

U. S. ATOMIC ENERGY COMMISSION
DIRECTORATE OF REGULATORY OPERATIONS

REGION III

Report of Construction Inspection

RO Inspection Report No. 050-329/74-01
RO Inspection Report No. 050-330/74-01

Licensee: Consumers Power Company
1945 Parnall Road
Jackson, Michigan 49201

Midland Plant, Units 1 and 2
Midland, Michigan

Licenses No. CPPR-81
and No. CPPR-82
Category: A

Type of Licensee: PWR (B&W) - Unit 1, 650 Mwe; Unit 2, 818 Mwe

Type of Inspection: Unannounced, Special

Dates of Inspection: January 10 and 11, 1974

Dates of Previous Inspection: December 6 - 8, 1973

Principal Inspector: *R. A. Rohrbacher*
R. A. Rohrbacher

1-30-74
(Date)

Accompanying Inspectors: *C. C. Williams*
C. C. Williams

1-30-74
(Date)

D. E. Whitesell

Other Accompanying Personnel: W. E. Vetter

Reviewed By: W. E. Vetter, Chief *W. E. Vetter*
Reactor Construction Branch

1-31-74
(Date)

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SUMMARY OF FINDINGS

Enforcement Action

A. Violations

Contrary to 10 CFR Part 50, Appendix B, and the Consumers Power Company Quality Assurance Manual, Section 5, a procedure, which was being used by the site contractor, did not have the required approval (RO Inspection Reports No. 050-329/73-11 and No. 050-330/73-11, Page 15). This apparent violation is considered to be of Category II severity.

During an inspection conducted on December 6 - 7, 1973, the licensee identified a situation wherein Class I work (preparation of containment building liner plates for erection) was determined to be in progress using a work procedure which had not been approved. Specifically, repair of liner plate surface defects, caused by removal of fit-up and/or lifting attachments, was being performed in accordance with Bechtel Corporation Procedure No. C-111, Appendix B. Appendix B to Specification C-111 was issued to the field for "information only" and was not approved for use. At the time of the December 6 - 7 inspection, the licensee was in the process of completing an investigation of this matter and had issued a nonconformance report to Bechtel Corporation.

During the current inspection, corrective action and statements relative to the nonconformance report (written response) on the part of the Bechtel Midland Project Superintendent, was determined to be as follows:

The liner plate records were intensively reviewed for accuracy. It was determined that one repair had, indeed, been made utilizing the unapproved appendix to C-111. NCR C-31 was issued to cover this work. Further steps regarding acceptability of inspection procedures need not be made, since all plate will be inspected for defects utilizing C-111, Appendix B, prior to sandblasting. This inspection will be made by QC and will be a hold point so that sandblasting will not take place until the inspection is completely satisfactory. The resolution of NCR C-31 will delineate the adequacy of the procedure used for this repair.

The unapproved copy of C-111, Appendix B, was sent to the site by telecopier machine. In the future, this type of transmittal is to be marked "Advance Copy" and is to have indicated on it the approval status (i.e., Information Only, Issued for Construction, etc.).

The document controller has received written instructions relative to the above procedure and is required to verify that these instructions are carried out.

Since it was determined, during the current inspection, that both the licensee and Bechtel Corporation had taken appropriate, corrective action relative to this specific violation, and measures to assure that future, similar violations would not occur had been established, the licensee will not be required to respond to a "Notice of Violation" to be issued in connection with this matter.

B. Safety Matters

No safety matters were identified during the inspection.

Licensee Action on Previously Identified Enforcement Matters

This inspection report, in addition to other matters, covers a special inspection to determine the adequacy of implementation of the corrective action previously committed to by the licensee relative to QA/QC program deficiencies and specific, apparent violations identified in conjunction with: (1) Cadwelding activities at the Midland construction site, and (2) design and procurement activities of the A-E (Bechtel Power Corporation located in Ann Arbor, Michigan). The results of this special inspection are contained in the Report Details Section of this report.

Design Changes

Not applicable - special inspection.

Unusual Occurrences

No unusual occurrences were identified during the inspection.

Other Significant Findings

A. Current Findings

1. Facility Status

The construction status remains essentially unchanged since the previous inspection on December 6 - 7, 1973. Cadwelding activities were resumed on, or about December 21, 1973, following modification of an Order to Show Cause by the Director of Regulations. Modification of the Order to Show Cause removed the ban on Cadwelding and was dated December 17, 1973.

2. Current Construction Activities

Construction activities in progress at the time of the current inspection were field welding of containment building liner plate,

installation of rebar for the Unit No. 2 base slab, and form work associated with the Unit No. 2 base slabe concrete pour.

3. Personnel Changes

Significant personnel changes have occurred and are discussed in the Details Section of this report. (Paragraph 3.a(2))

B. Unresolved Matters

1. Final review and approval of procedures covering specific site audit programs by CP QA. (Paragraph 2.b(1) of Report Details Section)
2. Qualifications of containment building tendon trumplates. (Paragraph 2.1(1) of Report Details Section)
3. Additional work and inspection procedures. (Paragraph 3.d(1) of Report Details Section)
4. Inspection certification program. (Paragraph 3.b(3) of Report Details Section)
5. Contacts with firms having QA expertise. (Paragraph 4.b of Report Details Section)

C. Status of Previously Reported Unresolved Matters

1. Inconsistencies Between Design Documents and the PSAR (RO Inspection Reports No. 050-329/73-10 and No. 050-330/73-10, Section B.2)
See Details Section of this report. (Paragraph 2.g(3))
2. Aggregate Storage (RO Inspection Reports No. 050-329/73-10 and No. 050-330/73-10)
See Details Section of this report. (Paragraph 2.f(3))
3. Tendon Trumplates (RO Inspection Reports No. 050-329/73-10 and No. 050-330/73-10)
See Details Section of this report. (Paragraph 2.1(3))

Management Interview

Two management interviews were held at the conclusion of the inspection and are discussed under A and B, below.

A. First Management Interview

The first management interview was conducted with licensee personnel only. Licensee personnel in attendance included:

Mr. S. H. Howell, Vice President
Mr. W. E. Kessler, Midland Project Manager
Mr. G. S. Keeley, Director of Quality Assurance Services
Mr. T. C. Cooke, Midland Project Superintendent
Mr. H. W. Slager, Midland Quality Assurance Supervisor
Mr. J. L. Corley, Field Quality Assurance Engineer

The meeting members were informed that the results of the inspection indicated that the licensee and Bechtel Corporation (Bechtel) had taken substantial and effective steps to implement previous commitments designed to: (1) assure that problems similar to those associated with improper Cadwelding activities would not occur, and (2) to correct shortcomings in the Midland Facility Quality Assurance Program. The licensee was informed, however, that a final evaluation of the adequacy of implementation of commitments is still under review. A licensee program to assure that continued construction of the Midland facilities would be performed in accordance with QA/QC program requirements was also discussed. This program is designed to provide, and account for, special and periodic management monitoring of QA/QC program commitments and efforts.

B. Second Management Interview

Personnel in attendance during the second management interview included the following:

Consumers Power Company (CP)

Mr. S. H. Howell, Vice President
Mr. W. E. Kessler, Midland Project Manager
Mr. G. S. Keeley, Director of Quality Assurance Services
Mr. T. C. Cooke, Midland Project Superintendent
Mr. H. W. Slager, Midland Quality Assurance Supervisor
Mr. J. L. Corley, Field Quality Assurance Engineer

Bechtel Corporation (Bechtel)

Mr. M. M. Krout, Midland Project Manager
Mr. E. E. Felton, Midland Project Superintendent
Mr. P. A. Martinez, Project Engineer
Mr. Z. G. Tucker, Quality Control Supervisor
Mr. J. I. Dotson, Project Quality Assurance Engineer
Mr. J. P. Connolly, Field Quality Control Engineer

Discussion during this second management interview included: (1) a revision schedule relative to the Bechtel Nuclear Quality Assurance Manual concerned with 10 CFR Part 50, Appendix B, Criteria II and XVII (see Paragraph 1.a, Report Details Section of this report), and (2) further corrective action relative to containment trumplates (see Paragraph 2.1, Report Details Section of this report).

REPORT DETAILS

Persons Contacted

The following persons, in addition to individuals listed under the Management Interview Section of this report, were contacted during the inspection.

Consumers Power Company (CP)

Mr. R. E. Whitaker, Quality Assurance Coordinator
Mr. B. H. Peck, Field Supervisor
Mr. D. R. Keating, Field Quality Assurance Coordinator

Bechtel Corporation (Bechtel)

Mr. J. L. Hurley, Assistant Project Engineer
Mr. J. C. Hink, Civil Group Supervisor
Mr. L. R. Albert, Quality Control Engineer

Results of Inspection

Implementation of Corrective Action Commitments

1. Commitments Identified in RO Inspection Reports No. 050-329/73-08 and No. 050-330/73-08, Licensee's Answer to Order to Show Cause, and the Licensee's Response to a Notice of Violation dated November 23, 1973

- a. Commitment No. 1

- (1) Commitment

The Nuclear Quality Assurance Manual (NQAM) was to be reviewed to incorporate the requirements for retention of records common to activities affecting quality. This revision was scheduled for completion by March 27, 1974. As an interim measure, a project amendment to the NQAM, incorporating record retention, was to be issued by December 17, 1973.

- (2) Implementation

A review of records and discussion with the licensee's representative established that substantive progress has been made in that the proposed revision of the NQAM has been issued for

review and comment. A review of the Bechtel interoffice memorandum, dated November 5, 1973, titled "NQAM Revision Program" established each proposed NQAM revision and the scheduled dates for issue; in this case, March 27, 1973. The licensee reported that this date is firm.

A review of records and discussion with the licensee established that an interim procedure for controlling records, common to activities affecting quality, was issued by December 17, 1973. Based on a review of these procedures, associated instructions, and the Bechtel Internal Procedures Manual, it is apparent that proper implementation of the interim procedure will assure that all such records will be controlled and retained in a manner consistent with 10 CFR Part 50, Appendix B, Criteria II and XVII requirements.

b. Commitment No. 2

(1) Commitment

Project stick files were to be updated in accordance with the latest information in the Midland drawing control log. In addition, the following corrective action steps were to be taken.

- (a) The Midland Internal Procedures Manual, Section 7.5, was to be revised.
- (b) Project personnel were to be instructed to "audit" the status of the stick files weekly.
- (c) The project administrator was to be assigned responsibility for maintenance of the master stick file in accordance with Division Engineering Standards, Volume G.
- (d) The project engineer and his staff are to perform monthly surveillance of the project record file to assure adherence to the latest Midland drawing control register (drawing control log).

(2) Implementation of Commitment

A review of records (procedures and instructions) and discussion with the licensee's representatives confirmed that all of the above commitments were presently in force at the

site and the Bechtel Ann Arbor engineering office, and were being properly implemented. Revision No. 1 to the Internal Procedures Manual, Section 7.5, was issued on October 19, 1973. The project group supervisors were instructed to perform weekly surveillance of stick files, and the project administrator was assigned responsibility for maintenance of the master stick file (as documented on letter dated November 9, 1973, from the Bechtel project engineer). Further, the project quality engineer and staff have performed monthly surveillance of record print file and discipline stick files against the drawing control register.

The results of these examinations are documented in Bechtel interoffice letters dated September 18, 1973, and December 12, 1973. Quality engineering personnel rechecked the status of the project stick files "to assure that corrective action had been taken" during the week of December 17, 1973, as is documented on interoffice memorandum dated December 27, 1973. Moreover, the status of the stick files (design document control) was determined to be an audit point on the project quality assurance engineer's schedule.

c. Commitment No. 3

(1) Commitment

Bechtel's San Francisco Office Divisional Quality Assurance Management was to amend the NQAM to include a more detailed definition of engineering design interface requirements; this manual amendment was scheduled for issuance on December 17, 1973. An Engineering Department procedure (for design interface control) was to be written and is also scheduled for issuance on December 17, 1973.

The Internal Procedures Manual issuance was to become a controlled document.

(2) Implementation of Commitment

The Internal Procedures Manual was revised and reissued in accordance with the control procedure on October 19, 1973. All superseded manuals were withdrawn from use. The project quality engineer and his staff have performed, and are to continue to perform, periodic surveillance to insure that only the latest revisions are used. Moreover, a review of

the subject procedures, records, and instructions, and discussion with the licensee's representatives, established that all of the essential elements of the above commitments have been met.

Project amendment for Job No. 7220 (design interface) dated December 17, 1973, Section II, was reviewed. Engineering Department Instruction No. 3.55.1 (Design Interface Control, Revision 0) was issued on December 17, 1973, and becomes mandatory on February 15, 1974. The interim amendment provides documentation of the current interface control procedures. The Internal Procedures Manual, issued to a Bechtel employee, was observed to have a document control number and had been assigned according to procedures. A document showing the assignment of all manuals was reviewed. Documented evidence showing the distribution and retrieval of all superseded internal procedures manuals was reviewed. An interoffice memorandum from the project engineer to the project quality engineer requires surveillance to verify proper use and status of the Internal Procedures Manual. Moreover, this consideration is included in the Bechtel QA detailed audit plan dated December 7, 1973.

d. Commitment No. 4

(1) Commitment

The NQAM, relative to vendor control, was to be amended on, or before, December 17, 1973, by: (1) deleting NQAM Exhibits No. 3.6A.1, No. 3.6A.2, and No. 3.6A.3, in favor of using specification No. 7220-G-20, 21 and 22, as applicable, and (2) providing the project engineer with flexibility to respond to QA specification changes with proper QA approval.

(2) Implementation of Commitment

Based on a review of records, instructions, the subject amendments, and discussion with the licensee personnel, regarding the previous use of QA specifications No. 7220-G-20, 21 and 22, it was established that an amendment to the NQAM, deleting Exhibits No. 3.6A.1, No. 3.6A.2, and No. 3.6A.3, and relating as required to QA Specifications No. 7220-G-20, 21, and 22, was issued on December 15, 1973. The NQAM amendment, dated December 15, 1973, provides the project engineer with flexibility in implementing changes to properly approved QA specifications as referenced by the NQAM.

2. Commitments Identified in RO Inspection Reports No. 050-329/73-10 and No. 050-330/73-10

a. Commitment No. 5

(1) Commitment

CP agreed to analyze and document the circumstances associated with Cadwelding program violations, with respect to any indications of QA program shortcomings, and to prescribe corrective action, if QA program breakdowns or shortcomings were identified.

(2) Corrective Action

The licensee identified shortcomings and identified corrective action in internal CP meetings and correspondence, and in meetings and correspondence between CP and Bechtel.

(3) Implementation of Commitments

During the current inspection documentation relative to the above corrective action was reviewed and discussed with CP management and QA personnel. The following documents, as well as internal CP and Bechtel memos relative to this subject, were reviewed:

- (a) CP letter, G. S. Keeley to S. H. Howell, "Analysis of Cadweld Problem at Midland." November 27, 1973.
- (b) CP letter, S. H. Howell to G. S. Keeley, "QA Problems at Midland," November 29, 1973.
- (c) CP letter, G. S. Keeley to M. M. Krout (Bechtel) "Suggestions Resulting from Cadweld Problems at Midland," dated December 4, 1973.
- (d) Bechtel letter, M. M. Krout to G. S. Keeley, "Bechtel Job 7220," response to CP letter, (c) above, December 19, 1973.
- (e) Bechtel letter, A. P. Yates to S. H. Howell, "Midland Units 1 and 2, QA/QC," December 19, 1973.

It was determined from the above document review and discussions with CP and Bechtel personnel that the analysis of the problem, and the corrective action prescribed, was adequate.

b. Commitment No. 6

(1) Commitment

Provide documentation of specific audit responsibilities and the scope of the CP QA audit of construction activities at the Midland site.

(2) Corrective Action (Steps)

Provide a master schedule, or matrix, of CP QA construction site audit activities indicating dates and/or the frequency of specific audit activities.

Provide specific, detailed CP field audit procedures which are to include scope, personnel involved, and detailed audit procedures for all Class I construction activities, prior to initiation of work in that particular activity.

(3) Implementation of Commitments

During the current inspection, a master schedule of the CP QA construction site audit activities was reviewed. Activities for the next six months were established, and frequencies of audit activities, beyond six months, were identified. CP QA personnel stated that a more refined version of this schedule would be completed by January 18, 1974.

The following five, detailed, CP QA field audit procedures were reviewed and were determined to be adequate, except as noted below:

- (a) Procedure for CP Field Auditing of Cadwelding Activities. (Completed)
- (b) Procedure for CP Field Auditing of Containment Liner Plate Activities - table of audit frequency and approval of procedure not completed yet.
- (c) Procedure for CP Field Auditing of Concrete Placement Activities - in final draft form.
- (d) Procedure for CP Field Auditing of Concrete Batch Plant Operations - in final draft form.
- (e) Checklist for CP Field Auditing of Bechtel Procedures - not yet approved.

The licensee stated that final review and approval of the procedures, now in final draft form, was in progress at the CP general office at the time of the inspection. This matter will receive further attention during the next inspection.

c. Commitment No. 7

(1) Commitment

Completion of (Bechtel) procedure revisions for Cadwelding activities, including draft forms for quality activity performance accounting covering fabrication and inspection of Cadwelds.

(2) Corrective Action Steps

- (a) Revise Section 10, "Mechanical Splicing of Reinforcing Bars," of Bechtel Specification No. 7220-C-231(Q) and Technical Specifications for "Forming, Placing, Finishing, and Curing of Concrete."
- (b) Revise Bechtel Quality Control Procedure No. C-231-1, "Inspection of Cadweld Mechanical Splicing of Concrete Reinforcing Steel."
- (c) Revise Bechtel Cadweld Inspection Form.

(3) Implementation of Commitments

The documents identified in (2), above, were revised, and a review of the revisions established that the revisions were adequate. Item (a), above, was revised on November 14, 1973 (Revision 4); item (b), above, on December 6, 1973 (Revision 2); and item (c), above, on November 29, 1973 (Revision 1).

d. Commitment No. 8

(1) Commitment

Demonstration by CP that the Bechtel efforts, to requalify the existing site Cadwelds, has been accomplished to the satisfaction of CP QA personnel.

(2) Corrective Action Steps

CP QA personnel planned to review Bechtel Cadweld documentation relative to such matters as reinspection procedures, inspection data sheets, nonconformance reports, retraining, and revisions to applicable specifications. In addition, CP planned to verify, by visual examination and by selected void area measurements, that the records did represent the condition of the existing Cadweld splices.

(3) Implementation of Commitments

A CP letter, R. E. Whitaker to S. H. Howell, "Requalification of Cadweld Splices," dated November 30, 1973, was reviewed. This letter identified the steps taken by CP QA to verify that the existing Cadweld splices for Units 1 and 2 were reinspected and that the reinspection of Cadwelds, performed by Bechtel, was adequate.

During this inspection, the RO:III inspector verified, on a random check basis, that the Bechtel Cadweld reinspection records examined by CP were as represented by CP QA. Additional Bechtel records, relative to some Cadwelds made after December 21, 1973, were reviewed and were determined to be adequate. In addition, a review of Cadweld splice tensile testing records for Unit 2 indicated that the frequency of testing of production and sister splices met the applicable Bechtel specifications. This frequency requirement is greater than the frequency stated in AEC Regulatory Guide 1.10.

e. Commitment No. 9

(1) Commitment

CP agreed to have CP QA personnel review Bechtel Cadwelding work and QC procedures.

(2) Corrective Action Steps

A review of Bechtel Cadwelding work and QC procedures, and preparation of a detailed procedure for field auditing of Cadwelding, which includes an audit of work and QC procedures to be used for this activity, was to be made.

(3) Implementation of Commitment

During this inspection, it was determined that, prior to December 19, 1973, CP QA personnel reviewed the following Cadwelding activities procedures:

- (a) Bechtel Specification 7220-C-231, Section 10, Revision 4.
- (b) Bechtel Field Inspection Manual.
- (c) Bechtel QA Procedure No. C-231-1, Revision 2.
- (d) Bechtel Inspection Plan C-231-1 (Cadweld) Revision 6.
- (e) Erico Manual RB5M 768.
- (f) Bechtel Cadweld Rebar Splicing Instructions for the Operator, Revision 1.

In addition, a CP procedure, Field Auditing of Cadwelding Activities (CW-1) has been prepared and approved for use on a continuing basis. This procedure specifies the listing of detailed work and inspection procedures involved, and a comparison of these procedure requirements with the applicable specifications. An audit report, with checklist attached, is required following the audit. The CP procedure includes a table establishing the frequency that various Cadwelding activities are to be audited.

f. Commitment No. 10

(1) Commitment

Adequate corrective action is to be taken relative to the 3/4" aggregate storage pile, adjacent to the concrete batch plant.

(2) Corrective Action Steps

Examine the coarse aggregate stockpiles at the Midland site, evaluate results, and recommend course of action to be used in the future relative to these stockpiles, to assure that out-of-specification aggregate is not incorporated into Class I structural concrete.

(3) Implementation of Commitment

This matter was investigated by Bechtel. A Bechtel field inspection report, dated December 19, 1973, and a Bechtel letter, D. J. Haavik to P. A. Martinez, dated December 20, 1973, relative to the Midland site concrete aggregate stockpiles, were reviewed. The letter contained an evaluation of the existing stockpiles and recommended a selective means of control which has been used successfully in the past. The inspector concluded that the use of this selected control method in obtaining aggregate from the stockpile, and sampling and testing of aggregate according to Bechtel Specification No. 7220-C-208, Revision 2 (September 20, 1973) would provide adequate assurance that only conforming aggregate would be used in Class I components.

g. Commitment No. 11

(1) Commitment

Demonstrate the existence of procedures that are designed to specifically assure that specifications covering Class 1 work properly reference and deal with all applicable criteria, such as the Midland Plant PSAR.

Provide clarification of inconsistencies between applicable specifications and the PSAR regarding Cadwelding requirements.

(2) Corrective Action

Bechtel was to provide CP with a revision to the Bechtel Design Requirements Procedure and information clarifying inconsistencies between applicable specifications and the PSAR regarding Cadwelding requirements.

(3) Implementation of Commitment

During the current inspection, Revision 1, dated November 30, 1973, of Bechtel Design Document Requirements Procedure was reviewed. This procedure defines the system to be used for assuring inclusion of all design and quality requirements in design documents. This procedure is to apply to all design work and to all significant revisions issued after December 15, 1973.

Bechtel issued an SAR Change Notice, dated November 15, 1973, to resolve differences between the Midland Plant PSAR, Appendix 5C, and Bechtel Specification No. 7220-C-231 relative to mechanical splicing of reinforcing bar using the Cadweld process.

h. Commitment No. 12

(1) Commitment

Provide further clarification regarding Cadwelder personnel retraining and maintenance of qualification.

(2) Corrective Action

Revise specification regarding personnel qualification and provide additional training and instruction.

(3) Implementation of Corrective Action

This commitment has been fully implemented in that:

(1) Specification No. 7220-C-213Q, Revision 4, dated November 4, 1973, was revised to include requirements for Cadwelder requalification (Paragraph 10.8.1) and (2) indoctrination and training of Cadwelding quality control personnel has been reinforced by additional retraining subsequent to RO identification of discrepant inspection techniques, i.e., the site quality control training records indicate that training sessions related to the various elements of Cadwelding (operators, inspection, and procedures) were held on November 11, 14, 15, and December 18, 1973. The attendance and personnel records indicate that all appropriate personnel were provided the specified training.

i. Commitment No. 13

(1) Commitment

The Bechtel project engineer's letter (File No. 0294-C-2) referenced the results of a Bechtel audit which identified QA deficiencies concerning quality documentation covering welding of trumplates for containment building post-tensioning systems in that the welding procedures had not been subject to prior approval. The subject letter stated, in context, that the quality documentation deficiencies would be resolved,

and all trumplate assembled (installed and stored) would be acceptable contingent upon the results of a "thorough visual inspection." The trumplate welding was to be performed in accordance with AWS D1.0 Standards (which requires visual inspection of welds). During previous inspections, the inspector observed that rusting of the trumplate assemblies had occurred to the extent that thorough visual inspection would be seriously compromised. The inspector also observed that a required protective coating material for the trumplates had deteriorated to a degree such as to be no longer effective.

(2) Corrective Action

All trumplate assemblies were to be cleaned, a new protective coating applied, and a thorough visual inspection of all welds was to be completed in accordance with recommendations of the Bechtel project engineer.

(3) Implementation of Corrective Action

While implementation of this commitment has been initiated and work is underway, the adequacy of the work was questioned by the inspector in that: (a) cleaning and reapplication of the required protective coating has been done on Unit 2 only on the inside of trumplate assemblies, whereas the design documents call for application of protective coating on both sides, and (b) although a visual inspection of the trumplate assembly welds on both Units 1 and 2 has been completed and the welds found acceptable by the project engineer, rust covering these welds had not been removed. This is of concern because the degree of rusting is such that a visual inspection, in conformance with common industrial practices and the requirements of AWS D1.0, does not appear to be feasible. Of further concern is the fact that the Bechtel inspection reports covering visual examination of the trumplate welds do not specifically relate to the weld fabrication requirements of AWS D1.0.

Subsequent to the inspection, the licensee informed RO:III that a CP instruction was sent to Bechtel (letter dated January 18, 1974) requesting immediate resolution of this conflict and associated nonconformance reports. This letter requires that the trumplate welds be cleaned of rust, inspected, and have protective coating applied as required by design documents and earlier instructions provided by the Bechtel project engineer. This matter will receive further attention during the next routine site inspection.

3. Commitments Identified in RO Inspection Reports No. 050-329/73-11 and No. 050-330/73-11

a. Commitment No. 14

(1) Commitment

CP agreed to take appropriate, corrective action measures to assure that future problems, similar to the Cadweld problems, should not occur, including:

- (a) Adequate top management dedication to quality assurance relative to the Midland Plant.
- (b) Provide additional, qualified QA personnel at the Midland site.
- (c) Procure outside assistance to maintain an adequate QA/QC program.
- (d) Take necessary personnel action to assume a strong QA/QC organization at the site.

(2) Implementation of Commitments

A review of CP top management internal correspondence (letter, G. S. Keeley to S. H. Howell, dated November 27, 1973, and letter, S. H. Howell to G. S. Keeley, dated November 29, 1973) indicated that CP top management was involved with, and initiated, QA corrective action measures relative to the Midland Plant.

In addition, subsequent to identification of the Cadwelding problem, CP corporate QA personnel (the Midland project quality assurance services) have made three visits to the site for the specific purpose of reviewing and auditing QA/QC activities in progress. (Two of these visits were documented while the third visit was not.)

During the current inspection, it was determined that four CP QA people (as opposed to one individual previously assigned to the site) were permanently assigned to the site and were actively engaged in verifying that Class 1 work was being performed according to applicable requirements, including 10 CFR Part 50, Appendix B.

In addition to the increase of CP QA personnel at the site, the Bechtel QC staff at the site has been increased by three individuals since the Cadwelding problem was identified, and six more individuals are scheduled to report for QC duties at the site on, or before, February 4, 1974. A tenth individual is scheduled to report to the site by January 21, 1974, to assume full-time duties as a Bechtel field quality assurance engineer.

With respect to outside assistance, CP has activated an existing consultant contract with NUS Corporation (NUS) with a request that: (1) the total Midland QA program be examined for adequacy, and (2) that NUS provide a recommendation with respect to the need for a continuing third party (such as NUS) audit of site QA/QC activities.

At the time of the current inspection, it was determined that three NUS engineers were assigned to the project, that the task was approximately 65 percent completed, and that current NUS plans were to submit a report of finding to CP during the week of January 13, 1974. According to the NUS engineer in charge, the evaluation of the Midland QA program was being based on the requirements of ANSI N45.2.

In addition to personnel changes at the Midland site to assure a strong QA/QC organization, training programs have been strengthened. The CP Project Quality Assurance Services Department (PQASD) established an indoctrination and training program, about mid-December 1973, and the first session was held in Jackson, Michigan, on January 3-4, 1974. All four CP site QA personnel, among others, were in attendance. AEC QA program requirements and CP QA policies and procedures were topics included in the session. Six additional sessions are scheduled for the near future. Additional information concerning QA training efforts appears under commitment No. 18 of this report.

b. Commitment No. 15

(1) Commitment

Bechtel senior management will become more involved with the Midland Plant construction and associated quality aspects of this project.

(2) Corrective Action Steps

A. P. Yates, Vice President, Bechtel Power Corporation, sent a letter to S. H. Howell, Vice President, Consumers Power Company, dated December 19, 1973, indicating renewed emphasis upon areas of quality assurance/quality control from the management of Bechtel. Commitments in this letter include corrective action measures in the following categories:

- (a) Special work processes.
- (b) Inspection responsibilities.
- (c) Response to quality (audit) findings.
- (d) Organizational changes.
- (e) Inspector certification.
- (f) Management attention.

(3) Implementation of Commitment

Implementation of Items (a) and (d), above, are covered in Paragraphs 2.c, 2.g, 3.b, 3.c, and 3.a, respectively, of the Details Section of this report. With respect to Items (b), (c), (e), and (f), the following information is applicable.

Item (b) - Inspection Responsibilities

A review of documentation at the site, and discussion with the Bechtel quality control supervisor for the Midland Plant, established that instructions have been developed, and procedures have been modified, to assure that inspection of Class I work performance will be performed by QC engineers as opposed to the previous practice of using construction field engineers.

Item (c) - Response to Quality (Audit) Findings and

Item (e) - Inspector Certification

The quality control supervisor has initiated steps to assure that Bechtel work procedures (Procedure No. G-3 for Nonconformance Action) and instructions for Inspector Certification (ANSI N45.2.6 and AEC Regulatory Guide 1.58) are changed in a

manner fully consistent with these commitments contained in the December 19, 1973, letter from A. P. Yates (Bechtel) to S. H. Howell (CP). This matter, item (e) above will receive further attention during the next inspection.

Included in these steps is a new requirement that the Bechtel quality control supervisor generate monthly reports, for Bechtel Ann Arbor management, covering all significant aspects of QC activities at the Midland site.

Item (f)

In addition to the management attention described under Item (e), above, Bechtel "management attention" has been demonstrated by a letter from H. O. Reinsch, Executive Vice President/General Manager, to all management personnel involved with the Midland construction project, wherein Mr. Reinsch states that QA policies will be immediately placed into effect as follows:

Whenever a significant QA/QC problem is detected by AEC, the Bechtel client, Bechtel personnel concerning Bechtel, or Bechtel subcontractor or supplier, a brief, written report shall be submitted by the project manager or his designee to the cognizant division manager. Information copies shall be sent to the cognizant manager of projects, department manager, QA manager, and the manager of quality assurance, Thermal Power Organization (TPO). This report shall describe the problem; how it was discovered and by whom; indicate other documents that may report the problem, such as reports to or by AEC or press releases; and indicate the immediate, remedial action underway or planned. A schedule for completing this remedial action, and a description of the types for formal reports to be prepared, shall be included. The report shall be submitted no later than 24 hours after discovery of the condition.

The manager of quality assurance, TPO, should be advised, by telephone, as soon as possible whenever the occurrence may have serious, adverse affects on relations with the AEC, public, or client. When considered necessary, the project manager should also advise the cognizant manager of projects by telephone. The manager of quality assurance, TPO, will be responsible for advising appropriate TPO management of these problems, as necessary.

In addition, Mr. P. R. Cassidy, Area Office Manager, Ann Arbor, has instructed all Bechtel QA/QC personnel as to the importance of QA/QC work and has required that the steps listed below must be taken to assure an effective QA/QC program.

- (a) Immediate response is to be made to each and every QA finding, and responses must be documented.
- (b) In cases of uncertainty, help from the QA Department is to be solicited.
- (c) Each department should have a fool-proof follow-up system to assure that corrective measures are taken within the specified time frame.

c. Commitment No. 16

(1) Commitment

CP commitments from Bechtel, relative to QA/QC program weaknesses, include: (a) Bechtel is to provide a method for critically relating inspection procedures to acceptance criteria, (b) Master Inspection Plans, generated by Bechtel, are to be sent to CP QA for review and comment prior to the start of Class I work activities, and (c) Bechtel inspection records are to provide "visibility" relative to individual inspection items.

(2) Implementation of Commitment

On November 30, 1973, Bechtel issued Revision 1 of the Midland Plant Design Document Requirements Procedure (DDRP) which defines the system to be used for assuring inclusion of all design and quality requirements in design documents. Revision 1 of the DDRP was reviewed and determined to be adequate. During the current inspection, it was determined that Bechtel is in the process of reviewing and revising current inspection procedures, to assure that inspection procedures relate to acceptance criteria and to assure that inspection procedures properly relate to inspection requirements, i.e., signoff to establish inspection was completed.

To date, CP has received seven Master Inspection Plans from Bechtel for review. The cover memo for this transmittal is

dated January 3, 1974. A Bechtel interoffice memo, "Distribution of Master Inspection Plans," dated January 10, 1974, states that copies of Master Inspection Plans are to be sent to H. W. Slager and J. L. Corley of CP QA. CP QA personnel have analyzed the Bechtel quality assurance procedures for the Midland Plant and have suggested changes in the procedures which include direct routing of Bechtel Master Inspection Plans to both the site and the CP corporate office. Current practice is that the Master Inspection Plans are sent to CP personnel for review and comment, prior to the use of these plans. Bechtel has developed a QC instruction to assure that all Master Inspection Plans are automatically forwarded to the proper CP QA personnel. Yet to be accomplished, in conjunction with this matter, are: (a) development of a procedure by CP prescribing the scope, timing, and "action plans" relative to the inspection plan review, and (b) development of a mechanism for documenting the fact of inspection plan review.

d. Commitment No. 17

(1) Commitment

CP commitments from Bechtel, relative to full attention to QA/QC program requirements in regard to construction activities at the Midland site, shall include: (1) a review of procedures by Bechtel prior to the start of each specific Class I work activity to assure clarity, (2) a system established by Bechtel to assure that work procedures are reviewed to contain quality information consistent with requirements, such as those contained in the Midland Plant PSAR, and (3) revision of work and inspection procedures to lesson reliance on and cross-reference to other, general documents.

(2) Corrective Action Steps

As a result of Midland site and CP corporate office visits by Bechtel corporate and management level personnel during the first half of December 1973, a letter, A. P. Yates (Bechtel) to S. H. Howell (CP) dated December 19, 1973, was sent to CP which describes corrective action measures that Bechtel has taken, or will take immediately, to improve procedures and attitudes to perform the work in accordance with CP and AEC requirements. This letter states that Bechtel is to institute a more formalized program to define the quality requirements for special work processes and to identify the required work and inspection procedures involved.

(3) Implementation of Commitment

During the current inspection, a Bechtel interoffice memo, J. T. Marvin to E. E. Felton, dated December 19, 1973, concerning QA/QC at Midland, was reviewed. This memo reiterates the corrective action measures stated in the Yates to Howell letter, referenced above, relative to the Midland construction site. A review meeting on this subject was held by Bechtel on December 20, 1973. CP stated that necessary work and inspection procedures, relative to these corrective measures, are being developed or revised by Bechtel. Subsequent to this inspection, CP stated that they plan to meet with Bechtel on January 22, 1974, to review the final drafts of these procedures. The licensee further stated that Bechtel is currently preparing work procedures for other processes, similar to those previously prepared for Cadwelding activities, with less reliance on reference documents. These matters will receive further attention during subsequent RO:III inspections.

e. Commitment No. 18

(1) Commitment

CP agreed to initiate a more formal training program for their QA personnel.

(2) Corrective Action

QA indoctrination and training activities for 1974 are to be scheduled. CP QA Department personnel are to attend, including those at the Midland site.

(3) Implementation of Commitment

During the current inspection, a CP internal memo, dated December 18, 1973, was reviewed. This memo included the schedule and coverage of CP QA indoctrination and training activities for 1974. (See Commitment No. 14 of this report.)

f. Commitment No. 19

(1) Commitment

Provide adequate visibility of Cadweld inspection results.

(2) Corrective Action

(a) Revise inspection procedures to include appropriate instructions.

(b) Revise inspection report forms (inspection plan) and issue new record form.

(3) Implementation of Commitment

A review of site records, the revised inspection procedure, and discussion with the licensee's representatives indicated that this commitment has been completely implemented. The revised procedure, titled, "Inspection of Cadweld Mechanical Splicing of Concrete Reinforcing Steel," the associated Master Inspection Plan No. C-231-1, Field Inspection Plan No. C-55-13, and form "QC - Cadwelds," collectively provide for clear and comprehensive documentation of all quality related activities involved in Cadweld inspection.

g. Commitment No. 20

(1) Commitment

Provide adequate instructions and procedures for storage and handling of Cadweld materials.

(2) Corrective Action

Produce and/or revise procedures which include adequate provisions.

(3) Implementation of Commitment

A review of the current procedures for Cadwelding, Cadweld inspection, the Master Cadweld Inspection Plan, and associated records establish that this commitment has been fully implemented. "Rebar Splicing Instructions for the Operator," Paragraph (A), provides instruction for "storage and handling of materials;" Quality Control Procedure No. C-231-1, Revision 2, delegates the principal responsibility for inspection of storage areas to the field engineer; and quality control engineers are now required to perform routine surveillance inspection of the Cadweld material storage and handling areas.

h. Commitment No. 21

(1) Commitment

Provide adequate procedures and records relative to the control of nonconforming Cadweld material.

(2) Corrective Action

Revise Cadweld inspection procedure to include identification of nonconforming material handling.

(3) Implementation of Commitment

A review of the subject procedure, records, and discussion indicates that this matter has been fully implemented. Revision 2, dated December 6, 1973, of Quality Control Procedure No. C-231-1, titled, "Inspection of Cadweld Mechanical Splicing of Concrete Reinforcing Steel," Section 1, now provides that: . . . Nonconformance shall be handled in accordance with Field Inspection Manual, Field Inspection Procedure G-3. A review of Field Inspection Procedure G-3 established that comprehensive instructions, regarding the identification and handling of nonconforming materials, were currently in effect.

i. Commitment No. 22

(1) Commitment

Provide instructions and procedures regarding Cadwelding preheat requirements and provide verification that the requirements have been met.

(2) Implementation of Commitment

Preheat instructions for Cadwelding activities are now included in Quality Control Procedure No. C-231-1. Verification of conformance to the requirement is assigned to the field engineer. The fact of conformance is documented on Master Inspection Plan No. C-231-1 (Cadweld), Revision No. 7.

j. Commitment No. 23

(1) Commitment

Adequate procedures for Cadwelding will be provided.

(2) Corrective Action

Provide Cadwelding procedures for the operator.

(3) Implementation of Commitment

As previously reported, the licensee produced the required procedure (Rebar Splicing Instructions for the Operator, Vertical and Horizontal Positions, Revision 1, dated December 6, 1973). Examination, observations, and discussion of this matter disclosed that the subject procedure has been properly distributed and is currently being enforced at the site.

k. Commitment No. 24

(1) Commitment

Provide adequate procedures for Cadweld splice inspection.

(2) Corrective Action

Bechtel to provide new or revised procedures pertinent to Cadweld inspection.

(3) Implementation of Commitment

The following documents, available at the Midland construction site, were reviewed and determined to be adequate relative to Cadweld inspection:

(a) Bechtel Quality Control Procedure No. C-231-1, Inspection of Cadweld Mechanical Splicing of Concrete Reinforcing Steel, Revision 2, dated December 6, 1973.

(b) Bechtel Quality Control Inspection Plan No. C-231-1 (Cadweld), Revision 6, dated December 5, 1973.

(c) Bechtel Form QC (Cadwelds), Revision 1, dated November 29, 1973, which is used in conjunction with Inspection Plan No. C-231-1.

l. Commitment No. 25

(1) Commitment

Cadweld inspection records are to provide evidence that Cadwelds conform to quality requirements.

(2) Implementation of Commitment

Current Cadweld inspection records (Bechtel Form QC (Cadwelds), Revision 1, dated November 24, 1973), were reviewed. These records were determined to include the required quality aspects for each Cadweld and are considered to be adequate.

4. Commitment Identified in Licensee's Answer to Order to Show Cause Not Covered in Other Sections of This Report

a. Commitment No. 26

(1) Commitment

Bechtel will place the Midland Testing Laboratory under the functional and technical direction of a field quality control engineer.

(2) Implementation of Commitment

Discussion with Mr. Z. Tucker, Bechtel QC Supervisor in charge of Bechtel QC at the Midland site, and examination of a Bechtel organization chart dated January 10, 1974, indicated that a Mr. P. Carpenter was assigned full-time duties at the Midland Testing Laboratory starting on December 3, 1973.

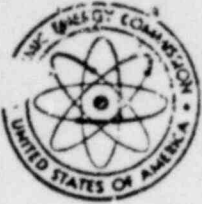
b. Commitment No. 27

(1) Commitment

CP agreed to contact firms having QA expertise in other industries to determine whether it would be desirable to obtain additional QA program viewpoints.

(2) Implementation of Commitment

During a discussion with CP subsequent to the inspection, RO:III was informed that CP met with personnel from Grumman Aerospace Corporation, U. S. Testing Company, and Nuclear Services Corporation during late December 1973 and early January 1974. This matter will receive further attention during the next RO:III inspection.



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A. RO Inspection Report No. 050-329/74-01
050-330/74-01

Transmittal Date : February 7, 1974

Distribution:
RO Chief, FS&EB
RO:HQ (5)
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Regulatory Standards (3)
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B. RO Inquiry Report No. _____

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