

UNITED STATES OF AMERICA
ATOMIC ENERGY COMMISSION

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

Construction Permits
Nos. 81 and 82

ANSWER TO ORDER TO SHOW CAUSE

December 24, 1973

8006090 712

Consumers Power Company (hereinafter "Consumers Power" or the "Licensee"), the holder of AEC Construction Permits Nos. 81 and 82 for Units 1 and 2 of the Midland Plant, states in answer to the Order to Show Cause issued by the AEC Director of Regulation on December 3, 1973 with respect to such Permits that all discrepancies or violations of AEC quality assurance (hereinafter sometimes "QA") regulations recited as the bases for such Order have been resolved; that the Licensee is presently implementing its QA program in compliance with the AEC quality assurance regulations; and that by reason of improvements in the QA organizations, practices and procedures of the Licensee and its architect-engineer, Bechtel, there is reasonable assurance that such compliance will continue throughout the construction process. More specifically, the Licensee states in answer to the Order to Show Cause as follows:

I. Background

1. Construction Permits Nos. 81 and 82 were granted to Consumers Power by the Atomic Safety and Licensing Board (hereinafter the "ASLB") on December 14, 1972, after a comprehensive hearing which, among other things, covered Consumers Power's Quality Assurance (QA) Program.

2. The ASLB held in its Initial Decision authorizing issuance of the construction permits that:

"Applicant is committed to a comprehensive documented quality assurance program for which it will have final responsibility. The application contains a description of the program including a discussion of how applicable requirements of Appendix B of 10 CFR Part 50 will be satisfied. The Board has reviewed this information and concluded that if the program is implemented in accordance with the representations in the application the requirements of Appendix B will be satisfied."^{1/}

^{1/} Initial Decision ASLB, December 14, 1972, p 24.

The ASLB also concluded that the question of enforcement of the Licensee's Quality Assurance Program was the responsibility of the Commission, which had delegated this enforcement function to the Director of Regulation. For this reason, the ASLB expressly did not consider the questions of whether there were deficiencies in the Licensee's implementation of its QA Program or the likelihood of the Licensee's implementing the QA Program which the ASLB found acceptable.^{2/}

3. On March 26, 1973, the Atomic Safety and Licensing Appeal Board (hereinafter the "Appeal Board") entered a Memorandum and Order (ALAB-106) stating in Paragraph III:

" * * * To begin with, we have found nothing which would cause us to overturn the Licensing Board's findings as to the consistency of the QA program with the requirements of Appendix B. We have reviewed the QA manuals for both the applicant and its architect-engineer. Both of these manuals, as presently revised, appear to present a satisfactory overall program to meet the quality assurance criteria of Appendix B."^{3/}

4. Despite the Appeal Board's conclusion in ALAB-106 that the Licensee and its architect-engineer, Bechtel, had a satisfactory QA Program, the Appeal Board modified the ASLB decision with respect to the issue of the likelihood that the Licensee would properly implement its QA Program. The Appeal Board stated that the ASLB should have examined the track record of the Licensee to decide this issue. Instead of remanding the matter to the ASLB for further action, the Appeal Board reviewed the record itself and imposed four conditions on the Licensee,

^{2/} Id. at 23-24

^{3/} ALAB-106, RAI-73-3, p 182, at 184 (March 26, 1973).

as a result of its conclusion that the record disclosed certain deficiencies and discrepancies relating to implementation of the Licensee's QA Program.^{4/} The deficiencies relied upon related to concrete work undertaken prior to the issuance of the construction permits pursuant to an exception, and had been discovered during inspections by the Directorate of Regulatory Operations, Region III (hereinafter "DRO-III") on September 29-October 1, 1970. On the basis of these deficiencies, the Appeal Board found that

" * * * Neither the applicant nor the architect-engineer has provided reasonable assurance that the QA program will be implemented properly, even though both organizations have experience in building reactors. They have in this project not demonstrated their concern with maintaining QA programs in synchronization with their construction programs, nor have they demonstrated that they will have properly trained^{5/} people on site to implement the QA program."

5. The four conditions imposed upon the Licensee by the Appeal Board in ALAB-106 required the Licensee to file a report with the Appeal Board describing quality assurance action being undertaken to assure the satisfactory condition of work theretofore performed and the materials then on site, in order to provide assurance that construction could safely continue following a prolonged shutdown. The order stated that the Appeal Board would "appreciate receiving staff comments on" the Licensee's report, "and these comments should include the results of any staff inspection." In its report, filed on May 25, 1973, the Licensee submitted procedures for inspection, evaluation and remedial

^{4/} The record disclosed that the actual structural work performed at Midland appeared to be satisfactory. ALAB-106, RAI-73-3, p 182, at 186.

^{5/} Id. at 185.

action to be undertaken in preparation for resumption of construction and summarized the results of the initial inspections under these procedures.^{6/} The Staff on the basis of its review of the Licensee's May 25, 1973 report, saw no substantial basis for asserting that Consumers Power had failed to comply with the reporting condition.^{7/} No additional Staff inspection had been performed, however.

6. In ALAB-132,^{8/} the Appeal Board found that it could not derive from the Licensee's May 25, 1973 report alone the assurance it anticipated as a result of ALAB-106. Accordingly, it directed the Staff to file a report of a full-field inspection, and comments on the Licensee's report in the light of that inspection. The Staff did so on July 20, 1973, reporting the results of a June 26-28, 1973 inspection, and the other parties filed comments on the Staff's submittal, at the Appeal Board's invitation.

7. In reviewing the various submittals, the Appeal Board noted that its action in ALAB-106 was intended to be remedial, not punitive, and to assure that prior QA shortcomings were being rectified.^{9/} The Appeal Board held in ALAB-147 that reasonable assurance had been provided that appropriate QA action was being taken, with one exception respecting Bechtel's Field QC organization, which was

^{6/} Applicant's Report on Quality Assurance Action Being Undertaken to Assure Satisfactory Condition of Work Already Performed and Materials Now on Site, May 25, 1973.

^{7/} AEC Regulatory Staff's Answer to Saginaw Intervenors' Motion to Enforce ALAB-106, June 19, 1973.

^{8/} ALAB-132, RAI-73-6, p 431 (June 28, 1973).

^{9/} ALAB-147, RAI-73-9, p 636 at 637 (September 18, 1973).

subsequently resolved between the Licensee and the AEC Staff pursuant to ALAB-152.^{10/}

8. On November 6-8, 1973, DRO-III personnel made an inspection of the Midland site. Among the items inspected were cadweld splices,^{11/} as to which the inspectors found a number of deficiencies:

A. Cadweld procedures and implementation

- (i) An Erico (the cadweld manufacturer) bulletin was being utilized as a specific cadweld procedure, and was deemed inadequate for the purpose, being inconsistent with the PSAR with respect to preheat temperature requirements, and being principally a sales promotion document.
- (ii) A specific procedure providing detailed instructions regarding the field QA inspector's activities and responsibilities during cadwelding was not available for review. Moreover, a field engineer performing cadweld inspections did not have a copy of the Master

^{10/} ALAB-152, RAI-73-10, p 816 (October 5, 1973). See letters from Mr. A. Giambusso of AEC-DOL to the Licensee dated November 20, 1973, and from Mr. S. H. Howell of the Licensee to Mr. Giambusso dated December 5, 1973. This matter could hardly be cited as evidence of incorrigible disregard of QA requirements, as even the AEC Staff, in petitioning for reconsideration of ALAB-147, requested certification of the matter to the Commission "as a major and novel question of law" as to which the Staff disagreed with the Appeal Board. That this area is one which is rapidly evolving is reflected in the recent Appeal Board decision, In the Matter of Pennsylvania Power and Light Company (Susquehanna Units 1 and 2), Dkt Nos 50-387-388, ALAB-163 (December 11, 1973), referencing the Commission memorandum and order of December 7, 1973, RAI-73-12, in the LaSalle case.

^{11/} Splices which join reinforcing bars by means of a joint which, at the end of the mechanical procedure (not a weldment) followed, produces a joint with basically the same mechanical properties as an unspliced reinforcing bar.

Inspection Plan, which defines (although determined to be lacking in content) his activities.

- (iii) Existing instructions and procedures relating to verification of minimum preheat temperature were not being implemented, and one cadweld assembly was at approximately ambient temperature minutes before firing.
- (iv) Observation of one Bechtel field engineer's inspection activities indicated that his method of measuring the area of voids in the cadwelds to determine whether the maximum 3.0 square inch criterion has been met was not in agreement with the method required by the Bechtel QC inspection specification. Two previously accepted cadwelds were rejected after the AEC inspector requested that the void areas be remeasured by the Project Field Quality Control Engineer.

B. Material control procedures and implementation.

- (i) A procedure was unavailable for review (a) to adequately define the elements of cadweld material control, (b) to account for cadweld materials issued from and returned to storage, (c) to direct how non-conforming cadweld materials are to be identified and segregated from conforming materials in storage, and (d) to implement the Bechtel specification requirement that splice kits be stored in a clean, dry, temperature-controlled area. Inspection of the cadweld storage facilities revealed that, while the

facilities were clean, dry and temperature-controlled, (a) access was apparently uncontrolled, (b) cups and an open thermos of coffee were placed on cadweld powder boxes in storage, and (c) a cadweld sleeve which was nonconforming in that it was unwrapped and had oxidized interior walls, was stored among conforming materials and not identified as nonconforming.

C. Cadweld records

- (i) Records were not maintained to furnish evidence that "Splicing In-process Production Control Activities" were actually performed as required.
- (ii) Records to provide evidence that issuance control requirements for cadweld splicing material were properly accomplished were not maintained.^{12/}

9. On the morning of the day following the inspection, November 9, 1973, Consumers Power's Director of Quality Assurance Services ordered the Consumers Power Quality Assurance Engineer at the Midland site to write a nonconformance on Bechtel covering the problem areas found during the AEC inspection, and also to issue a stop-work order with respect to placement of any concrete over the cadwelds until corrective action had been completed. The Consumers Power Midland Project Manager was immediately notified that this action would be taken. The Quality Assurance

^{12/} DRO-III Inspection Report No. 050-329, -330/73-10. This report was not issued until December 14, 1973, and was not received by the Licensee until December 17, 1973. Corrective action taken by the Licensee and noted in reports of later inspections was based on descriptions of the discrepancies given in exit interviews at the conclusions of the inspections and on telephone conversations with DRO-III representatives.

Engineer issued the nonconformance and the stop-work order to the Bechtel QA representative at the site at approximately 10:00 AM on November 9. Later that day, following a telephone conversation with the Reactor Construction Branch Chief of DRO-III, the Consumers Power Midland Project Manager ordered a suspension of cadwelding operations. In view of the voluntary shutdown of cadwelding operations, no stop-work order was issued by DRO-III. DRO-III's understanding that the work had been stopped and would not resume prior to reinspection of cadwelds and development and implementation of an acceptable cadwelding program was set forth in a November 9, 1973 letter from Mr. J. G. Keppler of DRO-III to Mr. Stephen H. Howell, Consumers Power's Vice President in charge of Electric Plant Projects. This letter was not received until November 12, and did not discuss any items except cadwelding.

10. On the afternoon of November 9, 1973, DRO-III representatives (Rohrbacher, Knop) telephoned the Licensee's Director of Quality Assurance Services and its Midland Project QA Supervisor to discuss the November 6-8 inspection findings. During the conversation the DRO-III representatives said they intended to reinspect on November 15 or 16, at which time they would expect to see evidence that:

- a. All cadwelds had been reexamined on Units 1 and 2.
- b. The reexamination had been documented.
- c. The inspectors and cadwelders had been retrained or reinstructed.
- d. The basis of acceptance or rejection of cadwelds is clearly defined.

- e. Rebar has been cleaned prior to cadwelding, by visual evidence or otherwise.
- f. Cadweld sleeves had been properly centered.
- g. Asbestos had been removed from cadwelds adequately to permit visual inspection.

Also on November 9, J. G. Keppler of DRO-III called S. H. Howell to indicate that the Licensee should examine the possibility that the cadwelding problems might be symptomatic of more fundamental QA deficiencies.

11. On November 12, 1973, five Consumers Power representatives discussed the November 9 AEC-Consumers Power telephone conversation with thirteen Bechtel engineering, construction and quality control representatives. The substance of new procedures was agreed upon for void measurements, rebar cleaning, preheat, material control, and inspection for asbestos removal. The need to write new procedures for cadweld inspections and retraining of cadwelders if their performance was substandard was also discussed.

12. An internal AEC-DRO memorandum entitled "Notification of an Incident or Occurrence" bearing a date of November 13, 1973 and the number "101" was written, describing "serious deficiencies associated with Cadweld splicing of concrete reinforcing bars." The memorandum was given wide distribution within the AEC and was even sent to the staff of the Joint Committee on Atomic Energy, but a copy was not sent to the Licensee. Washington counsel for the Licensee obtained a copy from the AEC Public Document Room on November 21. The memorandum states:

"A Region III inspection on November 6-8, 1973, at the Midland construction site, identified serious deficiencies associated with Cadweld splicing of concrete reinforcing bars. These deficiencies involved inadequate procedures for

installing Cadweld splices, for material control, and for documenting required quality parameters. In addition, the Regulatory Operations inspectors determined that inspection techniques were inadequate and acceptance criteria used for quality requirements were being misapplied."

The memorandum does not specify the nature of the "serious deficiencies" referred to in any further detail. However, it indicates that a delay "of at least one week" might be necessitated by the corrective action program. A copy of the November 13 internal memorandum is attached hereto as Exhibit A. The memorandum notes that Consumers Power had shut down all cadweld splicing operations at the site on November 9, but that other unrelated work would continue. It also notes that Consumers Power had agreed not to resume cadweld splicing until existing splices had been reinspected and accepted by properly qualified inspection personnel and until a DRO-III inspection had established that an acceptable program for cadweld splicing had been developed and implemented.

13. On November 15, 1973, Mr. Rohrbacher of DRO-III conducted a short follow-up inspection at the Midland site to determine the adequacy of the cadweld reinspection program. He determined that "(1) appropriate and adequate cleaning of Cadwelds had been completed prior to reinspection; (2) adequate procedures, techniques, and tools were being utilized, (3) Cadweld inspectors were adequately trained and competent, and (4) important quality aspects for each Cadweld were determined and recorded concurrent with inspection."^{13/}

^{13/} DRO-III Inspection Report No. 050-329, -330/73-10, dated December 14, 1973, Attachment A, p 1.

14. On November 16, 1973, the Director of Project Quality Assurance Services and two other members of the Consumers Power headquarters QA staff visited the Midland site to determine the status of corrective action associated with the DRO-III cadweld findings. They inspected splices for evidence of proper cleaning and centering, and corrective action associated with the DRO-III cadweld findings. They inspected pieces for evidence of proper cleaning and centering, and reviewed Bechtel report forms being used to record the reinspection of cadwelds. A modified reporting form was agreed to for use after resumption of cadwelding. The status of activities to be completed prior to a DRO-III reinspection was discussed with Bechtel field and QC engineers. It was determined that cadwelding procedures had been rewritten, that inspectors had been retrained and that cadwelders would be retrained by November 19. The Bechtel reinspection of Unit 2 cadwelds was scheduled to be completed by November 19.

15. On November 16, after the Consumers Power-Bechtel meeting, Mr. Rohrbacher of DRO-III was advised by telephone that there appeared to be no reason for DRO-III not to reinspect on November 20.

16. A DRO-III reinspection was performed on November 20-21, 1973 to determine "the adequacy of the licensee's corrective action relative to: (1) Cadwelding and Cadwelding inspection violations and deficiencies, and (2) an apparent lack of management involvement in the implementation in the Midland Quality Assurance Program."^{14/} As a result, the Licensee was informed that the cadwelding suspension must continue. The inspectors commented that although "corrective action on the part of the licensee relative to the issue at hand had been

^{14/} Id., Attachment B, p 1.

substantial,^{15/} at least the following additional corrective action was required:

- a. Consumers Power documentation demonstrating analysis of the cadweld program violation circumstances, with respect to any indication of QA program breakdown or shortcomings, and if any such are identified, prescribing corrective action.^{16/}
- b. Completion of Bechtel procedures, including draft forms, for QA performance accounting covering the performance and inspection of cadwelding.
- c. Consumers Power QA review and approval of such Bechtel procedures.
- d. Demonstration by Consumers Power that Bechtel's re-qualification of existing cadwelds has been accomplished to the satisfaction of Consumers Power QA.
- e. Documentation defining specific audit responsibilities and scope of construction activities by Consumers power QA personnel.
- f. Demonstration that there are procedures designed to specifically assure that specifications covering Class I work properly reference and deal with all applicable criteria.^{17/}

^{15/} Ibid.

^{16/} Id., Attachment B at p 2. In this connection, the Licensee, on December 10, 1973, filed a letter report addressed to Dr. Donald F. Knuth, DRO Director, reporting such deficiencies and corrective action pursuant to 10 CFR §50.55(e).

^{17/} Id., Attachment B at p 2.

With respect to the cadweld program, the DRO-III report noted that the following significant corrective action had already been taken:

- a. All cadwelders and cadweld inspectors had received training which included demonstrations at the site by the cadweld manufacturer.
- b. New instructions and procedures had been written to cover cadwelding and cadweld inspection.
- c. Personnel involved in cadwelding activities had been required to complete a written test designed to provide evidence of adequate qualifications.
- d. New forms, designed to demonstrate conformance to quality requirements, had been generated and found to be adequate in most areas of application. Some, however, were merely in rough draft or were lacking in one or more respects, or both.^{18/}

The inspectors had concluded, however, that the cadwelding problems indicated shortcomings in the implementation of the Midland QA program generally.

"Discussions with site and corporate management personnel indicated that the licensee had given considerable thought to this matter and that a number of meetings had been held by the licensee, both internally and with Bechtel. However, there were no documented results of this activity available for review at the time of the inspection and it was, therefore, not evident that licensee management had made an effort to specifically identify problem areas,

^{18/} Id., Attachment B at p 4.

and/or shortcomings, in QA program implementation, or that specific, corrective action measures had been taken to deal with QA program implementation deficiencies."^{19/}

In short, the DRO-III inspectors concluded that the Licensee was making significant progress in correcting the cadweld deficiencies, and their implications for the Midland QA program generally, but that not enough had yet been done.

17. In an action which can at best be characterized as extraordinary, the members of the Appeal Board Panel who sat in the Midland licensing case wrote a memorandum to the Director of Regulation dated November 26, 1972, prodding the Staff to shut down all construction activity at the Midland site pending a determination as to whether the QA shortcomings noted in the internal AEC memorandum of November 13 had implications for other aspects of the construction work.^{20/} The memorandum notes receipt of the November 13 internal memorandum. Although recognizing that the Appeal Board "clearly lacks jurisdiction to take official cognizance of the irregularities disclosed by the inspection, let alone issue any orders with respect thereto,"^{21/} the authors of the November 26 memorandum nevertheless stated that they felt constrained to record their

^{19/} Ibid. Consumers Power senior management personnel present at the exit interview were prepared to discuss fundamental changes in the QA program, but did not furnish the inspectors with a written description of such changes, none having been requested by DRO prior to the inspection.

^{20/} Memorandum to L. Manning Muntzing from Alan S. Rosenthal, John H. Buck and William C. Parler, "Quality Assurance Deficiencies Encountered at Midland Facility," November 26, 1973, para. 3 at p 4 ("Appeal Board Members' Memorandum"). This memorandum was attached to the Director's December 3, 1973 "Order to Show Cause," and was not sent to the Licensee prior to that time. See Licensee's "Motion to Dismiss Order to Show Cause" filed concurrently with this Answer, at p 10.

^{21/} Id. at p 2.

"extreme dismay"^{22/} respecting the new QA deficiencies, and their "firm belief that more drastic action against Consumers Power and its architect-engineer should be promptly considered."

"In this connection, had the construction permit proceeding still been before our Board at the time that the results of the November 6-8 inspection were announced, it is a virtual certainty that we would have ordered forthwith a cessation of all construction activities--to continue in effect at least until such time as properly trained quality assurance inspectors, fully independent of the construction organization, were available on site."^{23/}

In support of their position, the Appeal Board members cited ALAB-106, which was concerned with implementation of the QA program as it related to a concrete pour in 1970. The new deficiency, they said, "bears a startling resemblance to the deficiency referred to in ALAB-106 respecting the QA and QC personnel present at the concrete pour location" ^{24/}
On the basis of the Licensee's report pursuant to Condition 1 of ALAB-106, and a number of inspection reports filed by the Staff, the Board had found that "there is now a reasonable assurance that appropriate QA action is being taken by the applicant" and that, except for an organizational

^{22/} The authors of the memorandum apparently acted either in their capacity as private citizens or as employees of the AEC without any relevant official responsibilities concerning the Midland construction permits. As noted above, they freely admitted the lack of jurisdiction of the Midland Appeal Board either to take "official cognizance" of the matter referred to in the November 13 memorandum or to issue any orders with respect thereto.

^{23/} Ibid. The Board members did not indicate whether, had the matter still been before the Board, the Licensee would have been notified of and given an opportunity to comment upon such an order prior to its issuance.

^{24/} Id. at pp 3-4.

deficiency, there was no QA problem pertaining to Bechtel requiring corrective action.^{25/} Nevertheless, said the Board members,

"The only reasonable conclusion which we can draw from the disclosures of the November 6-8 inspection is that the assurances which we had received from the applicant were false and that, in point of fact, it and the architect-engineer still have not manifested both an ability and a willingness to take the steps necessary to waive proper QA activities."^{26/}

Therefore, the Appeal Board members concluded, it seemed evident that,

"contrary to our finding in ALAB-147 (which necessarily was founded on the materials then before us), there is not a reasonable assurance that appropriate QA action is now being taken. If anything, there is a solid assurance that exactly the opposite is the case."^{27/}

* * *

What we have here is a pattern of repeated, flagrant and significant QA violations of a non-routine character^{28/} --coupled with an unredeemed promise of reformation."^{29/}

From the Board members' memorandum it appears that the pejorative conclusions there expressed^{30/} were based solely upon the four conclusory

^{25/} ALAB-147, RAI-73-9, 636, at 637, 640 (fn 10) (September 18, 1973).

^{26/} Appeal Board Members' Memorandum, at p 3.

^{27/} Such "solid assurance" being based, of course, on the new material then before the Board, apparently consisting solely of the internal DRO memorandum of November 13, 1973.

^{28/} With respect to the 1970 QA violations pertaining to the concrete pour, however, the Staff's testimony was that the alleged deficiencies were "typical problems that occur" and that "fall into a general category of problems that we do run into continually in our inspection work at Midland and other sites." (Emphasis supplied) (Transcript, pp 4608-09).

^{29/} Appeal Board Members' Memorandum, p 4.

^{30/} E.g., assurances received from the applicant "were false"; there is "solid assurance" of inappropriate QA action; "repeated, flagrant and significant QA violations"; "unredeemed promise of reformation."

sentences in the November 13 memorandum, which were wholly lacking in detail. The Board members did more, however, than merely derive their strong views concerning Consumers Power and Bechtel from that memorandum. To be sure, they expressly recognized that since the adjudicatory proceeding had been completed, "the on-going supervision of construction activities is your function and not ours." Nevertheless, in stressing that if they still had the authority to do so, they would, on the basis of the November 13 internal memorandum, "have ordered forthwith a cessation of all construction activities . . .," they clearly conveyed their opinion that the memorandum required the Director of Regulation to take such action.

18. On November 27, 1973, Consumers Power's Director of Project Quality Assurance Services, Mr. G. S. Keeley, wrote a memorandum, attached hereto as Exhibit B, suggesting certain changes in the procedures to be followed and QA actions to be taken with respect to cadwelding, in light of DRO-III's verbally communicated inspection findings. Mr. Keeley recommended consideration of changes in void measurement method; a review of the procedures and acceptance criteria for other work functions to avoid misunderstandings of the kind disclosed by the void-measurement differences; a system for resolving differences among specifications, the PSAR and regulatory guides; Consumers Power review and discussion of inspection plans with Bechtel prior to commencement of work; greater depth and more written guidance for Consumers Power QA audits; more frequent routine presence of Consumers Power headquarters QA personnel at the site for the immediate future; and additional procedures and training for Consumers Power QA personnel. Mr. Howell replied to Mr. Keeley in

a November 29 memorandum, attached hereto as Exhibit C, directing Mr. Keeley to proceed immediately to carry out his November 27 recommendations and stressing the need to study the entire QA program, not just that portion applicable to cadwelding. Mr. Keeley thereafter transmitted such of the suggestions as applied to Bechtel to Bechtel's Midland Project Manager, Mr. M. Krout, by letter of December 4, 1973, referred to in item d. at page 10 of DRO Inspection Report 73-11 and attached hereto as Exhibit D.

19. By telephone conversation on November 29, 1973, a meeting between Consumers Power and DRO-III representatives in Chicago was arranged for Monday, December 3. The purpose of the scheduled meeting was to present to DRO-III the cadweld reinspection results, the redrafted cadweld procedures, and the Licensee's approach to the implications of the cadweld problems for other activities. Documentation of these items was assembled and reviewed by Consumers Power and Bechtel representatives on Friday, November 30, in preparation for the December 3 meeting.

20. At 4:45 PM on November 30, Mr. R. Knop of DRO-III notified Mr. Keeley by telephone that the meeting scheduled for December 3 was cancelled and that the Licensee would be notified on December 3 of a new date for the meeting. When no notification had been received by 2:00 PM Monday, December 3, it was determined by a telephone call to DRO-III that the DRO-III representatives with whom the meeting was to be held were away from the office. That evening, Dr. Knuth, Director of Regulatory Operations, notified Mr. Howell of Consumers Power that an Order to Show Cause had been issued.

21. It should be apparent from the foregoing that (a) the Licensee's QA program has been determined to be adequate, (b) doubts about the Licensee's implementation of its QA program and the adequacy of Bechtel's field QC organization that were raised in the Appeal Board's orders have been previously resolved, (c) while there were deficiencies in cadwelding installation and inspection, the Licensee was taking prompt action to correct the specific deficiencies relating to cadwelding, (d) the Licensee was taking action intended to substantially improve its QA program so as to provide reasonable assurance that that program would be implemented in accordance with Commission regulations throughout the construction process, and (e) the deficiencies, as well as the steps designed to improve the Licensee's QA program generally, were well along the road toward satisfactory resolution when the Order to Show Cause was issued, apparently prompted solely by the Appeal Board members' November 26 memorandum, which in turn was triggered by the internal DRO memorandum of November 13. We next turn to a specific discussion of the recited bases for the Order to Show Cause.

II. The 1970 Nonconformances

22. As noted in paragraph 4, above, the Appeal Board imposed several conditions on the Licensee in ALAB-106, relying on certain QA deficiencies and discrepancies disclosed by the record in the proceeding, relating to concrete work at the Midland site. These deficiencies were reported in the report of DRO-III's site inspection of September 29-October 1, 1970, as follows:

- "1. Observation of concrete placement activities at the construction site revealed:
 - a. The use of vibrators to move concrete.

- b. A lack of sufficient vibrator penetration.
- c. An absence of vibrator action at recommended intervals.

The above items are in disagreement with ACI-301, Paragraph 803.d (II-A-1.a).

- "2. The site testing laboratory was not taking aggregate gradation and organic tests at the frequencies stated in the PSAR (II-A-1.a).
- "3. The concrete sample obtained for the slump test at the point of transit truck discharge was not taken in accordance with the sampling instructions in ASTM-C-172 which require a representative sample (II-A-9.a).
- "4. The QA and QC inspection personnel present at the concrete pour location did not promptly identify and correct apparent deviations from the ACI-301 Standard regarding consolidation of concrete (II-A-9.b)." ^{31/}

The Order to Show Cause references these deficiencies, presumably to indicate that there has been a history of nonconformance to QA requirements on the part of the Licensee.

23. Immediately thereafter the Licensee and Bechtel took action to correct the deficiencies. The next DRO-III inspection report, in 1971, notes:

- "1. According to Messrs. N. Paige and B. Peck, corrective action by the applicant to improve the use of vibrators has been taken. Bechtel established a special crew of craft personnel to do the vibrator work. This crew has been trained in the proper use of vibrators.
- "2. Regarding the taking of aggregate gradation and organic tests in accordance with

^{31/} DRO-III Inspection Report No. 050-329, -330/70-6, pp 1-2. DRO-III requested comments on the first two items and on corrective action being taken, including any QA program changes, in the January 18, 1971 letter from Mr. B. H. Grier to Mr. R. C. Youngdahl attached hereto as Exhibit E. Mr. Youngdahl's February 5, 1971 reply is attached as Exhibit F.

the PSAR, Mr. Peck said that Consumers Power has reviewed the frequency of aggregate testing and, where necessary, more frequent tests will be made to comply with the PSAR.

- "3. Mr. Peck stated that they have been taking concrete samples for slump in accordance with ASTM-C-172-54 (Revised 1958) which requires only a single sample of concrete from stationary mixers. ASTM-C-172-68, which is a later edition, requires samples at two intervals during discharge of the middle portion of the batch. This difference in requirements has been brought to the attention of the applicant by telephone and will receive follow-up attention at the time concrete work resumes.
- "4. Regarding the lack of prompt attention on the part of QC inspection staff to identify and correct apparent deviations, the applicant, (according to Peck) has requested that Bechtel upgrade the QC inspection force in the area of concrete placement. In this regard, Peck reported that Bechtel and Consumers Power (CP) have conducted reviews of the ACI-301 standard. Additionally, special inspector training sessions have been conducted for the site inspection force and Bechtel has assigned a full-time engineer to inspect all Q-list pours."^{32/}

This report also indicated that all construction was shut down prior to that inspection. The shutdown occurred due to delays in obtaining the construction permits and continued until 1973, after the Appeal Board affirmed the ASLB's granting of the construction permits. Bechtel has advised the Licensee that, upon resumption of construction, it took further corrective action to prevent repetition of the four nonconformances itemized in Inspection Report No. 70-6, supra, as follows:

^{32/} DRO-III Inspection Report No. 050-329, -330/71-1, pp 2-3.

Items 1 & 4 - An intensive indoctrination and training program was implemented for personnel involved in forming, placing, curing and inspecting concrete work. This program was developed and presented by San Francisco Bechtel Home Office Quality Control, the Project Field Engineer and the Project Field Quality Control Engineer, and, in addition to the foregoing, contained detailed instructions in the proper use of vibrators. Detailed inspection plans were developed and implemented. Explicit instructions were given to quality assurance personnel to promptly identify, and take necessary actions to correct, any discrepancies noted during concrete operations.

Item 2 - Bechtel assigned a Quality Control representative to full-time monitoring of test lab activities. Additional requirements for indoctrination and training of Quality Control personnel at the Midland jobsite were established. In addition, the requirements for frequencies of aggregate gradation and organic testing were reemphasized to quality assurance and quality control personnel.

Item 3 - Upon project reactivation, the Bechtel specification governing testing of concrete, Specification C-8, was superseded by Specification C-208. In C-208, the applicable codes and standards were updated to the latest revision of the ASTM-C-172 which is specified in the 1971 revision and calls for obtaining fresh concrete samples "at two or in regularly specified intervals during discharge of the middle portions of the batch." As noted above, Bechtel assigned a Quality Control Representative to full-time monitoring of test lab activities.

24. On September 5-7, 1973, following reactivation of concrete placement activities, DRO-III inspectors made an unannounced inspection at the Midland site. With respect to the matters identified as deficient in 1970, the following findings were made:

"During this inspection, activities associated with the use of vibrators during concrete placement was observed. Through discussions with site personnel, review of records, and observation of concrete placement activities in progress, it was determined that the use of vibrators during concrete placement met applicable requirements (ACI-301). This matter is considered resolved. However, periodic inspection of concrete activities, including use of vibrators, are to be made during subsequent inspections." (Emphasis supplied.)^{33/}

* * *

"Discussions with site personnel during the current inspection, review of records, and observations of batch plant operation provided information to establish that the required frequency of the subject testing was being maintained. However, this matter remains open pending further record review and observations during further concrete production."^{34/}

* * *

"The Unit 2 tendon gallery outer wall placement area was inspected prior to concrete placement. It was observed that the formwork was solid, clean, tight, and adequately braced. The rebar was free from loose rust, properly spaced, and adequately held in place. Adequate transporting and handling equipment, vibrators, and crew were on hand prior to placement. Adequate personnel, as well as sampling and test equipment, were available at the placement site, and

^{33/} DRO-III Inspection Report No. 050-329, -330/73-07, p 2.

^{34/} Id. at p 3.

Bechtel QA, QC, and field engineers were present to observe and inspect operations in progress.

"Through observation of QA and QC activities at the time of concrete placement and from discussion with the QA and QC engineers present, it was determined that these engineers were qualified to monitor and audit concrete activities. A representative of CP stated that CP had reemphasized the need for adequate engineering surveillance and QC coverage by Bechtel during placement of all Class I pours.

"It was observed that concrete handling and vibrator usage were in accordance with applicable requirements. Two vibrator crews were observed at four areas of the pour during placement. Through discussions with site personnel and review of records, it was verified that instruction in the use of vibrators took place on August 27, 1973. Demonstration and practice included use of vibrators in fresh concrete. About 27 attended this Bechtel training session, including ten laborers, three foremen, and fourteen engineers (field, QA, and QC).

"During placement, it was observed that truck transit tickets were received and reviewed upon truck arrival and that sampling and testing was done properly and the results recorded. The inspector observed that the first load of concrete received for this pour was rejected at the placement location, due to improper slump. Methods used to take slump and air entrainment measurements met applicable requirements. It was observed that sampling and testing frequency was more frequent than required at the placement location and that samples were taken in a manner to obtain representative samples. A Bechtel QA engineer, among other engineers, was at the pour location verifying that sampling and testing requirements were met. The inspector did not identify any deviations from applicable requirements during observation of concrete placement activities.

"During observation of batch plant operations, it was noted that the required mix was being

batched and that sampling and testing met applicable requirements." (Emphasis supplied)^{35/}

Accordingly, the Licensee and its architect-engineer immediately responded to and have corrected the deficiencies noted in DRO-III Inspection Report 70-6. Their efforts began before the shutdown of construction in 1970 and continued when construction was resumed in 1973. This is hardly evidence of the Licensee's incorrigibility or flagrant disregard of QA requirements. It is one of the functions of quality control and quality assurance to anticipate and detect human error and to assure that correction occurs. The effectiveness of the efforts of the Licensee and Bechtel to correct and prevent recurrence of the discrepancies identified in 1970 is reflected in the fact that, after reactivation of the Midland project, the AEC found no discrepancies relating to the concrete work. The Licensee and Bechtel are involved in continuous programs of interpreting Appendix B and updating quality standards and procedures.^{36/} Their efforts hardly demonstrate "a pattern of repeated, flagrant and significant QA violations of a non-routine character--coupled with an unredeemed promise of reformation" as discerned--at a glance, apparently--by the Appeal Board members.^{37/}

^{35/} Id., at pp 10-11.

^{36/} Anticipating interpretations of AEC QA requirements is no simple matter. As noted by the General Accounting Office in a January 19, 1973 decision (B-164105) recommending improvements in the inspection program on the basis of a survey of DRO operations (including Region III) in 1972, "We analyzed the 18 criteria (set forth in title 10, part 50, appendix B of the Code of Federal Regulations, effective July 1970), and found that 21 terms, in our opinion, are subject to considerable subjective interpretation. * * * Without more thorough guidance to inspectors, it appears likely that decisions about the acceptability of licensees' quality assurance programs and the depth of inspections necessary to make such decisions will be made more on the basis of individual judgment than on the basis of established criteria."

^{37/} Appeal Board Members' Memorandum, p 4.

III. The September 1973 Recordkeeping Violations

25. As support for the Order to Show Cause, the Director of Regulation also cites the results of a design engineering inspection conducted on September 10 and 11, 1973, and a discussion of the findings on September 27, 1973:

"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."

The referenced inspection was conducted at Bechtel's Ann Arbor, Michigan offices. The DRO-III inspection report recited the following Bechtel activities as activities which appeared to be a violation of AEC regulations or in nonconformance with the Bechtel Nuclear Quality Assurance Manual or the Bechtel Procedures Manual for the Plant:

- "1. 10 CFR Part 50, Appendix B, Criterion II, states, in part, that: '. . . . This program shall be documented by written policies, procedures, and instructions' Criterion XVII of 10 CFR Part 50, Appendix B, states, in part, that: 'Consistent with applicable regulatory requirements, the applicant shall establish requirements concerning record retention, such as duration, location, and assigned responsibility.'

Contrary to the above, the Bechtel Corporation Nuclear Quality Assurance Manual does not include a requirement for retention of records common to activities affecting quality. Furthermore, other quality assurance program documentation dealing with record retention requirements was unavailable during the course of the inspection

- "2. 10 CFR Part 50, Appendix B, Criterion V, states, in part, that: 'Activities affecting quality shall be prescribed by documented instructions, procedures, or drawings of a type appropriate

to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings.'

The Bechtel Power Corporation Internal Procedures Manual for Midland Units No. 1 and No. 2, Section 7.5, titled, 'Drawing Control and Stick Files' requires that the current revision of each drawing be maintained in the stick files.

Contrary to the above, current revisions of certain drawings were missing from the stick files

- "3. 10 CFR Part 50, Appendix B, Criterion V, states, in part, that: 'Activities affecting quality shall be prescribed by documented instructions, procedures, or drawings of a type appropriate to the circumstances. . . .'

Contrary to the above:

- a. Procedures to prescribe control of interface activities between design groups were not available for review by the inspector at the time of the inspection
- b. Procedures to prescribe control, issuance, and changes to the Bechtel Corporation Internal Procedures Manual for Midland Units No. 1 and No. 2, were not available for review by the inspector during the inspection

- "4. 10 CFR Part 50, Appendix B, Criterion V, states, in part, that: 'Activities affecting quality shall be prescribed by documented instructions, procedures, or drawings of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings.' The Bechtel Corporation Nuclear Quality Assurance Manual, Section III, Procedure No. 4, specifies the use of Exhibits 3.6A.1, 3.6A.2, and 3.6A.3 for vendor control.

Contrary to the above, quality assurance specifications No. 7220 G-20, No. 7220 G-21, and No. 7220 G-22 were being used to accomplish this activity in the absence of an approved change to the manual authorizing the use of these Specifications"

The inspection report was transmitted to the Licensee by letter dated October 24, 1973, from Mr. James G. Keppler of DRO-III. The letter referenced the above findings as apparent violations of AEC rules and regulations and nonconformances with the Bechtel Nuclear Quality Assurance Manual (NQAM) or the Bechtel Internal Procedures Manual (IPM) for the Midland units, or both. The letter went on to state:

"This letter is a notice of violation sent to you pursuant to the provisions of Section 2.201 of the AEC's 'Rules of Practice,' Part 2, Title 10, Code of Federal Regulations. Section 2.201 requires you to submit to this office, within thirty (30) days of the date of this letter, a written statement or explanation in reply, including (1) corrective steps which have been taken by you, and the results achieved; (2) corrective steps which will be taken to avoid a further violation; and (3) the date when full compliance will be achieved."

26. In compliance with the October 24, 1973 notice of violation, Mr. S. H. Howell, Vice President of Consumers Power, submitted a written explanation by letter of November 23, 1973. The letter and its attachment are attached hereto as Exhibit G, and indicate that appropriate corrective action either had been completed or was in the process of being completed in an expeditious manner. Moreover, it should be noted that most of the violations had been identified by Bechtel's own quality assurance program prior to the AEC inspection:

- a. Bechtel QA had not concluded that it was necessary to include record retention requirements in the NQAM. However, the need to review record control procedures, including record retention procedures, had

been identified by Bechtel QA, as evidenced by the QA Daily Log Sheet dated August 21, 1973 and attached hereto as Exhibit H.

- b. The deficiency consisting of certain drawing revisions missing from the stick files was identified in the Bechtel Quality Audit Finding bearing an audit date of September 5, 1973 and attached hereto as Exhibit I. As the DRO-III inspector acknowledged:

" . . . Bechtel Ann Arbor QA had also detected this discrepancy on August 30, 1973. Corrective action, as a result of the Bechtel August 30, 1973, findings, requires preparation of a specific procedure for drawing control which will establish the responsibility for maintaining the stick file.^{38/}

- c. The Bechtel Quality Audit Findings attached hereto as Exhibits J and K, dated September 6, 1973 and August 28, 1973, respectively, indicate that Bechtel QA had already identified the discrepancies consisting of unavailability of interface control procedures and procedures for control of the IPM. Respecting the former, the AEC inspector states that he was advised

"that an audit by Bechtel Ann Arbor, Michigan, QA, on September 6, 1973, had previously revealed this deficiency. Bechtel QA described corrective action, in regard to this

matter, as the development and implementation of procedures to provide a means to assure that interface activities affecting quality have been satisfactorily accomplished."^{39/}

Concerning the IPM, the DRO-III report states:

"An audit by Bechtel, San Francisco, California, management QA had also established this deficiency in an audit performed on August 27 and 28, 1973."^{40/}

- d. At the time of the DRO-III inspection, the NQAM procedure No. 4 specified that Exhibits 3.6A-1, 3.6A-2 or 3.6A-3 be applied for vendor QA program requirements. However, the inspector found that these Exhibits had been replaced in the Manual by QA Specifications 5, 6 and 7. Moreover, the specifications then actually in use were Nos. 7220 G-20 and G-21, both issued prior to May 16, 1973, and G-22, issued later. The violation consisted in not having revised the NQAM to reflect the use of the new specifications.

But as the DRO-III report notes,

"A [Bechtel] QA Engineering audit report, No. 005, dated May 16, 1973, identified this conflict with the approved program and directed that corrective action be accomplished. On July 6, 1973, a letter was issued to the QA manager, San Francisco, requesting that the manual be revised to incorporate the new specifications and

^{39/} Id. at p 10.

^{40/} Id. at p 11.

delete the old specifications, numbered 5, 6, and 7."^{41/}

Quality Audit Finding 005, dated May 16, 1973, is attached hereto as Exhibit L. Thus, Bechtel's quality assurance program had already identified, prior to the AEC inspection, most of the violations cited by the DRO-III inspectors. This demonstrates that the QA program was being implemented properly and was effective--not the reverse.

IV. The 1973 Cadwelding Deficiencies

27. The remaining specific bases for issuance of the Order to Show Cause were the deficiencies associated with the cadweld splicing of rebar. These deficiencies were identified at a DRO-III inspection conducted on November 6-8, 1973. As a result of that inspection and subsequent conversations with DRO-III representatives, the Licensee voluntarily suspended all cadwelding operations on November 9. After the Licensee informed DRO-III that the corrective action would be completed by November 19, a special inspection was conducted on November 20-21. At that time,

"The inspectors commented that, while the results of the inspection had established that corrective action on the part of the licensee relative to the issue at hand had been substantial, a number of additional steps must be taken to assure that the quality assurance/quality control program shortcomings, identified in conjunction with inadequate performance of Cadwelding and Cadweld inspection, would not recur."^{42/}

^{41/} Id. at p 13. To preclude repetition of the discrepancy, the NQAM was amended by December 17, 1973 to provide Midland Project Engineering with the flexibility to respond to evolving QA requirements by means of QA specification changes with proper QA approval and without changing the NQAM.

^{42/} DRO-III Inspection Report No. 050-329, -330/73-10, Attachment B, pp 1-2.

The record thus establishes that the Licensee had attempted to correct the deficiencies identified in the November 6-8 inspection, and believed that it had done so. In this connection, it must be remembered that the written report of the November 6-8 inspection was not issued until December 14, 1973 and was not received by the Licensee until December 17--two weeks after issuance of the Order to Show Cause. Furthermore, no written notice of violation conforming to the requirements of 10 CFR §2.201 was issued. The Licensee was proceeding with its corrective action on the basis of verbal discussions with DRO-III representatives. Under the circumstances, no inference of "incurability" or lack of effort to remedy the deficiencies may properly be drawn.

28. The specific cadweld violations and deficiencies have been described in paragraph 8, supra, and in the DRO-III report of the November 6-8, 1973 inspection (No. 73-10). On December 6-7, 1973, DRO-III made a special inspection of the Midland site to determine the status of the Licensee's corrective action relative to QA/QC program deficiencies and the specific, apparent violations identified in conjunction with cadwelding. In the report of that inspection,^{43/} the inspectors concluded

"that CP management personnel had adequately analyzed the circumstances associated with the violations and discrepancies identified during the RO:III review of site Cadwelding activities, and had prescribed corrective action measures which, if properly implemented, provide adequate assurance that future problems of a similar nature should not occur."^{44/}

^{43/} Dated December 11, 1973 and received by the Licensee on December 17, 1973.

^{44/} DRO-III Inspection Report No. 050-329, -330/73-11, p 5.

29. The corrective action relative to the specific cadweld violations and deficiencies is described at pp 11-14 of Inspection Report 73-11, and may be summarized as follows:

Violation 1: (a) unavailable or inadequate procedures for cadwelding and cadweld inspection, (b) improperly implemented instructions and procedures for preheating, and (c) failure of inspection personnel to demonstrate knowledge and proper implementation of cadweld inspection criteria, leading to acceptance of twelve splices which were either questioned or rejected upon later reinspection.

Corrective action:

- (1a) The Licensee produced approved procedures for cadwelding and cadweld inspection activities, covering all requirements of the specifications, the site QA program, and the manufacturer's instructions and recommendations.
- (1b) Such procedures include specific instructions regarding all cadwelding preheat requirements and the means for verifying that these requirements have been met.
- (1c) All cadweld inspection personnel have been appropriately retrained and tested. The cadweld void measurement criteria have been

revised. All cadwelds at the site (320 in Unit 2, and 147 in Unit 1) have been reinspected at least twice by Bechtel for conformance to quality requirements. On the basis of reinspection utilizing a refined void measurement technique, nine cadwelds which were suspected of having unacceptable voids have now been accepted (one was later rejected for excess porosity). One splice previously identified as having excessive porosity has been rejected. The two splices with no evidence of reference lines have been accepted through engineering evaluation.

Violation 2: unavailable or inadequate, documented procedures to demonstrate control of handling and issuance of cadweld material, including return of unused material.

Corrective action: The Licensee has included instructions and procedures for storage and handling of cadweld materials, and return of unused material to storage, in the cadwelding production and inspection procedures.

Violation 3: unavailable procedures relative to control of nonconforming cadweld material, and unavailable records establishing proper control of nonconforming material.

Corrective action: The Licensee has included in its production and inspection procedures adequate reference to instructions and procedures for identifying, handling, controlling and segregating nonconforming materials.

Violation 4: failure to maintain records to furnish evidence of conformance to quality requirements.

Corrective action: (a) Inspection report forms, as revised, now include all quality requirements identified in the governing specification and inspection plan, plus instructions requiring timely verification and documentation of conformance to quality requirements.

Deficiency 1: inadequate provisions for maintaining continued acceptable cadwelder performance qualifications.

Corrective action: Bechtel Specification No. C-231 has been revised to reflect requalification requirements.

Deficiency 2: inconsistencies between design documents relative to cadwelding.

Corrective action: (a) the Licensee has asked Bechtel to develop instructions for review of work specifications to identify any such inconsistencies prior to the conduct of Class I work, (b) the Licensee has established provisions for

its QA review of work procedures which is to include attention to this matter, and (c) the Licensee has established procedures for auditing Class I work on an intensified scale.

No violations of AEC requirements were identified during the inspection.^{45/}

30. On December 17, 1973, the Director of Regulation issued a "Modification of Order to Show Cause" which modified the December 3 order to delete the prohibition therein on the resumption of cadwelding operations at the site. The December 17 Modification refers to the inspection of December 6 and 7, 1973, and states:

"As a result of this inspection it has been determined that the licensee now has appropriate procedures for cadwelding operations and that all cadweld inspection personnel have been appropriately trained. . . . In view of the foregoing . . . , IT IS HEREBY DETERMINED THAT: The public health, interest or safety does not require the continued suspension of cadwelding activities at the plant site"^{46/}

The Modification left intact the remainder of the Order to Show Cause. Thus, while the deficiencies which were the apparent occasion for and cause of the Order's issuance have been resolved to the satisfaction of the AEC Staff, there remains the question raised by the Appeal Board members in their November 26 memorandum to the Director of Regulation, namely, whether the cadwelding deficiencies indicate that similar QA shortcomings may affect other aspects of the construction work.

^{45/} DRO-III Inspection Report No. 050-329, -330/73-11, p 2.

^{46/} "Modification of Order to Show Cause," Construction Permit Nos. 81 and 82, December 17, 1973, pp 1-2.

V. Present Compliance With AEC QA Regulations

31. It has previously been held that the Licensee's QA program complies with applicable AEC Regulations.^{47/} On the basis of submittals of the Licensee and the Staff, and the results of a full-field inspection conducted by the Staff on June 26-28, 1973, the Appeal Board held that reasonable assurance had been provided that appropriate QA action was being taken, with one exception relating to Bechtel's field QC organization which was subsequently resolved.^{48/} No question has been raised as to the continued compliance of the Licensee's QA program with the Commission's regulations, and the Licensee believes that its QA program continues to satisfy the criteria set forth in 10 CFR Part 50, Appendix B. The recited bases for the Order to Show Cause, and the underlying November 26 memorandum of the Appeal Board members, have to do, not with the adequacy of the Licensee's QA program, but with the proper implementation of that program.

32. As we have seen, the specific deficiencies and violations recited by the Director in support of the Order to Show Cause have all been, or are being, resolved to the satisfaction of the Directorate of Regulatory Operations. DRO-III inspection reports disclose no outstanding unresolved violations of AEC QA requirements.^{49/} A number of "unresolved matters" have been noted in DRO-III inspection reports prepared

^{47/} See paragraphs 2 and 3, supra.

^{48/} See paragraph 7, supra.

^{49/} During the December 6-8, 1973 inspection, representatives of the Licensee called to the AEC inspectors' attention a procedural discrepancy relating to containment liner plate weld (Continued on next page.)

since construction resumed early in 1973.^{50/} They involve possible discrepancies or nonconformance with required procedures, but have not been cited as violations of AEC QA requirements. Of course, some have been resolved: e.g., those relating to the deterioration of rebar tie wire; concrete vibrator activities; and the Bechtel Organization Chart. Still unresolved items relate to procedures for the protection of site stored components, further improvements in Consumers' QA manual, examination of the Babcock & Wilcox Company (vendor) QA program, possible insufficient frequency of aggregate testing, the site sampling program, the adequacy of records relating to the inspection of tendon trumplates for rusting, procedures for RT Inspection of Containment Liner Welds, and work which Bechtel in an audit of its Midland QC field activities found not to be in compliance with its procedures. None of these involves violations of AEC QA regulations. Many exemplify the continuing nature of the work and of the AEC inspection process. Thus, Inspection Report No. 73-7 indicates that the aggregate is now being tested with sufficient frequency but that the inspectors wish to recheck as more concrete is mixed.

49/ (Con'd)

repair as to which "a violation of Part 50, Appendix B may be involved." (Emphasis supplied.) DRO-III Inspection Report No. 050-329, -330/73-11, p 7. Since the matter was still under investigation by the Licensee, the inspectors deferred a full review to the next routine inspection. Since the Licensee first identified the discrepancy, however, and since it involved possible use of an unapproved installation procedure rather than inadequate QA or QC procedures, this item obviously does not involve a breakdown of QA implementation so as to create the possibility that "serious QA shortcomings may be infecting other aspects of the construction work."

50/ DRO-III Inspection Report No. 050-329, -330/73-1 through 73-11.

Similarly, there is to be a follow-up on the corrective action taken with respect to the work found by Bechtel's audit of its QC activities not to be in compliance with its procedures. Discrepancies referred to in Inspection Report No. 73-8 involving Bechtel's Ann Arbor documents have in fact been resolved and no violations exist.^{51/}

VI. Reasonable Assurance That Licensee
Will Continue to Comply with AEC QA
Regulations Throughout Construction

33. Even though the specific discrepancies and violations cited by the Director in support of the show-cause order have been satisfactorily resolved, the question remains whether the Licensee has taken corrective action sufficient to provide reasonable assurance of compliance with the Commission's QA regulations during future construction activities. The Licensee believes that it has. DRO-III Inspection Report No. 73-11 notes that, in addition to action to correct and prevent the recurrence of the cadwelding and similar deficiencies, "further steps had been taken to assure that implementation of the Midland site quality assurance/quality control program was consistent with AEC requirements and good practice." The inspectors further advised the Licensee that its management personnel had adequately analyzed the cadweld-related discrepancies and "had prescribed corrective action measures which, if properly implemented, provide adequate assurance that future problems of a similar nature should not occur."^{52/} The steps to assure proper implementation are set out below.

^{51/} See paragraphs 25 and 26, supra.

^{52/} DRO-III Inspection Report No. 050-329, -330/73-11, p 5. See also paragraph 18, supra.

34. On the Licensee's part, recent steps taken to assure improved QA performance and continued QA compliance include the following:

a. Organizational Changes

- (1) Field QA Engineer R. E. Whitaker was assigned to the Midland site on May 25, 1973.
- (2) From July 23 to October 1, 1973, A. J. Birkle was temporarily assigned to assist the QA Administrator.
- (3) On August 16, 1973, H. W. Slager was assigned to QA Services in the Licensee's General Office (HQ).
- (4) On October 1, 1973, G. S. Keeley was appointed Director of Project Quality Assurance Services, reporting directly to the Vice President for Electric Plant Projects. This position is on a par with the Project Managers for Midland and other electric plant construction projects and with the Directors of other service departments.
- (5) On November 1, 1973, G. W. Ford was assigned to the General Office QA staff as Quality Assurance Engineer - Electric.
- (6) In November, 1973, H. W. Slager was appointed Midland Project Quality Assurance Supervisor, reporting to Mr. Keeley. Mr. Slager

will be responsible for the Licensee's Midland QA program, and will be required to spend at least one day every two weeks at the construction site.

- (7) On December 1, 1973, D. E. Karn was assigned to the Midland field QA organization as Field Quality Assurance Coordinator.
- (8) On December 3, 1973, T. W. Bowes was assigned to the General Office QA staff as Quality Assurance Engineer-Mechanical.
- (9) On December 6, 1973, J. L. Corley was appointed Field Quality Assurance Supervisor for the Midland Project, in charge of implementation of the Licensee's Midland QA program at the site.
- (10) On December 6, 1973, D. R. Keating was appointed Field Quality Assurance Coordinator for the Midland Project, reporting to Mr. Corley.
- (11) On December 7, 1973, R. E. Whitaker, formerly QA Engineer at the Midland site, was assigned as Field Quality Assurance Coordinator at the site, reporting to Mr. Corley.

b. Quality Assurance Documents

- (1) On November 30, 1973, the Licensee's Director of Quality Assurance Services sent DRO-III revised pages for the Licensee's Electric

Plant Projects Policies and Procedures Manual, describing the Licensee's new QA organization.

- (2) On December 6, 1973, DRO-III representatives were given, at the Midland site, updated copies of the Licensee's Midland Plant Quality Assurance Manual and its new Quality Assurance Services Department Procedures Manual.

c. Quality Assurance Consultants

- (1) The Licensee has engaged NUS Corporation as a consultant to review the Licensee's QA organization, manning levels and procedures. In addition, NUS is to make recommendations concerning the desirability of a continuing audit of the Licensee's and Bechtel's QA activities or of a third-party QA or QC operations.
- (2) The Licensee has also contacted firms having QA expertise in other industries, including the aerospace industry, to determine whether it would be desirable to obtain additional viewpoints.

d. Coordination with Bechtel

- (1) On December 4, 1973, the Licensee's Director of Project Quality Assurance Services wrote to Bechtel's Midland Project Manager, ^{53/} suggesting modifications in Bechtel's QA/QC program in order to preclude future occurrences

of the type manifested with respect to cadwelding. These included suggestions to (1) revise and simplify cadweld void measurement criteria, (2) review procedures and acceptance criteria in other areas to avoid the disparity in inspection results that appeared with respect to cadweld void measurement, (3) send to and discuss with Consumers Power Project QA Services, prior to the start of Q-listed work functions, the Master Inspection Plans for such work functions, (4) revise inspection forms to provide "visibility" that individual inspection items have been inspected, and (5) revision of work and inspection procedures to lessen reliance on and cross-references to other, general documents.

- (2) On December 7, 1973, Consumers Power representatives met with senior personnel of Bechtel, consisting of Mr. H. O. Reinsch, Executive Vice President of Bechtel Power Corporation and General Manager of the Thermal Power Organizations; Mr. H. F. Brush, Vice President and Deputy General Manager of the Thermal Power Organization; Mr. R. D. Allen,

Vice President and Division Manager, San Francisco Power Division; Mr. A. P. Yates, Vice President and Deputy Division Manager of the San Francisco Power Division; Mr. P. R. Cassidy, Area Manager, Ann Arbor Office; and Mr. M. M. Krout, Project Manager, Ann Arbor Office. The purpose of the meeting was to discuss the Licensee's concerns with the Midland QA problems, to obtain Bechtel's full commitment to the resolution of those problems, and to discuss corrective actions.

35. The Licensee has been advised that steps recently taken by Bechtel to improve its QA/QC performance include the following:

a. Organizational Changes

- (1) Since the resumption of construction at Midland earlier this year, the number of people assigned to Bechtel's San Francisco QC staff which provides support to the field has increased from 12 to 23.
- (2) A Quality Control Supervisor, responsible for Ann Arbor QC operations, Z. G. Tucker, was added to Bechtel's Ann Arbor Office in September 1973.
- (3) The former Midland Project Field Quality Control Engineer was replaced in December

1973 by J. P. Connolly, who reports directly to Z. G. Tucker.

- (4) To support intensified efforts in field quality training, a training sessions coordinator, L. R. Albert, has been assigned in the jobsite quality control organization.
- (5) On December 3, 1973, a materials test Quality Control Engineer was assigned to the Midland site.
- (6) On December 7, 1973, one mechanical and one electrical Quality Control Engineer were recalled from temporary assignment and added to the site force.
- (7) In mid-January, 1974, an additional mechanical Quality Control Engineer and an additional electrical Quality Control Engineer are scheduled to be assigned to the Midland site.
- (8) In mid-January, 1974, two Quality Control welding engineers are scheduled to be assigned to the Midland site.
- (9) Effective November 13, 1973, testing laboratories, previously under Field Engineering, are now receiving functional, technical direction from the Field Quality Control Engineer.

b. Quality Assurance Documents

(1) Bechtel has agreed to (a) institute a more formalized program of pre-planning for special work processes, (b) have QC engineers perform verification inspections on safety related work that could still be performed by field engineers under AEC requirements, (c) revise the Field Inspection Manual to provide for increased control and more timely processing of nonconformances and inspection findings, (d) certify QC personnel under ANSI Standard R45.2.6 and the recently-issued AEC Regulatory Guide 1.58, and (e) devote additional senior management attention, on a continuing basis, to evaluation of Bechtel quality performance at the Midland site.^{54/}

(2) In response to the Licensee's suggestions contained in a letter from G. S. Keeley, Licensee's Director of Project Quality Assurance Services, to M. M. Krout, Bechtel's Project Manager, dated December 4, 1973,^{55/} referenced at pp 10-11 of

^{54/} Letter from Alden P. Yates to Stephen H. Howell dated December 19, 1973, attached hereto as Exhibit M. Mr. Yates states that the steps being taken by Bechtel "are intended to improve procedures and attitudes so that each person assigned to the project recognizes his responsibilities and obligations to perform the work in accordance with client and AEC requirements for the project."

^{55/} Exhibit D.

DRO-III Inspection Report No. 73-11, Mr. Krout has transmitted to the Licensee a memorandum dated December 19, 1973, attached hereto as Exhibit N. The December 19 memorandum expresses Bechtel's full concurrence and intent to carry out the Licensee's suggestion. It also reflects the fact that cadwelding procedures have already been revised in accordance with those suggestions.

36. Thus, in addition to taking corrective action to remedy the cadwelding deficiencies that has been found satisfactory on reinspection by DRO-III, both Consumers Power and Bechtel have taken significant actions to upgrade their quality assurance efforts. The Licensee submits that these steps provide reasonable assurance that compliance with the Commission's QA regulations will continue throughout the construction process.

VII. Safety

37. The Order to Show Cause is based upon the results of three separate sets of discrepancies or violations identified in DRO-III inspections: the 1970 nonconformances relating to a concrete pour; the 1973 document violations at Bechtel's Ann Arbor, Michigan engineering offices; and the 1973 cadwelding violations and discrepancies relating to cadwelding. The 1970 nonconformances were long ago corrected, and the auxiliary building base slab concrete in question was determined to be

sound.^{56/} The 1973 Ann Arbor office violations were all documentary in nature, were for the most part identified by Bechtel prior to the DRO-III inspection, and appropriate action has been taken to correct them.^{57/} The 1973 cadwelding violations and discrepancies have been resolved.^{58/}

38. At the same inspections in which the discrepancies or violations were noted, the AEC inspectors concluded that there were no safety items involved. Thus, in CO Report No. 70-6, in which the concrete pour nonconformances were noted, the report states, in the Summary, "Safety Items - None."^{59/} With respect to the Ann Arbor document violations, DRO-III Inspection Report No. 73-0 states "No safety matters were identified,"^{60/} and in DRO-III Inspection Report No. 73-10, in which the cadwelding violations were identified, the inspectors concluded that "No safety matters were identified."^{61/} None of these violations or discrepancies was identified as impairing the safety of the project. This observation is made, not to depreciate the importance of quality assurance, but rather to underscore the conclusion that the public health and safety do not require suspension of activities under the Midland construction permits.

^{56/} CO-III Inspection Report No. 329, 330/71-1 [January 7, 1971], pp 3, 9.

^{57/} Paragraphs 25 and 26, supra; Exhibit G.

^{58/} DRO-III Inspection Report No. 050-329, -330/73-11; "Modification of Order to Show Cause," December 17, 1973.

^{59/} CO-III Inspection Report No. 050-329, -330/70-6, p 1.

^{60/} DRO-III Inspection Report No. 050-329, -330/73-08, p 3.

^{61/} DRO-III Inspection Report No. 050-329, -330/73-10, p 4. See also Licensee's December 10, 1973 letter report to Dr. Donald F. Knuth under 10 CFR §50.55(e).

VIII. Conclusion

39. The foregoing establishes that Consumers Power and Bechtel have taken extensive steps to improve their QA programs. Substantially more attention of executive officers is being devoted to QA; more and higher level personnel have been assigned to QA activities; changes in personnel have been made; quality assurance and procedures manuals have been revised and improved; inspection procedures have been more clearly related to inspection criteria; records of inspection of individual items have been clarified so as to make it apparent whether or not such inspections have in fact taken place; clearer and more easily accessible documentation describing work procedures are being established; and monthly inspection plans for significant work will be reviewed with the Licensee by the architect-engineer before the work begins. In addition, the Licensee has engaged an independent consultant, NUS Corporation, to review its QA organization, manning levels and procedures, as well as to make recommendations as to a continuing audit of all QA activities at Midland, or even as to the appropriateness of a third-party QA or QC operation. Consumers Power has also entered into discussions with QA consultants having expertise in other industries, including aerospace, to determine the desirability of utilizing their services. In summary, Consumers Power has taken a long, hard look at its QA program and is taking affirmative and effective action to correct any existing QA program weaknesses.

40. The Licensee submits that for the reasons and on account of the facts recited in the foregoing paragraphs and in the

documents attached hereto or referenced herein, it has adequately demonstrated that it is in compliance with the Commission's regulations pertaining to quality assurance, and that there is reasonable assurance that such compliance will continue throughout the construction process.

Respectfully submitted,

/s/ Judd L. Bacon

Judd L. Bacon
Consumers Power Company
212 West Michigan Avenue
Jackson, Michigan 49201
(517) 788-1366

Harold F. Reis
Newman, Reis & Axelrad
1025 Connecticut Avenue, NW
Washington, DC 20036
(202) 833-8371

Attorneys for Consumers Power Company

Dated: December 24, 1973

P 50-37-9
11/15/73No. 101Date 11/13/73

DIRECTORATE OF REGULATORY OPERATIONS
NOTIFICATION OF AN INCIDENT OR OCCURRENCE

Facility: CONSUMERS POWER COMPANY (Midland Units No. 1 and No. 2)

Problem: CADWELD SPLICING OF CONCRETE REINFORCING BAR AT MIDLAND

A Region III inspection on November 6 - 8, 1973, at the Midland construction site, identified serious deficiencies associated with Cadweld splicing of concrete reinforcing bars. These deficiencies involved inadequate procedures for installing Cadweld splices, for material control, and for documenting required quality parameters. In addition, the Regulatory Operations inspectors determined that inspection techniques were inadequate and acceptance criteria used for quality requirements were being misapplied.

In telephone conversations on November 9, 1973, Consumers Power Company (CP) stated that they had shut down all Cadweld splicing operations at the site. Other unrelated work will continue at the site. CP agreed that the cadweld splicing operations would not be restarted at the site until: (1) all currently existing Cadweld splices have been reinspected by properly qualified inspection personnel and determined to meet quality requirements, and (2) a site inspection by Region III inspectors establishes that an acceptable program for Cadweld splicing has been developed and implemented.

All subject Cadweld splices at the site are accessible for inspection (i.e., none have been covered with concrete).

It is estimated that the corrective action program will result in a delay of at least one week in the Cadweld splicing program at the site.

Action by Regulatory Operations:

1. A letter has been sent to CP confirming our understanding of the corrective action program for Cadweld splicing.
2. A press release was issued to local papers and wire services on November 10, 1973.
3. Mr. Myron Cherry, Esq. (counsel for the Saginaw Interceptor) was notified on November 9, 1973, of the applicant's shutdown of Cadweld splicing operation.
4. Regulatory Operations inspectors will be at the site upon completion of the corrective action program. The inspection will determine if the quality requirements have been satisfied for completed Cadwelds and to determine whether a revised Cadweld splicing QA program is in place to prevent recurrence of the problem.

5. Chairman Ray's Special Assistant, Commissioner Doub's Technical Assistant, Commissioner Larson's Technical Assistant, Commissioner Anders' Temporary Assistant, Commissioner Kriegsman's Assistant, the staff of the Joint Committee on Atomic Energy, and the Office of Information Services have been notified by telephone.

Contact:

Further information concerning this occurrence can be obtained from:

S. E. Bryan - X7353
 H. D. Thornburg - X7353
 J. G. Davis - X7541

Distribution:

Chairman Ray (3)
 Commissioner Larson
 Commissioner Doub
 Commissioner Kriegsman
 Commissioner Anders
 L. M. Muntzing, DR
 A. W. Jackson, ATDR
 L. V. Gossick, ADR
 C. K. Beck, DRGL
 S. H. Hanauer, DRTA
 E. E. Triner, DRPA
 D. J. Donoghue, DRA
 W. G. Dooly, DRA
 General Manager (2)
 Secretary (2)
 F. Ingram, IS
 J. Fouchard, IS
 J. A. Harris, IS
 Clare Miles, IS
 E. J. Bauser, JCAE
 J. D. Anderson, INS
 M. Biles, OS
 R. F. Fraley, ACRS (18)
 L. Rogers, RS
 R. B. Minogue, RS
 G. A. Arlotta, RS
 J. G. Smith, RS
 W. Mac Donald, OPS
 J. F. O'Leary, L
 E. G. Case, L
 J. M. Hendrie, L
 A. Giambusso, L
 S. A. Schwartz, DRGL
 S. MacKay, L

H. C. Kouts, RSR
 V. Stello, L
 V. A. Moore, L
 G. R. Grove, L
 H. Lowenberg, L
 F. Schroeder, L
 S. H. Smiley, L
 D. J. Skovholt, L
 R. C. DeYoung, L
 D. R. Muller, L
 R. L. Tedesco, L
 H. R. Denton, L (2)
 R. R. Maccary, L
 D. A. Nussbaumer, L
 R. E. Cunningham, L
 A. Schwencer, L
 L. I. Cobb, RO
 D. F. Knuth, RO
 J. G. Davis
 P. A. Morris, RO
 T. R. Wilson, RO
 B. H. Grier, RO
 D. Thompson, RO
 C. W. Kuhlman, RO
 H. Werner, RO
 L. Higginbotham, RO
 T. D. O'Neill, DCR
 J. L. Liverman, DBER
 W. H. Weyzen, DBER
 C. F. Eason, AWCR, AGMES
 S. Levine, OEA
 RO Regional Offices
 DR Reading File
 REG Central File
 PDR (5)
 Local PDR

TO SHHowell, P-26-336

FROM GS Keeley, P-14-306 *JK*

DATE November 27, 1973

SUBJECT Analysis of Cadweld Problem
at Midland

CC WEKessler, P-14-412B
HWSlager, P-14-226



**Consumers
Power
Company**

INTERNAL CORRESPONDENCE

Keel 169-73

The following is a discussion of the problems that occurred at Midland with respect to the cadwelds.

The basic causes for our nonconformance report QF-1 were:

(a) Inspection procedures were not clear enough which resulted in confusion on the part of inspectors and differences of opinion on measurement of void areas.

(b) There were differences in the work requirements between the PSAR, the Bechtel specification and the Erico specification.

Solutions to the specific deficiencies as well as a full answer to items which were brought out by the AEC in their exit interview on November 21, 1973 will be presented to you on November 30, 1973 as you requested.

As a result of the cadweld problem and the investigation that followed, I believe that the following suggestions and changes should be implemented. Action on some of them has already been initiated.

(a) I believe that the misunderstanding in the method for taking void measurements has been cleared up, however, in conversations with Mr. D. Johnson and Mr. Z. Tucker of Bechtel, I indicated that Bechtel should investigate the possibility of coming up with a simplified type measurement which would prevent misinterpretation in the future and simplify the calculation of voids. I will follow up on this with a memo to Bechtel.

(b) The same type of misunderstanding as in (a) above may occur on QC inspections of other work functions during the job. It is suggested Bechtel should factor this into setting up inspection procedures and inspection acceptability criteria. Any procedure or acceptance criteria should not result in a difference of 30% in the end result when the procedure is applied by two separate people as was the case for the cadweld voids.

(c) There should not be unapproved and undocumented differences between specifications, PSAR, and regulatory guides. A system is necessary to

SHHowell
Analysis of Cadweld Problem
at Midland
November 27, 1973

2

prevent this and QA Services discussed this with M. Hanson and wrote a memo on November 19, 1973 on this subject. An implementation procedure will be discussed with you on November 30, 1973.

(d) Because of possible misunderstanding in responsibilities of Bechtel QC personnel which were spelled out in our response to ALAB-152, I believe that Quality Assurance Services should review and discuss with Bechtel, their Master Inspection Plan on work functions prior to initiation of work. I have written this into our procedures. QA Services will follow up on this.

(e) Consumers QA personnel have not audited to the depth which I think we should. As you are aware, we have been shorthanded and have recently added another man on site. We are also working up a more formal audit plan for Consumers QA Services personnel on site to give them more guidance. This will apply to work functions other than just cadwelds. QA Services personnel on site must do a thorough audit to Appendix B requirements prior to the start of work functions and during work functions.

(f) I have asked that Harvey Slager spend a minimum of one day every two weeks on site for the immediate future. Another item which will make our group function better will be when we issue our updated Electric Plant Projects Policies and Procedures Manual, Midland Quality Assurance Manual and Quality Assurance Services Procedures Manual. As you know, we have been pointing towards a December 1, 1973 date for these. In addition, we must train QA Services personnel in the application of the manuals and we have additional training planned which must be given to our personnel.

COPY

EXHIBIT C

TO GSKeeley, P-14-306B
FROM SHHowell, P-26-336
DATE November 29, 1973
SUBJECT Quality Assurance Problems at Midland



Consumers
Power
Company

INTERNAL CORRESPONDENCE

CC WEKessler, P-14-412B

I have reviewed your letter of November 27, 1973 which contains an analysis of the quality assurance problem at Midland and which makes recommendations for corrective action. I have also reviewed NCR QF-1 and the series of internal memorandums discussing and documenting investigations, meetings and action on the problem.

I understand the problem and your analysis and I concur with your recommendations. Where action on your recommendations has not yet been taken, please proceed immediately.

Although in this case the specific problem has appeared in the performance of cadwelds, as we have discussed, and as is indicated by your analysis and recommendations, the problem has broader symptomatic aspects to our total quality assurance program and the remainder of the project. I wish to stress this fact, to ensure that everyone has full recognition of it, and that our whole program is critically studied for problems or weaknesses.

In addition to the above, I want to add a word of caution that, in our concern for the present problem, we are not distracted from quality assurance in other areas.

SHH/sjb



Consumers
Power
Company

General Offices: 212 West Michigan Avenue, Jackson, Michigan 49201 • Area Code 517 788-0550

December 4, 1973

Keel 172-73

SUGGESTIONS RESULTING FROM
CADWELD PROBLEMS AT MIDLAND
Serial: 700

Mr. M. M. Krout
Bechtel Corporation
PO Box 1000
3861 South Research Park Dr
Ann Arbor, MI 48106

Dear Mr. Krout:

As a result of the recent cadweld problems at Midland, I have the following comments or suggestions:

1. Due to the misunderstanding in making void measurements on the cadwelds, I suggested to Mr. D. Johnson and Mr. Z. Tucker that someone in Bechtel should look at the possibility of simplifying the measurement process and acceptability criteria into a possible go no go type criteria. If the measurement results on a given cadweld gives a no go, then the next step on the given cadweld would be a refined measurement such as is presently done. This suggestion is further substantiated by E. Felton's letter to T. Cooke BCCC97 which on Page 2, 5th paragraph states that acceptance criteria for voids could exceed 3 square inches.
2. The same type of misunderstanding as occurred on cadweld voids may occur on QC inspections of other work functions during the job. It is suggested that Bechtel should factor this into setting up inspection procedures and acceptability criteria. Procedures and acceptance criteria should not result in a difference of 30% in the end result when the procedure is applied by separate people as was the case for cadweld voids.
3. In the future, Consumers Power Project Quality Assurance Services requests that Bechtel send them the proposed Master Inspection Plans for work functions on Q-listed items. We wish to discuss these with your QC personnel prior to start of work.

I would appreciate your reply to Items 1, 2 and 3.

Mr. M. M. Krout
Suggestions Resulting From
Cadweld Problems at Midland
December 4, 1973

2

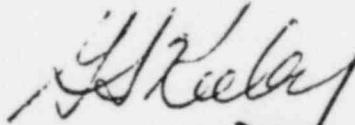
4. We also wish to discuss with you the use of inspection plan forms and "inspection results" sign-off sheets. Where an inspection plan calls for inspections on individual items it is our opinion that visibility must be shown in enough detail on the sign-off sheets as to what the inspection point was and indicate a sign-off on each individual item inspected.

5. We also wish to discuss with you the preparation of work procedures and inspection procedures. It is our opinion that Bechtel relies too much on one or two documents to cover work procedures, training and qualification of personnel, material control, testing, and inspection. We believe that for most cases, implementing procedures should stand on their own with a minimum of references.

As was discussed with you on the phone, we believe that Items 4 and 5 should be acted upon for cadweld work and that you will modify the cadweld procedures to incorporate these thoughts.

Please advise when you will be available to discuss Items 4 and 5 for subsequent work functions.

Yours very truly,



G. S. Keeley
Director of Project
Quality Assurance Services

GSK/cg

CC: Howell
WEKessler
HWSlager



EXHIBIT E

UNITED STATES
ATOMIC ENERGY COMMISSION
DIVISION OF COMPLIANCE
REGION III
799 ROOSEVELT ROAD
GLEN ELLYN, ILLINOIS 60137

This Copy For: WE Kessler
NG Paige
BH Peck
C. Q. Mills

file 0505.2

January 18, 1971

Consumers Power Company
212 West Michigan Avenue
Jackson, Michigan 49201

Attention: Russell C. Youngdahl
Senior Vice President

Gentlemen:

This letter relates to discussions Messrs. Cowar and Hayes of this office held with Messrs. Hills, Paige, Peck, Bruner and others of your staff, at the conclusion of the inspection conducted on September 29 through October 1, 1970, regarding the construction activities authorized by the Midland 1 & 2 construction permit exemption dated July 30, 1970.

As noted during the discussion, certain items were identified which were apparently not in conformance with statements in the preliminary safety analysis report (PSAR) or which may otherwise raise questions concerning the adequacy of construction. These items are as follows:

1. The PSAR, by reference to ACI-301 (Paragraph 803-d) requires that concrete be consolidated by various means ... vibrators shall be inserted and withdrawn at many points, from 18 to 30 inches apart ... and use of vibrators to transport concrete within form shall not be allowed.

Contrary to this statement, our inspectors observed: (1) the transport of concrete with vibrators, (2) a lack of vibrator penetration to the desired depth and/or for the desired periods of time, and (3) the absence of vibrator action in accordance with a preplanned pattern to assure consolidation at the recommended spacing.

ICAN 2 1 1971

January 18, 1971

2. The PSAR, on Page 5-3, Amendment No. 2, requires that aggregate tests be carried out at certain stated intervals.

Contrary to this statement our inspectors were informed that organic tests and tests on sand, 3/4 inch and 1 1/2 inch aggregates were made at intervals which were significantly less frequent than stated in the application.

Please provide us, within 30 days, with your comments concerning these items and any steps which have been or will be taken to correct them and to minimize recurrence, including any appropriate changes that have been made to your quality assurance program.

Should you have any questions concerning the matters discussed in this letter, you may communicate directly with this office.

Sincerely,

Boyce H. Grier
Regional Director

cc: C. Q. Hills
QA Engineer

R. C. Youngdahl
Senior Vice President

COPY



**Consumers
Power
Company**

General Offices: 212 West Michigan Avenue, Jackson, Michigan 49201 • Area Code 517 788-1880

February 5, 1971

MIDLAND PLANT - UNITS 1 & 2
AEC Compliance Questions

United States Atomic Energy Commission
Division of Compliance, Region III
779 Roosevelt Road
Glen Ellyn, Illinois 60137

Gentlemen:

Att: Mr. Boyce H. Grier
Regional Director

This letter is in response to your letter of January 18, 1971 regarding items considered to be not in conformance with statements in the Preliminary Safety Analysis Report (PSAR). We have reviewed each item in depth and the following comments summarize our review.

Vibration of Concrete

The observations made by the AEC Compliance Inspectors were discussed in detail at the conclusion of the September 29 through October 1, 1970 inspection. To verify the structural adequacy of the structure and to insure against a recurrence of this condition, the following steps were taken.

1. Ultrasonic testing of the structure was performed after approximately six days when the concrete was still green and again after 41 days when the concrete had undergone some curing. The conclusion reached as the result of testing the overall structure on a grid pattern, was that the quality of the concrete was good. In the opinion of the consultant (Letcher & Associates) who tested the slab, it was sound. This report is in our files for your inspection.
2. Bechtel's engineering department has established a procedure for reviewing in advance, construction placement plans for critical concrete pours.
3. Training sessions were instituted to insure that laborers received instructions in proper vibration procedures and techniques.

4. The quality control surveillance effort by Bechtel Corporation was upgraded by the addition of a placement engineer in addition to the concrete engineer. Both will be assigned to all critical concrete pours.

5. Consumers Power Company field personnel have reviewed the requirements for correct vibration of concrete, and will provide increased surveillance during critical concrete pours to ensure compliance with ACI-301, Paragraph 803-d.

Testing of Concrete Aggregate

The frequency of aggregate testing has been reviewed. The requirements of the PSAR had been correctly specified to the concrete testing laboratory. An examination of reporting sheet Bechtel Form QC-40 shows provision for aggregate testing in conformance with the PSAR requirements. Prior to the inspection of September 29 through October 1, 1970, tests were made less frequently for noncritical concrete than for critical concrete pours; but to alleviate the possibility of confusing critical with noncritical testing, this practice was discontinued and all tests are performed as for critical concrete.

A review of the pour records did reveal instances during the earlier stages of project work when tests on critical concrete were performed at less frequent intervals than specified; however, in all cases the concrete cylinder compression tests exceeded the design values.

Bechtel Corporation has been directed to ensure complete compliance with the specifications by the concrete testing laboratory and to intensify the quality control surveillance in this area.

Consumers Power Company field personnel have also conducted increased surveillance of concrete aggregate testing to ensure that intervals stated on Page 5-8 of the PSAR are followed.

Bechtel has stated that the procedures and the quality assurance program of the testing laboratory will be reevaluated and revised as required to insure against deficiencies before resuming concrete work.

Yours very truly,



RCY/lb

BCC: SHHowell ✓
CJMaynard
WEKessler

COPY

Stephen H. Howell
Vice PresidentConsumers
Power
Company

General Offices: 212 West Michigan Avenue, Jackson, Michigan 49201

November 23, 1973

MIDLAND PLANT
ABC Audit Findings
Locket Nos 50-327 and 50-530

Mr. James G. Keppler, Regional Director
Directorate of Regulatory Operations
Office of Regulation
United States Atomic Energy Commission
Region III
779 Roosevelt Road
Glen Ellyn, Ill. 60137

Dear Mr. Keppler:

The attached information is submitted in response to the discrepancies which you found in your audit of the Ann Arbor-Bechtel engineering offices on September 10 and 11, 1973, and which you identified in your letter to me dated October 24, 1973. We believe that this information is responsive to the questions which you have raised, delineates the corrective measures taken to prevent recurrence, and specifies the dates by which these actions will be complete.

Yours very truly,

SHH/sjb

BCC: PAMartinez (Bechtel, AA) w/enc
JDotson (Bechtel, AA) w/enc
MKrout (Bechtel, AA) w/enc
GSKeeley, P-14-306B w/enc
HWSlager, P-14-226 w/enc

QUALITY ASSURANCE

MIDLAND PLANT UNITS 1 & 2
JOB NO. 7220

RESPONSE TO AEC LETTER TO CPCO DATED OCTOBER 24, 1973

AEC Finding No. 1

10 CFR Part 50, Appendix B, Criterion II, states, in part, that: ". . . This program shall be documented by written policies, procedures, and instructions . . ." Criterion XVII of 10 CFR Part 50, Appendix B, states in part that: "Consistent with applicable regulatory requirements, the applicant shall establish requirements concerning record retention, such as duration, location, and assigned responsibility."

Contrary to the above, the Bechtel Corporation Nuclear Quality Assurance Manual does not include a requirement for retention of records common to activities affecting quality. Furthermore, other quality assurance program documentation dealing with record retention requirements was unavailable during the course of the inspection.

Bechtel Corrective Action No. 1

The Nuclear Quality Assurance Manual is currently undergoing revision to incorporate the requirements for retention of records common to activities affecting quality. Scheduled completion date is March 27, 1974. As an interim measure, a project amendment to the NQAM incorporating record retention is being processed and will be issued by December 17, 1973.

Bechtel standards and procedures which provide requirements in compliance to Criterion II and XVII of 10 CFR, Part 50 and N-45.2.9 are:

1. Bechtel Engineering Standards, Volume G, "General."
2. Bechtel Internal Procedures Manual, Midland Units 1 & 2.
3. Bechtel Corporate Record Retention Schedule, dated October 30, 1973.

Requirements contained in the aforementioned manuals, procedures, and standards describe the program for record retention including; location, duration of retention, and assigned responsibilities.

In an inter-office memo from the Manager of Engineering, dated November 2, 1973, project personnel were directed to comply to the requirements contained in the Corporate Record Retention Schedule. Additional controlled copies of Bechtel Engineering Standards, Volume G, have been requested for project personnel and the applicable requirements therein will simultaneously be presented to project supervisory personnel. Full compliance to AEC Criterion II and XVII regulations for record retention will have been completed by approximately March 15, 1974. Subsequent to March 15, the Project Quality Engineer and his staff will perform surveillance to assure project's compliance to these requirements.

AEC Finding No. 2

10 CFR Part 50, Appendix B, Criterion V, states, in part, that: "Activities affecting quality shall be prescribed by documented instructions, procedures, or drawings of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings."

The Bechtel Power Corporation Internal Procedures Manual for Midland Units 1 & 2, Section 7.5, titled, "Drawing Control and Stick Files" requires that the current revision of each drawing be maintained in the stick files.

Contrary to the above, current revisions of certain drawings were missing from the stick files.

Bechtel Corrective Action No. 2

Measures were taken on September 18, 1973 by Quality Engineering to review all stick files on the project. The stick files were updated in accordance with the Midland drawing control log.

Further corrective action taken was a revision to Section 7.5 of the Midland Internal Procedures Manual which now reads in part: "It is the responsibility of each group to update and maintain its own stick file." Project personnel direction was provided by the Project Engineer to all project supervisory personnel requiring that this procedure be performed weekly. Additionally, the Project Administrator has been assigned responsibility for maintenance of the project record print file (which is the master stick file) in accordance with the Division Engineering Standards, Volume G.

The Project Quality Engineer and his staff will perform a monthly surveillance of the project record print file and the discipline stick files to assure adherence to the latest Midland Drawing Control Register.

AEC Finding No. 3

10 CFR Part 50, Appendix B, Criterion V, states, in part, that: "Activities affecting quality shall be prescribed by documented instructions, procedures, or drawings of a type appropriate to the circumstances . . ."

Contrary to the above:

- a. Procedures to prescribe control of interface activities between design groups were not available for review by the inspector at the time of inspection.
- b. Procedures to prescribe control, issuance, and changes to the Bechtel Corporation Internal Procedures Manual for Midland Units No. 1 and No. 2, were not available for review by the inspector during the inspection.

Bechtel Corrective Action No. 3a

Requirements regarding design office interface activities are provided in the Nuclear Quality Assurance Manual, Section 2, Procedure No. 6. SFO Divisional Quality Assurance Management is presently amending the NQAM to include a more detailed definition of engineering design interface requirements. This amendment is scheduled for issuance on December 17, 1973. Detailed interface requirements for Project Engineering personnel are presently included in the Divisional Engineering Standard (Volume G) in Sections 1.3 and G-200 and in the individual Discipline Engineering Standards. The requirements contained in these documents are being incorporated into an engineering department procedure which is also scheduled for issuance December 17, 1973.

Bechtel Corrective Action No. 3b

The Bechtel Internal Procedures Manual for Midland Units 1 & 2, Revision 1 - now has control serial numbers. Distribution is controlled by a formal control list for assignments of the manual showing applicable serial numbers and assignments of the manual by recipients name. The Internal Procedures Manual was revised and reissued in accordance with this control procedure on October 19, 1973. All superseded manuals have been withdrawn from use. The Project Quality Engineer and his staff has performed and will continue to perform periodic surveillance and spot checks to insure that only Internal Procedures Manuals with the latest revisions are in use. A revision block with date and approvals has also been provided.

AEC Finding No. 4

The AEC Finding indicated that Quality Assurance specifications No. 7220-G-20, No. 7220-G-21, and No. 7220-G-22 were being used for vendor control in lieu of exhibits 3.6A.1, 3.6A.2 and 3.6A.3 as specified in the Nuclear Quality Assurance Manual (NQAM).

Bechtel Corrective Action No. 4

As discussed with the AEC Inspector, the appropriate actions to amend the NQAM had been taken prior to the audit. Approval of the use of Specifications No. 7220-G-20, 21 and 22 had been granted by Quality Assurance Management and the mechanics for change had been set in motion. The NQAM will be amended by December 17, 1973 deleting references to exhibits 3.6A.1, 3.6A.2 and 3.6A.3. Additionally, to preclude repetition of the above finding, the amendment will provide Midland Project Engineering with the flexibility to respond to changing Quality Assurance requirements via QA specification changes with proper Quality Assurance approval.



QUALITY ASSURANCE PROGRAM

DAILY LOG SHEET

D Popham
FILE - SUSPENSEJob No. 7220

QAE

J. S. NelsonDate 8/21/73

NO.	ITEM	ACTION REQUIRED	ACTION TAKEN & RESOLUTION	DATE
1	Discussed need for IPM - EDP change for QA Records Identification and Control with D. Popham N45.2.9 Draft 11 may apply? - Procurement and Engineering Records	Please evaluate and respond by 8/31/73 D. Popham	Midland Project personnel have been directed to comply to records control specified in the Bechtel Engineering Standards, General Standards, and Corporate Record Retention Schedule. Additionally, an Engineering Department Procedure 3.13 has been issued by SF and is being coordinated for comment in Ann Arbor at this time and will be issued effective for the Midland Project in the near future. This EDP when placed in to effect will be supplemented with an additional Quality Engineering records instruction which is now in preparation by Quality Engineering. <i>D. Popham</i>	12/20/73

EXHIBIT H

FIGURE 8.3A

QUALITY AUDIT FINDING

AUDIT IDENT.	E-2(15)
AUDIT DATE	9-5-73
ISSUE ITEM NO.	

PROJECT / DEPARTMENT / SELLER	Midland 7220	TYPE OF AUDIT	Engineering	<input type="checkbox"/> FIELD <input checked="" type="checkbox"/> OFFICE	AUDITOR	W. Holub	
PARAGRAPH	3	CHECKLIST ITEM		WHERE FOUND	Civil Group - Engineering	DISCUSSED WITH	R. Stafford
CONTROLLING DOCUMENT, SECTION, PARAGRAPH, ETC.				SAME AS I.			
NQAM Section II No. 6, Para. 5 & 6							

Project checking of calculations, drawings and specifications is performed by independent checking

Bechtel practices provide for several levels of review and approval of design work.

Civil Drawing C-140 is identified as Rev. 0 7-13-73 on the Drawing Control Log. This same drawing C-140 on the stick file carries a Rev. 2, also dated 7-13-73. Also neither Rev. 0 nor Rev. 2 of C-140 have been checked. Civil Drawing C-200 Rev. 3 on the stick file shows no date, no approval signatures, and no Q identification in the title block. Civil drawing C-202 Rev. 1 shows no approval signatures.

CORRECTIVE ACTION

- 1) Secure appropriate approvals of the above referenced drawings.
- 2) Strengthen the existing control mechanism to prevent recurrence.

SCHEDULE COMPLETION DATE	RESPONSIBILITY FOR CORRECTIVE ACTION
	P. Martinez

- CORRECTIVE ACTION TAKEN
1. Drawings in the above stick file have been corrected as of 9-13-73.
 2. Quality Engineering is on the distribution for Midland drawing control logs and Specification register, and is performing surveillance of all stick files on the project at periodic intervals.

DATE COMPLETED	SUBMITTED BY RESPONSIBLE AUTHORITY	DATE
9-13-73	<i>[Signature]</i>	9/13/73
CORRECTIVE ACTION VERIFIED BY		
<i>[Signature]</i>		

QUALITY AUDIT FINDING

AUDIT IDENT. E-2(17)
AUDIT DATE 9-6-73
ADD ITEM #

PROJECT/DEPARTMENT/SELLER Midland 7220		TYPE OF AUDIT Engineering	<input type="checkbox"/> FIELD <input checked="" type="checkbox"/> OFFICE	AUDITOR W. Holub
ASR/BA ITEM 3	CHECKLIST ITEM 4	WHERE FOUND Civil Group - Engineering	DISCUSSED WITH R. Stafford	
CONTROLLING DOCUMENT, SECTION, PARAGRAPH, ETC. 10 CFR 50 Appendix B No. V			SAME AS # 8	

Activities affecting Quality shall be prescribed by documented instructions, procedures . . . for determining that important activities have been satisfactorily accomplished.

The group supervisors have been assigned the responsibility of providing coordination of Design Interfacing between the various disciplines but the interfacing activities currently preformed are not controlled procedurally.

CORRECTIVE ACTION

(1) (2)

Develop and implement a procedure to provide a means to assure interface activities affecting Quality have been satisfactorily accomplished.

SCHEDULE COMPLETION DATE (1) 11/1/73 (2) 11/8/73	RESPONSIBILITY FOR CORRECTIVE ACTION (2) (1) P. Martinez/D. Popham
CORRECTIVE ACTION TAKEN	

DATE COMPLETED 11	SUBMITTED BY RESPONSIBLE AUTHORITY (2)
CORRECTIVE ACTION VERIFIED BY QA	
DATE	

QUALITY AUDIT FINDING

AUDIT IDENT.	QAF #1
AUDIT DATE	8-28-73
AUDIT ITEM	1.
AUDITOR	C. Roady
DISCUSSED WITH	D. Popham/C. Shortt

PROJECT DEPARTMENT/SELLER	Midland - Job No. 7220	TYPE OF AUDIT	Mgmt. Engineering	<input type="checkbox"/> FIELD	<input checked="" type="checkbox"/> OFFICE
CHECKLIST ITEM	V	CHECKLIST ITEM	2, 4, 5 & 6	WHERE FOUND	Quality Supervisor's Files
REFERENCE NO. DOCUMENT, SECTION, PARAGRAPH, ETC.	10CFR50 App. B, Criteria II & VI		SAME AS 1.		"Engineering Quality Control"

Criterion II

"This program shall be documented by written procedures, or instructions..."

Criterion VI

"Measures shall be established to control the issuance of documents, such as instructions, procedures and drawings, including changes thereto, which prescribe all activities affecting quality. These measures shall assure that documents, including changes, are reviewed for adequacy and approved for release by authorized personnel and are distributed to and used at the location where the prescribed activity is performed."

Project Internal Procedures and Engineering Department Instructions need to be controlled in a better manner to assure that revisions are distributed to the required personnel. IPM's are not serialized nor is there a list identifying authorized manual holders. There is no documented system in place to control distribution of revisions to IPM's or EDP's.

- Assign serial numbers to all copies of IPM's in current use.
- Provide a formal control list of assigned IPM's showing names of holders and copy numbers.
- Provide a document control system adequate to assure that applicable revisions are in use for IPM and EDP/EDI documents.

DATE OF COMPLETION	10/5/73	RESPONSIBILITY FOR CORRECTIVE ACTION	Project Engineer
--------------------	---------	--------------------------------------	------------------

a and b. This is now incorporated into the Internal Procedures Manual, Revision 1 dated 10-19-73.

c. This control is referenced in EDP 1.2 dated 8-13-73 and EDP 1.4 dated 8-13-73 or EDP/EDI. The control for IPM is handled by the implementation of C.A. for items a and b above.

DATE COMPLETED	10-22-73	SUBMITTED BY RESPONSIBLE AUTHORITY	<i>[Signature]</i>
----------------	----------	------------------------------------	--------------------

QUALITY AUDIT FINDINGS

AUDIT IDENT.	1A(005)
AUDIT DATE	5-16-73
ADD ITEM	5

PROJECT / DEPARTMENT / FACILITY	Midland 7220	TYPE OF AUDIT	Engineering	<input type="checkbox"/> FIELD	<input checked="" type="checkbox"/> OFFICE	AUDITOR	J. I. Dotson
---------------------------------	--------------	---------------	-------------	--------------------------------	--	---------	--------------

ADDENDA ITEM	CHECKLIST ITEM	WHERE FOUND	DISCUSSED WITH
2	3	Project	P. Martinez

CONTROLLING DOCUMENT, SECTION, PARAGRAPH, ETC.	NAME AS IS
NCAW Section V No. 1 Paragraph 2	

"Sections and procedures contained in this nuclear quality assurance manual...are division standard practices. All project personnel are directed to observe these requisites..."

"Under special circumstances the project manager may issue...or a project addenda change from the program."

Specifications G-20, G-21 have been issued for project use without the necessary review/approval-project addenda issuance.

Submit G-20, 21 as project addenda.

SCHEDULE COMPLETION DATE	RESPONSIBILITY FOR CORRECTIVE ACTION
7-11-73	

G-20 and G-21 are currently revised and issued for approval. Project addenda request has been submitted to Quality Assurance. Ref: IOM P. Martinez to J. Dotson 7/2/73.

DATE COMPLETED	SUBMITTED BY	DATE
6-11-73	<i>P. Martinez</i>	7-5-73
CORRECTIVE ACTION VERIFIED BY		
<i>[Signature]</i>		

Bechtel Power Corporation

Post Office Box 1000
3621 South State Road
Ann Arbor Michigan 48106



December 19, 1973

Mr. Stephen H. Howell
Vice President
Consumers Power Company
212 West Michigan Avenue
Jackson, Michigan 49201

Subject: Midland Units 1 and 2
Quality Assurance/Quality Control

Dear Mr. Howell:

The purpose of this letter is to outline our renewed emphasis upon areas of quality assurance/quality control and to assure you that this originates from the management of Bechtel, and that this direction will be transmitted to all project personnel.

As a result of visiting the Midland site on Thursday, December 6th, and also returning to visit the site on Wednesday, and Thursday, December 12th and 13th, and site visits by Bill Gibbons, Manager of Division Quality Assurance; Jim Marvin, Manager of Construction; Don Johnson, Chief Field Quality Control Engineer, and others; I have concluded that there are a number of areas on which we must concentrate our effort.

This conclusion has also been reviewed with Ed Felton, Midland Project Superintendent; Jim Marvin, Manager of Construction; Milt Krout, Midland Project Manager; P. R. Cassidy, Area Manager; and R. D. Allen, Manager of the San Francisco Power Division of Bechtel Power Corporation, and has the highest priority in Bechtel.

The following measures that we have taken recently or will take immediately are intended to improve procedures and attitudes so that each person assigned to the project recognizes his responsibilities and obligation to perform the work in accordance with client and AEC requirements for the project.

(1) Special Work Processes

A more formalized program will be instituted to define the quality requirements for special work processes. This program which constitutes the basic pre-planning of any operation will identify the required procedures, instructions or work plans, inspection plans, specifications and drawings required. Further, this pre-planning operation will assist in identifying deviations from specified requirements, as required by the eighteen criteria of

Mr. Stephen H. Howell
Consumers Power Company

December 19, 1973
Page Two

10CFR-50, Appendix B, such as Field Change Requests (FCRs) and Non-Conformance Reports (NCRs). This program will include a review of all work functions to determine those that are special work processes. A list will be prepared for review by Consumers Power Company. Appropriate work plans will then be prepared and reviewed with Consumers Power Company prior to proceeding with the work.

(2) Changed Inspection Responsibilities

Previously, some in process production control inspections of record as identified on the inspection plans were performed and signed off by field engineers. Now, however, all inspection activities listed on the inspection plans, including of course all quality acceptance and verification inspections (for Q-list work), will be performed and signed off by Quality Control Engineers.

(3) Response to Quality Findings

Implement an action program to provide more timely response to quality assurance/quality control findings, using a revised procedure for identifying, reporting and resolving non-conformances. Section G3 covering Non-Conformances in the Bechtel Field Inspection Manual is under revision. This revised procedure provides for increased control over the processing of non-conformances and inspection findings by quality control and quality assurance personnel and for more timely and action oriented reporting of non-conformances to engineering and quality assurance personnel.

(4) Organizational Changes

Organizational changes have been made to provide additional coverage for quality control operations. A Quality Control Supervisor, responsible for Ann Arbor quality control operations, Z. G. Tucker, has been added to our Ann Arbor Office. The former Project Field Quality Control Engineer has been replaced by J. P. Connolly, who reports directly to Z. G. Tucker. This latter change was required to support the increased quality control inspection responsibilities described in Item 2. These new personnel, along with members of the construction organization, have intensified efforts in field quality training. To insure the adequacy of training, a training sessions coordinator, L. R. Albert, has been assigned in the job site quality control organization.

(5) Inspector Certification

Although our inspectors are qualified by training programs, past work history and education, certification of these inspectors will

Bechtel Power Corporation

Mr. Stephen H. Howell
Consumers Power Company

December 19, 1973
Page Three

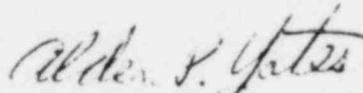
be performed in accordance with a written procedure covering the qualifications, indoctrination, training, testing and certification of quality control personnel to meet the requirements of ANSI Standard N45.2.6 and the AEC Regulatory Guide 1.58.

(6) Management Attention

Additional management and supervisory personnel attention will be maintained to assure that the foregoing items have been accomplished. Senior personnel will make periodic site visits and will receive additional monitoring reports to evaluate quality performance on a continuing basis.

This list is not necessarily all inclusive. By constant monitoring we may determine that other areas require intensified attention and reassignment of personnel. We will keep you informed as to our progress in these matters.

Very truly yours,



Alden P. Yates
Vice President

APY/mh

cc: G. Keeley
W. Kessler
R. D. Allen
E. Felton
M. Krout
J. Marvin
P. R. Cassidy

Bechtel Power Corporation

Post Office Box 1000
3621 South State Road
Ann Arbor Michigan 48106



December 19, 1973

BLC-554

Consumers Power Company
1945 Parnall Road
Jackson, Michigan 49201

Attention: Mr. G. S. Keeley

Subject: Consumers Power Company
Midland Units 1 & 2
Bechtel Job 7220
Reference Letter Keel 172-
173, of December 4, 1973
File: 0270

Gentlemen:

This is in response to the comments and suggestions contained in your letter of December 4, 1973, Keel 172-73.

We are in full agreement with the suggestion, in paragraph numbered 1 of the letter, for simplifying the measurement process and acceptability criteria relating to void measurements on cadwelds through the use, if possible, of "go, no-go" type criteria. We have, in fact, already begun investigating this possibility and representatives of Erico Products Company have been asked to assist in this investigation.

As we understand the suggestions in the other four numbered paragraphs of the letter, their purpose is to strengthen the QA/QC program so as to provide substantially greater assurance of quality on the project. We concur in each of those suggestions and are prepared to put them into effect.

With respect to paragraph numbered 2, inspection procedures and acceptance criteria are being reevaluated and will be revised where necessary, prior to their use, to avoid substantial differences in results when inspections are carried out by different persons.

Mr. G. S. Keeley
December 19, 1973
Page Two

With respect to paragraph numbered 3, Bechtel will send Master Inspection Plans for "Q-listed" items to Consumers Power Company Quality Assurance Services for discussion with Bechtel Quality Control personnel prior to the start of work.

We are also in agreement with the objectives expressed in paragraphs numbered 4 and 5 of the letter. Sign-off sheets will be reviewed and revised as necessary to provide sufficient "visibility" and detail to show that each required inspection point has been signed off. Additional detailed, clear, written instructions will be furnished which require a minimum of cross referencing.

Our Ann Arbor Quality Control Supervisor is prepared to meet with you at your earliest convenience to discuss Inspection Plan Forms, "Inspection Results," sign-off sheets and the preparation of work and inspection procedures in order to carry out the foregoing comments.

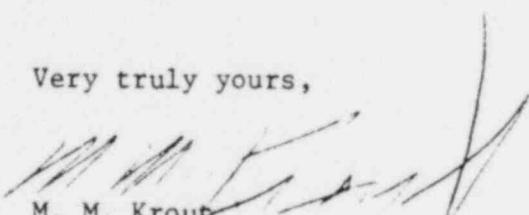
As previously discussed, the suggestions in your paragraphs 4 and 5 have been incorporated in the following cadweld procedures:

Quality Control Procedure No. C-231-1, Inspection of Cadweld Mechanical Splicing of Concrete Reinforcing Steel, dated December 5, 1973.

Cadweld Rebar Splicing Instructions for the Operator, dated December 4, 1973.

Quality Control Program - Description of referenced documents for Cadweld Mechanical Splicing of Concrete Reinforcing Steel, dated December 5, 1973.

Very truly yours,



M. M. Krout
Project Manager

MMK:mmp

cc: W. E. Kessler
H. W. Slager
J. Dotson
W. Ferriss
D. R. Johnson
P. Cassidy
Z. Tucker
P. A. Martinez

UNITED STATES OF AMERICA
ATOMIC ENERGY COMMISSION

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

Construction Permits
Nos. 81 and 82

AFFIDAVIT

STATE OF MICHIGAN)
) SS.
COUNTY OF JACKSON)

Stephen H. Howell, being duly sworn according to law, deposes
and says:

1. I am Vice President of Consumers Power Company in charge
of Electric Plant Projects.

2. I have read the "Answer to Order to Show Cause," dated
December 24, 1973, and am familiar with the facts recited therein. To
the best of my knowledge and belief, the facts recited in said Answer
are true and correct.

Further deponent says not.

/s/ Stephen H. Howell

Stephen H. Howell

Subscribed and sworn to before me this 24th day of December, 1973.

/s/ Phyllis Bogart

Phyllis Bogart, Notary Public,
Jackson County, Michigan.
My Commission Expires April 20, 1974

UNITED STATES OF AMERICA
ATOMIC ENERGY COMMISSION

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

Construction Permit
Nos. 81 and 82

CERTIFICATE OF SERVICE

I hereby certify that copies of the attached Licensee's "Motion to Dismiss Order to Show Cause," "Answer to Order to Show Cause," and letter of the undersigned to the Secretary of the Commission, all dated December 24, 1973, have been served on the following by deposit in the United States mail, first class, this 24th day of December, 1973:

Secretary (20)
U. S. Atomic Energy Commission
Att: Chief, Public Proceedings Branch
Washington, DC 20545

James P. Murray, Jr.
Chief Rulemaking and Enforcement Counsel
U. S. Atomic Energy Commission
Washington, DC 20545

Myron M. Cherry, Esq
Jenner & Block
One IBM Plaza
Chicago, IL 60611

/s/ Judd L. Bacon
Judd L. Bacon, Senior Attorney
Consumers Power Company
212 West Michigan Avenue
Jackson, MI 49201
(517) 788-1366