, 257 Apr. 17, 1973; ALAB-123, RA-73-5, 371 May 16, 1973; ALAB-132, RA-73-4, 431 June 28, 1973; ALAB-147, RA-73-6, 614 Sept. 18, 1973; ALAB-152, RA-73-10, 816 Oct. 5, 1973; ALAB-160, RA-73-11, 1007 Nov. 26, 1973.
²ALAB-157, *supra*.
³ALAB-106, *supra* at 186.

is a process for fusing together metal bars used in reinforced concrete construction, and represents a critical step in construction of the Midland facility. The Order to Show Cause also referred to a memorandum, dated September 3, 1973, from the Atomic Safety and Licensing Appeal Board to the Director of Regulation, which pointed to certain deficiencies in Consumers' implementation of its quality assurance program, and urged that appropriate enforcement action be taken against Consumers. The Appeal Board also referred to the conditions it had imposed on Consumers in ALAB-106, and the history of the failure of Consumers and its staff engineers to observe required quality assurance practices and procedures. The Director of Regulation indicated that the Appeal Board memorandum warranted examination of whether Consumers would comply with required quality assurance requirements throughout the construction process. Thus, the December 3 Order suspended all Cadwelding operations at the Midland plant site, pending further order and determination by the Director of Regulation.

4. Thereafter, Consumers answered the Order to Show Cause, claiming compliance with AEC quality assurance regulations, and urging that the Order to Show Cause be dismissed. On December 24, the Saginaw-Sierra Intervenor (Saginaw), intervenors to the Commission's construction permit hearing proceedings involving the Midland facilities, requested a hearing on the Order to Show Cause. On December 17, 1973, as a result of a special inspection, the Director of Regulation issued a Modification of Order to Show Cause, which lifted the suspension of Cadwelding activities at the Midland plant site. The Modification, however, provided that all other provisions of the December 3, 1973, Order to Show Cause would remain in effect. On December 18, 1973, the Saginaw filed a petition to revoke the construction permits.

B. The Commission's January 21, 1974, Order for Hearing

5. On January 21, 1974, the Commission issued a Memorandum and Order denying Saginaw's petition to revoke, denying Consumers' Motion to dismiss, and granting Saginaw's request for hearing. The Commission specified the following issues to be decided by the Atomic Safety and Licensing Board (Board):

- (1) Whether the licensee is implementing its quality assurance program in compliance with Commission regulations; and
- (2) Whether there is a reasonable assurance that such implementation will continue throughout the construction process.

The Commission directed this Board to determine whether Consumers' construction permits should be modified, suspended or revoked, or whether other action is warranted by the record, in the event either of the two issues was decided adversely to Consumers. Consumers, Saginaw, Dow Chemical Company (Dow), and the Regulatory Staff were made parties to the

schedule for the proceeding. The date of June 25, 1974, was established for commencement of hearing.

11. On April 22, 1974, counsel for Saginaw, Consumers and Bechtel served acts of interrogation on the various parties to the proceeding, including the Staff. In addition, both Consumers and Bechtel served a Request to Admit Facts on the Staff, and a Notice of Deposition on Saginaw.

12. On May 10, 1974 the Board determined that answers to certain of the interrogatories served on the Staff by Saginaw were necessary to a proper decision in the proceeding and were not reasonably obtainable from any other source. Thus, pursuant to Section 2.718(i) of the Commission's Rules of Practice,¹² we certified to the Commission the question of whether these interrogatories should be answered by the Staff. In our certification, we expressed the view that the attitude of Consumers, especially that of senior management personnel, toward compliance with Commission regulations and license requirements was relevant and material to the resolution of the issue of future compliance, and recommended that the Staff be required to provide whatever available information it may possess respecting Consumers' licensed activities which might reflect upon Consumers' attitude toward compliance with Commission regulations and license requirements. Without awaiting a Commission ruling, on May 22, 1974, the Staff answered the interrogatories which the Board had certified. The Board's ruling with respect to the scope of permissible discovery was subsequently applied to the objections of Consumers to Saginaw's discovery request.

13. On May 10, 1974, the Board also denied Saginaw's Motion for an Extension of Time to file a request for the production of documents. This order was based upon the representation of Consumers that it had voluntarily made available to Saginaw for inspection and copying all documents referenced in Consumers' answers to interrogatories.

14. It was not until May 11, 1974 that counsel for Saginaw filed a Verified Petition and Motion to the Atomic Energy Commission for Expert Witnesses' Fees and Attorneys' Fees. The petition stated that unless such fees were forthcoming, Saginaw would be unable to participate in a meaningful manner in this proceeding,¹³ and alleged that the participation of Saginaw was necessary for an adequate airing of the issues and explanation of the facts.¹⁴

15. On May 22, 1974, all parties, except Saginaw, filed answers to interrogatories which were directed to them by other parties. On May 21, 1974, the day before answers to interrogatories were due from each party, Saginaw filed several motions which, in substance, requested an extension of the

¹²10 CFR 2.718(i) (1974).

¹³In the Matter of Consumers Power Company (Midland Plant, Units 1 and 2), Verified Petition at pp. 2, 3 (May 11, 1974).

¹⁴Id. at p. 7.

discovery period. These requests were granted on the fact that the Commission had not acted upon Saginaw's petition for fees which had been filed 10 days earlier.

16. On May 30, 1974, the Board held a second prehearing conference in Chicago, Illinois. After hearing oral argument, the Board denied Saginaw's several requests, including a motion for continuance pending a Commission decision on Saginaw's petition for fees. The Board, however, gave Saginaw leave to renew its motion for continuance in the event a favorable ruling on its petition was forthcoming from the Commission.¹⁴ The Board ordered Saginaw to answer interrogatories served upon it by June 5, 1974.¹⁵ The Board also reiterated its ruling on the burden of proof, but accorded Consumers until June 10, to present the Board with a memorandum of law on the burden of proof in an administrative show cause proceeding.¹⁶

17. The Board also adopted a revised schedule for the proceeding, as follows:

- A. Discovery to close on June 17, 1974;
- B. Written testimony from all parties due on June 28, 1974;
- C. Trial briefs due on July 8, 1974; and
- D. Hearing to commence in Midland, Michigan, on July 16, 1974.¹⁷

18. On June 5, 1974, Saginaw filed its answers to the interrogatories propounded by Consumers and Bechtel. Shortly thereafter, Consumers filed a Motion to Compel Answers to Interrogatories, on the ground that the answers of Saginaw were unresponsive and incomplete.¹⁸ The Board granted this motion,¹⁹ but Saginaw did not respond.

19. On June 5 and 6, 1974, Bechtel and Consumers filed with the Commission responses to Saginaw's petition for fees, requesting that the petition be denied. The Staff filed its answer to Saginaw's petition for fees on June 10, 1974.

20. On June 10, 1974, Consumers also filed a "Motion to Impose the Burden of Proof on the Proponent of an Order Suspending, Revoking or Otherwise Modifying Construction Permits Nos. 81 and 82", in which Consumers argued that the proponent of an order modifying the construction permits bears the ultimate burden of proof. On June 12, 1974, Bechtel filed a brief in support of Consumers' motion, arguing that the burden of proof in this proceeding should properly be placed on the Staff and/or Saginaw. On June 18, 1974, the Staff also responded by stating that the burden of proof lay with the proponent of the Order to Show Cause. Saginaw filed no response.

¹⁴ Tr. 116.

¹⁵ Tr. 115.

¹⁶ Tr. 114, 135-136, 138.

¹⁷ Tr. 128, 133.

¹⁸ Tr. 157.

¹⁹ Tr. 158.

21. On June 28, 1974, Consumers, Bechtel and the Staff filed written testimony and exhibits with the Board and other parties. Saginaw filed no written testimony. On this date, the Board also initiated a conference call to all counsel, and advised them that the Board, upon considering Consumers' motion to change the burden of proof, had reversed its earlier ruling with respect to burden of proof, and was placing the burden of proof on the Staff and Saginaw.²⁵

22. On July 8, 1974, trial briefs were filed by Consumers, Bechtel and the Staff. No trial brief was filed by Saginaw, despite a specific order to do so from the Board at the May 30, 1974, prehearing conference:

If you have no witnesses, your trial brief ought to reflect that fact, or if you don't have a direct case, other than the case you make in cross-examination, you should indicate this in your trial brief. We would want something from you along these lines.²⁶

23. On July 9, 1974, the Board placed another conference call to counsel for all parties, for the express purpose of determining whether Saginaw intended to go forward with a presentation, or otherwise appear, at the evidentiary hearing. Counsel for Saginaw advised the Board and the other parties that he would not be participating on behalf of Saginaw, unless the Commission were to grant his petition for fees.

24. On July 10, 1974, the Commission issued a Memorandum and Order denying the Saginaw petition for fees. The Commission concluded that the petition must be denied for lack of a proper showing of need.²⁷

25. On July 10, 1974, the Board placed another conference call to counsel for the parties to determine whether Saginaw's counsel or Saginaw, in view of the Commission's July 10, 1974, Memorandum and Order,²⁸ intended to go forward. Counsel for Saginaw advised the Board that he would not be present at the evidentiary hearings. However, counsel did indicate he would participate further in the proceedings to the extent of filing proposed findings of fact and conclusions of law, as well as a memorandum requesting the Board to take official notice of certain documents Saginaw intended to rely upon to carry its burden.²⁹

26. On July 10, 1974, the Board issued its written Memorandum and Order ruling that the burden of proof in this proceeding was on the Staff and Saginaw to the extent that these parties desired that Construction Permit Nos. 81 and 82 be modified or revoked.

²⁵ Tr. 124-125.

²⁶ Tr. 152.

²⁷ Memorandum and Order, # AB-74-7, 1 (July 10, 1974).

²⁸ See n. 24, *supra*.

²⁹ Tr. 153.

27. On July 16, 1974, the Commission issued a Memorandum and Order²⁷ on the question certified to it on May 14, 1974, concerning whether or not the Staff was required to answer Saginaw's interrogatories. The Commission ruled that the Staff should answer all interrogatories with respect to which the Board had determined that answers were necessary to a proper decision, and were not reasonably obtainable from any other source. As we have noted, these answers had already been provided by the Staff on May 22, 1974.

28. On July 16, 1974, pursuant to a *Notice and Order for Commencement of Evidentiary Hearing*²⁸ dated June 17, 1974, the evidentiary hearing commenced in Midland, Michigan, and continued through July 18, 1974. All of the parties to the proceeding were present except for Saginaw. Each of the other parties presented testimony and participated in cross-examination. The Board required both Consumers and the Staff to present witnesses²⁹ in addition to those who had submitted prepared testimony. The Board also questioned various witnesses that had been presented.

29. The Staff presented four witnesses—Mr. Walter E. Vetter, the technical assistant to the Director of Directorate of Regulatory Operations, Region III; Mr. Roger Rohrbacher, Principal Reactor Inspector for Directorate of Regulatory Operations, Region III; Mr. Cordell C. Williams, Reactor Inspector for Directorate of Regulatory Operations, Region III; and Mr. Dolphus E. Whitesell, Reactor Inspection Specialist for Directorate of Regulatory Operations.

30. In addition, Mr. James G. Keppler, the Director of Directorate of Regulatory Operations, Region III, appeared and gave testimony at the specific request of the Board.

31. Consumers presented four witnesses, including Mr. Russell C. Yonindahl, Senior Vice President, and Mr. Stephen H. Howell, Vice President. The Board requested that Consumers make available Mr. Ralph Sewell, Nuclear Licensing Administrator for Consumers, to answer the Board's questions concerning statements he had given to the Directorate of Regulatory Operations in connection with an investigation of Consumers' Palisades facility.

32. Bachtel presented ten witnesses, as well as a panel comprised of five persons.

33. Neither Saginaw's counsel nor anyone representing Saginaw appeared at the evidentiary hearing.

34. Following the Staff's direct case, and after no evidence was offered by Saginaw, Consumers moved:

(1) That the Board issue an order holding that Saginaw was in default under 10 CFR § 2.707; and

²⁷ Memorandum and Order, RA1-74-7, 4 July 16, 1974.

²⁸ 19 F.2 R.G. 22447.

²⁹ Tr. 155, 159.

(2) That the proceeding be dismissed, since the burden of proof had not been met.¹⁶

The Board denied this motion.¹⁷ The Board also indicated it would give Saginaw until July 25, 1974, to file its memorandum requesting official notice to be taken of certain documents.¹⁸ At the close of the evidentiary hearings on

July 18, 1974, Consumers renewed its motion to hold Saginaw in default and to dismiss the proceeding on the grounds that the burden of proof had not been met.¹⁹ The Board indicated it would take this renewed motion under advisement.²⁰ Our ruling on this motion is set forth below.

15. On July 25, 1974, the Board, having received no memorandum from Saginaw, issued an Order closing the record. Proposed findings of fact and conclusions of law were submitted by Consumers and Bechtel jointly, and by the Staff, on the specified date of August 12, 1974. No reply findings were filed. Saginaw did not file proposed findings of fact or conclusions of law. However, Saginaw filed a "Motion" on August 12, 1974, requesting a two-week extension in the deadline to file proposed findings. The Board denied the "Motion" for lack of good cause shown. Saginaw renewed its "Motion" on August 26, 1974, and the Board again denied it for lack of good cause shown.

D. Consumers' Renewed Motion

16. The Board has considered Consumers' renewed motion to hold Saginaw in default, and to dismiss this proceeding on the grounds that the burden of proof has not been met. We deny this motion. While there appears to be ample precedent for this Board to grant Consumers' motion, the Board believes that in the circumstances here present, a determination is warranted on the record respecting Consumers' compliance with Commission quality assurance requirements and the implementation of Consumers' quality assurance program. Indeed, we would not have ordered hearings to proceed were it not for the fact that the Board believed substantial public interest questions existed regarding Consumers' compliance with Commission quality assurance requirements and Consumers' implementation of its quality assurance program.

II. FINDINGS OF FACT

A. Issue No. 1

Whether the licensee is implementing its quality assurance program in compliance with Commission regulations.

¹⁶Tr. 429-438.

¹⁷Tr. 432.

¹⁸Tr. 190-193.

¹⁹Tr. 705.

²⁰Tr. 707.

37. The first issue is whether Consumers is implementing its Quality Assurance Program in compliance with the Commission's regulations. The regulations governing quality assurance are set forth in 10 CFR Part 50, Appendix B. Although the language of Appendix B has not been amended in any significant way since it originally became effective on July 27, 1970,²⁵ the interpretation of its requirements has been changing in an evolutionary process over the years. Licensee compliance with the Appendix has been evaluated by the Staff consistent with the interpretation which was in effect at the time of evaluation.

38. The function of the Directorate of Regulatory Operations, as it relates to this case, is to conduct field inspections of the activities of Consumers (and its contractors) to obtain, by means of selective sampling (inspections, reasonable assurance that licensed activities are in accord with the AEC's requirements²⁶ and are not, or will not be, inimical to the health and safety of the public. This function, which in this case is carried out by personnel of the Region III Office in Glen Ellyn, Illinois, is exercised in accordance with guidelines provided by the Directorate of Regulatory Operations Headquarters Staff by experienced and knowledgeable Regional Office inspectors, assisted by various specialists and consultants. The principal activities by these personnel with respect to the Midland facility have included:

- (a) Examination of Consumers' and its contractor's QA and QC programs to compare the requirements and controls actually imposed by Consumers with commitments made to the Commission;
- (b) Inspections of quality control records;
- (c) Observations of construction work in progress; and
- (d) Selective examinations of construction procedures.²⁷

39. Limited preconstruction permit activities at the Midland site commenced under an AEC exemption issued in July of 1970 and were suspended by Consumers in November, 1970, when extensive delays in issuance of a Construction Permit became apparent. Construction was resumed in June, 1973, and has continued, with the brief suspension discussed herein, to the present.²⁸ Quality assurance activities, both by Consumers and by the Regulatory Staff, however, began even before the start of construction in 1970.

40. The Midland Preliminary Safety Analysis Report (PSAR) was issued on January 13, 1969. Appendix B of the PSAR (which predated Appendix B of 10 CFR Part 50) was a very brief description of the Quality Assurance Program for

²⁵ 35 Fed. Reg. 10498.

²⁶ These requirements are found in the construction permit, the application, the provisions of the Atomic Energy Act, and the rules and regulations of the Commission (10 CFR 155).

²⁷ Tr. 186-188, 241-242; 247-251; 357-366.

²⁸ Testimony of Howell, following Tr. 487, pp. 6-7, 13.

the proposed facility.⁵⁰ Amendment No. 4 to the PSAR was issued on October 2, 1969, subsequent to the publication⁵¹ on April 17, 1969, of the proposed Appendix B. This amendment was a complete revision of the original quality assurance program.⁵² Amendment No. 6 to the PSAR was issued on December 29, 1969, in response to the Commission's request for a description of the manner in which the Midland Quality Assurance Program would be implemented. Amendment No. 8 was issued on February 9, 1970, to provide, pursuant to the Commission's request, documentation of interface responsibilities during design, procurement, construction and pre-operational testing. These amendments provided more details than described in the initial issuance of Appendix B and spelled out more specifically the responsibilities of Consumers, Bechtel, and B&W and the interfaces between those organizations.⁵³ During 1970, the Directorate of Regulatory Operations (RO), then the Division of Compliance, carried out a number of inspections. During the period September 29 to October 1, 1970, shortly before Consumers' suspension of construction, RO conducted a site inspection during which deficiencies relating to the placement of concrete were identified. Consumers and Bechtel evaluated the findings and took the actions they considered appropriate.⁵⁴ RO was not able at that time to complete its inspection and evaluation of these corrective actions because of the cessation of construction. Re-inspection of these activities, however, did not occur in September 1971.⁵⁵

31. During the 1970-1973 suspension of construction, Consumers and Bechtel made numerous changes in the Quality Assurance Programs, some for internal reasons and some in response to the AEC's developing interpretation of Appendix B.⁵⁶ After resumption of construction, inspections continued. In some cases deficiencies in the Quality Assurance Program were found and corrective actions taken.⁵⁷ On December 3, 1973, the Director of Regulation issued the Order to Show Cause, identifying three specific examples which indicated a possible failure of Consumers to implement its Quality Assurance Program in compliance with Commission regulations. These examples, each of which is discussed below, were:

(a) Inspections occurring on September 29-October 1, 1970, revealed several instances of Consumers' non-conformance with quality assurance program requirements involving concrete work. These matters were discussed by the Appeal Board in its Memorandum and Order of March 26, 1972

⁵⁰ Licensee's Exhibit K-4.

⁵¹ 34 Fed. Reg. 6898.

⁵² Licensee's Exhibit K-4.

⁵³ Testimony of Keeley, following Tr. 458, pp. 8-14.

⁵⁴ *Id.* at p. 14.

⁵⁵ Tr. 200-202.

⁵⁶ Keeley, pp. 14-19; Howard, pp. 8-12.

⁵⁷ Keeley, pp. 19-26.

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(ALAB-106), in which the Appeal Board imposed certain additional conditions on Consumers with respect to its quality assurance program;
 (b) Inspections conducted on September 10, 11 and 27, 1973, revealed several additional violations of 10 CFR Part 50, Appendix B, Criteria II and V, involving inadequate record keeping procedures relating to quality assurance and unavailability of certain quality assurance records; and
 (c) Inspections conducted on November 6-8, 1973, identified serious deficiencies associated with Cadweld splicing of concrete reinforcing bars. These constitute violations of 10 CFR Part 50, Appendix B, Criteria II, V, XIII, XV and XVII.⁴⁹

Concrete Placement

42. On September 29 and 30, and on October 1, 1970, RO conducted the use inspections mentioned supra, during which they found certain deficiencies in concrete placement activities, including the improper use of vibrators.⁵⁰ Immediately following this RO inspection, Consumers and Bechtel evaluated the findings and took the following corrective action:

- (a) Bechtel committed itself to review the applicable ASTM specification regarding concrete sampling.⁵¹
- (b) Bechtel established a special crew of craft personnel to do the vibrator work. This crew had been trained in the proper use of vibrators.⁵²
- (c) Bechtel assigned a Quality Control Engineer to full-time monitoring of all QMC concrete pours.⁵³
- (d) Consumers field personnel were instructed to provide increased surveillance during concrete pours to insure compliance with established requirements, including taking of samples, and additional documentation was required to transport between the batch plant and the pour location.⁵⁴

43. Although construction at the Midland site was by then suspended, RO conducted an inspection at the job site on January 6-7, 1971. At that time, the inspectors were informed of the corrective action undertaken by Consumers and Bechtel regarding the concrete deficiencies noted in the previous RO inspection. However, due to the fact that construction had been halted, the inspectors were not able to observe implementation of the corrective action and, therefore, informed Consumers that these items would remain in the follow-up status until

⁴⁹ In the matter of Consumers Power Company (Midland Plant, Units 1 and 2), Order to Show Cause Docket No. 17, 1973.
⁵⁰ *Id.* at p. 14.
⁵¹ *Id.* at p. 14.
⁵² *Id.*
⁵³ *Id.*
⁵⁴ *Id.* at p. 14.

construction resumed and RO could verify that the corrective procedures had been implemented.¹³

44. Prior to the actual resumption of concrete activities in 1973, the Bechtel Quality Assurance group conducted a review of inspection reports and other documentation to determine whether or not further corrective action was required in order to satisfy the commitments made in 1970. As a result of this review, an intensive indoctrination and training program was implemented for personnel involved in placing and inspection of concrete work. This program contained, among other things, detailed instructions in the proper use of vibrators. Detailed inspection plans were developed and implemented and quality assurance personnel were instructed to promptly identify and to take necessary actions to correct any discrepancies noted during concrete operations. In addition, Bechtel assigned a Quality Control representative to full-time monitoring of test lab activities. Additional training and indoctrination requirements for Quality Control personnel were established, and the Bechtel specification governing testing of concrete was updated to the latest revisions of industry codes and standards.¹⁴

45. On September 5-7, 1973, at its first inspection following re-activation of construction at the Midland Plant, RO observed the corrective action relative to the concrete deficiencies. RO determined that the deficiencies had been corrected but that certain of these activities would be further observed in subsequent inspections.¹⁵ This was finally considered by RO to be resolved as a result of an inspection on March 6-7, 1974.¹⁶

Record Keeping Procedures

46. On September 10, 11 and 27, 1973, RO performed an inspection of Bechtel Engineering to evaluate compliance with the applicable quality assurance criteria for design and procurement activities at Midland. In its report of that inspection, RO cites deficiencies in documentation control procedures.¹⁷ Although each of the discrepancies identified by RO had been previously identified by Bechtel's Quality Assurance Group and corrective action had been initiated,¹⁸ Bechtel completed corrective action in each of the following areas:

- (a) Retention of records common to areas affecting quality;
- (b) Maintaining current drawings in the Project Engineering stick files;
- (c) Procedures to prescribe control of interface activities between design groups;

¹³Tr. 267-8; Licorne's Exhibit CP-2.

¹⁴Testimony of Detton, following Tr. 59", pp. 18-20.

¹⁵Licorne's Exhibit CP-3.

¹⁶Licorne's Exhibit CP-19.

¹⁷Licorne's Exhibit CP-12.

¹⁸Bechtel's Exhibits Detton-17, -18, -19, -20A, -20B, and -21.

(d) Procedures to prescribe control, in 1972 and changes to Bechtel's Internal Procedures Manual; and

(e) Amending the Nuclear Quality Assurance Manual to provide Project Engineering the flexibility to impose evolving quality assurance requirements on vendors.⁴⁷

47. During its inspection of January 10-11, 1974, RO reviewed the actions taken to correct the deficiencies in the above areas and concluded that the corrective actions taken was adequate and was being properly implemented.⁴⁸

Cadweld Splicing

48. On November 1, 1973, the Bechtel Field Quality Assurance Engineer found several completed Cadweld splices from which the asbestos packing had not been completely removed.⁴⁹ He issued an open Quality Assurance Daily Log to the Bechtel Project Superintendent⁵⁰ which required corrective action prior to covering the Cadwelds with concrete.⁵¹

49. On November 6-8, 1973, RO carried out an inspection at the site that indicated to them that serious deficiencies existed with respect to Cadwelding. These deficiencies related to void measurement techniques and the associated acceptance criteria, the comprehensiveness of records to demonstrate correct performance of Cadwelding, and the adequacy of the existing procedures for proper control and documentation of Cadwelding activities. Mr. Vetter testified that as a result, the Staff, on November 9, requested in a telephone call to Consumers' Project Manager that Cadwelding be suspended pending corrective action and review by the Staff of the corrective action. The Project Manager responded that he, also, had felt that there had been major QA/QC problems associated with the Cadwelding, that a hold had been placed on the activities the previous day, that Consumers personnel had thoroughly reviewed the matter, and that, as a result of their subsequent actions, they felt that the hold should be lifted. He was informed that it was the Staff position that all existing Cadwelds should be re-inspected and requalified by properly qualified personnel and that a determination should be made by the regional office that an acceptable program for Cadwelding had been developed and implemented before work was resumed. Shortly afterwards, the Project Manager confirmed that the Cadwelding had been suspended in accordance with the Staff's request.⁵²

50. As a result of that inspection, Consumers took a number of actions. In addition to requalifying the Cadwelds, Consumers undertook the following additional steps:

⁴⁷ Docket, pp. 23-28.

⁴⁸ Lawrence's Exhibit CP-16; Tr. 327.

⁴⁹ Docket, p. 3; Bechtel's Exhibit Docket-2.

⁵⁰ Kretz, p. 28.

⁵¹ Tr. 402.

⁵² Tr. 185-190, 289-290, 317-321.

(a) An increase in the number of Consumers' Field Quality Assurance personnel from one, prior to the November 6-8 RO inspection, to four during the early part of December;

(b) Consumers' quality assurance personnel were provided with procedures requiring audits to determine that all safety-related activities would be accomplished in accordance with the requirements of 10 CFR 50, Appendix B and ANSI N45.2. In addition to these program type audits, Field Quality Assurance personnel were also provided procedures requiring verification, by actual observation, that Bechtel work and inspection Procedures for quality-related activities were being implemented;

(c) Consumers' field quality assurance personnel were made responsible for reviewing and approving all Bechtel Master Inspection Plans to determine whether these inspection plans adequately assure the quality of work function by providing adequate Quality Control acceptance parameters, adequate detail of the inspection function and adequate evidence that all quality-related activities were being properly observed and documented; and

(d) Procedures for regular meetings between Consumers' General Office personnel and Consumers Field Quality Assurance personnel were written and implemented. These procedures require one-day visits every two weeks by the Midland Quality Assurance Supervisor to the Midland Site, one-day visits every two months by Consumers' Director of Quality Assurance Services, and quarterly meetings between Consumers' Midland Quality Assurance Services personnel with the Vice President of Electric Plant Projects, the Director of Quality Assurance Services and members of the Midland Project Organization.⁵⁵

51. Bechtel management also took steps to verify that the C&D fields were of proper quality, to determine necessary revisions to the Bechtel Quality Assurance program for Midland and to insure that similar situations would not recur.⁵⁶ This action included:

(a) Development of more formalized procedures for specialized work processes;

(b) Requiring Quality Control Engineers to conduct quality acceptance and verification inspections;

(c) Implementation of an action program to provide more timely response to Quality Assurance/Quality Control findings;

(d) Qualification of Quality Control Engineers in accordance with written procedures covering qualifications, indoctrination, training, testing and certification in accordance with requirements of ANSI N45.2.6 and AEC Regulatory Guide 1.58; and

⁵⁵ Kestry, pp. 29-30.

⁵⁶ Testimony of Yates, following Pt. 579, pp. 10-11.

(e) Increased management and supervisory personnel attention including visits to the site at least twice per year by the Bechtel Vice President and Deputy Division Manager, San Francisco Power Division, each quarter by the Vice President and Area Manager of the Ann Arbor area office, and once every other month by the Ann Arbor Office Manager of Construction.⁶⁷ Implementation of these actions was verified by Bechtel management⁶⁸ and directives were issued to re-emphasize Bechtel's commitment to Quality Assurance.⁶⁹

52. Special inspections were carried out by the Staff at the site on November 20 and 21 and December 6 and 7, 1973, after Consumers had notified the Staff that necessary corrective actions had been completed. At the first of these inspections, the Staff found that, although substantial corrective action had been taken with respect to the specific Cadwelding problems, further action was necessary by Consumers with regard to its analysis of the implications of the Cadwelding problems to the overall implementation of the Midland quality assurance program. Although it appeared to the Staff that attention had been addressed to this latter matter, the Staff did not find adequate documentation of such action.⁷⁰

53. The fact that the actions taken by Consumers and its contractors between November 9 and the November 20-21 inspection did not entirely fulfill the Staff's requirements appears to have resulted, at least in large part, from a lack of mutual understanding of what was required.⁷¹ On November 21 the Staff further clarified its position to include the requirements that:

Consumers Power Company ... demonstrate that the Midland quality assurance/quality control programs had been analyzed for shortcomings by Consumers Power Company and ... corrective action, indicated to be necessary as a result of [the] quality assurance/quality control program shortcomings analysis had been adequately prescribed.⁷²

54. As a consequence of this clarification, Consumers formally documented its analysis of the programmatic aspects of the Cadweld deficiencies⁷³ and another RO inspection was scheduled for December 3, 1973. This inspection was subsequently cancelled by RO and Consumers was notified shortly thereafter of the issuance of the Order to Show Cause. The cancelled inspection was rescheduled and held on December 6 and 7, 1973.⁷⁴ During this inspection, RO concluded that the programmatic deficiencies, including management involve-

⁶⁷ See Staff's Exhibit Y-2-5.

⁶⁸ See pp. 10-11.

⁶⁹ See Staff's Exhibits Y-2-4, -7, and -8.

⁷⁰ Is. 191, 290, 321-322.

⁷¹ Is. 191, 213-216, 222-223, 240-270, 309-311.

⁷² Is. 191.

⁷³ Exhibit B, p. 19. Licensee's Exhibit K-7 and K-8.

⁷⁴ Exhibit B, of Licensee's Exhibit CP 16.

ment, and special problems relating to Castwelding at Midland had been satisfactorily resolved.

55. On December 13, a Memorandum was sent by Dr. Knuth (Director of Regulatory Operations) to Mr. Munizing (Director of Regulation) recommending that the Order to Show Cause, which had been issued on December 3, 1973, be modified to permit Castwelding activities to resume. The Order to Show Cause was so modified on December 17, 1973.¹⁸

56. An additional re-inspection was made on January 10 and 11, 1974, to determine the degree of implementation of the commitments made earlier, including those made in Consumers' answer to the Order to Show Cause. The Staff found that Consumers had taken appropriate action.¹⁹

57. Based upon the testimony of the witnesses presented by the Regulatory Staff and the testimony of Consumers' and Bechtel's witnesses, the Board finds that Consumers is implementing its quality assurance program in compliance with the Commission's regulations.

B. Issue No. 2

Whether there is a reasonable assurance that such implementation will continue throughout the construction process.

58. The second issue that must be decided by this Board is whether there is reasonable assurance that Consumers' implementation of its quality assurance program in compliance with Commission regulations will continue throughout the construction process. The Board has analyzed the evidence of record and has classified such evidence into three general areas, which it believes will be useful in deciding this issue. The first is the actions that Consumers and its contractors have taken in the past to establish an effective program and to watch out and put into effect improvements in it. The second is the expressed points of view and intents of the senior personnel involved. The third is the opinions of the Staff's expert witnesses and the bases for these opinions. With respect particularly to the latter two areas, the Board realizes that its judgments will necessarily be somewhat subjective and will be based in part on the testimony of the witnesses, which the Board has carefully observed and considered.

Actions by the Licensee

59. The actions taken by Consumers and its contractors to improve their quality assurance programs prior to the November 1970 suspension of construction have been discussed *supra*.²⁰ Subsequent to the suspension, on February 1, 1971, a corporate reorganization was instituted by Consumers, in

¹⁸ Tr. 192-193; 291; 322-324; 342, 402-404.

¹⁹ Tr. 196-201; 291-292; 325-326.

²⁰ Paragraph 48.

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which overall responsibility for specific corporate projects was delegated to specified individuals. The philosophy underlying the new organization structure was that if total responsibility for each project was delegated to specified individuals, projects could be properly supervised without the complexity of coordinating corporate activity through various departmental interfaces.⁷⁸ On August 31, 1971, and again on December 8, 1971, Consumers' Quality Assurance Program Audit Manual was voluntarily upgraded to provide more detailed procedures for implementation.⁷⁹ Similarly, Consumers' Departmental Communications Guideline Manual was issued in December of 1971 and revised in March of the following year.⁸⁰ The Midland Project Procedures Manual, which was required by these guidelines, was issued in October, 1972.⁸¹

60. In March of 1972 Bechtel submitted to Consumers for review and concurrence a policy statement revising and defining the policy and responsibilities for the Quality Assurance Program of its Power and Industrial Division. Consumers' comments on this statement were resolved and the statement was accepted by Consumers in February of 1973.⁸²

61. In an effort to obtain another perspective regarding Commission quality assurance requirements, Consumers employed the NUS Corporation as a consultant to examine the Quality Assurance Program. NUS submitted its report on December 13, 1972, stating that Consumers had a complete and detailed audit plan. NUS recommended that the Quality Assurance organization be given complete independence from those groups having cost and scheduling functions and that Quality Assurance activities be expanded beyond its auditing function. As a result of this report, Quality Assurance activities were expanded and the Quality Assurance organizations were given greater, although not complete, independence. Under the new organization, which became effective February 15, 1973, the title of the Quality Assurance Engineer was changed to Quality Assurance Administrator and he reported directly to Mr. Howell, the Vice President in charge of Electric Plant Projects.⁸³ Soon after this reorganization the QA Administrator inferred from a statement in an RO inspection report that the Commission did not correctly understand the new organization. Discussions were held with the RO staff to rectify this and as a result, a further reorganization was made on October 1, 1973. The position of Director of Quality Assurance Services was created on the same level as all project managers and directors of service organizations and reporting directly to the Vice President, Electric Plant Projects. This reorganization resulted in a separation of the Quality Assurance organization from the Midland Project organization which

⁷⁸ Keeley, pp. 14-15; Howell, pp. 9-9.
⁷⁹ Keeley, p. 12; Howell, p. 9.
⁸⁰ Keeley, p. 18.
⁸¹ Id., p. 19.
⁸² Id., pp. 15-18; Yater, pp. 2-3; Br. Staff's Exhibit Y-1.
⁸³ Howell, pp. 11-13; Licensee's Exhibits H-3 and H-4.

had cost and scheduling responsibilities. This independent Quality Assurance organization was given responsibility for all aspects of Quality Assurance including policy and implementation. The organization and responsibilities remain essentially the same today.⁶² Also, during 1973, additional staffing was provided for the quality assurance organization, the Quality Assurance Manual and the Policies and Procedures Manual were revised, and a new Quality Assurance Services Department Procedures Manual was written to provide procedures for the new organization.⁶³

62. Shortly after the reorganization, Consumers asked NUS to make a new review of the QA program⁶⁴ and, after the Cadwelding problem arose, expanded the assignment to include a recommendation regarding the desirability of using a third-party inspection organization independent of both Consumers and Bechtel. NUS recommended against such use of a third-party inspection group.⁶⁵ They did recommend, however, that Consumers (1) incorporate pertinent requirements of ANSI N45.2 standards into its Quality Assurance Program, (2) consolidate Quality Assurance procedures into a single Quality Assurance Manual, (3) consolidate all Quality Assurance activities (including operational) under a single Quality Assurance Manager, (4) clearly define Quality Assurance responsibilities during pre-operational testing, (5) perform a detailed review of the Bechtel and B&W Quality Assurance Program, (6) conduct a baseline audit of principal vendors using a third party organization, and (7) establish a Quality Assurance/Quality Control Surveillance, Inspection Program tied to the Midland construction schedule. With the exception of the consolidation of both construction and operational Quality Assurance functions under one Quality Assurance Manager, and the recommendation regarding third-party baseline audits of principal vendors, an activity already completed by Consumers Project Quality Assurance Services Department (PQASD) personnel, these NUS recommendations have been fully implemented by incorporation into a revised Consumers Quality Assurance Manual.⁶⁶

63. In recognition of the usefulness of a periodic third party review, Consumers has retained the General Electric Nuclear Engineering Services Apollo group to review and comment on the revised manual. That review process is under way and upon completion of the review, a revised manual and implementing procedure will be issued. In addition, General Electric has reviewed the audits which Consumers has completed.⁶⁷ To date, General Electric Apollo has not indicated that any major changes in the Consumers Quality Assurance

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but not the QA program
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⁶² Howell, pp. 14-15; Licensee's Exhibit H-5.

⁶³ Howell, p. 15.

⁶⁴ Id., p. 16.

⁶⁵ Id., p. 20.

⁶⁶ Id., pp. 20-22; Licensee's Exhibit H-10.

⁶⁷ Howell, p. 22.

Program would be desirable.⁶⁰ General Electric AEP has also been asked to conduct annual reviews of the Consumers Quality Assurance Program for the purpose of determining whether that program is being properly implemented and to offer recommendations for updating the Program to meet evolving regulatory and industry standards.⁶¹

64. Consumers also has directed Bechtel to assure that their procedures used on the Midland Project comply with both 10 CFR 50, Appendix B and ANSI N45.2 and to consider ANSI N45.2 as the controlling document in evaluating the Bechtel Quality Assurance Program. When a major audit of Bechtel activities was conducted during March of 1974, ANSI N45.2 was used as one of the bases of the audit. In NCR-68, dated April 1, 1974, Consumers directed Bechtel to revise its Nuclear Quality Assurance Manual to specifically state policy requirements supporting the procedures which Bechtel had established in order to comply with the requirements of ANSI N45.2. Bechtel has complied with the corrective action of this nonconformance report.⁶²

65. Similarly, in August of 1973, Consumers directed B&W to apply its newly revised Quality Assurance Program to the Midland Project. Thus, Consumers became the first utility to put into effect the upgraded B&W Quality Assurance Program.⁶³

66. As a consequence of the Cal-solding problem, additional steps were taken by both Consumers and Bechtel to upgrade quality assurance. These steps have been described in connection with Issue No. 1.⁶⁴

67. Consumers has also instituted two types of field audits to assure that Bechtel construction and Quality Control personnel have received effective training, that Bechtel inspection procedures are adequate and that proper documentation is provided. The first of these audits, the program audit, consists of using a checklist provided in the Quality Assurance Services Procedures manual to review Bechtel field activities prior to commencement of work at the site. The program audit procedures also require a comparison of the Bechtel Master Inspection Plan with the requirements listed in the Preliminary Safety Analysis Report, Commission regulations, specifications and drawings. PQASD also approves the Master Inspection Plan prior to commencement of work in the field. In addition to these program audits, an implementation audit surveillance is also performed by Consumers' PQASD personnel to assure that Bechtel work and inspection activities are being accomplished in accordance with approved procedures and that approved specifications are being met.⁶⁵

⁶⁰ T. 1-40-491.

⁶¹ Exh. pp. 32-33.

⁶² Id. pp. 33-34.

⁶³ Id. p. 35.

⁶⁴ Paragraphs 50 and 51 supra.

⁶⁵ Exh. pp. 1-4.

68. In addition to these field activities, PQASD includes and conducts (1) audits of Bechtel Engineering, Procurement, Inspection and Quality Assurance; (2) audits of B&W Engineering, Procurement, Quality Assurance and fabrication facilities; and (3) audits of major suppliers.⁹⁸ Consumers and Bechtel have both also instituted additional training activities. Consumers instituted a formal training program for all of its Quality Assurance personnel in 1973.⁹⁹ It was expanded in 1974 to include the use of outside, as well as Consumers, personnel to conduct the training. The training of new employees and the retraining of present employees will be a continuing process.¹⁰⁰

69. Similarly, Bechtel's indoctrination and training program continued to evolve through the addition of more detailed and comprehensive requirements. Presently, each Quality Assurance Engineer is required to complete an in-depth, comprehensive training program consisting of classroom preparation, on-the-job experience and participation in different kinds of audits. Quality Control Engineers are certified under a program designed to comply with ANSI N45.2.6 and Regulatory Guide 1.58.¹⁰¹ The training program for Engineers and Designers has become more formal and more comprehensive.¹⁰² Bechtel's Procurement Inspection training program also has continued to evolve to the point where it presently includes certification, recertification and supplementary sessions tailored to meet specific needs. This program is currently being upgraded to meet the requirements of ANSI N45.2.6 and N45.2.12.¹⁰³

Licenses' Management Position

70. Russell C. Youngdahl, Senior Vice President in charge of all aspects of Consumers' electric generating and transmission planning, construction, operation and maintenance, including nuclear generating stations, presented testimony on this subject. Mr. Youngdahl is one executive level below the chief executive officer. Mr. Youngdahl's perception of the attitude of the President and Chairman of the Board of Directors toward Quality Assurance has been one of insistence on the highest standards of Quality Assurance; this attitude has been expressed in the presence of representatives of the Commission.¹⁰⁴ Mr. Youngdahl testified that the Commission's rules and regulations, as well as license requirements, are regarded by Consumers' management as the equivalent of statutes and, as such, are considered binding on the Company and its employees.¹⁰⁵ Mr. Youngdahl stated that, although the management has always

⁹⁸Id., p. 6.

⁹⁹Howell, p. 72.

¹⁰⁰Id., Exer. pp. 6-8.

¹⁰¹Testimony of Fuchs, following Tr. 663, pp. 7-9.

¹⁰²Testimony of Martins, following Tr. 626, pp. 11-12.

¹⁰³Testimony of Southard, following Tr. 641, pp. 1-6.

¹⁰⁴Tr. 529-528.

¹⁰⁵Testimony of Youngdahl, following Tr. 519, p. 6.

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demanded quality in its work at least equal to industry standards, its approach has evolved from one of primary reliance on its engineering contractor to a more formalized reliance upon its own Quality Assurance organization and program.¹⁰⁰ In order to formally document this approach, Mr. Younedahl on March 29, 1974, issued a Quality Assurance Policy Statement which committed the entire electric organization, including both the operating group and the projects group, to implement a Quality Assurance plan which meets both 10 CFR 50, Appendix B and ANSI N45.2. In order to make certain that this policy is implemented by the operating group, a Director of Quality Assurance Operations was named on June 1, 1974.¹⁰¹

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71. Mr. Younedahl's personal involvement in the QA process ranges from daily review of EPP activities to monthly review of PQASD activities. He participated in meetings with Bechtel senior management following the November 6-8, 1973, RO inspection at which it was stressed that Quality Assurance implementation must be improved and that Bechtel management must be more closely involved in quality assurance at Midland. It was his intention to procure a third party review of the Midland Quality Assurance Program.¹⁰²

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72. The Palisades Nuclear Plant investigation by the Commission and the United States Department of Justice stimulated the production of a management directive which explicitly set forth responsibilities for reporting violations of Commission rules, regulations and license requirements. This directive requires notification to the Commission by Consumers of all items which are deemed to be violations and also of all items which are subject to interpretation as to whether or not they are in fact violations.¹⁰³

73. The Board requested that Consumers make Ralph B. Sewell, Nuclear Licensing Administrator for operating nuclear power plants, available for questioning on the attitude of senior management personnel toward compliance with Commission rules and regulations.¹⁰⁴ The Board questioned Mr. Sewell regarding statements given the RO staff in connection with the operation of the gaseous radwaste system at the Palisades plant during 1972.¹⁰⁵ The Board's concern was that, in this instance, extraordinary steps may have been required to direct the attention of Consumers' management to important safety matters. Mr. Sewell testified that it was Consumers' intent to fully comply with all Commission rules, regulations and licensing requirements.¹⁰⁶ Mr. Sewell's

¹⁰⁰ Younedahl, pp. 3-4.
¹⁰¹ Younedahl, p. 5; Licensee's Exhibit Y-2.
¹⁰² Younedahl, pp. 4-5.
¹⁰³ Younedahl, p. 6; Licensee's Exhibit Y-3.
¹⁰⁴ Tr. 399-402; and 479.
¹⁰⁵ Tr. 546-547.
¹⁰⁶ Tr. 563.
¹⁰⁷ Tr. 564.



statement described his normal channels of communication within the company.¹¹⁸ Mr. Sewell emphasized that he did not have to take extraordinary steps to draw management's attention to his request to the Palmdale operating staff to perform corrective maintenance on the gaseous radwaste system.¹¹⁹ When they communicated his concerns, the operating personnel at Palmdale performed extensive maintenance on the system,¹²⁰ and therefore, he did not give management affirmation on his positive.¹²¹

74. Stephen H. Howell, Vice President in charge of Electric Plant Projects, having direct responsibility for design, construction and construction quality assurance activities for nuclear power plants, testified at the hearing. He stated that the policy of Consumers is and has always been to comply with all laws, ordinances, regulations and rules and to require its contractors to do the same.¹²² Mr. Howell stated that his perception of the attitude of his superiors toward Quality Assurance was that they believed it to be important and that they had manifested this belief to him on numerous occasions.¹²³

75. The attitude toward compliance with Commission rules and regulations was set forth by Gilbert S. Lacey, Director of Project Quality Assurance Department Services in response to a Board question as to why the future implementation of the Midland Quality Assurance Program will be better than its past implementation in terms of effectiveness:

Now there is no doubt in my mind [that] we have been implementing [the upgraded QA program carried out since Oct. 1, 1973], if the AEC feels that they want us to provide more visibility on any of these functions we are doing, we're going to do it as far as I am concerned.

As I say, I have been given that responsibility to implement or to set QA policy and to see that the policy is implemented, not only by Consumers Power Company but by B&W and Bechtel.¹²⁴

76. In order to insure that management personnel remains informed of Quality Assurance activities at the Midland site, Consumers has had periodic in-depth status meetings among its management personnel for a number of years.¹²⁵ On February 1, 1974, the requirement for these meetings was formalized so as to require at least quarterly meetings between Vice President, EPP, and representatives of General Office Quality Assurance, Midland Field Quality Assurance and the Midland Project. Reports of these meetings are

¹¹⁸Tr. 579-582.
¹¹⁹Tr. 584-585.
¹²⁰Tr. 586-590.
¹²¹Tr. 583-585.
¹²²Howell, pp. 4-5.
¹²³Tr. 582-583, 587.
¹²⁴Tr. 677.
¹²⁵Howell, p. 24.

10-605 reference to Records of QA Operations? removed June 1, 1974 - LWD?
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submitted to the Senior Vice President.¹¹⁰ These formal procedures further require one-day visits every two weeks to the Midland site by the Midland Quality Assurance Supervisor and one-day visits every two months by the Director of Quality Assurance Services.¹¹¹ In addition, PQASD submits a monthly resume of Quality Assurance activities to the Vice President, EPP and through him, to the Senior Vice President. The Vice President, EPP, further reviews all audit reports, nonconformance reports and RO inspection reports.¹¹² For example, when a Consumers nonconformance report (NCR) is issued and the responsible Quality Assurance individual has made the initial analysis as to whether the deviation is reportable under 10 CFR 50.45(e), the Vice President, EPP, is contemporaneously advised.¹¹³

Many NCRs deemed reportable

Staff's Views on Future Compliance

77. The Staff's views on the question of future compliance are embodied primarily in Mr. Vetter's prepared testimony and in the Board's direct examinations of Mr. Vetter and Mr. Keppler. After testifying that:

① shortcomings in implementation of the Midland quality assurance/quality control programs have been identified and corrected, and ② Consumers Power Company Management personnel have demonstrated awareness of the need to become involved, and stay involved, with quality assurance/quality control programs designed to assure proper construction of the Midland Plant.¹¹⁴

Mr. Vetter concluded that "reasonable assurance now exists that compliance will continue throughout the construction period."¹¹⁵

78. Mr. Keppler was asked by the Board to characterize quality assurance program at Midland as it compared to that at other facilities under construction in his region. He stated as his opinion that it was "probably comparable."¹¹⁶ but suggested that his inspectors might be in a better position to make such a judgment. When polled, they concurred with Mr. Keppler's assessment.¹¹⁷

79. Mr. Keppler was asked by the Board what evidence he would look for in order to determine whether or not it was likely that a licensee would comply with the rules and requirements in the future.¹¹⁸ After pointing out that with a new licensee he can only inspect to determine whether the licensee is satisfying

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¹¹⁰ Youngdahl, p. 8; LaCrosse, Exhibit Y-1.
¹¹¹ Keeley, p. 36.
¹¹² Housell, p. 24.
¹¹³ Tr. 504.
¹¹⁴ Tr. 201-202. The bases for this statement appear at Tr. 194-201.
¹¹⁵ Tr. 201.
¹¹⁶ Tr. 377-378.
¹¹⁷ Tr. 307-395.
¹¹⁸ Tr. 379.

Q to Kappeler -
What future licensees did
look for in the

the commitments made to the Directorate of Licensing.¹²⁹ He went on to say that in the case of a licensee who has had previous nuclear experience, he looks at "the past performance of the utility in terms of their ability to comply with their commitments in the past." Among the actions that he considers are:

the action that management has taken with respect to making sure that the commitments are being met, that appropriate instructions have been provided, that there's a plan of action laid out to see that the commitments are fulfilled and that there is a program of audit developed to follow up and assure that the commitments are fulfilled.¹³⁰

30. After responding affirmatively to the question of whether he had considered the past performance of Consumers Power Company from this standpoint, he was asked for his views on the performance.¹³¹ He prefaced his answer by pointing out that one must consider this question in the light of changes in the regulatory inspection and enforcement programs. He pointed out that the Big Rock Point facility was "over ten years old" and that the Palisades plant "was licensed around 1970".¹³² During the intervening time, many changes, in addition to adoption of the quality assurance criteria, have taken place. Originally there were very few plants and the program for dealing with violations and noncompliance matters "was less structured than it is today",

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being based more on efforts to bring licensees into compliance than on resort to enforcement actions. As there came to be more and more licensees and their performance was not "as good as had been hoped for" stronger enforcement practices were adopted.¹³³ With this introduction, Mr. Kappeler testified that there had been "many situations that we dealt with on Big Rock Point and in the early stages of Palisades which I would characterize as a negative attitude on the part of a licensee" and that he is "on record as having been concerned about the performance of Consumers Power Company". He then testified that, despite the serious reservations about past performance, "it is my view that we have seen a very discernible change over the past several months . . . that has been factored into our thinking on this case: changes in organization structure, changes in facing up to commitments, and dealing with commitments" and that "they had seemed to face up to this problem in a much more professional way than I have seen them face up to any other problem; that they had convinced themselves of



¹²⁹ Tr. 380.

¹³⁰ Tr. 380-381.

¹³¹ Tr. 383.

¹³² The Board notes that the construction permit for Big Rock Point was issued May 31, 1960, and the operating license August 30, 1967, and that the comparable dates for Palisades were March 14, 1967, and March 24, 1971. These differences from Mr. Kappeler's recollections enhance, rather than detract from, his point.

¹³³ Tr. 383-384.

what it took to do the job and they were taking steps to do it." 124 Mr. Keppler identified the recent events that characterized the "very discernible change" as including the careful consideration on the part of the company reflected in the commitments regarding the Quality Assurance Program contained in the response to the Order to Show Cause, the discussion between the Staff and Consumers' senior management personnel regarding the Palisades matter, the regularization both at the site and at the home office to focus more management involvement in the problems being experienced and changes in attitude on the part of the people with whom inspectors had been dealing. 125

based on previous commitments, not actions

81. Because of the fundamental role played by the RO inspection program in reaching conclusions such as those of Mr. Keppler stated above, the Board asked Mr. Keppler to provide a general description of the inspection program for reactors under construction. 126 His description, 127 and the testimony regarding the program by the other Staff witnesses, has led the Board to conclude that the Staff has an active and effective program that is capable of detecting significant deviations from the Commission's requirements. Although the Board does not consider it necessary to recite the details of the program here, we note that the general approach includes enlarging the inspection effort in cases where the findings indicate a need for such intensification. 128 As one Staff witness characterized it, "we give the oil to the squeaky wheel". This philosophy, in the view of the Board, should assist in the detection of incipient adverse quality assurance trends before they become major problems and before they result in difficult-to-correct hardware deficiencies. In this respect we also note the increasingly effective enforcement procedures of the Staff 129 and Mr. Keppler's assertion 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." 130

similar to past - rail

82. Based upon consideration of the entire evidentiary record in this proceeding, the Board concludes that although there have been questions of compliance and an attitude regarding QA in the past, there is reasonable assurance that implementation of the Midland QA program will continue to be conducted in compliance with Commission requirements during the remainder of the construction process. We take particular note of Mr. Keppler's statement that "... if the company fails to live up to its obligations that we're (the Staff) not afraid to step in and stop construction. ..." (Tr. 386).

124 Tr. 365-386. The other Staff witnesses were asked for their characterizations of Consumers' attitude. Their answers, which agree with Mr. Keppler's, appear at Tr. 417-421.
 125 Tr. 385-389.
 126 Mr. Verter's description of the program as it relates to this case (Tr. 184-188) has been discussed with respect to issue No. 1.
 127 Tr. 397-361. See also Tr. 347-351 and 405-407.
 128 Tr. 347-349; 375-376.
 129 Tr. 384-385; 387, 391-393.
 130 Tr. 386.

III. CONCLUSIONS OF LAW

83. Based upon the foregoing findings of fact, and upon consideration of the entire evidentiary record in this proceeding, the Board concludes as follows:

1. Consumers is implementing its quality assurance program in compliance with Commission regulations;

2. There is reasonable assurance that such implementation will continue throughout the construction process;

3. Construction Permit Nos. 81 and 82 issued to Consumers Power Company for the Midland Plant, Units 1 and 2, should not be suspended, modified or revoked.

IV. ORDER

WHEREFORE, it is ORDERED, in accordance with the Atomic Energy Act of 1954, as amended, and the Commission's Rules and Regulations, that this proceeding is terminated.

It is further ORDERED, in accordance with Sections 2.760, 2.762, 2.764, 2.785 and 2.786 of the Commission's Rules of Practice, that this Initial Decision shall be effective immediately, and shall constitute the final action of the Commission forty-five (45) days after the date of issuance hereof, subject to any review pursuant to the Commission's Rules of Practice and the Commission's Memorandum and Order and Notice of Hearing, dated January 21, 1974. Exceptions to this Initial Decision may be filed by any party to this proceeding within seven (7) days after service of this Initial Decision. Within fifteen (15) days thereafter (twenty (20) days in the case of the Regulatory Staff), any party filing such exceptions shall file a brief in support of such exceptions. Within fifteen (15) days after service of the brief of the party or parties filing exceptions (twenty (20) days in the case of the Regulatory Staff), any other party to this proceeding may file a brief in support of, or in opposition to, exceptions which have been filed.

ATOMIC SAFETY AND LICENSING BOARD

Emmeth A. Luebke

Lester Kornblith, Jr.

Michael L. Glaser

Issued at Bethesda, Maryland,
this 25th day of September, 1974.

NRC ~~Dep~~ Ex 2
Keeley (10-23-80)

RESUME OF PROFESSIONAL AND
EDUCATIONAL EXPERIENCE

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Work: Consumers Power Company
1945 West Farnall Road
Jackson, Michigan 49801
(517) 788-0321

I. Professional Experience

- a. July, 1975 to Present. Project Manager on Midland Nuclear Power Plant which is a dual-purpose nuclear plant designed to supply 1300 megawatts electrical to the Consumers Power system and up to 4,000,000 lb/hr of process steam to the Dow Chemical Company. Up until March, 1980, I had overall responsibility for the licensing, design, construction, testing, costs, scheduling and contract administration of contracts between Consumers and its principal suppliers and between Consumers and Dow Chemical for this \$3.1 billion Project until fuel loading takes place. Upon appointment of a Vice-President for Midland in March of 1980, my responsibilities as Project Manager were changed to include design, construction, testing and administration of contracts.
- b. November, 1973 to July, 1975. Appointed Director of Quality Assurance Services for nuclear and conventional power plants' design and construction. Responsibility for: Building up staff of QA personnel, seeing that they were given training, setting QA policies for the Company, and preparing necessary QA Program Manuals and Procedures. Supervise staff of 11 people (6 in General Office and 5 at Midland Plant Site) who have expertise in areas of Mechanical, Electrical, Civil, Instrumentation and Control, and Non-destructive Examination (NDE). This staff reviews and approves QA Programs of Architect-Engineers, Suppliers, and Construction Contractors and conducts audits and surveillance for implementation of quality-related activities. The staff is spokesman for Consumers Power on NRC Regulatory Operations inspections on site.
- 1970 to November, 1973. Director of Electric Plant Projects Engineering. Supervised staff of four Nuclear Engineers, three Mechanical Engineers, one Metallurgical Engineer, two Civil Engineers, one Instrumentation and Control Engineer, and one Electrical Engineer. This staff was responsible for: Developing Consumers power design bases for Nuclear and Conventional power plants; developing inputs for specifications for Consumers power prime contractors such as

- boiler, HECS, and turbine/generator; reviewing designs and specifications produced by Architect-Engineer; writing pre-operational and hot functional tests and reviewing test results; reviewing recommendations made by Architect-Engineer on procurement of power plant equipment; technical review of potential suppliers for placement on Consumers Power Approved Bidders List; and assisting in licensing activities with the NRC or State.
- c. 1968 to 1970. Supervisory Nuclear Engineer. Supervised staff of two Engineers. Responsible for: Writing up specifications for nuclear fuel; performing evaluation of fuel bids and recommending supplier; review of engineered safeguards systems, reactor protective systems, radwaste systems, and nuclear instrumentation systems to assure they met latest industry standards and AEC criteria; assisted in AEC licensing activities; and compiled site meteorological data and made dose calculations.
 - d. 1963 to 1970. Nuclear Engineer. Reviewed designs of nuclear plant engineered safeguards systems, reactor protective systems, radwaste systems, and nuclear instrumentation systems to assure they met latest industry standards and AEC criteria. Wrote up specifications for nuclear fuel, did fuel cost calculations, recommended fuel supplier, and assisted in writing fuel contract. Initially performed as Project Engineer on Palisades Plant for assembly and review of PCIR and organized Start-up Test Program for Palisades.
 - e. 1961 to 1963. Start-up Engineer at Big Rock Point Plant. Responsible for Consumers Power review of preoperational test procedures. Responsible for running tests. Evaluated test results with assistance from other Consumers Power personnel, HECS personnel and AE personnel. Obtained AEC Cold License on the plant and functioned temporarily as Shift-Supervisor until additional Consumers Power personnel were qualified.
 - f. 1955 to 1961. Engineer in Atomic Power Division of Westinghouse Electric Corporation. From 1955 to 1956, I was Reactor Engineer on the SLW Plant at the Navy Reactor Test Facility (NRTF), Idaho, with responsibilities in the areas of reactor operations and plant instrumentation, including the qualification of Navy reactor plant operators. From 1956 to 1957, I was Senior Engineer in the SLW Engineering Group, concerned with the design and procurement of nuclear instrumentation and reactor protective system equipment. During part of 1957, I was a member of the Westinghouse start-up crew at the Shippingport Atomic Power Plant responsible for various phases of reactor plant check-out and had prime responsibility for qualification of the utility's reactor plant operators and for initial criticality operations. In 1958 and 1959, I was plant Reactor Engineer for the ALW Plant at NRTF, Idaho, responsible for reactor plant instrumentation testing and qualification of Navy reactor plant operators. From 1959 to 1960, I was Supervisor of the ALW Instrument Shop with responsibility for setting up all instrumentation for ALW Plant testing. From 1960 to 1961, I was ALW Chief Operator Trainee, receiving training in all aspects of ALW Plant operation.

- g. 1949 to 1955. Electrical maintenance and start-up with Pacific Gas and Electric in conventional steam plants. Four years of this time was as Electrical Maintenance Foreman at PG&E's Antioch Steam Generating Plant supervising five electricians.
- h. 1948 to 1949. Test Engineer for General Electric Co in Schenectady, New York. Assigned as Test Engineer in areas of induction motors, electronic control and armament controls.

II. Educational Experience

- a. 1940 - Graduate of Topeka, Kansas High School.
- b. 1942 - Graduate of Kansas City, Missouri Junior College with Associate Science Degree in Engineering.
- c. 1946 to 1948. Attended University of Missouri at Rolla and graduated with B.S. in Electrical Engineering. "B+" average. Member of Tau Beta Pi and Phi Kappa Phi national honorary fraternities.
- d. 1953 - Taught relay courses to PG&E Electricians.
- e. 1958 to 1961. Post-graduate courses from University of Idaho extension at Idaho Falls. 18 hours' credit towards Masters in Electrical Engineering for such courses as Advanced Engineering Math, Pulse and Digital Circuits and Transistor Circuits.
- f. 1965 - 2-semester course at University of Michigan on Computer Solutions to Transmission Line Problems.
- g. 1968 - 2-semester Welding Technology night course at Jackson Junior College.
- h. 1974 - Assisted in conducting training of Consumers Power QA personnel on nuclear power plant systems; AEC and Industry QA requirements. Attended courses we arranged in QA Program Evaluation, ASME Section 3, and NDE.
- i. 1974 - Taking one semester Jackson Junior College night course in NDE (Radiography, Diepenetrant and Magparticle) with lab work.

III. Committee and Society Membership

- a. 1964 to 1973. Member of Consumers Power Company Safety, Audit and Review Board for its Nuclear Power Plants.
- b. 1964 to 1970. Member of IEEE Nuclear Power Standards Group involved in writing electrical standards for nuclear power plants.

- 4
- c. 1970 to 1975. Member of ASCE E45.2 Standards Committee writing QA Standards to supplement Appendix B to 10 CFR 50.
 - d. 1972 to 1975. Chairman of ASCE E45.2.13 Work Group writing QA Standard "Quality Assurance Requirements for Control of Procurement of Items and Services for Nuclear Power Plants."
 - e. Member of Tau Beta Pi, National Engineering Honorary Fraternity.
 - f. Registered Engineer in State of Michigan.
 - g. Member of Michigan Society of Professional Engineers.

October 22, 1980

NUCLEAR REGULATORY COMMISSION

ORIGINAL

In the Matter of: CONSUMERS POWER COMPANY : DOCKET NOS.
(MIDLAND PLANT, UNITS 1 AND 2) :
50-329-OM
50-330-OM
50-329-OL
50-330-OL

Deposition of SHERIF EL-SAYED AHMED AFIFI

DATE: October 30, 1980 PAGES: 124 - 222
AT: Ann Arbor, Michigan

ALDERSON  REPORTING

400 Virginia Ave., S.W. Washington, D. C. 20024

Telephone: (202) 554-2345

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THE UNITED STATES

NUCLEAR REGULATORY COMMISSION

----- X

In the Matter of:

CONSUMERS POWER COMPANY
(Midland Plant, Unit 1 and 2)

----- -X

Bechtel Associates, P.C.
777 East Eisenhower Parkway
Ann Arbor, Michigan

Thursday, October 30, 1980

Deposition of

SHERIF EL-SAYED AHMED AFIFI,

the deponent, called for examination by the staff of the
Nuclear Regulatory Commission, pursuant to notice, at 9:15 a.m.,
when were present on behalf of the respective parties:

For the Nuclear Regulatory Commission..

WILLIAM D. PATON

BRADLEY JONES

JOSEPH KANE

DARL HOOD

RONALD ERICKSON, Army Corps of Engineers

JAMES W. SIMPSON, Army Corps of Engineers

HARI N. SINGH, Army Corps of Engineers

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On behalf of Consumers Power:

ISHAM, LINCOLN & BEALE
 1 First National Plaza
 Chicago, Illinois 60603
 By: ALAN S. FARNELL, ESQ.
 JAMES BRUNNER, ESQ.

C O N T E N T S

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WITNESS:

EXAMINATION

Sherif El-Sayed Ahmed Afifi (Resumed)

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MR. PATON: Dr. Afifi, you have been previously sworn.

This is the second day of the deposition of Dr. Sherif Afifi, and we will follow our practice of asking each person in the room to identify himself. I guess we skipped over you, yesterday.

SHERIF EL-SAYED AHMED AFIFI

having been previously duly sworn, was examined and testified as follows:

MR. PATON: Would you start, Dr. Afifi?

A Sherif El-Sayed Ahmed Afifi, and I am with Bechtel.

MR. FARNELL: Alan Farnell, and I am representing Consumer's Power.

MR. BRUNNER: James Brunner with Consumers Power.

MR. SIMPSON: James W. Simpson, Army Corps of Engineers, North Central Division.

MR. KANE: Joseph Kane, U. S. Nuclear Regulatory Commission.

MR. PATON: William Paton, attorney for the NRC staff.

MR. JONES: Bradley Jones, attorney for the NRC staff.

MR. SINGH: Hari N. Singh, U. S. Army Corps of Engineers, Detroit.

MR. ERICKSON: Ronald Erickson, U. S. Army Corps of Engineers, Detroit.

MR. PATON: Darl Hood, D-a-r-l, H-o-o-d, is with us,

1 but he stepped outside for a minute.

2 EXAMINATION

3 BY MR. PATON:

4 Q Dr. Afifi, do you understand that you are still under
5 oath?

6 A Yes, I do.

7 MR. FARNELL: Bill, before we start, Sheriff has
8 something he'd like to say.

9 A Yesterday you requested the name of the consultant
10 that replaced -- is to replace Chuck Gould on the underpinning
11 matter for the Auxilliary Building, and here is the name of the
12 company. I'll give you the piece of paper and I'll read it for
13 the record. It's Johnson and Desmond Consulting Engineers. The
14 name of the two persons who are involved are Jim Gould and
15 Ed Burke.

16 BY MR. PATON:

17 Q Dr. Afifi, are you able to distinguish what construction
18 activities were performed by Canonie as opposed to the construction
19 activities performed by Bechtel?

20 MR. FARNELL: Are you talking just soils?

21 MR. PATON: Let's start there.

22 A Not exactly.

23 BY MR. PATON:

24 Q What do you know about it?

25 A I know that, I understand that Canonie did the entire

5
1 dikes around the plant, the dikes, and done some work in the
2 extension of the dikes around the plant. I do not know the
3 exact zones of what areas Canonie has done and the areas Bechtel
4 has done. That would be construction, construction would be able
5 to answer that.

6 Q Who in Construction would know that answer?

7 A I believe it would be A. Boos. That's the person that
8 I would refer you to. I'm not sure he'd have the detailed
9 information, but he's the one.

10 Q Do you know the name of the organization he is with,
11 I mean what section, group, branch?

12 A My understanding, at the time, Mr. Boos was with the
13 Bechtel Power Corporation at the Midland Construction job site.

14 Q He's with Bechtel at the site?

15 A At the site.

16 Q He's in something you call Construction?

17 A Yes, right, the Construction group.

18 Q Construction group; is that what you call it?

19 A It's what I call it, yes. He is with Bechtel
20 Construction at the site.

21 Q I want to ask you whether you know the name of the
22 specific name of the organization at the site that he's with?

23 A I believe it is Bechtel Power Corporation. I believe
24 that's the name of the company.

25 Q That, I understand, but I want to know what section,

6

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1 group, branch?

2 A I wouldn't know that.

3 Q Did there come a time that Bechtel became dissatisfied

4 with Canonie's work?

5 A I'm not aware of this.

6 Q Do you know whether Canonie continued the work that they

7 had contracted for, or was their work cut short prior to the end

8 of the contract period?

9 A I don't know.

10 Q Who would know that?

11 A That would be either Bechtel Construction or Bechtel

12 Engineering. I referred you to A. Boos, as far as the Con-

13 struction. The engineering department would be another source for

14 information.

15 Q Who might know that in Engineering?

16 A I would have to refer you to the Project Engineer at

17 that time, R. L. Castleberry, and he would know who would be able

18 to answer this question best.

19 Q Dr. Afifi, do you have any responsibility to know what

20 is going on during plant fill operations at the site?

21 MR. FARNELL: What time are you talking about?

22 MR. PATON: During plant fill operations.

23 MR. FARNELL: Plant fill operations were going on for a

24 long time.

25 MR. PATON: That's fine.

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1 BY MR. PATON:

2 Q Did you have any responsibility during plant fill
3 operations to know what was going on at the site?

4 A I would like to try and identify the period, if you
5 would.

6 Q During plant fill operations.

7 A You mean at the time the plant fill was originally
8 placed?

9 Q During the time that the plant fill operations were
10 going on.

11 MR. FARNELL: You're talking from 1973 --

12 MR. PATON: No, that's all right. I don't think you
13 should testified. I'll ask the witness.

14 MR. FARNELL: I'm telling you --

15 MR. PATON: If the witness does not know when plant
16 fill operations were going on, that's his business.

17 BY MR. PATON:

18 Q Do you know when plant fill operations were going on?

19 A I wouldn't know exactly when it was going on, but I can
20 tell you that after the discovery of the Diesel Generator
21 Building problem, sometime after that, the Geotechnical group
22 became involved in assisting the remaining fill work at the site.

23 Before that, I'm not aware of any involvement on our
24 part in the plant fill placement.

25 Q After the discovery of the settlement problem at the

Diesel Generator Building, did you have any responsibilities to know what was going on at the site with respect to plant fill?

A For sometime after the problem, the Geotechnical group was not involved in the fill placement, but at some later date, we became involved, and I don't recall exactly. Mr. Wanzek was assigned as a coordinator, and his responsibility was to provide engineering guidance to the onsite Geotechnical soil engineer.

Q Did Mr. Wanzek report to you, activities at the site?

A Mr. Wanzek reported to me activities as he felt necessary, yes.

Q After the discovery of the problem at the Diesel Generator Building, approximately how often would you visit the site yourself, approximately?

A I have visited the site probably two or three times a year except for meetings that I had to go to with NRC. That's about the approximately the number of times I have been at the site.

Q Do you consider that the frequency of your visits to the site have been sufficient for you to carry out your professional responsibilities with respect to the Midland Project?

A I rely on the services of Mr. Wanzek who was assigned to this job, and he is supposed to be watching all these activities.

Q You say he was supposed to be watching?

A He is watching these activities for me.

Q So that the information you obtained from Mr. Wanzek, you believe is sufficient for your knowledge of activities at the

9
1 site to enable you to carry out your professional responsibilities?

2 A Yes.

3 Q You don't feel that your work suffers any by your
4 isolation from the site?

5 MR. FARNELL: He didn't say he was isolated from the
6 site. That question was asked and answered, and I don't want
7 you to argue with the witness.

8 BY MR. PATON:

9 Q Can you answer the question?

10 MR. FARNELL: He didn't say he was isolated.

11 MR. PATON: Are you instructing him not to answer?

12 MR. FARNELL: No.

13 A I believe that Mr. ~~Wanzek~~ sufficiently qualified to oversee
14 the work and if any need for further involvement on my part, I
15 would have undertaken that involvement.

16 BY MR. PATON:

17 Q Do you know whether Canonie placed the plant fill
18 initially under the Diesel Generator Building?

19 A I do not know for a fact whether he participated, but I
20 have heard statements that some of that fill was placed by
21 Canonie, but I do not know for a fact.

22 Q If you have heard that some of the fill was placed by
23 Canonie, have you heard that some other part of the fill was
24 placed by someone else?

25 A Yes, I have heard some other part was placed by someone

10

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1 else.

2 Q Who?

3 A I believe it is Bechtel. That's my understanding. I,
4 again, don't know that for a fact myself.

5 Q Do you know anything more than what you have already
6 stated about the division of work between Bechtel and Canonie with
7 respect to plant fill as to who did what?

8 A I don't recall anything other than what I told you
9 already.

10 Q All right. Dr. Afifi, I'd like to show you a document
11 that has been covered with three attached pages. On the cover,
12 it's dated August 3rd, 1979. It's from T. E. Johnson of Civil/
13 Structural -- and there may be another word that follows that, but
14 it's covered over, at the Ann Arbor Office. It's to --
15 distribution is to E. Rumba, K. Weidner, J. Milandin, P. Martinez,
16 R. Castleberry, B. Dhar, spelled D-h-a-r, S. Blue, and S. Afifi.

17 Let me show you that document and ask you if you have
18 seen it.

19 Why don't I mark that NRC Deposition Exhibit 2, 10-30-80
20 (Afifi).

21 A I couldn't read all of the last page. The copies are
22 not quite clear.

23 MR. PATON: Could we ask for another copy of Page 3?
24 If you will do that, I'll abandon that line of questioning right
25 now.

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1 MR. FARNELL: I'll note for the record that that is one
2 of the documents we produced in response to the Notice of
3 Deposition. We produced those documents Monday morning at
4 approximately 11:30.

5 BY MR. PATON:

6 Q Dr. Afifi, do you know whether data and drawings con-
7 cerning separation of Canonie's work from Bechtel work by
8 Construction were ever forwarded to Geotechnical Services for
9 review?

10 A I recall sometime that an attempt was made to do that,
11 but I don't -- I am not fully -- I can't completely remember if it
12 was ever completely done.

13 Q If it was forwarded to Geotechnical Services to whom
14 would it have been forwarded?

15 A I believe the person that would know most about it would
16 be Mr. Wanzek.

(Discussion off the record.)

18 BY MR. PATON:

19 Q Dr. Afifi, I want to hand you a document which is
20 numbered in the lower right hand corner beginning with SB 801725
21 and ending with SB 801745. It's dated August 20, 1979. It has
22 the words, "Work File" written in the upper right hand corner,
23 and immediately below that, Bechtel Associates, professional
24 corporation. It's from Karl Wiedner, W-i-e-d-n-e-r of Engineering
25 at Ann Arbor. It is addressed to Distribution. There are seven

1 names, the first one is, copies to P. Bechel, B-e-c-h-e-l, with
2 attachment. The subject is Midland Diesel Generator Task Group
3 Meeting Notes.

4 I turn to the second piece of paper which is numbered
5 SB 401726 and ask you to read the two sentences at the bottom of
6 the page beginning "This item enclosed," and follows another
7 sentence.

8 Have you read the two sentences, Dr. Afifi?

9 A Yes, I have read them.

10 Q As a matter of fact, I think for ease of reference, I'll
11 read the second sentence into the record since this may not be an
12 exhibit.

13 "The data and drawings concerning separation of
14 Canonie's work from Bechtel work by Construction have been for-
15 warded to Geotechnical Services for review."

16 Does your reading those two sentences refresh your
17 recollection on whether the data and drawings referred to were, in
18 fact, ever sent to Geotechnical Services?

19 A Only that I recollect that the attempt was made, and
20 I'm not sure if such drawings were actually produced and sent, but
21 this says that they were sent, so as I say, the person who would
22 be most familiar with these is Mr. Wan. It's not inconceivable
23 that they had been forwarded and may be available someplace.

24 Q If they were available, would they be with Mr. Wanzek
25 or under his control?

1 A I would believe that they would be in the drawing files.

2 Q Where are the drawing files located?

3 A The Geotechnical Group Files, the Central Files, if
4 they exist, such drawings exist.

5 Q Who has custody of those files?

6 A The custody of the Central Files is under the manager.

7 Q Who is that?

8 A S. L. Blue. These files are department files.

9 MR. PATON: Are you willing to let us look at those
10 files?

11 MR. FARNELL: Well, I think you have put it in -- we'll
12 entertain any request but I think we'd like it in writing and in
13 an appropriate manner.

14 MR. PATON: You are not willing to let us look at those
15 files without an appropriate written request?

16 MR. FARNELL: Right.

17 MR. PATON: Is that a change in the approach to discovery
18 that we have discussed?

19 MR. FARNELL: I thought that both sides would give a
20 formal document production request that differentiated from the
21 request to produce that accompanied each deposition notice.

22 Are you talking about looking at these today, or in the
23 near future?

24 MR. BRUNNER: Do you know which document you want to see?
25 If you'd place a request for specific drawings, we'll attempt to

14

1 locate them for you.

2 MR. PATON: Would you be willing to provide us today
3 with an index to design and construction drawings related to
4 soil structure foundations, to soils and structure foundations?

(Discussion off the record.)

6 MR. FARNELL: At lunch time we'll attempt to ask the
7 appropriate people if there is such an index, and if there is,
8 I'll locate it and provide it to you.

9 MR. PATON: We would like to accept the offer, and to
10 ask that one of the Corps of Engineers, one or two of the Corps
11 of Engineer people with us to look at the specific data and
12 drawings referred to in this paragraph.

13 MR. FARNELL: I don't know if we can get that for you
14 in two seconds or I don't know if we can get it for you today.

15 MR. PATON: Will you see, and if it is available, he can
16 -- you have that request under advisement, or are you considering
17 that last request?

18 MR. BRUNNER: I don't -- I must have lost the page you're
19 referring to.

20 MR. PATON: The two sentence paragraph at the bottom of
21 the second piece of paper.

22 MR. BRUNNER: The record should reflect that the re-
23 quested drawings, the data and drawings concerning separation of
24 Cananomie's work from Bechtel work by construction and their
25 identified on document dated August 1st, 1979 entitled Meeting

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1 Notes Number 1018, Midland Plant, Units 1 and 2.

2 I'm not certain we'll be able to find the drawings
3 but I thought you were referring to a specific set of drawings
4 and these may or may not be identified.

5 MR. PATON: It seems to me they referred to some
6 specific drawings. We're asking you to see if that is true, and
7 if it is, could we look at those drawings?

8 MR. BRUNNER: The problem is that I am not sure who
9 separated out these drawings and from this document, it's not
10 clear who is in possession of the drawings.

11 MR. PATON: Okay, we're just asking you to make an
12 attempt. If you can't do it, you can't do it.

(Discussion off the record.)

14 BY MR. PATON:

15 Q I am marking as NRC Staff Deposition Exhibit 3, dated
16 10-30-80 (Afifi). It's a document that has a number at the lower
17 right hand corner, SB 80233 and continues to a document with the
18 numbers SB 800238 dated September 13, 1974. It appears to be
19 from S. Afifi, but there are lines drawn through S. Afifi, and it's
20 to R. L. Castleberry. The subject, Plant Area Fill, and there are
21 copies to five people and copies to 1320 and 3410, which I don't
22 know what that means.

23 I hand you that document and ask you if you have ever
24 seen that before?

25 MR. FARNELL: Do you want him to read the whole thing?

16 1 MR. PATON: Off the record.

2 (Discussion off the record.)

3 MR. FARNELL: He has seen the document.

4 BY MR. PATON:

5 Q Do you recall yesterday that we had a discussion, some
6 questions and answers concerning compaction criteria?

7 A Yes, sir.

8 Q And do you recall there came a time in 1974 when you
9 said you advised people, you advised someone what you thought
10 was the correct compaction criteria?

11 A Yes, sir.

12 Q Is NRC Staff Deposition Exhibit Number 3 the document
13 in which you advised others what you thought was the correct
14 compaction criteria?

15 A Yes, sir.

16 Q And I direct your attention to a sentence, the second
17 to last sentence in this document -- excuse me, the second to last
18 paragraph which appears on Page SB 800235. I'll read it and then
19 I'll hand it to you.

20 "This information will allow a complete evaluation of
21 any in-place fill for its proposed function in addition to pro-
22 viding information which will be needed for the FSAR. It should
23 also clear up any questions as to how fill should be placed in
24 the future."

25 Do you agree that that's what that second to last

17 1 paragraph says?

2 MR. FARNELL: You're asking him if he read it
3 correctly?

4 MR. PATON: Yes.

5 A I believe you read the paragraph correct, yes.

6 BY MR. PATON:

7 Q Let me ask you this, based on all of the knowledge you
8 have today, is it your opinion that this document cleared up any
9 question as to how fill should be placed in the future?

10 MR. FARNELL: Would you read that back?

11 (Record read.)

12 MR. FARNELL: The document speaks of any questions and
13 you said question.

14 MR. PATON: Your exception is to the fact that --

15 MR. FARNELL: I'm saying that I thought you were trying
16 to read off that document and you didn't have it phrased right.

17 MR. PATON: I said question instead of questions; is
18 that the problem?

19 MR. FARNELL: Yes.

20 MR. PATON: Okay, I'll ask it again.

21 BY MR. PATON:

22 Q Based on all of the knowledge you have today, is it your
23 opinion that this letter -- excuse me, this Inter-Office
24 Memorandum cleared up any questions as to how fill should be
25 placed in the center?

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1 A Can you just explain it a little more, what the
2 question is, please?

3 Q All right. Dr. Afifi, am I correct that you wrote in
4 this letter, "It should also clear up any questions as to how fill
5 should be placed in the future"? Are those your words?

6 A I believe they are my words. The memo is signed by me.

7 Q What does that mean?

8 A Okay, I believe the intent of the sentence is that it
9 sets forth the percent compaction that should be used for fill
10 supporting structure. That's the intent of the sentence in my,
11 my -- the best of my recollection.

12 Q What does it mean when it says, "It should also clear
13 up any questions"?

14 A The question at the time was, should it be 1557
15 Method D, and that is referred to in the first paragraph of the
16 letter.

17 Q Specifically referring to this sentence, I want to ask
18 you what does it mean, "It should also clear up any questions as
19 to how fill should be placed in the future"? What did you mean
20 by that?

21 A I thought I stated I believe the sentence means that
22 now you know, in my opinion, how fill should be placed below
23 structures, I mean, to what degree of compaction it should be
24 placed.

25

19

1 Q You say, now you know; now who knows?

2 A The project, in my opinion.

3 Q In your opinion?

4 A Yes.

5 Q In your opinion this document should clear up any
6 questions as to how fill should be placed in the future. And my
7 question was, did it accomplish that; did it clear up any
8 questions as to how fill should be placed in the future?

9 A From reading the document you presented to me yesterday,
10 the summary document and all of those various questions about fill
11 placement, I don't believe that the questions were clear. The
12 intent of the document was to convey my opinion to the project
13 engineer, and then the project engineer from then on would
14 proceed with the required action.

15 Q Would you agree that, in fact, this document did not
16 clear up questions as to how fill should be placed in the future?

17 MR. FARNELL: I think he already answered that.

18 BY MR. PATON:

19 Q Would you answer that?

20 A From my standpoint, the intended purpose of the memo
21 was to advise the project engineer so that action would be taken.
22 To my knowledge, based upon the information you showed me, it
23 appears the action was not taken.

24 Q All right. Now from the documents I showed you --

25 A And also the fact that the fill was not, the percent of

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compaction was not used on site past that date.

Q When did you first come to realize that questions as to how the fill should be placed were not resolved after this memo?

A I found out for sure during the FSAR operation process.

Q When was that?

A I don't recall when we started and that was in the year '76, '77 when we started working on the FSAR and started requesting information, detailed information as to what methods were used and all that. Then it became evident that method was not used.

Q Is your statement correct: It was not until approximately two years after you sent out a memo which states, "It should also clear up any questions as to how fill should be placed in the future" that you first discovered that questions as to how fill should be placed were not resolved; is that an accurate statement?

MR. FARNELL: Would you read that back.

(Record read.)

A I believe I stated that I knew for sure after that the method was, that my recommendation would not follow for sure. I knew that during the FSAR operation period, but before that, I did not know one way or the other.

BY MR. PATON:

Q Dr. Afifi, I believe you told me once before, and we had to go through the routine, when was the FSAR preparation done?

A That was --

1 Q Now you're going back to -- I'm trying to get time.

2 A I'm talking about for sure. I don't recall if -- I did
3 not have direct involvement during that period of time and one
4 way or another I didn't know if my recommendation was followed or
5 not for sure.

6 Q Would your words, you didn't know for sure, do you agree
7 with my statement that my statement is accurate?

8 MR. FARNELL: Get the statement.

9 BY MR. PATON:

10 Q I asked you, is it true. Let me ask you that again.
11 Is my statement true?

12 MR. FARNELL: Let's have that statement back.

13 BY MR. PATON:

14 Q Is it true or not true? It's either true or not true.

15 A I would like to hear it with the modification.

16 MR. PATON: Fine, let's hear it again with the
17 modification.

18 (Record read.)

19 BY MR. PATON:

20 Q I'm asking you, is it true or not true?

21 A My answer, I didn't know for sure until two years later.
22 During that period, within that period, I didn't know one way or
23 another for sure if my recommendation was accepted or not, one way
24 or another.

25 Q Did you try and find out if it was accepted?

22

1 A No.

2 Q Dr. Afifi, that two year period, do you recall whether
3 you visited the site, whether you personally visited the site?

4 A I may have visited the site in connection with something
5 else other than the fill placement. I recall visiting the site
6 once in connection with the pre-award meeting or pre-bid
7 meeting for one of the, I believe, intake structure. I don't
8 recall being involved in fill or questions on fill during that
9 period.

10 Q Did you ever consider during this two year period,
11 either while you were at the site or at Ann Arbor, to make any
12 attempt to verify whether the correct compaction criteria were
13 being used?

14 A I don't recall ever attempting to do that, and I don't
15 believe it is my duty to verify which compaction criteria is to
16 be used from my understanding of my duties, my assignment on this
17 project.

18 Q Is it your duty to clarify any questions as to how
19 fill should be placed?

20 A My duty at the time, since the question was raised and
21 I was asked to provide input, to recommend, make a recommendation
22 to the project engineer.

23 Q Are you indicating that the duty to provide an answer
24 to this question only arose because someone asked you to do it?

25 A And I became aware of it, so I -- I was asked to comment

23

1 and I commented.

2 Q You became aware of what?

3 A I became aware that the method of compaction 1557

4 Method D may not have been used on site and as intended by the
5 engineer, wall structures. The question came in from construction
6 which method should we use.

7 Q So it was your responsibility to provide them with
8 information, or with your opinion on which?

9 A My recommendation.

10 Q And then as I understand it, your responsibility
11 terminates?

12 A The way I interpret it, yes.

13 Q You did not understand that you have any responsibility
14 to make any determination as to whether or not your recommendation
15 is being followed?

16 MR. FARNELL: We're still talking about that two year
17 period?

18 MR. PATON: Yes.

19 A Yes, for that -- there's no way I can force the project
20 to do something the project will not accept.

21 BY MR. PATON:

22 Q When you visited the site, if you wanted to verify
23 whether the correct compaction tests were being used, what would
24 you have to do; ask?

25 A I really don't know. I may -- maybe -- it might be

1 asking, yes, for one of the things.

2 Q Who would you ask?

3 A I would ask the Construction people, Construction crew.

4 Q Do you know who, for example you would ask; Mr. Cook?

5 A Who is Mr. Cook?

6 Q Who at the site would you ask?

7 A I would probably ask Mr. -- I don't recall who was in
8 charge of Construction at the time, that I could have asked
9 during that period. I would have asked somebody in charge of
10 Construction at the time.

11 Q So in fact, if it had occurred to you, you could have
12 obtained that information by just asking somebody?

13 MR. FARNELL: He didn't say that at all. What do you
14 mean, if it occurred to him?

15 BY MR. PATON:

16 Q Do you have trouble with that question?

17 A Yes.

18 Q If you had been interested in finding out whether the
19 correct compaction criteria were being applied to the site, am I
20 correct that all you would have had to do is to ask someone at the
21 site; is that correct?

22 A That is probably correct, yes.

23 Q Is it your practice to review Construction records while
24 you are visiting the site to see if required specifications on
25 fill placement are being met?

1 MR. FARNELL: When are you talking about?

2 MR. PATON: During the two year period that we've been
3 discussing.

4 A That has not been my responsibility and I have not been
5 assigned for it.

6 (Discussion off the record.)

7 MR. PATON: There has been some discussion between
8 counsel concerning some records kept by Bechtel at Ann Arbor that
9 relate to soils at the Midland site. There has been a reference
10 to some large number, for example 170,000 documents. The staff is
11 not presently advised of the nature of those documents, and the
12 staff has requested that we be allowed to inspect those documents.
13 The staff has also requested that some brief summary be provided
14 to let us know what kind of documents are kept by Bechtel in
15 Ann Arbor with respect to the soil matter in Midland.

16 My recollection was that after Isham, Lincoln & Beale
17 had the opportunity to look at these documents, some consideration
18 was to be given to providing the staff an opportunity to look at
19 these documents. I had thought that that opportunity was going to
20 be provided to the staff several weeks ago. As I understand the
21 situation -- strike as I understand the situation.

22 I am making this statement on the record because there
23 is apparently some disagreement between counsel as to what they
24 intend to offer in that regard. That's the end of my statement.

25 MR. FARNELL: I'll attempt to talk to Mr. Zameron over

1 lunch. Mr. Zamerin was the attorney chiefly involved in some
2 conversations dealing with this subject, and after I've discussed
3 this with him, I will make a statement.

4 BY MR. PATON:

5 Q Dr. Afifi, did you state yesterday that compaction that
6 meets 95 percent of the 56,000 pound test is approximately equal
7 to compaction that meets 100 percent of the 20,000 pound test?

8 A I meant this in the context of the Midland clay field.

9 Q Can you tell me the basis on which you arrived at that
10 conclusion?

11 A The basis is, the first basis that was apparent from
12 the Dames and Moore report that one method was substituted for the
13 other. 100 percent of the 20,000 pound in one report was sub-
14 stituted for 95 percent of the other in the other report. That is
15 what one basis is. The other basis is that from this previous
16 experience, I feel that way, and we have data right now and the
17 data is available to the NRC of running both types of test on the
18 clay field and the data to support the statement.

19 Q Do you know whether there were any requirements for
20 qualifications of compaction equipment that was used at the site?

21 MR. FARNELL: What time are we talking about now?

22 MR. PATON: During plant fill operations.

23 MR. FARNELL: Has anything changed over the time, if
24 you know.

25 MR. PATON: I don't want my question to be amended.

1 I asked a question.

2 MR. FARNELL: If you're going for a long period of time,
3 I don't think it's an appropriate question. Why don't you ask
4 him for a year or two years?

5 MR. PATON: I'll ask the questions.

6 MR. FARNELL: I'll make my comments, too.

7 A Can you repeat the question, then?

8 BY MR. PATON:

9 Q Yes. Do you know if there were any requirements for
10 compaction equipment that was used during plant fill operations;
11 did they have to be qualified in any way?

12 A I recall that there existed requirements for qualifica-
13 tion of compaction equipment, yes.

14 Q Do you know whether those requirements were met?

15 A After the discovery of the unexpected settlement at the
16 Diesel Generator Building, my people became involved in tests to
17 qualify this equipment at the Midland job site.

18 Q All right, sir. Now please address the period of time
19 prior to the discovery of the problem at the Diesel Generator
20 Building.

21 Do you know whether those equipment qualification re-
22 quirements were met?

23 A I do not know.

24 Q Do you know whether those equipment qualification re-
25 quirements were met after the discovery of the problem at the

1 Diesel Generator Building?

2 A Sometime after that period, we conducted tests, my
3 people, under the supervision of my people, and in my opinion,
4 these tests qualified the equipment for the use and placement of
5 fill.

6 I would like to take objection to the word "qualifica-
7 tion of equipment." I am using it in the context of qualifying
8 and providing a construction, developing a construction procedure,
9 and a qualified construction procedure, but not a qualified piece
10 of equipment.

11 Q Your statement is that there were required procedures;
12 is that correct?

13 A A qualified procedure for each piece of equipment.
14 That is a technical significance.

15 Q There is a qualified procedure?

16 A For the compaction equipment.

17 Q For the compaction equipment.

18 When you use the expression "qualified procedure for the
19 compaction equipment," were you referring to lift thickness?

20 A And number of passes.

21 Q Would that also include moisture content?

22 A That's an inherent part of the specification. It's not
23 necessarily related. That's a different subject. Moisture
24 conditioning has to be done. It has nothing to do with it.

25 Q Is it your testimony that after the discovery of the

1 problem at the Diesel Generator Building these qualified proce-
2 dures were followed?

3 A To the best of my knowledge.

4 Q And is it also your testimony that prior to the
5 d'scovery at the Diesel Generator Building you do not know
6 whether these qualified procedures were followed?

7 A I believe I stated that prior to the discovery of the
8 problem, I do not know if the procedure was developed.

9 Q Okay, so you're not even sure whether there were
10 procedures -- strike that.

11 You're not sure whether there were procedures; is that
12 the idea?

13 A I don't know for a fact there were procedures.

14 Q After the discovery of the problem at the Diesel
15 Generator Building, were qualified procedures followed for both
16 sand and clays?

17 A I believe that in Q-listed areas, the sands were
18 qualified. I don't believe we qualified the equipment for Q-
19 listed placement of clay.

20 Q Would you tell me why not?

21 A To my knowledge, the application did not exist, that
22 sand was used in Q-listed areas.

23 Q Is optimum moisture the same for both the 56,000 and
24 the 20,000 pound test?

25 A No, sir.

1 MR. FARNELL: Why don't we take a little break?

2 (Short recess taken.)

3 BY MR. PATON:

4 Q Dr. Afifi, I show you a table 12-1 which is entitled
5 Summary of Supporting Soil Conditions and Planned Remedial
6 Measures for All Safety Related Structures and Utilities. I'm
7 not going to mark it as a deposition exhibit unless your counsel
8 requests me to do it, because it is in Volume 1 of NRC responses
9 -- of your responses to NRC 5054 F requests, in response to
10 Question 12.

11 I want to direct your attention specifically to the
12 paragraph under Supporting Soil Conditions immediately to the
13 right of AX 6, 9, 18. I'd like you to read the entire document.

14 MR. FARNELL: I would like to see the entire response
15 to the Question 12 to see where this came from and put it in con-
16 text.

17 MR. PATON: I would also indicate that the table that
18 I have referred you to is Table 12-1, Page 1 of 5, revision 3 and
19 it's dated 9-79.

20 BY MR. PATON:

21 Q In the sentence that I asked you to read, there is a
22 reference to a possible local void. My question is, do you know
23 whether or not that void is real?

24 MR. FARNELL: I don't think we have established that
25 Sheriff wrote this letter.

1 MR. PATON: All right, I'll back up.

2 BY MR. PATON:

3 Q Do you know whether there is a possible local void under
4 concrete mat elevation 590 to 589 at boring AX 9?

5 A The best of my recollection, that has been reported on
6 the boring log for that boring. It's one out of three borings
7 in the area.

8 Q Your answer is that it has been reported on the boring
9 log?

10 A To the best of my recollection.

11 MR. FARNELL: Would you read back the question.

12 (Record read.)

13 BY MR. PATON:

14 Q Does your response mean that there is a possible local
15 void under concrete mud mat elevation 590 to 589 at boring AX-9?

16 A Yes.

17 Q Now this next question specifically refers to the word,
18 possible. I'm asking you, is there, in fact, a local void in
19 that area?

20 My question is your degree of certainty. Is it
21 possible or are you certain that there is one there?

22 MR. FARNELL: Or any other radiation, I gather.

23 A Would you read the question again?

24 BY MR. PATON:

25 Q Yes. How do you know there is a possible local void

1 under concrete mud mat elevation 590 to 529 at boring AX-9?

2 A I believe I stated that that was reported on the
3 boring log to the best of my recollection.

4 Q Did the boring log indicate to you that there was a
5 possible void or that there is a real void?

6 A I did not personally drill the boring, so I don't think
7 I can answer -- I have the answer to the question, but since the
8 words -- you have said possible local void, and I would have to
9 say in my judgment it would have to be a possibility of a local
10 void.

11 Q On what information do you base your answer that there
12 is a possible local void in that area?

13 A I recall at the time the borings were drilled that that
14 method came and was considered important enough to include in
15 the response to the NRC question.

16 Q Do you know what, if anything, has been done to
17 eliminate the void?

18 MR. FARNELL: He didn't say there was a void. He said
19 there was a possibility of a void. Are you eliminating the
20 possibility of a void?

21 BY MR. PATON:

22 Q Has any action been taken to --

23 A Can I take a look at this?

24 Q Sure.

25 A The remedial action, I would like to include for the

1 record, the proposed remedial action is included on the fourth
2 column of the table and it states, "Pressure grouting, avoid
3 below concrete mud mat as needed."

4 To my knowledge, that has not been done yet.

5 Q Do you know whether you plan any further investigation
6 to determine whether or not that void is a possible void or a
7 real void?

8 A That would be apparent at the time grouting actually
9 takes place.

10 Q You mean at the time you start grouting you will not
11 know whether the void is a possible void or a real void?

12 A No, I didn't say that. I indicated already that the
13 information I have led me to believe that this is a possible
14 local void. Grouting has not been accomplished yet. And grouting
15 will be accomplished as it is promised in this response.

16 Q As need, isn't that what it says?

17 A Yes.

18 Q How are you going to determine whether or not it is
19 needed?

20 A You just simply pump, continue to pump grout until
21 you cannot accept anymore grout, in my opinion.

22 Q Have you conducted any other explorations at close
23 spacing to determine whether there are other voids or possible
24 voids?

25 MR. FARNELL: Repeat that, please.

1

(Record read.)

2

MR. FARNELL: I don't think he testified they did explorations at close basings.

3

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MR. PATON: I believe you are correct.

5

BY MR. PATON:

6

Q Have you conducted any investigations to determine whether there are other voids or possible voids within 50 feet of the void, the possible local void that is mentioned here?

7

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A The borings conducted in this area, I do not recall how far away from each other, but this particular boring is one out of three in the limited area of the control tower, and there has been no, to my knowledge, possible voids recorded on any of the other borings in the vicinity.

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Q In your professional judgment, is the investigation that has been conducted here sufficient to determine whether or not there are other voids or possible voids within 50 feet of the void that is mentioned here?

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MR. FARNELL: I don't believe he said they conducted investigations as to that possible void.

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MR. PATON: Okay, if he didn't, that's fine. That's a good answer.

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A Yes, we did not. I don't believe we conducted investigations just for that purpose, but there were borings drilled. The dates on the boring logs would indicate when the borings were drilled. I don't recall how many of these were drilled before and

1 how many of these were drilled after.

2 BY MR. PATON:

3 Q Do you know whether there are any voids or possible
4 voids within 50 feet of the possible local void that is mentioned
5 in this paragraph I asked you to read?

6 A Well, I know that to the best of my knowledge, none was
7 reported on the boring logs.

8 Q Dr. Afifi, that's not my question. My question is, do
9 you know whether there are any voids or possible voids within 50
10 feet of the local, of the possible local void mentioned in this
11 paragraph?

12 MR. FARNELL: I think he answered that.

13 MR. PATON: If he did, I'd like to know the answer.

14 A The answer is that to the best of my knowledge, none
15 were reported in the borings that were taken in that vicinity.

16 BY MR. PATON:

17 Q That's the same answer you gave me before. You said
18 none were reported.

19 A Yes, sir.

20 Q My question is, do you know whether there are any there,
21 and I conclude from your answer that you don't know whether there
22 are any there or you -- have you concluded that there are none
23 there, or what?

24 My question is, to the best of your -- are there any
25 voids or possible voids within 50 feet of the possible local void

1 mentioned in this paragraph?

2 A Can I speak with my counsel?

3 MR. PATON: Certainly.

4 (Discussion off the record.)

5 A My answer to your question is that I don't know.

6 BY MR PATON:

7 Q Did knowledge of this possible local void, was that
8 developed from an exploration that was made?

9 MR. FARNELL: I think it has been stated that it's a
10 boring log and the boring log developed the knowledge of a
11 possible local void. I don't understand your question.

12 BY MR. PATON:

13 Q Did knowledge of this possible local void come from
14 borings that were performed?

15 A From a boring.

16 Q Now, do you plan to require additional borings to
17 investigate whether there are other voids or possible voids?

18 A No.

19 Q Dr. Afifi, if I asked you whether voids are sometimes
20 discontinuous, do you understand my question?

21 A Yes, sir.

22 Q Could you explain to me what that means, of what your
23 understanding of that word means?

24 A A limited area that is -- it would not be extensive in
25 size.

1 Q Dr. Afifi, do you plan any borings or other
2 explorations for the purpose of determining whether there are
3 other voids or possible voids within 50 feet of the possible
4 local void that is mentioned in this paragraph?

5 MR. FARNELL: That's been asked and answered.

6 MR. PATON: Off the record.

7 (Discussion off the record.)

8 A I don't know at this time.

9 BY MR. PATON:

10 Q Dr. Afifi, I show you Pages 13-1 through 13-6 which
11 has attached to it, several figures. This is in Volume 1 and it's
12 Consumer's Answer to Staff Question 13.

13 I specifically address your attention to Page 13-5.
14 Near the top of the page, there's a Paragraph Number 2.

15 MR. FARNELL: Is there a revision date on that?

16 MR. PATON: No revision date on either 13-1 or 13-5.
17 There is on 13-2.

18 MR. FARNELL: You're just going to ask about 13-5?

19 MR. PATON: 13-5 has no revision date on it.

20 MR. FARNELL: Fine.

21 BY MR. PATON:

22 Q You can read any part of this that you want, but my
23 question is going to specifically address this sentence: "The
24 analysis of buried structures with bends or restrained ends is
25 based on the equations for beams on an elastic foundation."

1 I'll tell you my question. The first one is going to
2 be, what were the values of the modulus of sub-grade reaction
3 used in the analysis?

4 A I don't know.

5 Q Do you know who within Bechtel would know that?

6 A That would be Mr. Dhar, D-h-a-r. Mr. Dhar, he would be
7 the person to refer to for that answer.

8 Q Do you have any responsibility to determine these
9 values?

10 A Sometimes.

11 Q When?

12 A When requested by project engineering in connection
13 with any specific problem.

14 Q Have you been asked for these values at anytime?

15 A I don't know.

16 MR. FARNELL: He's talking about these values set forth
17 in 13-5.

18 BY MR. PATON:

19 Q My question, and I'll state it again, the question was,
20 what were the values of the modulus of sub-grade reaction used in
21 the analysis?

22 MR. FARNELL: You're just talking this analysis on
23 Page 13-5?

24 MR. PATON: Yes.

25 A I don't recall if there was specifically asked about

1 this.

2 BY MR. PATON:

3 Q If I were to ask you how were those values determined,
4 would you again refer me to Mr. Dhar?

5 A Yes, sir.

6 Q If you had been asked for these values, would there be
7 any records that would reflect that in the documents you have
8 provided to the NRC, that you have personally provided to the NRC
9 for the purpose of this deposition?

10 A Not necessarily.

11 Q Where would those documents be?

12 A It's possible that it's a computation made and handed
13 in to project.

14 Q And you would not keep a record of that?

15 A It would be in the calculations file.

16 Q There is a calculations file that you don't keep
17 yourself?

18 A That's correct.

19 Q Is there an index to that calculation file?

20 A I believe so.

21 MR. PATON: Mr. Farnell, would you be willing to
22 provide a copy of that index?

23 MR. FARNELL: At lunch we'll make an effort to locate
24 it. I would also like to put on the record that we are being
25 cooperative in looking for the indexes, I would expect the same

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1 treatment from the NRC. I take it by your sound that you would
2 agree with that?

3 MR. PATON: No, I didn't make any comment. I think we
4 have some disagreement between us as to how much cooperation each
5 side is extending to the other side.

6 MR. FARNELL: If I ask you for certain indexes, are
7 you going to say no?

8 MR. PATON: I think that the NRC has been extremely
9 cooperative in providing documents up to this date to the point
10 of providing handwritten notes in the person's personal file.
11 I don't know of any instances which we have refused any document
12 that has been requested. Right now I am not aware of anything
13 that would indicate any change in that type of cooperation.

14 BY MR. PATON:

15 Q Do you know whether anyone at Bechtel has re-evaluated
16 the value of the modulus of sub-grade reactions because of
17 inadequately compacted soils at the Midland site?

18 MR. FARNELL: Again, are we referring to Page 13-5?

19 (Discussion off the record.)

20 MR. PATON: The question does not limit itself to
21 Page 13-5. It references to any seismic analysis that has been
22 made.

23 MR. FARNELL: Another question. Are you talking about
24 all buildings, specific buildings?

25 MR. PATON: I'm referring to buildings founded on the

1 inadequately compacted plant fill.

2 MR. FARNELL: Repeat the question.

3 BY MR. PATON:

4 Q Dr. Afifi, do you know whether anyone at Bechtel has
5 re-evaluated the value of the modulus of sub-grade reactions for
6 input into seismic analysis of structures founded on inadequately
7 compacted soil at the Midland site?

8 A The answer is, I don't know for sure.

9 Q Dr. Afifi, I want to make a statement and ask you whether
10 you agree with it or whether you believe it is true.

11 "The remedial measure for the inadequately compacted
12 soil under the electrical penetration areas of the Auxilliary
13 Building is to bridge over the questionable soil utilizing the
14 structural capacity of the electrical penetration rooms by
15 providing caissons at their extremities."

16 Do you agree with that? Or do you want me to read it
17 again?

18 A Yes.

19 Q "The remedial measure for the inadequately compacted
20 soil under the electrical penetration areas of the Auxilliary
21 Building is to bridge over the questionable soil utilizing the
22 structural capacity of the electrical penetration rooms by
23 providing caissons at their extremities."

24 MR. FARNELL: Your question is whether --

25 MR. PATON: Whether he agrees that that is true.

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MR. FARNELL: Word for word?

A Can you explain to me what that means, please?

BY MR. PATON:

Q No, I get to ask the questions and you get to answer them.

A I'm not clear on the question.

Q The question is, is that a clear statement?

MR. FARNELL: Is it word for word true, in substance true?

(Discussion off the record.)

BY MR. PATON:

Q Can you answer the question?

A I am not sure the question is technically correct.

Q Do you mean that you're not certain that all the facts I read to you are true; is that what you're saying?

A No, I'm not referring to facts. I'm referring to the interpretation of what is being done. I'm not sure whether that is technically correct.

Q You mean the proposed remedies, you're not sure I accurately stated the proposed remedy?

A I'm not sure the entire statement you read accurately reflects, is technically, is correct technically to describe what will be done. I'm not sure.

Q Can you tell me what part of it you are not sure of?

A The reference to bridging and the structural capacity

1 of the structure, things that I can't answer.

2 Q All right. Is there a problem with inadequately
3 compacted soil under the electrical penetration areas of the
4 Auxilliary Building?

5 A In my opinion, yes.

6 Q Is there a proposed remedy?

7 A Yes, sir.

8 Q What is that proposed remedy?

9 A To install caissons at both extremities of that, of
10 these two electrical penetrations.

11 Q I will ask you about the very last thing you said, it
12 is to provide caissons where?

13 A Install caissons at the extremities of the two
14 electrical penetration areas, at both ends of the two electrical
15 penetration areas.

16 Q Do you agree that the proposed remedy you just recited
17 would transmit half of the load from the electrical penetration
18 rooms on the proposed caissons and the remaining half on the
19 control tower?

20 MR. FARNELL: Can I have that read back?

21 (Record read.)

22 A I don't know.

23 BY MR. PATON:

24 Q Do you know who would know that?

25 A This is a structural question.

1 Q Is it true that the caissons would support part of the
2 load imposed by the electrical penetration areas?

3 A I believe so.

4 Q And the control tower would support the other part of
5 that load?

6 MR. FARNELL: I think he said -- that's been asked and
7 answered.

8 A I believe that response to that should be provided by
9 a structural engineer.

10 BY MR. PATON:

11 Q Do you have any idea whether the control tower would
12 support part of the load imposed by the electrical penetration
13 areas?

14 MR. FARNELL: I'm going to object to form.

15 A In my judgment, I'm not a structural engineer, but in
16 my judgment, there would be some load transfer.

17 BY MR. PATON:

18 Q Is it correct that you don't know what portion of the
19 total load imposed by the electrical penetration area would be
20 supported by the control tower; is that correct?

21 A Can you restate this, please?

22 Q I believe you have stated that part of a load of the
23 electrical penetration area would be supported by caissons; is
24 that correct?

25 A Yes, sir.

1 Q I believe you have also stated that part of the load
2 imposed by the electrical penetration area would be supported by
3 the control tower?

4 A Yes.

5 Q Do you know what proportion of the total load imposed
6 by the electrical penetration areas would be supported by the
7 control tower?

8 A I would not know how much of it.

9 Q Will the remedy you described for this problem result
10 in an additional load on the control tower?

11 MR. FARNELL: Additional compared to what?

12 MR. PATON: Whatever was there before the remedy.

13 A I thought I stated that the answer to that should come
14 from somewhere else, and I stated that in my judgment there would
15 be some load transfer and I didn't know how much.

16 BY MR. PATON:

17 Q Will that additional load that is transferred cause the
18 control tower to settle?

19 A That depends on the magnitude of the load. In my
20 judgment, the material there is quite good and the settlement
21 would have to be small.

22 Q You mean the material below the control tower?

23 A Yes, sir.

24 Q Do you know of any investigation of the possible
25 settlement of the control tower because of the additional weight

1 imposed by the remedy that you have described?

2 A I don't know if one is planned at this time.

3 Q Can you name a person who would be knowledgeable with
4 respect to the amount of load that would be transferred to the
5 control tower because of the remedy you have described?

6 A I believe I earlier stated that that would be Mr. Dhar
7 who would be able to refer you to -- that information would be
8 under his control, the Civil Group Supervisor.

9 Q You indicated that he could give us the answer or that
10 he would refer us to someone else?

11 A This is his area of control. He is in control of that
12 information, to my knowledge.

13 Q I'm not sure I know what you mean by "control." For
14 example, if I ask Mr. Dhar the questions I ask you, do you know
15 if he would provide the answers or would he refer us to someone?

16 A I believe he would provide you an answer.

17 Q Dr. Afifi, in recognition of the possible local void
18 under the control tower, which we were discussing a few minutes
19 ago, and the additional load that will be imposed on the control
20 tower caused by the remedy you described for the soil problem
21 in the electrical penetration area, in your professional judgment,
22 is there a need to investigate the extent of possible voids and
23 future settlement?

24 MR. FARNELL: Let's take them one at a time.

25 BY MR. PATON:

13

1 from Consumers Power.

2 Q And is the essence or the summarizing the position, is
3 it that there is no need for new borings?

4 A Yes, we have discussed that previously with the Staff,
5 Dr. Peck, and I have participated in these discussions. That's
6 how we feel from an engineering standpoint.

7 Q Can you tell me whether that was Bechtel's decision or
8 Consumer Power's decision?

9 A With aspect to the subject of settlement, I personally
10 recommended strongly that is not the way to go, and that's all I
11 can tell you. The decision ultimately is the client's decision.

12 Q You said you recommended strongly. Can you tell me why
13 you said, strongly?

14 A Because I believe that the full scale measurement that
15 we made on the Diesel Generator Building provided sufficient basis
16 to predict what the performance of the building was with respect
17 to settlement. I believe this is reliable and gives us the answers
18 we are looking for.

19 Q The need for additional borings -- strike that.

20 There is no plan to have a Surcharge Program at the
21 Auxiliary Building, is there?

22 A No, sir.

23 Q Do you plan to take new borings in response to request
24 from the Corps of Engineers with regard to the remedies at the
25 Auxiliary Building?

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1

MR. FARNELL: Would you repeat that, please?

2

(Record read)

3

A I don't recall that the remedy, that the Corps of Engineers requested settlement evaluation for the Auxiliary Building, with respect to fill.

4

5

6

BY MR. PATON:

7

Q You have been requested to take additional borings by the Corps of Engineers and the Staff, with respect to the remedies at the Aux Building; is that correct?

8

9

10

A Yes, sir.

11

Q And did you have a recommendation with respect to those borings?

12

13

A My recollection is that the request was in relation to boring capacity -- can you --

14

15

Q Both bearing capacity and settlement --

16

A So what's the question?

17

Q Do you you have a recommendation as to whether or not those additional borings should be taken?

18

19

A Where? Are we talking the Auxiliary Building?

20

Q Yes.

21

A Deep in my heart, I do not feel that these borings were necessary. I have no objection to taking them or not taking them. Deep in my heart, I don't believe they were necessary.

22

23

24

Q Can you tell me why?

25

A Because the caissons would be supported on the natural

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15

1 fill at the site. There would be excavations made, the opportunity
2 to inspect the excavations, there would be load tests done on
3 these caissons during construction, and there is opportunity to
4 take samples from the tip of the caissons, if we needed to do that,
5 right below the tip of the caissons, and get the information we
6 want. It would be better information than drilling a hole 25 or
7 30 feet away from the building.

8 Q Do load tests provide information on long term settlement?

9 A No, sir.

10 Q Do you believe that if you took these borings requested
11 by the Staff and the Corps of Engineers, you would be provided any
12 information with respect to settlement predictions and bearing
13 capacity at the Auxiliary Building?

14 MR. FARNELL: Read that back, please.

15 (Record read)

16 A Can you clarify the question, please?

17 BY MR. PATON:

18 Q You don't understand the question?

19 A Yes, if you would clarify it, please.

20 Q In what way?

21 A Are you saying any information at all?

22 Q Yes, that's what I want you to say.

23 A Any information whatsoever?

24 Q Yes, that relates to a settlement prediction.

25 A Irrespective of whether it's valuable information or not?

16

1 Q You can start there. That's what I asked you, would you
2 receive any information --

3 A There will be information obtained from the borings.

4 Q Will that information be of any value in predicting
5 settlement?

6 A It could be of some value.

7 Q Could it be of some value in predicting bearing capacity?

8 A Yes, sir.

9 Q Dr. Afifi, are there any requests for information in the
10 document submitted by the Corps of Engineers dated July 7, from
11 pages 1 through 16, within your area of responsibility that you do
12 not understand?

13 MR. FARNELL: Same objection.

14 (Discussion off the record)

15 BY MR. PATON:

16 Q I'll say page 1 and he can answer, and then I'll say
17 page 2. As a matter of fact, starting from page 1 at your attorney's
18 request and going through page 16, would you answer for each page?

19 MR. FARNELL: I want better than that. I want each
20 individual request.

21 MR. PATON: Are you instructing him not to answer the
22 question?

23 MR. FARNELL: The way you have it phrased, yes.

24 MR. PATON: All right.

25 MR. FARNELL: I am willing to have him answer as to each

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1 individual specific request. I think it is a compound question.

2 MR. PATON: That's fine, you have instructed him not to
3 answer, so I don't see the need for --

4 MR. FARNELL: He's here to answer your questions.

5 MR. PATON: All right, you instructed him not to answer
6 and I'll ask him another question.

7 BY MR. PATON:

8 Q Dr. Afifi, I direct your attention to page 1 of the
9 Corps report dated July 7, 1980.

10 A Are you referring to page 1, sir, where the letterhead
11 exists?

12 Q Yes, sir, the page that has at the top in all caps,
13 SUBJECT: INTER AGENCY AGREEMENT, et cetera.

14 Are there, in your opinion, any requests for information
15 on that page?

16 A Okay, I have difficulty with pages 1 and 2, in general.

17 Q In understanding them?

18 MR. FARNELL: I think he's indicating there's something
19 about them he didn't understand.

20 MR. PATON: I'll ask another question.

21 BY MR. PATON:

22 Q Dr. Afifi, would your address page 1 of the Corps docu-
23 ment dated July 7, and I ask you, do you understand, is there any-
24 thing on page 1 that you do not understand?

25 MR. FARNELL: Take it line by line.

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(Discussion off the record)

(Recess taken)

BY MR. PATON:

Q Dr. Afifi, I believe you testified that you had recommended strongly that Consumers not provide the Staff with additional borings that were requested by the Staff and the Corps of Engineers; is that correct?

MR. FARNELL: I don't believe that was correct.

A I don't believe I said that, no.

BY MR. PATON:

Q Is it correct that you recommended strongly that the borings not be taken; is that what you said?

A No, I didn't say that.

Q You referred to a strong recommendation, which you made about 10 minutes ago. Can you tell me what that strong recommendation was?

A I believe I was referring to the method of predicting settlement, should be based on the full scale measurements. Settlement prediction is best obtained from full scale measurements in my opinion, if that access is available.

Q Do you know whether Dr. Peck concurred in that recommendation?

A I believe Dr. Peck agrees with that.

Q Did you ever hear Dr. Peck made any statement concerning the advisability of taking additional borings for predicting

19

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1 settlement?

2 A I don't recall hearing Dr. Peck talk to me about that.

3 Q Did you hear him talk to anybody about that subject?

4 A I believe there was a statement made once that if the
5 Staff is concerned about the three feet of fill just below the
6 foundation, that may be tried, and the only way to satisfy the
7 Staff along these lines would be to run a consolidation test to
8 verify there would not be additional settlement, or something
9 along these lines.

10 Q Are there any other statements by Dr. Peck that you
11 recall he made at any time, with respect to taking additional
12 borings for the purpose of predicting settlement?

13 A I don't recall any others, and I'm not actually sure
14 that the first statement was made by Dr. Peck. I remember in the
15 back of my mind it was made as to, was made to me by Walter
16 Ferris, and I don't recall if that was from Walter Ferris or was
17 a result of a discussion between Walter Ferris and Dr. Peck.

18 Q Have you told us all of the statements that you can recall
19 that, to your knowledge, were made by Dr. Peck to anyone con-
20 cerning taking additional borings for the purpose of predicting
21 settlement?

22 A Well, with respect to shear strength -- would you
23 please repeat the question?

24 Q Have you told us all of the statements that you can
25 recall having heard from Dr. Peck concerning his recommendations

20 1 for taking additional borings for the purpose of predicting
2 settlement?

3 MR. FARNELL: I don't think it was his recommendation
4 concerning --

5 BY MR. PATON:

6 Q Recommendation for or against taking the borings for the
7 purpose of determining --

8 A My understanding is that Dr. Peck is not in favor of
9 predicting settlements from borings. He, himself, is not in favor.

10 Q Is that statement applicable to the plant fill at
11 Midland, or is that generally his position?

12 A I thought I understood your question, you were referring
13 to predicting of the general settlement.

14 Q Okay, I'll accept your answer with that understanding.

15 Do you recall Dr. Peck ever making any statements about
16 the desirability of taking additional borings for the purpose of
17 determining bearing capacity?

18 A I have difficulty with the word "desirability."

19 Q Advisability?

20 A I believe one of the times we have discussed that if
21 the Staff is insisting on the borings for the bearing capacity,
22 there would be nothing wrong with doing them, as far as the
23 bearing capacity is concerned.

24 Q Do you plan to do them for that purpose, for revealing
25 information about bearing capacity?

21

1 A I believe that we have estimates, sufficiently
2 estimated bearing capacity with available information that we have.
3 I believe that the additional data that we would get would not
4 result in any significant alteration in our estimates, but I would
5 have no objections to doing it.

6 Q You would have no objections to doing it, but right now
7 you have no plans for doing it; correct?

8 A That's right.

9 Q Is there any difference between your position and Dr.
10 Peck's position concerning the advisability of taking additional
11 borings for the purpose of determining bearing capacity?

12 A As far as I know, I don't believe there is a difference
13 as far as I know.

14 Q Do you know what the standard review plan is?

15 A Yes.

16 Q Generally, what is it?

17 A It's list of, check list of items which are required,
18 which are used as bases by the Staff for reviewing the safety
19 analysis report.

20 Q Does Bechtel use the standard review plan for any
21 purpose?

22 A I believe I recall that we used it in the process of
23 preparing the Midland FSAR.

24 Q Do you use it to help you determine what information to
25 provide the NRC?

22

1 A To the best of my recollection, this has been done.

2 Q Do you ever provide the NRC with information in the
3 absence of a request for that information from the NRC?

4 MR. FARNELL: Are you talking about the Midland project?

5 MR. PATON: The Midland project.

6 A I don't -- I can't recall exactly. I believe that in
7 many cases, some of the responses to the question -- I'm talking
8 in my area, went beyond the questions, somewhat beyond the
9 question, in my area that I can recall, but I can't speak for the
10 rest.

11 Q Your answer is that you are speaking for yourself only;
12 is that correct?

13 A Yes, I want to make you aware that I am speaking from
14 one area only in responding to the soil question. I do recall
15 that we attempted, in every case, to respond to the question, and
16 in some cases, we went beyond the items in the question to
17 complete the subject that was brought in.

18 Q With respect to the soils issue, I'm not talking about
19 this litigation or these depositions, but with respect to the
20 soils issue in your normal review process, have there been any
21 change, have you received any different instructions on the
22 amount of information you should provide to the NRC than you had
23 prior to the soils issue?

24 A Well, prior to the soils issue, we were preparing an
25 FSAR, working on an FSAR, and that is a standard review plan for

23

1 the FSAR. In this particular matter, to the best of my knowledge,
 2 we are working with 50-54 F, and I am not -- I am under the system
 3 where we respond to all of the questions and provide all of the
 4 factual information.

5 Q In the last four years, and I am excluding from my
 6 question any instructions you may have received in connection
 7 with the deposition today, I'm excluding that, have you received
 8 any instructions that bear on providing the NRC information?

9 MR. FARNELL: With respect to Midland?

10 MR. PATON: With respect to Midland.

11 A Sure, I have received instructions.

12 BY MR. PATON:

13 Q Can you tell us what the instructions were ?

14 A I cannot possibly recall all of the instructions, but
 15 we have received instructions to provide information in connection
 16 to responding to various NRC questions and make amendments to
 17 various NRC questions and provide response for additional
 18 information that has been included in the 50-54 F Volumes.

19 Q All right, again, I'm not asking you about any instruc-
 20 tion that you may or may not have received in connection with this
 21 deposition.

22 Have you ever received an instruction in the last four
 23 years with respect to Midland and with respect to the soils
 24 problem to refrain or to not provide certain information to the
 25 NRC?

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1 A I have been instructed to respond to the questions
2 fully and to the best of my knowledge.

3 Q And you have not received any change in that instruction
4 with respect to the soils issue in the Midland case in the last
5 four years?

6 A Can I speak with my counsel?

7 Q Surely.

8 (Discussion off the record)

9 A There has been a change, and that is the difference
10 between working in an FSAR system and the 50-54 F system. These
11 are two different matters. In my working with the FSAR, updating
12 FSAR constantly is one matter, and the 50-54 F agreement that I
13 understand we are working on, that is a different matter.

14 BY MR. PATON:

15 Q Okay, keeping the FSAR up to date calls for you to
16 volunteer information; is that correct?

17 A Calls for you to comply with the standard review plan
18 and the section 1.70 step by step and to respond to every single
19 step on those.

20 Q And in responding to the 50-54 F requests, do you re-
21 spond to the question -- you do not additionally volunteer any
22 information; is that correct?

23 A I respond to the question in full, and we have, I
24 believe, provided a factual data.

25 Q In the 50-54 F process, do you feel that there is a

25

1 need to freely submit geotechnical information to the NRC in a
2 manner similar to the manner in which you respond to the standard
3 review plan?

4 A I am not familiar with the rules of the 50-54 F myself.
5 Maybe I'm not understanding the question.

6 Q By 50-54 F, I'm just referring --

7 A Are you asking me to change the 50-54 F method of
8 reporting into an FSAR; is that what you're asking?

9 MR. PATON: He understands very well.

10 BY MR. PATON:

11 Q Dr. Afifi, I show you what I previously marked as NRC
12 Deposition Exhibit 2. It is a document dated August 3, 1979.
13 The subject is Problem Alert, Incorrectly Placed Back Fill. The
14 document has a number on it, SB 801598 through SB 801600. The
15 last page should probably be numbered 601. The last page I have
16 has no number on it, but it was substituted because the original
17 last page could not be read. Let me ask you to look at that
18 document.

19 You can look at it again, Doctor, but let me ask you,
20 have you ever seen this before?

21 A I believe I saw either this one or something similar to
22 it. It's possible that it's this one because it has my initials
23 on it.

24 Q Do you know what it is?

25 A Yes.

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Q What is it?

A It's a document that I understand is supposed to be sent to Bechtel to alert from recurrence of similar problem as what happened in Midland.

Q Is it an attempt on Bechtel's part to summarize the problems that occurred at Midland?

A I did not prepare the document. I may have had some input into reviewing the initial draft of it. I don't believe the document is intended to summarize the problem at Midland, but my understand, the document is intended to provide the lessons as to what may have had to be learned from the experience at Midland.

Q You don't have any trouble applying the words, lessons learned to the document, things that Bechtel doesn't wish to have happen again?

(Discussion off the record)

(Record read)

MR. PATON: I'll strike the question.

A I believe I intended to state the Midland experience.

BY MR. PATON:

Q All right, you did not view that as a summary of the problems that were encountered at the Midland site?

A I don't believe it is.

Q But you do think it is a check list of items that Bechtel doesn't want to have repeated at other sites?

MR. FARNELL: Don't answer.

27

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1 (Discussion off the record)

2 BY MR. PATON:

3 Q Dr. Afifi, is it correct that after the settlement
4 problem was discovered, Bechtel took a series of borings and
5 conducted laboratory tests which included consolidation testing?

6 A Are you referring to the Diesel Generator Building
7 problem?

8 Q Yes.

9 A Yes, sir.

10 Q With settlement computations and predictions made based
11 on those laboratory test results?

12 A I don't recall that any were made.

13 Q Do you know why they were not made?

14 A I believe I responded to that question yesterday once.

15 Q You gave a lot of answers yesterday, and I'm not sure
16 I can sort out what answer you're referring to.

17 A The very initial intent of the test was to diagnose the
18 problem and perhaps if it was possible, to predict settlement and
19 be able to get reasonable settlements without any remedial action.
20 That would be one action to take. That was the immediate thought
21 that was, I believe, that occurred to me is to investigate and see
22 the quality of the fill as it exists, but it became apparent that
23 a fix is required, and the full surcharge method provided a
24 superior method for consolidating the fill, the land fill together
25 For that reason, this data lost its meaning, in my opinion.

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1 Q Can you answer my question, yes or no, were settlement
2 computations and predictions made based on those laboratory test
3 results?

4 MR. FARNELL: I think he answered.

5 A I thought I said, I don't know.

6 BY MR. PATON:

7 Q You don't remember?

8 A I don't remember.

9 Q You said it became apparent that a fix was required.
10 Almost immediately it became apparent that a fix was required?

11 A Almost immediately? I didn't use the words, almost
12 immediately.

13 Q You said that there was an initial --

14 A In initial reaction was to take the borings and take the
15 regular types of tests everybody goes out and runs on site where
16 soil conditions are unknown. Later, our thought developed rather
17 rapidly into the surcharge program and there was no reason not to
18 proceed with the tests.

19 Q You went out and took a series of borings and you
20 conducted laboratory tests, but then you stopped just short. You
21 stopped short of making the computations; is that correct?

22 MR. FARNELL: I don't think he took the tests to make
23 consolidation, to make settlement with.

24 A Not necessarily.

25 BY MR. PATON:

1 Q Well, tell me the purpose of taking the series of
2 borings that you took?

3 A It was to evaluate the conditions of the fill.

4 Q And you conducted laboratory tests?

5 A Yes.

6 Q And those included consolidation tests?

7 A They did.

8 Q How much effort would have required -- strike that.

9 Dr. Afifi, do you know who within Bechtel would know
10 whether or not any settlement computations and predictions were
11 made based on the laboratory tests?

12 A I can check for you. It would not be a problem. Over-
13 night I can check it out.

14 Q Would you be willing, with the consent of your lawyer,
15 to provide that information tomorrow, if he agrees to it?

16 A I'll check and see.

17 MR. FARNELL: If you can check, fine.

18 BY MR. PATON:

19 Q If these computations had been made, where would they
20 be located?

21 A They would be in our computations files.

22 Q How long would it take a person who is qualified to
23 make settlement computations and predictions, to have made settle-
24 ment computations and predictions having in his possession the
25 results of the laboratory tests?

1 MR. FARNELL: Is this in relation to a specific
2 building or plan?

3 MR. PATON: The Diesel Generator Building.

4 MR. FARNELL: What laboratory tests are we talking about?

5 MR. PATON: The lab tests you just referred to.

6 A The process includes evaluating the data very closely
7 and selecting the parameters and conducting the tests. It's not
8 a lot of work.

9 BY MR. PATON:

10 Q Would it take less than a day?

11 A Not in the case of the Diesel Generator Building. It
12 would take less than a day in another situation, but not in the
13 case of the Diesel Generator Building.

14 In order for me to come up with something reasonable, I
15 have to put somebody for two weeks, look at it very carefully,
16 evaluate the data, to see the availability of the soil properties,
17 where the samples were taken and be careful about doing it. It's
18 not a uniform deposit.

19 Q So your estimate today is that to make the settlement
20 computations and predictions with respect to the Diesel Generator
21 Building, would have taken approximately two weeks?

22 A A careful evaluation. A crude evaluation would take
23 less than a day.

24 Q Did you learn anything from the laboratory test results
25 that indicated to you, that gave you any reason that you should

1 not make the settlement computations?

2 MR. FARNELL: I think he said he didn't recall whether
3 they made them or not.

4 MR. PATON: Okay, that's not the answer to my question.

5 MR. FARNELL: Would you read that back, please.

6 (Record read)

7 A I don't believe so.

8 BY MR. PATON:

9 Q Do you know who -- if a decision was made not to make
10 settlement computations and predictions, is that within the scope
11 of your responsibility at that time?

12 A Yes.

13 Q Is that the type of thing that you would have discussed
14 with anybody higher than you in the organization, or is that a
15 decision you would have made?

16 A I would say it's a decision that I would make.

17 Q Is there, as opposed to the careful analysis you
18 described, is there a crude estimate of settlement computations
19 that could be made in approximately a half a day?

20 MR. FARNELL: I believe he said less than a day -- okay.

21 BY MR. PATON:

22 Q Is there such a thing?

23 A I need to know what settlement computations you are
24 talking about now.

25 Q An estimate of the settlement at the Diesel Generator

1 Building would have under the surcharge?

2 A That would be -- that can be made crudely and one would
3 be able to arrange, a rather crude range.

4 Q Do you know whether any crude estimate was made?

5 A I recall that by comparing the lab data, a range, the
6 range and the actual complicity range, you would back figure
7 from the tests from the full scale measurement, that the number
8 would be, it would be higher, could be higher, but that accounts
9 for the fact that most, a lot of the samples were on the soft side,
10 so that makes me return again to the connection about the careful
11 analysis of the data that would be required in case one wants to
12 make an estimate to very carefully look at it. It's not a big
13 problem.

14 Q Okay, I'm not sure I understand your answer to my
15 question about the crude estimate.

16 Was a crude estimate made?

17 A There is a crude estimate made of the range of the
18 complicity parameters. I cannot recite it for you at the
19 moment, but I can get it for you.

20 Q All right, would you do that?

21 A Yes.

22 Q Was the crude estimate you just referred to of a
23 compressibility index?

24 A Yes, sir.

25 Q Did you make any crude estimate of settlement?

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1 A No, I stated before, I don't recall if that was done or
2 not.

3 MR. FARNELL: Off the record.

4 (Discussion off the record)

5 MR. PATON: The request for the compressibility index,
6 we do not need it overnight. If you are willing to give it to
7 us, would you just indicate some reasonable time that you can
8 supply it to us?

9 MR. FARNELL: We'll provide it within two weeks.

10 BY MR. PATON:

11 Q Were six borings made near the Diesel Generator Building
12 after removal of the surcharge for shear wave velocity measurements

13 A Can you explain what you mean by, near?

14 (Discussion off the record)

15 BY MR. PATON:

16 Q All right, let me amend the question.

17 Were six borings made -- Dr. Afifi, I read to you from
18 page 1 of Consumers Power Exhibit No. 3, Heller Deposition,
19 October 9, 1980.

20 "After removal of the surcharge, six additional borings
21 were made to conduct in-situ shear wave velocity measurements,"
22 and I hand you that document if you want to read that statement.

23 A Yes.

24 Q Is that a true statement?

25 A Yes, sir.

1 Q Did you compare the blow counts obtained from borings
2 before and after surcharging the Diesel Generator Building?

3 MR. FARNELL: Would you read that back?

4 (Record Read.)

5 MR. PATON: Off the record.

6 (Discussion off the record)

7 BY MR. PATON:

8 Q Let me read it again. Did you compare the blow counts
9 obtained from borings before and after surcharging the Diesel
10 Generator Building?

11 A Yes, sir.

12 Q Do you know if that comparison has been provided to the
13 NRC?

14 A No.

15 Q Do you plan to provide that information to the NRC?

16 MR. FARNELL: You asked him, did he know, and he said,
17 no, he didn't know.

18 MR. PATON: I asked him, has he provided it, and I guess
19 he said he didn't know. Now I asked him, does he plan to provide
20 it.

21 MR. FARNELL: It already may be provided, he doesn't
22 know.

23 MR. PATON: Okay, if he's already provided it, maybe he
24 doesn't plan to provide it.

25 MR. FARNELL: Can you ask the question again?

1 BY MR. PATON:

2 Q To repeat my question, I have to back up another
3 question. I ask you, did you compare the blow counts obtained
4 from borings before and after surcharging the Diesel Generator
5 Building; did you answer, yes?

6 A Yes, sir.

7 Q Have you provided that information to the NRC?

8 A I have not.

9 Q Do you plan to provide that information to the NRC?.

10 A I have no immediate plans for that.

11 Q Has the NRC, to your knowledge, asked you for that
12 information?

13 A No.

14 Q Do you consider that information to be significant?

15 MR. FARNELL: To what?

16 MR. PATON: I'm asking him.

17 MR. FARNELL: It's too general.

18 BY MR. PATON:

19 Q Do you consider that information to be significant for
20 any purpose?

21 A I don't believe the information is very significant.

22 MR. PATON: Mr. Farnell, would you be willing to have
23 Mr. Afifi provide us the information he has just described on the
24 comparison of blow counts obtained from borings before and after
25 the surcharge?

1 MR. FARNELL: We'll provide you with that comparison
2 you asked for, but we would like you, at the end of this deposi-
3 tion when the transcript comes in, to submit to us a list of what
4 you had requested so that we can have it all in one place, and
5 also, we are doing this on the assumption that we will get the
6 same treatment from your witnesses as to providing documents that
7 are asked for during depositions.

8 MR. PATON: Well, I think, rather than, you know,
9 postpone that problem and wait until the deposition comes in --

10 MR. FARNELL: We'll work on it now, but I want something
11 so that it will be fairly immortalized in one place.

12 MR. PATON: Well, let's do it right now. I don't want
13 to go home and wait for that to come in and then you read the
14 transcript and go through all of that -- I think we've only got
15 two or three items here. If you want a list, put it on the record
16 right now.

17 MR. FARNELL: All right.

18 MR. PATON: Number 1 is the matter we have just dis-
19 cussed, and that's in the transcript right at this point. Do you
20 want me to state what that is?

21 MR. FARNELL: Yes.

22 MR. PATON: All right, blow count comparison. The
23 second is, index of construction and design drawings. Certainly,
24 if I have not described it accurately, as far as you're concerned,
25 please correct the record.

1 (Discussion off the record)

2 MR. PATON: The Staff has requested that Consumers and/
3 or Bechtel provide several items, and the parties now wish to place
4 on the record what those items are. Then Mr. Farnell will respond
5 with their reply to our request.

6 The first item is a comparison of blow counts obtained
7 from borings before and after surcharging the Diesel Generator
8 Building.

9 (Discussion off the record)

10 MR. PATON: The second item is an index of construction
11 and design drawings limited to soils and structural foundations.
12 The third item is an index of computations made by Geotechnical
13 Services. The fourth item is to advise us whether settlement
14 computations and predictions were made after a series of borings
15 were taken after discovery of the settlement problem and after
16 laboratory tests were conducted. The last item is a list of
17 compressibility indexes.

18 MR. FARNELL: With respect to item four, we understand
19 this to be, to relate to the Diesel Generator Building and prior
20 to position of the surge tank in the Diesel Generator Building.

21 We'll provide the information set forth by Mr. Paton in
22 items one through five to the extent that it exists and is dis-
23 coverable.

24 MR. PATON: Off the record.

25 (Discussion off the record)

1 MR. FARNELL: We will either provide you with the
2 information or the answer that it is not available within two
3 weeks.

4 BY MR. PATON:

5 Q With respect to the six borings that we have been
6 discussing in connection with the Diesel Generator Building, were
7 these continuous standard penetration tests or intermittent?

8 A I believe they were intermittent.

9 Q If they were -- all right.
10 Do you know the spacing?

11 A I don't recall the spacing. These borings have been
12 provided to the NRC. Logs of these borings have been provided to
13 teh NRC.

14 Q Considering the use of intermittent standard penetration
15 tests, can you determine soil shear strength and compressibility
16 characteristics of the soils between the sampled intervals?

17 MR. FARNELL: Would you read that back, please.

18 (Record read.)

19 MR. FARNELL: The question is compound. It deals with
20 either soil shear strength or compressibility characteristics, one
21 or the other.

22 MR. PATON: All right, I'll take them one at a time.

23 BY MR. PATON:

24 Q Do you want me to read the question again?

25 A Yes.

1 Q Considering that the standard penetration tests were
2 intermittent, can you determine soil shear strength of the soil
3 between the sampled intervals?

4 A On the basis of the collection of the borings made, it is
5 usual to be able to interpret shear strength behavior based on all
6 of the data put together from all of the borings.

7 Q By, from all of the borings, do you mean all six borings?

8 A If we are talking about only those six borings, it would
9 only be those six borings.

10 Q Is the data gathered from those six borings sufficient
11 to determine soil shear strength of the soil between the sampled
12 intervals?

13 A These borings were not intended for determination of
14 shear strength.

15 Q What was their purpose?

16 A To determine shear wave velocity.

17 Q Do you know the shear strength and compressibility
18 characteristics of the plant fill under the Diesel Generator
19 Building since a surcharge was removed?

20 MR. FARNELL: Again, one at a time. Shear strength and
21 then compressibility.

22 BY MR. PATON:

23 Q Do you know the shear strength characteristics of the
24 plant fill under the Diesel Generator Building since the surcharge
25 was removed?

1 A Yes.

2 Q What are they?

3 A We predicted the friction angle to be 29 degrees and
4 the conservatively, the cohesion intercept to be taken as zero or
5 greater as reported previously in the September 14 submittal.

6 Q Did the shear strength used in bearing capacity analysis
7 come from samples as far away as the bore rated water tank?

8 A Yes, sir.

9 Q In recognition of the heterogeneous plant fill, is that
10 acceptable?

11 MR. FARNELL: Would you read that back, please.

12 (Record read)

13 MR. FARNELL: Acceptable in what regard, to whom, for
14 what purpose?

15 BY MR. PATON:

16 Q Is it acceptable to use shear strength from as far away
17 as the bore rated water tank in bearing capacity analysis?

18 MR. FARNELL: I have the same --

19 BY MR. PATON:

20 Q For the purpose of making your bearing capacity analysis.

21 MR. FARNELL: I have the same questions, for what, to
22 whom, for what purpose?

23 MR. PATON: Acceptable for the purpose of making a
24 bearing capacity analysis.

25 MR. FARNELL: I don't understand it.

1 A On the basis that the soil material has been used and the
2 clay fill is the same and that is the cooling pond area and that
3 the plastistic characteristics of the sampled tested are similar to
4 those found under the Diesel Generator Building and the fact that
5 the calculated safety factors are on the order of six or more, the
6 resulting bearing capacity evaluation should be considered satis-
7 factory.

8 BY MR. PATON: Dr. Afifi, I show you a document entitled,
9 a one-page document entitled, Trip Report. It has at the top,
10 Midland Units 1 and 2, Job 7220-001, dates January 30 to March 24,
11 1978.

12 The question I am going to ask you specifically refers
13 to a sentence in the middle of the second paragraph that begins
14 with the words, "As built drawings."

15 Dr. Afifi, did you read the sentence -- the document
16 that I have just asked you to look at is NRC Exhibit 6, which I
17 have marked and dated October 30, 1980 (Afifi). I direct your
18 attention to the sentence which I will now read.

19 "As built drawings as well as boring logs, daily reports
20 and other miscellaneous data were transmitted to S. S. Afifi as
21 they became available."

22 Did you receive those, do you remember whether you
23 received those as built drawings?

24 A I don't recall exactly what is meant by, as built
25 drawings, in this memorandum.

1 Q The sentence also refers to, daily reports. Do you
2 remember whether you received daily reports as indicated in this
3 letter?

4 A Normally on this type of assignment, people prepare
5 reports and whatever data they collect, and they are filed in the
6 Geotechnical Files.

7 Q Is your statement that that is not the type of informa-
8 tion you would specifically remember receiving; is that what you
9 are saying, that you may have received it, but you don't remember
10 particularly that you received this information?

11 A Yes, I may have received it and I gave it to someone
12 else to take care of it, do something with it. If this information
13 existed, it would be in the Geotechnical Files.

14 MR. PATON: Mr. Farnell, there's a reference here to
15 boring logs that were forwarded to Mr. Afifi. I'd like to request
16 that if those boring logs are in Mr. Afifi's files, we'd be
17 provided copies of them. I'm specifically referring to the boring
18 logs referred to in Staff Exhibit 6.

19 A May I make a comment?

20 MR. PATON: Yes.

21 A In response to the September 15 report, specifically
22 refers to the boring logs, and I have already indicated that the
23 Applicant will provide the logs in response to the question.

24 BY MR. PATON:

25 Q Approximately when do you think those logs will be

1 provided?

2 A I do not know the schedule for submitting this upcoming
3 amendment.

4 MR. PATON: Based on that information provided by Dr.
5 Afifi, I'd like to withdraw our request.

6 MR. FARNELL: I accept your request.

7 BY MR. PATON:

8 Q Dr. Afifi, with reference to Staff Exhibit 6, do you know
9 at the time the borings for the piezometers were drilled, what was
10 the level of the cooling pond?

11 A To the best of my recollection, that was before the
12 pumping started, or very shortly after the pumping started, so I
13 do not know the precise level.

14 Q Before the pumping started, what was the level, the
15 approximate level?

16 A Well, there would be no water in the pump.

17 Q Not at all?

18 A No, but I can check.

19 Q Do you have any concern for future hydrolic fracturing
20 because of the drilling for the borings for piezometers?

21 MR. FARNELL: Read that back.

22 (Record read.)

23 MR. FARNELL: Are you talking about the past piezometer
24 drillings that were done?

25 MR. PATON: The answer, yes.

1 A I don't know, sir.

2 Q Am I correct that you do not consider that in your area
3 of expertise?

4 A Yes.

5 MR. PATON: Off the record.

6 (Discussion off the record)

7 MR. PATON: Okay, that's the end of today's deposition.

8 (Whereupon, at 5:00 p.m., the taking of the deposition
9 adjourned until Friday, October 31, 1980 at 9:00 a.m.)

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This is to certify that the attached proceedings before the

in the matter of: CONSUMERS POWER COMPANY

(Midland Plant, Unit 1 and 2)

Date of Proceeding: October 30, 1980

Docket Number: 50-329, 330 OM and 329, 330 OL

Place of Proceeding: Ann Arbor, Michigan

were held as herein appears, and that this is the original transcript thereof for the file of the Commission.

Dolores Crabtree

Official Reporter (Typed)

Dolores Crabtree

Official Reporter (Signature)