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UNITED STATES OF AMERICA
ATOMIC ENERGY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of)	Construction Permit
CONSUMERS POWER COMPANY)	Nos. 81 and 82
(Midland Plant, Units 1 and 2))	

CONSUMERS POWER COMPANY, BECHTEL POWER CORPORATION
AND BECHTEL ASSOCIATES PROFESSIONAL CORPORATION
PROPOSED FINDINGS OF FACT AND CONCLUSIONS OF LAW

I. Introduction

1.1. On January 13, 1969, Consumers Power Company (C.P.Co.) filed an application with the United States Atomic Energy Commission (Commission) to construct the Midland Nuclear Plant Units 1 & 2 (Midland). Midland is a dual purpose plant designed to deliver 1300 megawatts of electricity to C.P.Co. customers and 4,050,000 pounds of process steam to Dow Chemical Company. The plant is located in the Tittabawassee River in Midland County, Michigan.

1.2. On October 29, 1970, the Commission published a Notice of Hearing, with respect to the issuance of construction permits for Midland.¹ On December 1, 1970, a hearing was commenced and limited appearance witnesses were heard. The hearing then recessed to allow the parties who had intervened to commence discovery and to set forth the issues which they ultimately wished to litigate.

1. 35 F.R. 16749.

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On June 21, 1971, the hearing resumed on radiological health and safety matters. On July 23, 1971, after 17 days of actual hearings in which the radiological health and safety issues were substantially completed, the proceeding was again adjourned. On that same day, the Calvert Cliffs Co-ordinating Committee v. Atomic Energy Commission¹ case was decided. As a result, on December 4, 1971, the Commission issued a Supplementary Notice of Hearing on Environmental Matters.² Following the pre-hearing procedures, the environmental hearings commenced on May 17, 1972 and were adjourned on June 15, 1972.

1.3. An Initial Decision granting Construction Permits Numbered 81 and 82 to C.P.Co. for Midland was issued on December 14, 1972. Certain of the parties to the proceeding filed exceptions to the Initial Decision and the Atomic Safety and Licensing Appeal Board (Appeal Board) thereafter issued a number of decisions relating to the Midland construction permits.³ By October 5, 1973, the Appeal Board had disposed of all of the issues raised by the parties to the original proceeding and had affirmed the Initial Decision.⁴ However, as a result of its review of the record, the Appeal Board imposed additional requirements on C.P.Co. with respect to its Quality Assurance

1. 449 F.2d 1109 (D.C. Cir. 1971).

2. 36 F.R. 23169.

3. See: In the matter of Consumers Power Company (Midland Plant, Units 1 and 2): ALAB-100, RAI-73-2, 58 (February 12, 1973); ALAB-101, RAI-73-2, 60 (February 20, 1973); ALAB-106, RAI-73-3, 182 (March 26, 1973); ALAB-115, RAI-73-4, 257 (April 17, 1973); ALAB-123, RAI-73-5, 331 (May 16, 1973); ALAB-132, RAI-73-6, 431 (June 28, 1973); ALAB-147, RAI-73-9, 636 (September 18, 1973); ALAB-152, RAI-73-10, 816 (October 5, 1973); and ALAB-160, RAI-73-11, 1002 (November 26, 1973).

4. ALAB-152, supra.

program. These requirements were set forth in ALAB-106 wherein the Appeal Board stated that, "[T]hese conditions, to which the outstanding construction permits are to be deemed subject, and which are to be considered as a predicate for the permits now to remain in effect are as follows:

1. By April 9, 1973, or the date of resumption of construction activities (whichever is later), the applicant shall furnish a complete report to this Board, with copies to all other parties to this proceeding, on the quality assurance action being undertaken by the applicant and/or its architect-engineer to assure that the construction work already performed and the materials now on the site are in satisfactory condition. This report, in addition to covering actual construction work and materials, shall also cover inspection and calibration of instrumentation to be used in the QA program.
2. On the date specified in condition 1, supra, and on the first day of each calendar quarter thereafter, reports shall be submitted to the regulatory staff on the construction work to be performed during that quarter. Such reports shall contain the names of the QA supervisors and engineers of both the applicant and the architect-engineer who will be on site during the period covered by the report.
3. A statement of the QA qualifications of each individual named in the reports required by conditions 1 and 2 will be supplied in the report in which he or she is first mentioned.
4. A monthly nonconformance report covering the previous month's work will also be forwarded to the staff, with enough detail so that the reasons for the discrepancies, if any, will be apparent. When a discrepancy is discovered too near the end of the reporting period to permit determination of adequate corrective measures by the end of the period, the corrective measures shall be given in the next monthly report.¹

1. ALAB-106, supra, at p. 186.

C.P.Co. has complied with these requirements in the past and will continue to comply with them in the future.¹

1.4. On July 30, 1970, prior to the issuance of the construction permits, C.P.Co. was granted a variance allowing limited construction activity. Construction at the site continued under this variance until November 14, 1970 when C.P.Co. stopped construction pending receipt of an Initial Decision by the Board. Construction was resumed in June of 1973 and, except for a brief suspension of cadwelding activities which is discussed in subsequent findings, has continued thereafter.

1.5. During a Commission inspection of Midland conducted by the Directorate of Regulatory Operation (DRO) on November 6-8, 1973, the DRO inspectors uncovered certain deficiencies associated with cadwelding operations.² Cadwelding is a mechanical means (not a weldment) of joining two reinforcement bars at their end with a splice sleeve.³ The deficiencies associated with this operation can be summarized as follows:

- A. Deficiencies in written procedures for cadwelding production and inspection;
- B. Failure to properly implement written procedures which are available;
- C. Inadequate control of materials; and
- D. Insufficient details in documentation of quality verification activities.⁴

1. Tr. 458 at pp. 22-23. The Atomic Safety and Licensing Board assigned to the Midland Show Cause proceeding requested and was furnished copies of the ALAB-106 reports for its use in that proceeding. Tr. 240 and 526.

2. C.P. Ex. 14.

3. Tr. 597 at p. 30.

4. Tr. 458 at p. 29.

Following the DRO inspection, C.P.Co., on the morning of November 9, 1973, issued a stop work order prohibiting the placement of concrete over the cadwelds and after further discussions with DRO, C.P.Co., during the afternoon of November 9, 1973, ordered a suspension of all cadwelding operations.¹ Subsequent inspections were held by DRO on November 15 and 20-21, 1973.²

1.6. On November 26, 1973, the Appeal Board assigned to the original Midland licensing action, conceding that it no longer had jurisdiction over the proceeding, sent an unsolicited letter to the Commission's Director of Regulation concerning the Quality Assurance program at Midland which focused specifically on the facts, as the Appeal Board perceived them, surrounding the cadwelding deficiencies discovered by DRO on November 6-8, 1973.³ The November 26 letter stated in the first paragraph that it was based on a copy of the November 13, 1973 "Notification of an Incident or Occurrence" issued by DRO.⁴ This document is a condensed version of the events

1. Tr. 485 at p. 16.

2. Tr. 190-192.

3. See: In the Matter of Consumers Power Company (Midland Plant, Units 1 and 2), Order to Show Cause, Exhibit A, December 3, 1973. It should be noted that while this document is part of the documentary record in this proceeding, it is not a part of the evidentiary record and as such may not be relied upon to support findings of fact, or conclusions of law. Tr. 231 and 352. By a Memorandum dated January 22, 1974, this Appeal Board disqualified itself from any participation in the show cause proceeding.

4. C.P. Ex. 23.

which took place during the DRO inspection of November 6-8, 1973 at Midland. The Appeal Board did not have benefit of (1) the complete inspection report concerning that incident, since it was not issued until December 14, 1973;¹ (2) nor did they have available the reports issued for the subsequent inspections of November 15, 20-21, 1973;² (3) nor did they have the views of individual inspectors who had actually conducted the investigation; (4) nor did they have any information concerning the steps taken by C.P.Co. and Bechtel to resolve the cadwelding deficiencies and to upgrade the Midland Quality Assurance program.³ Testimony at the hearing in the instant proceeding by the DRO Director of Region III established that, when the show cause order was issued, Region III did not believe such action was necessary.⁴

1.7. On December 3, 1973, as a result of the Appeal Board's Letter of November 26, 1973,⁵ the Commission through its Director of Regulation ordered C.P.Co. to show cause why all activities under the construction permits for Midland should not be suspended pending a showing by C.P.Co. that it was in compliance with Commission regulations pertaining to quality assurance and that there was reasonable

1. C.P. Ex. 14.

2. C.P. Ex. 14, Attachments A & B.

3. C.P. Exs. 25-A (C.P.Co. Request to Admit Facts) and 26-B (Reg. Staff Answer to Request to Admit Facts).

4. Tr. 391-393.

5. Tr. 392 and 231.

assurance that such compliance would continue throughout the construction process.¹ In addition, even though C.P.Co. had continued its stop work order on cadwelding, the Order to Show Cause suspended all cadwelding activities at Midland pending further order of the Commission.²

The Order to Show Cause also provided that C.P.Co. or any interested person could request a hearing and that, in the event a hearing was requested by C.P.Co. or any interested party, the issues to be considered at such hearing would be:

(1) whether the licensee is implementing its quality assurance program in compliance with Commission regulations, and (2) whether there is reasonable assurance that such implementation will continue throughout the construction process.³

1.8. On December 6-7, 1973, DRO conducted a special inspection to determine whether C.P.Co. had corrected the deficiencies noted during DRO's inspection of November 6-8, 1973. After the results of this inspection were reviewed, the Director of DRO recommended to the Director of Regulation that:

1. In the Matter of Consumers Power Company (Midland Plant, Units 1 and 2) Atomic Energy Commission Order To Show Cause, December 3, 1973.

2. Ibid.

3. Ibid.

...a determination be made that cadwelding, at the site be resumed, and that the appropriate order be issued.

The foregoing recommendation is made on the basis that (1) adequate action has been taken to resolve the deficiencies in cadwelding operations which led to suspension of cadwelding... (2) Consumers Power Company management has become involved in QA activities, and has indicated its intent to stay involved in those matters.¹

Accordingly, the Commission, through its Director of Regulation, issued a modification to the Order to Show Cause on December 17, 1973 which lifted the cadwelding suspension, but which left the remainder of the Show Cause Order in effect.

1.9. On December 24, 1973, C.P.Co. filed its verified Answer to the Order To Show Cause and a Motion to Dismiss Order To Show Cause. In its Answer, C.P.Co. generally controverted the allegations made or referenced in the Order To Show Cause, and stated that all deficiencies cited as the basis for the Order To Show Cause had been resolved. C.P.Co. requested a hearing if the Commission either determined that the Answer of C.P.Co. was insufficient to show cause why activities under the construction permits should not be suspended, or it denied the Motion to Dismiss of C.P.Co.

1.10. On December 24, 1973, a Request for a Hearing by Interested Persons in Response to Order to Show Cause was filed by Saginaw Intervenors Nuclear Study Group, Citizens Committee for

1. Tr. 403-404.

Environmental Protection of Michigan, the Sierra Club, United Auto Workers of America and the West Michigan Environmental Action Council (Saginaw-Sierra).

1.11. On January 21, 1974, the Commission denied C.P.Co.'s Motion to Dismiss and granted the request of Saginaw-Sierra for a hearing in the show cause proceeding.¹ On the same date, the Commission issued a Notice of Hearing with respect to the Order to Show Cause.² This Notice indicated that a hearing would be held before an Atomic Safety and Licensing Board (Licensing Board) on the issues framed in the Order to Show Cause issued December 3, 1973 and further stated that, should either of the two issues be decided adversely to C.P.Co., the Licensing Board should determine whether the construction permits for Midland should be modified, suspended or revoked, or whether other action was warranted by the record. The Notice identified the parties to the hearing as the Commission's Regulatory Staff (Staff), C.P.Co., Saginaw-Sierra and the Dow Chemical Company (Dow), and it further provided a mechanism for persons whose interest could be effected by the proceeding to file a Petition to Intervene.

1.12. On February 11, 1974, C.P.Co. filed its Answer to a Notice of Hearing on the Order to Show Cause stating that it

1. On the same date, the Commission denied a petition filed by Saginaw-Sierra on December 18, 1973 to revoke the construction permits for Midland.

2. 39 F.R. 2619.

would appear at the hearing and present evidence in its own behalf. On the same date, Bechtel Power Corporation and Bechtel Associates Professional Corporation (Bechtel), the engineer-constructor for C.P.Co. at Midland, filed with the Commission a Petition to Intervene alleging an interest in the proceeding and requesting that it be granted the status of a party.

1.13. On March 4, 1974, the Licensing Board issued a Notice and Order for Prehearing Conference to be held on March 28, 1974, to consider the simplification, clarification and specification of the issues, various other matters which could aid in the orderly disposition of the proceedings and the Petition to Intervene filed by Bechtel.

1.14. The first prehearing conference was held in Chicago, Illinois at the request of counsel for Saginaw-Sierra on March 28, 1974. At that conference, Bechtel's Petition to Intervene¹ was granted and Bechtel was admitted as a party to the proceeding. The Licensing Board ruled that the two issues stated in the Order to Show Cause were very broad and extended beyond the cadwelding² activities which had precipitated the Order to Show Cause, that the hearing was limited to construction of nuclear power plants as opposed to operation,³ but that the hearing would not be so broad

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1. Tr. 20.
 2. Tr. 43.
 3. Tr. 68.

in scope as to involve the question of whether or not C.P.Co. "should be in the nuclear business".¹ The Licensing Board also ruled that C.P.Co. had the burden of proof and that the Staff had the burden of going forward with the evidence.²

Counsel for Saginaw-Sierra informed the Licensing Board that he would be unable to proceed in the active representation of his clients' interests unless he received financial assistance from the Atomic Energy Commission. Counsel for Saginaw-Sierra then agreed to prepare the appropriate papers requesting such financial assistance and file them with the Commission "within a few days"³ and requested a "couple of weeks" delay in the proceeding to wait for an answer from the Commission on its petition for fees.⁴

Counsel for Dow informed the Licensing Board that his client would not actively participate in the show cause proceeding.⁵

The Licensing Board informed all parties that it would require written testimony and a trial brief be filed with the Licensing Board prior to the hearing in connection with the matters proposed to be addressed by evidence.⁶ Finally, the following schedule for the proceeding was adopted:

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1. Tr. 42.
 2. Tr. 48-51.
 3. Tr. 83.
 4. Tr. 29-30.
 5. Tr. 31.
 6. Tr. 56-58.

- A. April 22, 1974: Interrogatories to be filed by the parties and, to the extent possible, motions for the production of documents to be filed.
- B. April 29, 1974: Objections to Interrogatories and motions for production of documents to be filed.
- C. May 7, 1974: Objections to Motions for production of documents due.
- D. May 22, 1974: Answers to Interrogatories due. Where objections to Interrogatories are overruled, answers are due in 15 days or May 22, 1974, whichever is later.
- E. May 28, 1974: Another prehearing conference to be held.
- F. June 25, 1974: Show Cause hearing to commence. 1

1.15. On April 22, 1974, counsel for Saginaw-Sierra, C.P.Co. and Bechtel² served sets of Interrogatories on the various parties to the proceeding, including the Staff. In addition, both C.P.Co. and Bechtel served a Request to Admit Facts on the Staff, and a Notice of Deposition³ on Saginaw-Sierra.

1.16. On May 10, 1974, the Licensing Board, pursuant to 10 CFR §2.718(i), certified the Interrogatories directed to the Staff from Saginaw-Sierra Group to the Commission for a determination as to whether or not information concerning quality assurance matters at the Big Rock Point, Palisades, Fermi-I and Quanicassee facilities was relevant and material to a resolution of the issues

1. Tr. 77-83.

2. Bechtel adopted the Interrogatories propounded by C.P.Co. to avoid duplication.

3. This notice was revised on April 24, 1974.

in this proceeding. The Licensing Board asserted, in its opinion, that the attitude of C.P.Co., especially that of senior management, toward compliance with Commission regulations and license requirements was relevant and material to the resolution of the issue of future compliance, and, as such, discovery on this subject should be allowed. The Licensing Board also stated that Answers to C.P.Co.'s Interrogatories directed to the Staff, although not objected to, were also to be certified to the Commission. The Licensing Board's ruling with respect to the scope of permissible discovery was subsequently applied to the objections of C.P.Co. to Saginaw-Sierra's discovery request. On the same date, the Licensing Board denied Saginaw-Sierra's Motion for an Extension of Time in which to file a request for the production of documents. This order was based upon the representation of C.P.Co. that it had voluntarily made available to Saginaw-Sierra for inspection and copying all documents referenced in C.P.Co.'s Answers to Interrogatories.

1.17. On May 11, 1974, forty-four days after the first prehearing conference, counsel for Saginaw-Sierra 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-Sierra would be unable to participate in a meaningful manner in this proceeding and alleged that the participation of Saginaw-Sierra was necessary for an adequate airing of the issues and explanation of the facts.

1. In the matter of Consumers Power Company (Midland Plant, Units 1 and 2) Verified Petition... at pp. 2, 5 (May 11, 1974).

2. Id. at p. 7.

1.18. On May 22, 1974, all parties, except Saginaw-Sierra, 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-Sierra filed several motions which requested an extension of the discovery period. These requests were based on the "failure" of the Commission to act upon the Saginaw-Sierra Petition for Fees which had been filed ten days earlier, and stated that if they were required to answer Interrogatories, give depositions and file further procedural papers in advance of a decision by the Commission on their Petition for Fees, Saginaw-Sierra would be denied the right to have their Petition promptly heard by the Commission.

1.19. On May 30, 1974, a second prehearing conference was held in Chicago, Illinois. After oral argument, the Licensing Board denied the motion by Saginaw-Sierra to defer its responses to Interrogatories and ordered Saginaw-Sierra to answer the Interrogatories by June 5, 1974.¹ Although the Licensing Board reiterated its earlier ruling on the burden of proof,² C.P.Co. was given until June 10, 1974, to present the Licensing Board with a memorandum of law on the burden of proof in an administrative show cause proceeding.³

1. Tr. 115.

2. Tr. 114 and 135-136.

3. Tr. 139.

After discussion with the parties, a revised schedule for the proceeding was issued:

- 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.

1.20. On June 5, 1974, Saginaw-Sierra filed its Answers to the Interrogatories propounded by C.P.Co. and Bechtel. Shortly thereafter, C.P.Co. filed a Motion to Compel Answers to Interrogatories on the ground that the answers of Saginaw-Sierra were unresponsive and incomplete.² Although the Licensing Board granted this motion,³ Saginaw-Sierra has not responded.

On June 5 and 6, 1974, Bechtel and C.P.Co. filed responses to Saginaw-Sierra's Petition For Fees, requesting that the Petition be denied on both factual and legal grounds. The Staff filed its response to this Petition on June 10, 1974.

1.21. On June 10, 1974, C.P.Co. filed a Motion to Impose the Burden of Proof on the Proponent of an Order Suspending, Revoking or Otherwise Modifying Construction Permit Nos. 81 and 82. In support of that motion, C.P.Co. also filed a memorandum arguing 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 C.P.Co.'s motion arguing that the burden of proof in this proceeding should properly be placed on the Staff and/or Saginaw-Sierra. On June 18, 1974, the Staff also responded by stating

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- 1. Tr. 128 and 133.
 - 2. Tr. 157.
 - 3. Tr. 158.

that the burden of proof lay with the proponent of the Order to Show Cause. Saginaw-Sierra filed no response.

1.22. On June 28, 1974, C.P.Co., Bechtel and the Staff filed extensive written testimony and exhibits with the Licensing Board and the other parties. Saginaw-Sierra filed no written testimony.

1.23. On July 8, 1974, trial briefs were filed by C.P.Co., Bechtel, and the Staff. No trial brief was filed by Saginaw-Sierra despite a specific order to do so from the Licensing Board at the second 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 those lines.¹

1.24. On July 8, 1974, the Commission issued a Memorandum and Order denying the Saginaw-Sierra Petition for Fees. The Commission concluded that the petition must be denied for lack of a proper showing of need, citing an annual report of the UAW to the U.S. Department of Labor and a report of the sound and improving financial condition of the Sierra Club.

1.25. On July 10, 1974, the Licensing Board revised its previous position with respect to the party having the burden of proof and ruled that the burden of proof in this proceeding was on the Staff and Saginaw-Sierra to the extent that these parties desired

1. Tr. 124-125.

that Construction Permits Nos. 81 and 82 be modified or revoked.

1.26. On July 16, 1974, the Commission issued a Memorandum and Order on the question certified to it on May 14, 1974, concerning whether or not the Staff need answer Saginaw-Sierra's Interrogatories seeking disclosure of a broad range of information relating to Consumers' activities at all of its nuclear facilities. The Commission ruled that the Staff should answer all interrogatories with respect to which the Licensing Board determines that Answers are necessary to a proper decision, and are not reasonably obtainable from any other source. These answers had already been provided by the Staff on May 22, 1974 in order to help expedite the proceeding.

1.27. On July 16, 1974, pursuant to a Notice and Order for Commencement of Evidentiary Hearing¹ 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-Sierra. Each of the other parties presented testimony and participated in cross-examination. The Licensing Board questioned witnesses extensively and required both the Staff and C.P.Co. to present witnesses² in addition to those for whom prepared testimony had been submitted.

1. 39 F.R. 22447.

2. Tr. 155 and 439.

1.28. The parties presented the following witnesses:

A. The Regulatory Staff of the AEC.

1. Walter E. Vetter, the Technical Assistant to the Director of DRO, Region III - testified in regard to his actions regarding and conclusions on C.P.Co.'s Quality Assurance Program as a result of his reviews and participation in inspections conducted by DRO at Midland.
2. Roger Rohrbacher, the Principal Reactor Inspector for DRO, Region III, testified on his inspection activities at Midland, including the results of those inspections.
3. Cordell C. Williams, the Assistant Reactor Inspector for DRO, Region III, testified regarding his participation in and the results of inspections at which he was present at Midland.
4. Dolphus E. Whitesell, a Reactor Inspection Specialist for DRO, testified on the inspection criteria and policies of the Commission's DRO staff.
5. James G. Keppler, the Director of DRO, Region III, testified on the inspections conducted by DRO both at Midland and other facilities within Region III, on the conclusions reached by DRO regarding C.P.Co.'s Quality Assurance program, and on the attitude of its senior management personnel in complying with Commission rules and regulations.

B. Consumers Power Company.

1. Earl V. DeCarli, the Quality Assurance Manager for Babcock & Wilcox (B&W), testified on the chronology and implementation of the Quality Assurance program at B&W for Midland.
2. Ralph B. Sewell, the Nuclear Licensing Administrator for C.P.Co., testified concerning statements he had given the DRO Staff in connection with the operation of the gaseous radwaste system at Palisades during 1972.
3. Gilbert S. Keeley, the Director of the Quality Assurance Services Department at C.P.Co., testified on the evolution and implementation of the Quality Assurance Program and organizations for C.P.Co. Mr. Keeley also testified on the attitude of C.P.Co. on compliance with Commission rules and regulations.
4. Steven H. Howell, the Vice President in charge of Electric Plant Projects for C.P.Co., testified regarding his involvement in C.P.Co.'s Quality Assurance program and his attitude on compliance with Commission rules and regulations.
5. Russell C. Youngdahl, the Senior Vice President of C.P.Co., testified as to his involvement in C.P.Co.'s Quality Assurance Program and on his and C.P.Co.'s attitude toward compliance with Commission rules and regulations.

C. Bechtel.

1. Alden P. Yates, Vice President and Deputy Division Manager of Bechtel's San Francisco Power Division, testified as to Bechtel senior management's involvement in quality assurance and described the interrelationship of the Bechtel groups involved in the design and construction of the Midland Plant.

2. William E. Ferriss, Quality Assurance Supervisor of Bechtel's Ann Arbor Area Office, described the evolution of Bechtel's Quality Assurance Program and the general implementation of the program by the Quality Assurance group.

3. Johnny I. Dotson, a member of Mr. Ferriss' staff and former Project Quality Assurance Engineer for the Midland Project, testified in detail as to the activities of the Midland Quality Assurance Group and described the corrective action taken by Bechtel to the items identified by DRO subsequent to the resumption of construction in 1973.

4. Philip A. Martinez, Midland Project Engineer, testified concerning quality requirements imposed upon design of Midland and described the activities of the quality engineering group which has responsibility for many of those requirements.

5. Edward F. Rye, Ann Arbor Office Procurement Manager, described the historical application of quality requirements during the procurement phase of nuclear power plant construction and the implementation of those requirements for Midland.
6. Jerry L. M. Southard, Area Office Inspection Manager, described the evolution of the quality related requirements of Bechtel's Procurement Inspection Group and detailed their implementation at Midland.
7. Robert C. Sommerfeld, Ann Arbor Supervisor of Materials, Fabrication and Quality Control Services, testified concerning the historical development of that Group and its quality requirements in accordance with ASME codes and the implementation of the requirements at Midland.
8. Terry C. Valenzano, Midland Project Field Engineer, described the first line quality responsibilities of the construction group and the implementation of those requirements during field construction.
9. Zolly G. Tucker, Ann Arbor Office Quality Control Supervisor, described Bechtel's Quality Control Group and testified concerning the evolution of Bechtel's Quality Control Program.
10. James P. Connelly, Midland Project Field Quality Control Engineer, testified concerning the detailed

implementation of Bechtel's Quality Control Program on the Midland Project.

11. Bechtel also presented a panel of witnesses which included Messrs. Dotson, Martinez, Valenzano, Connelly and John C. Hink, Civil Design Group Supervisor for the Midland Project. This panel presented written testimony which provided a detailed summary of some of the activities of Bechtel's groups having quality responsibilities with regard to the Unit 2 base mat pour and the erection of liner plate for Unit 2.

1.29. Following the Staff's direct case and after no response was forthcoming from Saginaw-Sierra,¹ C.P.Co. moved (1) that the Licensing Board issue an order holding that Saginaw-Sierra was in default under 10 CFR 2.707 and (2) that the proceeding be dismissed since the burden of proof had not been met.² The Licensing Board denied this motion and, over the objections of the other parties, allowed Saginaw-Sierra to file a list of documents which it wished the Licensing Board to take official notice by the close of business on July 25, 1974.³ At the close of the evidentiary presentation, C.P.Co. renewed its Motion to default Saginaw-Sierra and dismiss the proceeding on the grounds that the burden of proof had not been met.⁴ The Licensing Board took this renewed motion⁵ under advisement.

1. Tr. 429.

2. Tr. 429-438.

3. Tr. 590-593.

4. Tr. 705.

5. Tr. 707.

1.30. On July 25, 1974, the Licensing Board, having received no communication from Saginaw-Sierra, issued an Order closing the record in this proceeding.

II. QUALITY ASSURANCE IMPLEMENTATION IN COMPLIANCE WITH COMMISSION REGULATIONS

2.1. The first issue for consideration in this hearing, as set forth in the Order to Show Cause, is whether C.P.Co. is implementing its Quality Assurance Program in compliance with Commission regulations.

2.2. The Commission's regulations which govern quality assurance are set forth in 10 CFR 50, Appendix B, and it is compliance with that regulation which this Licensing Board must determine. Construction at Midland began in 1970 and has proceeded, with some suspensions, through today. Appendix B was promulgated on June 27, 1970,¹ approximately 18 months after C.P.Co. had submitted its original quality assurance program.² Although the language of Appendix B has not been amended in any significant way, the interpretation of its requirements by the AEC and C.P.Co. have been changing in an evolutionary process over the years. For example, following the issuance of Appendix B, the American National Standards Institute (ANSI) began a program of delineating specific quality assurance requirements.³ During the past four and one-half years, the Commission has produced a number of regulatory guides based on the ANSI requirements which set forth acceptable standards for implementing each of the eighteen criteria of Appendix B.⁴

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1. 35 F.R. 10499, as amended on September 11, 1971, 36 F.R. 18301.
 2. Tr. 458 at p. 8.
 3. Tr. 466.
 4. Ibid.

This program culminated in the issuance by the Commission of the following three documents:

- A. Guidance on QA Requirements during Design and Procurement Phase of Nuclear Power Plants - June, 1973 (Grey Book);
- B. Guidance on QA Requirements During the Operations Phase of Nuclear Power Plants - October 26, 1973 (Orange Book); and
- C. Guidance on QA Requirements During the Construction Phase of Nuclear Power Plants - May 10, 1974 (Green Book).¹

These documents contain a compilation of the ANSI standards (both draft and final), and were issued to clarify the Commission's posture and expectations with respect to quality assurance.² Despite the fact that the 18 criteria set forth in Appendix B have remained constant, the requirements of the Commission relative to satisfaction of Appendix B criteria have become increasingly stringent. This evolution is still continuing. For example, the Director of Region III DRO testified that certain standards referenced in ANSI N45.2 are not yet in final form,³ and the Grey Book itself was revised on May 24, 1974 to update the standards contained therein.⁴ Thus, compliance with Commission quality assurance regulations must be evaluated using the requirements which were in effect at the particular point in time being examined.

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1. Tr. 363-366, and 421-422.
 2. Tr. 363-364.
 3. Tr. 422-423.
 4. Tr. 422.

Quality Assurance cannot be equated to the total absence of deficiencies or deviations from applicable requirements and the Commission's quality assurance regulations do not contemplate a total absence of deficiencies or deviations from applicable requirements during the construction of a nuclear power plant. To the contrary, Appendix B recognizes that deficiencies will occur; for example, Commission regulations specifically acknowledge that, "...conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and non-conformances ... may occur."¹ Similarly, Criteria XVII-XVIII of 10 CFR 50, Appendix B, as well as 10 CFR 50.55(e) which discusses auditing, record keeping and reportability of "deficiencies" and "significant deficiencies", provide further evidence that deviations from quality assurance requirements are within the contemplation of the regulations.

In the instant proceedings, the Technical Assistant to the Director of Region III DRO testified that compliance does not mean a history of zero violations nor a complete absence of quality assurance/quality control problems.² Accordingly,

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1. 10 CFR, Appendix B, Criterion XII.
 2. Tr. 202.

"compliance with Commission regulations" does not require a total absence of deficiencies or significant deficiencies, but rather that measures be established to identify and correct such matters and prevent their recurrence where appropriate.¹

Therefore, the Commission's inspection program is oriented toward verification of "compliance" with stated requirements which have been set forth in an acceptable quality assurance plan.²

Thus, this Licensing Board has determined that in the context of quality assurance matters, "compliance with Commission regulations" contemplates that construction of a nuclear power plant can be accomplished with quality assurance deviations provided that measures have been established and implemented to promptly detect and correct such deviations, and that in order to preclude recurrence of significant deviations, appropriate levels of management must be appraised of such deviations and the necessary corrective action taken.

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1. 10 CFR 50, Appendix B, Criterion XVI and 10 CFR 50.55(e).
 2. Tr. 361.

2.3. The Commission, through its Director of Regulation, pointed to three specific examples which suggested a possible failure of C.P.Co. to implement its Quality Assurance Program in compliance with Commission regulations.

These were:

1. Inspections occurring on September 29-October 1, 1970, revealed several instances of the licensee's 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 (ALAB-106), in which the Appeal Board imposed certain additional conditions on the licensee with respect to its quality assurance program;
2. 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
3. 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.¹

1. In the matter of Consumers Power Company (Midland Plant, Units 1 and 2), Order to Show Cause, December 3, 1973.

2.4. The Midland Preliminary Safety Analysis Report (PSAR) was issued on January 13, 1969. Appendix 1B of the Report described the quality assurance program for the proposed facility.¹ As previously noted, this Midland quality assurance program preceded the promulgation of 10 CFR Part 50, Appendix B.

On October 2, 1969, Amendment No. 4 was issued to the PSAR as a result of meetings conducted with the AEC. This amendment, the first to affect the Midland quality assurance commitment, consisted of a complete rewrite of the quality assurance program which was originally described in Appendix 1B.² Shortly thereafter, on December 29, 1969, Amendment No. 6 to the PSAR was issued to respond to the Commission's request for a description of the manner in which the Midland Quality Assurance Program would be implemented.³ Amendment 8 was issued on February 9, 1970 to provide, pursuant to the Commission's request, documentation of interface responsibilities during design, procurement, construction and preoperational testing.⁴ Amendments 4, 6 and 8 provided more details than described in the initial issuance of Appendix 1B and spelled out more specifically the responsibilities of C.P.Co., Bechtel, and B & W and the interfaces between those organizations.⁵

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1. Tr. 458 at p. 8; C.P. Ex. K-5.
 2. Tr. 458 at p. 9.
 3. Tr. 458 at p. 10.
 4. Ibid.
 5. Ibid.

II. QUALITY ASSURANCE IMPLEMENTATION IN COMPLIANCE WITH COMMISSION REGULATIONS

2.1. The first issue for consideration in this hearing, as set forth in the Order to Show Cause, is whether C.P.Co. is implementing its Quality Assurance Program in compliance with Commission regulations.

2.2. The Commission's regulations which govern quality assurance are set forth in 10 CFR 50, Appendix B, and it is compliance with that regulation which this Licensing Board must determine. Construction at Midland began in 1970 and has proceeded, with some suspensions, through today. Appendix B was promulgated on June 27, 1970,¹ approximately 18 months after C.P.Co. had submitted its original quality assurance program.² Although the language of Appendix B has not been amended in any significant way, the interpretation of its requirements by the AEC and C.P.Co. have been changing in an evolutionary process over the years. For example, following the issuance of Appendix B, the American National Standards Institute (ANSI) began a program of delineating specific quality assurance requirements.³ During the past four and one-half years, the Commission has produced a number of regulatory guides based on the ANSI requirements which set forth acceptable standards for implementing each of the eighteen criteria of Appendix B.⁴

1. 35 F.R. 10499, as amended on September 11, 1971, 36 F.R. 18301.

2. Tr. 458 at p. 8.

3. Tr. 466.

4. Ibid.

This program culminated in the issuance by the Commission of the following three documents:

- A. Guidance on QA Requirements during Design and Procurement Phase of Nuclear Power Plants - June, 1973 (Grey Book);
- B. Guidance on QA Requirements During the Operations Phase of Nuclear Power Plants - October 26, 1973 (Orange Book); and
- C. Guidance on QA Requirements During the Construction Phase of Nuclear Power Plants - May 10, 1974 (Green Book).¹

These documents contain a compilation of the ANSI standards (both draft and final), and were issued to clarify the Commission's posture and expectations with respect to quality assurance.² Despite the fact that the 18 criteria set forth in Appendix B have remained constant, the requirements of the Commission relative to satisfaction of Appendix B criteria have become increasingly stringent. This evolution is still continuing. For example, the Director of Region III DRO testified that certain standards referenced in ANSI N45.2 are not yet in final form,³ and the Grey Book itself was revised on May 24, 1974 to update the standards contained therein.⁴ Thus, compliance with Commission quality assurance regulations must be evaluated using the requirements which were in effect at the particular point in time being examined.

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1. Tr. 458 at p. 8; C.P. Ex. K-5.
 2. Tr. 458 at p. 9.
 3. Tr. 458 at p. 10.
 4. Ibid.
 5. Ibid.

2.5. On March 10, 11 and 12, 1970, DRO conducted an intensive review of the Midland Quality Assurance Program which covered both the extent of compliance with commitments noted in the previous paragraph and the extent to which the then proposed Appendix B had been implemented.¹ Based upon this review, C.P.Co. took the following actions:

(a) the organization and document control sections and other implementing procedures in the C.P.Co. Quality Assurance Audit Manual were completed and the manual was issued on July 1, 1970; and

(b) the C.P.Co. Field Audit and Inspection Procedures Manual was issued on August 1, 1970 to provide procedures to be used by C.P.Co. field quality assurance personnel.²

2.6. Prior to the commencement of construction at Midland, DRO conducted two additional inspections. No findings were reported at either of these inspections.³

2.7. Construction at Midland started July 30, 1970 under an exemption from the AEC allowing limited preconstruction activities.⁴ Shortly thereafter, on September 29 and 30, and

1. Tr. 458 at p. 10.

2. Tr. 458 at p. 13.

3. Tr. 458 at p. 14.

4. Tr. 485 at p. 6.

October 1, 1970, DRO conducted a site inspection during which they found certain deficiencies in concrete placement activities, including the improper use of vibrators.¹ Immediately following this DRO inspection, C.P.Co. and Bechtel evaluated the findings and took the following corrective action:

A. Bechtel committed itself to review the applicable ASTM specification regarding concrete sampling.²

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.³

C. Bechtel assigned a Quality Control Engineer to full time monitoring of all Q list concrete pours.⁴

D. C.P.Co. 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.⁵

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1. Tr. 458 at p. 14; C.P. Ex. 1. The findings in this report were set forth by the Commission in its Order to Show Cause in this proceeding.
 2. C.P. Ex. 2.
 3. Ibid.
 4. Ibid.
 5. Tr. 458 at p. 14.

On November 14, 1970, prior to any further DRO inspection activity, construction at the Midland site was suspended by C.P.Co.¹ Although construction activities relating to Appendix B did not resume until June of 1973, DRO nevertheless 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 C.P.Co. and Bechtel regarding the concrete deficiencies noted in the previous DRO 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 C.P.Co. that these items would remain in the follow up status until construction resumed and DRO could verify that the corrective procedures had been implemented.²

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,

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1. Tr. 485 at p. 7.
 2. Ex. C.P. 2; Tr. 267-9.

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.¹

On September 5-7, 1973, at its first inspection following reactivation of the Midland Plant, DRO observed the corrective action relative to the concrete deficiencies. DRO determined that the deficiencies had indeed been corrected and stated that these activities would be further observed in subsequent inspections.²

2.8. While construction activities at the Midland site were suspended, C.P.Co. and Bechtel continued to modify and upgrade the Midland Quality Assurance Program organization.

1. Tr. 597 at pp. 19-20; and Tr. 599.

2. Ex. C.P. 3. In its report of an inspection on March 6-7, 1974 (Ex. C.P. 19) DRO states that the concrete matter was considered resolved.

On February 1, 1971, a corporate reorganization was instituted by C.P.Co. which delegated overall responsibility for specific corporate projects 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.¹ On August 31, 1971 and again on December 8, 1971, the C.P.Co. Quality Assurance Program Audit Manual was voluntarily upgraded to provide more detailed procedures for implementation.² Similarly, the C.P.Co. Departmental Communications Guideline Manual was issued in December of 1971 and revised in March of the following year.³

In addition, C.P.Co., in 1972, obtained and examined copies of quality assurance programs of other utilities in order to aid in a determination as to whether the C.P.Co. Quality Assurance organization complied with current AEC regulations and retained Nuclear Utility Services Corporation (N.U.S.) as a consultant in this matter. N.U.S., having examined the C.P.Co. quality assurance program reported that the C.P.Co. audit plan was the most complete and detailed plan which N.U.S. had reviewed. N.U.S. recommended that complete independence

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1. Tr. 485 at p. 15.
 2. Tr. 458 at p. 15.
 3. Tr. 458 at p. 18.

for the quality assurance and quality control functions be accomplished. C.P.Co.'s Quality Assurance Organization was subsequently made completely independent from the project; however, C.P.Co. decided not to implement the recommendation of independence for quality control, believing that to do so would result in a duplication of efforts since both the Project Superintendent and the Quality Assurance Administrator would then be responsible for first line construction quality.¹

2.9. Bechtel was committed to a quality program even prior to the promulgation of Appendix B to 10 CFR 50. This commitment resulted in the evolutionary development of Bechtel's Quality Assurance Program in order to comply with industry and Bechtel standards, client requirements, and Commission criteria.² Evidence of this evolutionary development included the continuous upgrading of the different manuals of the functional groups having quality responsibilities,³ and the promulgation of Policy Statement 4-1 in which senior management committed Bechtel to a strong and viable quality assurance program.⁴

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1. Tr. 458 at pp. 11-12.
 2. Tr. 570 at pp. 2, 12-13.
 3. Tr. 677 at pp. 1-4; Tr. 663 at pp. 2-4; Tr. 641 at pp. 2-4.
 4. Tr. 570 at pp. 2-3, 12-13; Bechtel Yates Ex. 1. C.P.Co. accepted Policy Statement 4-1 in February, 1973.

2.10. During this period, C.P.Co. and representatives from the Commission engaged in discussions which were intended to explain C.P.Co.'s new organization and its underlying rationale. C.P.Co. explained that while quality assurance was independent and reported directly to the C.P.Co. vice-present in charge of electrical construction, the field quality control organization reported directly to the project superintendent since he retained the basic responsibility for the quality of the plant. C.P.Co. explained that the field quality control organization would be audited by the independent quality assurance organization.¹

Although Region III DRO had reservations as to whether the organization would function satisfactorily, they did not disapprove the plan. Nevertheless, C.P.Co. undertook certain changes in their organizational structure in order to eliminate any concern which DRO might have. This reorganization of the quality assurance department functions and personnel became effective on October 1, 1973. This reorganization created a Director of Quality Assurance Services and consolidated all aspects of quality assurance under his direction. The concept of field quality control reporting to the project superintendent was abandoned.²

The new organization was explained to DRO on October 10-11, 1973. Thereafter, C.P.Co.'s Quality Assurance Manual

1. Tr. 485 at pp. 13-14.

2. Tr. 485 at p. 14.

was revised to incorporate the new organization and its responsibilities. This revision was issued on November 29, 1973.¹ Appropriate changes were then made to the Policies and Procedures Manual and the manual was reissued on November 30, 1973.²

2.11. On September 10, 11 and 27, 1973, DRO 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, DRO cited deficiencies in documentation control procedures.³ Although each of the discrepancies identified by DRO had been previously identified by Bechtel's Quality Assurance Group and corrective action had been initiated,⁴ 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;

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1. Tr. 485 at p. 15; and C.P. Ex. K-1.
 2. Tr. 485 at p. 15; and C.P. Ex. K-2.
 3. C.P. Ex. 12. The findings in this report were set set forth by the Commission in its Order to Show Cause in this proceeding.
 4. Bechtel Ex. Dotson - 17, 18, 19, 20A, 20B, 21.

C. Procedures to prescribe control of interface activities between design groups;

D. Procedures to prescribe control, issuance 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.¹

During its inspection of January 10-11, 1974, DRO reviewed the actions taken to correct the deficiencies in the above areas and concluded that the corrective action taken was adequate² and was being properly implemented.

1. Tr. 597 at pp. 23-28.

2. C.P. Ex. 16.

2.12. On November 6-8, 1973, DRO conducted an inspection at Midland. Among the activities examined during this inspection was cadwelding. Prior to this inspection, C.P.Co. had, on two occasions, specifically reviewed the status of cadwelding activities at Midland.

In the middle of October, 1973, C.P.Co. had learned that a problem relating to cadwelding had arisen at the D. C. Cook Plant. When C.P.Co. learned of this incident, its Field Quality Assurance Engineer contacted the Quality Assurance Engineer at the Cook Plant who reported that the problem involved a rusty cadweld sleeve.¹ Thereafter, the Field Quality Assurance Engineer discussed this incident with the Bechtel Midland Project Quality Control Engineer and was informed that rusty sleeves would not be a problem at Midland because the inspection plan required that they be checked and cleaned prior to cadwelding.² Based upon this information, no further follow-up was deemed necessary by C.P.Co.³

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.⁴

1. Tr. 458 at p. 28.

2. Tr. 597 at p. 35.

3. Tr. 458 at p. 28.

4. Tr. 597 at p. 5, Bechtel Ex. Dotson-2.

He issued an open Quality Assurance Daily Log to the Bechtel Project Superintendent¹ which required corrective action prior to the covering the cadweld's with concrete.² During an earlier audit of Bechtel Engineering, a discrepancy had been noted by Bechtel Quality Assurance between the PSAR requirements and the Erico specification.³ A Quality Audit Finding which required corrective action had been prepared on this discrepancy. C.P.Co. was advised of these actions.⁴

Based upon the preceding incidents C.P.Co. did not anticipate the nature of the deficiencies in the Midland Quality Assurance Program for cadwelding that were identified by DRO following its November 6-8, 1973 inspections. These deficiencies can be summarized as follows:

- A. Deficiencies in written procedures for cadwelding production and inspection;
- B. Failure to properly implement written procedures which were available;
- C. Inadequate control of materials; and
- D. Insufficient details in documentation of quality verification activities.⁵

Upon review of the deficiencies which were identified by DRO, C.P.Co. determined that some of the deficiencies were of such a nature that they would require corrective action beyond the scope of the corrective action required to requalify the cadwelds themselves, i.e. some of the deficiencies suggested possible programatic shortcomings in the Midland Quality Assur-

1. Tr. 602 and Tr. 458 at p. 28.

2. Ibid.

3. Ibid.

4. Tr. 458 at p. 28.

5. Tr. 458 at p. 29. The findings surrounding these deficiencies were set forth by the Commission in its Order to Show Cause in this proceeding.

ance Program.¹ Therefore, in addition to requalifying the cadwells which had been installed at the site and assuring itself that future cadweld activities would be accomplished in an acceptable manner, C.P.Co. undertook additional steps to insure that certain programmatic deficiencies in the Midland Quality Assurance Program, disclosed by the cadwelding inspection, would be rectified. These steps included:

- A. An increase in the number of C.P.Co. Field Quality Assurance personnel from one, prior to the November 6-8 DRO inspection, to four during the early part of December;
- B. C.P.Co. 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. C.P.Co. 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 C.P.Co. General Office personnel and C.P.Co. 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 the C.P.Co. Director of Quality Assurance Services, and quarterly meetings between

1. Tr. 458 at p. 29.

C.P.Co. 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.¹

In addition to the corrective action taken by C.P.Co. for its activities, Bechtel management took steps to verify that the cadwelds were of proper quality, to determine necessary revisions to the Bechtel Quality Assurance program for Midland and to insure² that similar situations would not recur. . 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
- 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.³

Implementation of these actions were verified by Bechtel management and directives were issued to re-emphasize Bechtel's commitment to⁴ Quality Assurance.⁵

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- 1. Tr. 458 at pp. 29-30.
 - 2. Tr. 570 at pp. 10-11.
 - 3. Bechtel Ex. Yates-5.
 - 4. Tr. 570 at pp. 10-11.
 - 5. Tr. 570 at p. 11; and Bechtel Exs. Yates-6, 7 and 8.

2.13. After reviewing the results of the November 8, 1973 inspection, the Director of Quality Assurance for C.P.Co. ordered a stop work order to be issued by the Field Quality Assurance Engineer, prohibiting the placement of any concrete over the cadwelds until appropriate corrective action had been completed. In the afternoon of that day, following a telephone conversation with DRO, the C.P.Co. Midland Project Manager ordered suspension of all cadwelding operations.¹

2.14. On November 9, 1973, the Director of DRO Region III placed a telephone call to C.P.Co. expressing his concern with the cadweld problem. He stated that DRO should not be called back for a reinspection until C.P.Co. was satisfied that all installed cadwelds were satisfactory. Discussion then followed regarding the need to view the programmatic aspects of the deficiencies and it was agreed that C.P.Co. would consider measures to be taken that would prevent similar occurrences in other construction activity.²

2.15. On November 13, 1973, C.P.Co. received a letter from DRO which stated their understanding that cadwelding activities had been suspended at the Midland site and would not be resumed until all existing cadwelds had been reinspected by properly qualified inspection personnel and determined to meet quality requirements, and that a site inspection by DRO had established that an acceptable program for cadwelding had been developed and implemented. This letter did not refer to any programmatic deficiencies which may have been identified in the November 6-8 inspection.³

1. C.P. Exhibit H-9.

2. Tr. 485 at p. 17.

3. Tr. 485 at p. 17; and C.P. Ex. H-6.

2.16. DRO inspectors next visited the Midland site on November 15, 1973. This special inspection was conducted to determine the scope and adequacy of the cadweld reinspection program. At the conclusion of the inspection, it was determined that:

- A. Adequate cleaning of cadwelds had been completed prior to reinspection;
- B. Adequate procedures, techniques and tools were being utilized;
- C. Cadweld inspectors were adequately trained and competent; and
- D. Important quality aspects for each cadweld were ¹ determined and recorded concurrent with inspection.

This inspection was conducted upon the initiation of the DRO. C.P.Co. had not yet notified the DRO that it was prepared for re-²inspection on cadwelding activities.

On November 19, 1973, C.P.Co. informed DRO that it expected to be ready for reinspection of cadwelding activities on the following day.³ Pursuant to this notification, on November 20-21, 1973, a follow-up inspection was conducted at Midland, the purpose of which was to determine the adequacy of the corrective action taken by C.P.Co.

1. Tr. 289-290, 305-306; and C.P. Ex. 14.
2. Tr. 308.
3. Tr. 290.

Following the November 20-21 inspection, DRO stated that they were satisfied with the requalification of the existing cadwelds. Furthermore, DRO acknowledged that discussions with site and corporate management personnel indicated that C.P.Co. had given considerable thought to this matter. DRO noted, however, that it was not fully satisfied since there was no documentation that C.P.Co. management had made an effort to specifically identify programatic shortcomings in the Midland Quality Assurance program, or that specific, corrective action measures had been taken to deal with such programatic deficiencies.¹

At the time of the DRO exit interview on November 21, 1973, C.P.Co. was prepared to discuss those fundamental actions which it had planned to take with regard to the programatic problems associated with the cadwelding deficiencies, but, at that time, these proposed actions were summarized in outline form for discussion with DRO and had not been formally drafted.²

2.17. Following the DRO inspection of November 20-21, 1973, C.P.Co. formally documented its analysis of the programatic aspects of the cadweld deficiencies³ and a DRO inspection was scheduled for December 3, 1973. This inspection was subsequently cancelled by DRO and C.P.Co. 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, 1973.⁴

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1. Tr. 485 at p. 18; C.P. Ex. 14.
 2. Tr. 485 at p. 18.
 3. Tr. 485 at p. 19; and C.P. Ex. K-7 and K-8.
 4. Tr. 485 at p. 19; and C.P. Ex. 14.

2.18. As a result of its December 6-7, 1973 inspection, DRO concluded that the programatic deficiencies, including management involvement, and special problems relating to cadwelding at Midland had been satisfactorily resolved.¹ Pursuant to this conclusion, a letter was sent by DRO to the Commission recommending that the Order to Show Cause be modified to permit the resumption of cadwelding activities at Midland.² On December 17, 1973, the Order to Show Cause was so modified by the Commission.

An inspection was held by DRO on January 10 and 11, 1974 to (1) verify implementation of the Midland quality assurance program after cadwelding activities resumed, and (2) to verify implementation of the commitments made by C.P.Co. to correct the programatic deficiencies identified in its analysis of the November 6-8, 1973 inspection. The DRO inspectors determined that the quality assurance program relative to cadwelding was being implemented, and that C.P.Co. and Bechtel were in the process of meeting the commitments made to correct the programatic deficiencies.³ Additional inspections conducted by DRO have confirmed that the actions committed to by C.P.Co. and Bechtel as a result of the November 6-8, 1973 inspection are being implemented.⁴

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1. C.P. Ex. 15.
 2. Tr. 403-404.
 3. Tr. 343-4; C.P. Ex. 16.
 4. C.P. Ex. 17; and Tr. 254.

2.19. Bechtel's Quality Assurance Program has extensive quality requirements throughout those portions of its organization which are involved in the design and construction of the Midland Plant. These requirements have been established in order to provide multiple levels of quality responsibilities in order to insure that applicable codes, standards, PSAR commitments and Commission regulations are complied with.¹ The Bechtel groups for which these quality requirements have been established include: Engineering; Quality Control; Procurement; Procurement Inspection; Materials, Fabrication and Quality Control Services; Construction; and Quality Assurance. In summary, the Bechtel Midland Quality Assurance Program, through each of these groups, provides for the establishment and implementation of quality assurance requirements through construction, inspection and testing. Additionally, Quality Assurance group provides surveillance, monitoring and auditing activities over the functions of each of the groups having quality responsibilities in order to provide assurance that the quality requirements of the various groups are properly implemented, resulting in a proper level of confidence of the quality and safety of the Midland plant.² Bechtel management has provided for reporting responsibilities which insure that any given quality matter is brought to the attention of management at a level which insures its proper disposition.³

1. Tr. p. 570 at p. 3; 574-578.

2. Tr. 570 at pp. 7-8.

3. Tr. 570 at p. 8.

2.20. B&W, the nuclear steam supplier for Midland, has implemented a quality assurance program which is applicable both to B&W and to its vendors.¹ This program was instituted prior to the promulgation of 10 CFR 50, Appendix B, and has continued to be updated as quality assurance requirements evolved.² In August, 1973, B&W, at the request of C.P.Co., applied a newly upgraded quality assurance program to Midland.³ Procedures have been implemented to coordinate the transfer of the nuclear steam supply system components from B&W to Bechtel in order to insure that quality documentation for B&W components is properly received and filed at Midland.⁴ In addition to the B&W program, Bechtel employs a resident inspector at the Mt. Vernon shop of B&W who performs a surveillance activity for Bechtel and C.P.Co. of B&W activities.⁵ C.P.Co. also conducts audits of B&W.⁶

1. Tr. 441 at p. 1.

2. Tr. 441 at pp. 11-15.

3. Tr. 441 at p. 14.

4. Tr. 458 at pp. 45-46.

5. Tr. 452; Tr. 458 at p. 44; Tr. 444 at p. 3.

6. Tr. 458 at p. 47.

2.21. We have reviewed the testimony and exhibits of C.P.Co. and Bechtel relating to the Quality Assurance activities from design through installation of a specific component at Midland, the containment liner plate. This evidence establishes that multiple levels of quality assurance occur at every stage of the engineering, procurement, fabrication and installation of components for the Midland facility.¹

2.22. As reflected in the Staff's testimony the actions taken by C.P.Co. and Bechtel prior to and subsequent to the November 6-8, 1973 DRO inspection, indicate that C.P.Co. and Bechtel are implementing the Quality Assurance Program at Midland in compliance with Commission regulations. Indeed, the Technical Assistant to the Director of DRO testified that C.P.Co. "has demonstrated and continues to demonstrate that [C.P.Co.] is in compliance ... with the Commission's regulations pertaining to quality assurance."² This testimony was based on the fact that deviations from the quality assurance program have been identified and corrected and that management has analyzed the Midland Quality Assurance Program and has taken appropriate corrective action.³ Both the principal reactor inspector for Midland and the assistant reactor inspector for Midland supported the conclusion of the Technical Assistant to the Director of DRO.⁴

1. Tr. 458 at pp. 39-62; C.P. Ex. K-14; Tr. 701 at pp. 1-7; and Bechtel Exs. Panel 1-12, 14-30, 32, 33, 38-48, 50-63, 65-68, 70, 71, 86, 87 89-91 and 95-106.

2. Tr. 202.

3. Tr. 201-202.

4. C.P. Ex. 16.

2.23. C.P.Co. and Bechtel have prepared a number of reports documenting deviations from the Midland Quality Assurance Program.¹ However, as the Licensing Board has already noted, the very nature of constructing an extremely complex and massive project such as a nuclear power plant is going to lead to deviations.² None of the deviations from the Quality Assurance Program for Midland involved a situation which, if undetected, would have resulted in an adverse effect on safety.³

In this regard, the Licensing Board requested that DRO provide a comparison of the status of quality assurance at Midland as compared to other facilities. The Director of DRO Region III testified that the status of the Quality Assurance Program at Midland was comparable to what is seen at other sites.⁴ The remaining staff witnesses supported this conclusion.⁵

2.24. The Licensing Board has analyzed the implementation of the Midland Quality Assurance Program as disclosed by DRO inspection reports, C.P.Co., and the Staff and Bechtel testimony and exhibits in this proceeding, and finds that while there have been deviations at Midland, measures have been established to promptly detect and correct them, and that procedures also exist and have been implemented whereby management is appraised of such deviations. Management has taken prompt corrective action when necessary.

1. Tr. 597 at pp. 8-16; and C.P. Ex. K-10.

2. See also: Tr. 235-236.

3. Tr. 628 and Tr. 458 at pp. 37-38.

4. Tr. 377-378.

5. Tr. 394-395.

III. REASONABLE ASSURANCE OF IMPLEMENTATION IN THE FUTURE

3.1. The second general issue for consideration in this hearing is whether there is reasonable assurance that C.P.Co. will continue to implement its Quality Assurance Program in compliance with the Commission's rules and regulations throughout the construction process at Midland.

3.2. The Licensing Board believes that the following considerations are relevant to the resolution of this issue:

(a) the present compliance by C.P.Co. with Commission regulations as discussed in Section II, supra;

(b) the past performance of C.P.Co. regarding the implementation of the Midland Quality Assurance Program;

(c) the present commitment of C.P.Co. to review and upgrade the Midland Quality Assurance Program in the future; and

(d) the attitude of C.P.Co., especially its senior management personnel, with respect to compliance with Commission regulations.

3.3. As set forth in the preceding paragraphs, C.P.Co. and Bechtel have continually upgraded their Quality Assurance Program to meet the evolving requirements, standards and codes of the AEC and industry.

3.4. In the fall of 1972, C.P.Co., in an effort to obtain another perspective regarding Commission quality assurance requirements, employed the N.U.S. Corporation, as a consultant, to examine the C.P.Co. Quality Assurance Program. N.U.S. submitted its report on December 15, 1972, stating that C.P.Co. had the most complete and detailed audit plan they had ever seen.¹ N.U.S. recommended, however, that the C.P.Co. Quality Assurance organization be given complete independence from those groups having cost and scheduling functions and that Quality Assurance activities of C.P.Co. be expanded beyond its auditing function.² As a result of this report, Quality Assurance activities were expanded and the Quality Assurance organizations were given greater, although not complete, independence. Additionally, N.U.S. agreed that Bechtel Policy Statement 4-1 should be implemented.³

3.5. Following these changes, C.P.Co. continued to review its Quality Assurance organization and its Quality Assurance program both internally and with the DRO. As a result of these discussions, on October 1, 1973, C.P.Co. initiated action to reorganize its Project Quality Assurance Services Department (PQASD).⁴ The position of Director of Quality Assurance Services

1. Tr. 485 at pp. 11-12; and C.P. Ex. H-3.

2. Tr. 485 at p. 11.

3. Tr. 485 at p. 12; and C.P. Ex. H-4.

4. Tr. 458 at p. 2.

was created on the same level as all project managers and directors of service organizations.¹ As such, the new Director reports directly to the Vice President, Electric Plant Projects (EPP).² This reorganization resulted in a separation of the Quality Assurance organization from the Midland Project organization which had cost and scheduling responsibilities. An independent Quality Assurance organization was created and given responsibility for all aspects of Quality Assurance including policy and implementation.³ The new C.P.Co. PQASD organization was explained to DRO on October 10-11, 1973.⁴ In November, 1973, the Bechtel Quality Control Group was given additional independence when the Project Field Quality Control Engineer began reporting to the Ann Arbor Quality Control Supervisor.⁵ In early 1974, Bechtel provided further independence to the Quality Assurance Group by changing the reporting relationship of the Quality Assurance Engineers from the Project Manager to the Bechtel Quality Assurance Organization.⁶

3.6. Prior to November 6-8, 1973, C.P.Co. had imposed increased Quality Assurance requirements with respect to the Midland project. On August 30, 1973, C.P.Co. directed Bechtel to assure that their procedures used on the Midland Project comply with both 10 CFR 50, Appendix B and ANSI N45.2. Since that time C.P.Co. has

1. Tr. 485 at p. 14.

2. Ibid.

3. Ibid.

4. Tr. 485 at p. 15.

5. Tr. 670 at p. 1. The Quality Control Supervisor at Ann Arbor reports directly to the Chief, Field Quality Control Engineer in San Francisco.

6. Tr. 677 at p. 4.

considered ANSI N45.2 to be a 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-61, dated April 1, 1974, C.P.Co. 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.¹

Similarly, in August of 1973, C.P.Co. directed B & W to apply its newly revised Quality Assurance Program to the Midland Project. Thus, C.P.Co. became the first utility to put into effect the upgraded B & W Quality Assurance Program.²

These voluntary actions by C.P.Co. imposed additional Quality Assurance requirements upon the overall Midland Quality Assurance Program.

3.7. Following its October 1, 1973 reorganization, C.P.Co. again employed N.U.S. to audit PQASD and review its Quality Assurance manuals. This second review was undertaken at the initiative of C.P.Co. management and predated the DRO inspection of November 6-8, 1973.³ N.U.S. was asked to

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1. Tr. 458 at pp. 33-34.
 2. Tr. 450.
 3. Tr. 485 at p. 16.

completely review the C.P.Co. Quality Assurance Program and, after the November 6-8, 1973 inspection, to provide a recommendation concerning the advisability of using a third-party inspection organization independent of both C.P.Co. and Bechtel. N.U.S. recommended against such use of a third-party inspection group.¹ They did recommend, however, that C.P.Co. (1) incorporate pertinent requirements of ANSI N45.2 and the daughter 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 Midand 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 C.P.Co. PQASD personnel, these N.U.S.

1. C.P. Ex. H-10.

recommendations have been fully implemented by incorporation into a revised C.P.Co. Quality Assurance Manual.¹

C.P.Co., recognizing the usefulness of a periodic third party review, has retained the General Electric Nuclear Engineering Services Apollo group to review and comment on the revised manual. That review process is underway and upon completion of the review, a revised manual and implementing procedure will be issued. In addition, General Electric has reviewed the audits which C.P.Co. has completed.² To date, General Electric Apollo has not indicated that any major changes in the C.P.Co. Quality Assurance Program would be desirable.³ General Electric Apollo has been retained to conduct annual reviews of the C.P.Co. 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.⁴

3.8. As noted in the paragraphs above, C.P.Co. was actively involved in updating its Quality Assurance organization and program prior to the November 6-8, 1973 DRO inspection. Subsequent to this inspection, further action was taken by C.P.Co. to upgrade the Quality Assurance Program. For example, by

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1. Tr. 458 at pp. 20-22.
 2. Tr. 485 at pp. 21-22.
 3. Tr. 491.
 4. Tr. 458 at p. 33.

November 15, 1973, the causes and solutions of the cadwelding deficiencies which had been identified on November 6-8, 1973 had been resolved to the satisfaction of DRO.¹ On November 27, 1973, the C.P.Co. Director of PQASD documented his analysis of the programmatic aspects of these deficiencies and recommended actions to the C.P.Co. Vice President, EPP to resolve these discrepancies.² On November 29, 1973, the Vice President, EPP, responded to these recommendations, stating that the cadwelding problem "has broader systematic aspects to our total quality assurance program and the remainder of the project," and requested that action on the recommendations proceed immediately.³ A meeting was then held with senior Bechtel personnel to discuss both the specific cadwelding problems and to develop means to insure that similar deficiencies in the Quality Assurance Program did not recur.⁴ Several actions were then taken by Bechtel, including transmittal of master inspection plans for review by C.P.Co. Quality Assurance personnel prior to commencement of work to be done at the site, the

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1. Tr. 305-306.
 2. C.P. Ex. H-7.
 3. C.P. Ex. H-8.
 4. Tr. 485 at p. 19.

assignment to Bechtel Quality Control Engineers of all quality acceptance and verification inspecting and the certification of inspectors. A commitment was also received for increased Bechtel management attention to the Midland Project.¹ Subsequently, at C.P.Co.'s request, Bechtel clarified its commitment relating to increased Bechtel management attention toward Quality Assurance/Quality Control matters and also committed to furnish C.P.Co. with a monthly record of visits to the site and Quality Assurance related meetings.² Since that time, Bechtel has fully implemented these commitments.

3.9. The C.P.Co. Quality Assurance Manual for Midland was reissued on November 29, 1973 to document changes in the PQASD organization and responsibilities.³ The C.P.Co. implementing procedures were modified and additional procedures were added to provide guidance to PQASD personnel in the performance of their duties. These procedures are contained in the Quality Assurance Services Procedures Manual⁴ which was issued on

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1. C.P. Ex. H-9.
 2. Tr. 485 at p. 20.
 3. C.P. Ex. K-1.
 4. C.P. Ex. K-2.

November 30, 1973.¹ A new Quality Assurance Services Department Procedure Manual was written to include specific procedures for the new PQASD. This manual was issued on December 17, 1973.²

3.10. As a result of the DRO inspection of cad-welding operations in November, 1973, programmatic changes in the Midland Quality Assurance Program were instituted. These changes are described in paragraphs 2.12-2.18, supra. These changes, the professional manner in which management responded to the deficiencies disclosed as a result of the cadwelding inspection and the fact that C.P.Co. has been implementing these changes in a timely, responsible manner, has given DRO confidence that the Quality Assurance program will be implemented throughout construction.³

3.11. C.P.Co. has endeavored to assure not only that the number of Quality Assurance personnel on the Midland Project is adequate, but also that such personnel are properly trained. In 1973, C.P.Co. instituted a formal training program for all of its Quality Assurance personnel.⁴ This

1. Tr. 485 at p. 15.

2. Ibid.

3. Tr. p. 386.

4. Tr. 485 at p. 22.

initial program has been completed. It was expanded in 1974 to include the use of outside, as well as C.P.Co., personnel to conduct the training.¹ The particular topics emphasized during the training program included the Electric Plant Projects Policies and Procedures Manual - March 28, 1973; Appendix B to 10 CFR 50, 15.2 and daughter standards - June 25 through June 29, 1973 (General Office) July 16 and 17, 1973 (Field); Appendix B, N45.2 and daughter standards, 50.55(e), EPP Policies and Procedures, Quality Assurance Services Procedures Manual - January 3 and 4, 1974; X-Ray Engineering Taped Training Film on Nondestructive Examination, ASME Section III - February 11 through 14, 1974; and Regulatory Guides, Reactor Safety, Nuclear Plant Systems and Components, ASME Section III - March 14 and 15, 1974; L. Marvin Johnson and Associates Training Course on "Applied Evaluation (Audit) Techniques for Quality Assurance Effectiveness" - April 22 through 26, 1974; and "Quality Assurance/Quality Control Hands On Nondestructive Examination Training Course" at Newport News Industrial Corporation (three persons) - May 20 through May 31, 1974.² The training of new employees and the retraining of present employees will be a continuing process.³

Similarly, Bechtel's indoctrination and training program continued to evolve through the addition of a more detailed

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1. Tr. 458 at p. 4.
 2. Tr. 458 at pp. 4-5.
 3. Tr. 485 at p. 22.

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. In addition, mini-training sessions provide specialized training on timely subjects and a workshop has been prepared and presented by the Bechtel Quality Assurance training staff to teach quality awareness to other Bechtel personnel.¹ Bechtel's Quality Control Engineers receive extensive on-the-job training as well as supplementary training. The supplementary training sessions includes general instruction on the application of established quality assurance procedures and special technical training covering various inspection activities. Quality Control Engineers are then certified under a program designed to comply with ANSI N45.2.6 and Regulatory Guide 1.58.² The training program for Engineers and Designers has become more formal and more comprehensive.³ 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 N45.2.12.⁴

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1. Tr. 677 at pp. 6-7.
 2. Tr. 663 at pp. 7-9.
 3. Tr. 626 at pp. 11-12.
 4. Tr. 641 at p. 5.

3.12. After reviewing the factors surrounding the November 6-8, 1973 DRO inspection of cadwelding operations, PQASD 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 or audit surveillance is also performed by C.P.Co. 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.¹

In addition to its field activities, PQASD schedules 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.²

1. Tr. 458 at pp. 5-6.

2. Tr. 458 at p. 6.

3.13. C.P.Co. and Bechtel had taken a number of significant steps prior to the November 6-8, 1973 DRO inspection which were designed to upgrade and make more effective their Quality Assurance program. Not only had C.P.Co. reorganized its Quality Assurance department, it had begun upgrading its quality assurance manuals and had engaged an outside consultant to review its overall organization and programs. After the November 6-8, 1973 DRO inspection, C.P.Co. and its senior management moved immediately to provide additional quality assurance personnel and became more involved in approving and reviewing Bechtel's Master Inspection Plans prior to their implementation in the field. C.P.Co. also employed an additional outside consultant to perform periodic audits, as well as instituting procedures for periodic audits by a team of experts from within C.P.Co. but independent of EPP.¹ These actions represent both past implementation and future commitments to review and upgrade the C.P.Co. Quality Assurance program. These steps are taken by C.P.Co.'s management not only to comply with the requirements of Appendix B to 10 C.F.R. 50 but also to protect C.P.Co.'s investment in the Midland facility and to insure that Midland provides reliable electric generation and process steam.²

3.14. As specified by the Licensing Board, the attitude of C.P.Co., especially that of its Senior Management, toward compliance with Commission rules and regulations was a matter at issue

1. C.P. Ex. H-11.

2. Tr. 485 at p. 6.

in this proceeding as a component of the issue of reasonable assurance of continued compliance with Commission Regulations regarding quality assurance.¹

3.15. Russell C. Youngdahl, C.P.Co.'s Senior Vice President in charge of all aspects of 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 of C.P.Co. Mr. Youngdahl's perception of the attitude of the C.P.Co. 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.² The Commission's rules and regulations, as well as license requirements, are regarded by C.P.Co. Management as the equivalent of statutes and, as such, are considered binding on the Company and its employees.³ Mr. Youngdahl stated that, although the management of C.P.Co. has always demanded quality in its work at least equal to industry standards, its approach has evolved from one of primary reliance on its engineering con-

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1. Tr 173-174, Bechtels attitude towards compliance with AEC rules and regulations is in accord. Bechtel's Vice-President and Deputy Manager stated that "[I]t is the policy of Bechtel Management that work on the Midland Power Plant will be performed in conformance with AEC regulations and applicable codes." Tr. 570 at p. 3.
 2. Tr. 528-529.
 3. Tr. 519 at p. 6.

structor to a more formalized reliance upon its own Quality Assurance organization and program.¹ In order to formally document this approach, Mr. Youngdahl, 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 N.45.2.² In order to make certain that this policy is implemented by the operating group, C.P.Co. named a Director of Quality Assurance Operations on June 1, 1974.³

Mr. Youngdahl's personal involvement in the QA process ranges from daily review of EPP activities to monthly review of PQASD activities. Moreover, he participated in meetings with Bechtel senior management following the November 6-8, 1973 DRO 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.⁴ It was his suggestion to procure a third party review of the Midland Quality Assurance Program.⁵

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1. Tr. 519 at pp. 3-4.
 2. Tr. 519 at p. 5; and C.P. Ex. Y-2.
 3. Tr. 519 at p. 6.
 4. Tr. 519 at p. 4.
 5. Tr. 519 at p. 5.

3.16. During the course of this proceeding, the Commission and the United States Department of Justice were investigating certain alleged failures of C.P.Co. to conform to the reporting requirements of the technical specifications of its operating license for its Palisades Nuclear Plant. Notwithstanding the Company's policy described above, the Palisades investigation stimulated the publication of a management directive which explicitly set forth responsibilities for reporting violations of Commission rules, regulations and license requirements.¹ This directive requires notification of the Commission by C.P.Co. on all items which are deemed to be violations and also on all items which are subject to interpretation as to whether or not they are in fact violations.

3.17. On June 17, 1974, the Licensing Board requested that C.P.Co. make Ralph B. Sewell, Nuclear Licensing Administrator for operating nuclear power plants, available for questioning on the attitude of C.P.Co. senior management personnel toward compliance with Commission rules and regulations.² C.P.Co. called Mr. Sewell as a witness on the same day.³

1. Tr. 519 at p. 6; and C.P. Ex. Y-3.

2. Tr. 399-402; and 439.

3. Tr. 543-567.

The Licensing Board questioned Mr. Sewell regarding statements given the DRO staff in connection with the operation of the gaseous radwaste system at the Palisades plant during 1972.¹ The Licensing Board's concern was that, in this instance, extraordinary steps may have been required to direct the attention of C.P.Co. management to important safety matters.² Mr. Sewell testified that it was the intent of C.P.Co. to fully comply with all Commission rules, regulations and licensing requirements.³ Mr. Sewell's statement described his normal channels of communication within C.P.Co.⁴ Mr. Sewell emphasized that he did not have to take extraordinary steps to direct management's attention to his request to the Palisades operating staff to perform corrective maintenance on the gaseous radwaste system.⁵ Soon after he communicated his concerns, the operating personnel at Palisades performed extensive maintenance on the system,⁶ and therefore, he did not seek management affirmation on his position.⁷

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1. Tr. 546-547.
 2. Tr. 563.
 3. Tr. 564.
 4. Tr. 559-562.
 5. Tr. 564-565.
 6. Tr. 548-550.
 7. Tr. 563-565.

3.18. Stephen H. Howell, C.P.Co. Vice-President in charge of Electric Plant Projects testified at the hearing. Mr. Howell is the C.P.Co. executive having direct responsibility for design, construction and construction quality assurance activities for nuclear power plants. Mr. Howell stated that the policy of C.P.Co. is and has always been to comply with all laws, ordinances, regulations and rules and to require its contractors to do the same.¹ With regard to his approach to quality and quality assurance, Mr. Howell testified that:

It has always been my belief that construction quality is a primary concern and I have given direction to my subordinates accordingly. Throughout my employment in Consumers Power Company in various departments, it has always been Company policy to assign its own employees to monitor the work of contractors. It has been the responsibility of those persons and their superiors to see that the work met all applicable codes, standards, regulations and laws and was constructed to operate safely and reliably. It was also their responsibility to see that realistic cost and schedule requirements were met. It was our philosophy that these objectives could be best met by a single coordinated responsibility centered in one person or group with quality being insured by the professionalism and integrity of Company employees. This is still our philosophy, for even today the Project Manager and his staff have primary responsibility for building a safe and reliable plant. Two major items, however, now provide a new dimension to this quality concept. The first is the concept of "quality assurance" as distinguished from "quality." While the building of quality into the plant is still a line responsibility, an independent group has been established to assure that that is the case. The second difference is that procedures and documentation have been formalized to a much greater extent. These two changes in approach have been brought about by the AEC's specific regulations regarding quality assurance, a part of the Commission's defense in depth concept.²

1. Tr. 485 at p. 4.

2. Tr. 485 at pp. 4-5; and Tr. 496-497.

This attitude toward Quality Assurance does not represent a drastic flip-flop resulting from the November 6-8, 1973 DRO inspection. Rather, it reflects a continuous evolution in Mr. Howell's attitude which began long before November 6, 1973, resulting from an increasing understanding of the Commission's Quality Assurance requirements and a growing appreciation of the value of an independent Quality Assurance Organization.¹ Mr. Howell indicated that, were the Commission's Quality Assurance requirements removed, C.P.Co. would nevertheless not make substantial changes in its approach to Quality Assurance. As evidence of this, Mr. Howell indicated that C.P.Co. has voluntarily instituted Quality Assurance programs for non-nuclear plants similar to those required for nuclear plants.² 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.³

3.19. The attitude of Gilbert S. Keeley toward compliance with Commission rules and regulations was perhaps set forth best in response to a Licensing 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:

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1. Tr. 485 at pp. 13-14 and 494-497.
 2. Tr. 496-497.
 3. Tr. 502-503 and 507.

* * *

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.¹

3.20. The Board questioned each of the C.P.Co. and many of the Bechtel witnesses closely regarding their attitude towards compliance with AEC regulations and observed their demeanor and the manner in which they responded to questions. Each witness answered questions candidly, in a straightforward manner and without hesitation. On the basis of its observation of the witnesses and having considered their testimony, the Board finds that the attitude of C.P.Co. and Bechtel towards compliance with AEC regulations is one of commitment to compliance, without any reservations whatsoever.

3.21. In order to insure that management personnel remains informed of Quality Assurance activities at the Midland site, C.P.Co. has had periodic in-depth status meetings among its management personnel for a number of years.² On February 1, 1974, however, the requirement for these meetings was formalized so as to require at least quarterly meetings between Vice President, EPP,

1. Tr. 477.

2. Tr. 485 at p. 24.

and representatives of General Office Quality Assurance, Midland Field Quality Assurance and the Midland Project. Reports of these meetings are submitted to the C.P.Co. Senior Vice President.¹ These formal procedures further require one-day visits to the Midland site by the Midland Quality Assurance Supervisor and one-day visits every two months by the Director of Quality Assurance Services.² 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 DRO inspection reports.³ For example, when a C.P.Co. non-conformance 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, 55(e), the Vice-President, EPP, is contemporaneously advised.⁴

3.22. As reflected in the Staff's testimony, the actions taken by C.P.Co. and the attitude of its management in responding to the November 6-8, 1974 DRO inspection provide reasonable assurance that C.P.Co. will continue to implement its Quality Assurance program in compliance with Commission rules and regulations throughout the construction process at Midland. For example, the Technical Assistant to the DRO Director, Region III, testified that "[R]easonable assurance now exists that compliance will con-

1. Tr. 485 at p. 24; Tr. 519 at p. 4; and C.P. Ex. Y-1.

2. Tr. 458 at p. 30.

3. Tr. 485 at p. 24.

4. Tr. 504.

tinue through the construction process."¹ This conclusion was based on his personal observations at the Midland jobsite, of the upgraded programs that have been instituted and on the manifestations of additional management involvement on behalf of C.P.Co. thereby assuring greater dedication to Quality Assurance.² In addition, the Senior DRO Reactor Inspector assigned to Midland testified that past violations had been timely resolved³ and that, with reference to the cadwelding incident, there was no type of corrective activity which should have been undertaken but was not undertaken.⁴

3.21. Finally, the Director of DRO, Region III, testified that despite the concern the Staff had with C.P.Co.'s past performance of C.P.Co. in the operation, as opposed to construction, of nuclear plants he felt that there was reasonable assurance that the Quality Assurance program of C.P.Co. would be carried out in accordance with Commission rules and regulations in the future.⁵ He stated as follows:

. . . [I]t is my view that we have seen a very discernable change over the last several months with this Company that have been factored into our thinking on this case: changes in organization structure, changes in facing up to commitments, and dealing with commitments.

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1. Tr. 201.
 2. Tr. 207.
 3. Tr. 289.
 4. Tr. 306. It should be noted that this determination was made on November 15, 1973, one week after the cadwelding incident and eleven days before the Appeal Board wrote its unsolicited letter of November 26, 1973.
 5. Tr. 386.

And so we made an observation or drew a conclusion that while the company - while we had some concerns with the company's past performance, that they 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 what it took to do the job and they were taking the steps to do it.

Now I have to make a judgment on this basis that okay, this is how we feel and we are going to-It is our belief that if they carry out this program, continue to meet their commitments, that we have confidence that the QA program will be met the remainder of the construction period.¹

This witness was also quite explicit in stating that his conclusions were based on the performance of C.P.Co. in the nuclear field generally and not solely related to construction at Midland.²

1. Tr. 385-386.

2. Tr. 383-387.

CONCLUSIONS OF LAW

Based upon the foregoing findings of fact which are supported by reliable, probative, and substantial evidence as required by the Administrative Procedure Act and the Commission's Rules of Practice, and upon consideration of the entire evidentiary record in this proceeding, the Board concludes as follows:

1. Saginaw-Sierra has failed to comply with a pre-hearing order of this Board entered pursuant to Section 2.752 of the Commission's Rules of Practice regarding the filing of a pre-hearing brief. Saginaw-Sierra did not appear at the hearings in this matter. Pursuant to Section 2.707 of the Commission's Rules of Practice, upon motion duly made by C.P.Co. during the hearing (See Tr. pp. 430 and 705), this Licensing Board holds Saginaw-Sierra to be in default and dismisses it as a party to this proceeding.

2. No party to this proceeding has introduced evidence supporting a modification of Construction Permits Numbered 81 and 82 for the Midland facility. Accordingly, the burden of proving that any alteration in said construction permits should take place has not been met. Therefore, this Licensing Board concludes that Construction Permits Numbered 81 and 82 should not be suspended, modified or revoked.

3. Pursuant to Section 2.203 of the Commission's Rules of Practice, the Board has taken evidence and conducted its own examination of witnesses to determine, in the public interest, if the Quality Assurance program for Midland has been implemented in compliance with Commission regulations. Based on the testimony, exhibits and the above findings of fact, the Board concludes that C.P.Co. and Bechtel are implementing the Quality Assurance plan for Midland in compliance with Commission regulations.

4. Pursuant to Section 2.203 of the Commission's Rules of Practice, the Board has taken evidence and conducted its own examination of witnesses to determine, in the public interest, if C.P.Co. and Bechtel will continue to implement the Quality Assurance program for Midland in compliance with Commission regulations during the construction process at Midland. Based on the above findings of fact, the Board concludes that there is reasonable assurance that C.P.Co. and Bechtel will continue to implement the Quality Assurance Program for Midland in compliance with Commission regulations during the construction process at Midland.

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 thirty (30) days after the date of issuance hereof, subject to any review pursuant to the Rules of Practice and the Commission's Notice of January 21, 1974.

Dated: August 12, 1974

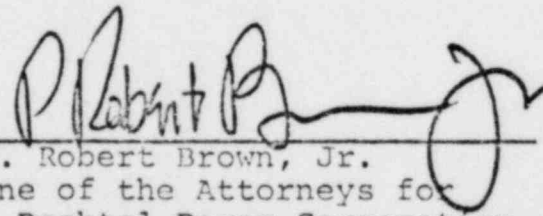
Isham, Lincoln & Beale
One First National Plaza
Suite 4200
Chicago, Illinois 60670
(312) 786-7500

Clark, Klein, Winter,
Parsons & Prewitt
1600 First Federal Bldg.
Detroit, Mich. 48226

Respectfully submitted,



Michael I. Miller
One of the Attorneys for
Consumers Power Co.



P. Robert Brown, Jr.
One of the Attorneys for
Bechtel Power Corporation
and Bechtel Associates
Professional Corporation