

U. S. ATOMIC ENERGY COMMISSION
DIRECTORATE OF REGULATORY OPERATIONS

REGION III

Report of Construction Inspection

RO Inspection Report No. 050-329/74-07
RO Inspection Report No. 050-330/74-07

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

Midland Plant, Units 1 and 2
Midland, Michigan

License No. CPPR-81
License No. CPPR-82
Category: A

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

Type of Inspection: Routine, Unannounced

Dates of Inspection: April 18 and 19, 1974

Date of Previous Inspection: March 15, 1974 (Construction)

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

5/13/74
(Date)

Other Accompanying Personnel: None

Reviewed By: *W. E. Vetter*
W. E. Vetter,
Technical Assistant to the Director

5-13-74
(Date)

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SUMMARY OF FINDINGS

Enforcement Action

A. Violations

No violations of AEC requirements were identified during the current inspection.

B. Safety Matters

No safety matters were identified during the current inspection.

Licensee Action on Previously Identified Enforcement Action

No previously identified enforcement matters remained unresolved at the time of the current inspection.

Design Changes

None identified.

Unusual Occurrences

None identified.

Other Significant Findings

A. Current Findings

1. Project Status

The licensee estimated current project status to be as follows:

Engineering - 38% complete

Construction - 4.6% complete

The containment building base slab for Unit 2 has been poured.

Containment building liner plate prefabrication activities at the site are continuing. Presently, about twenty pairs of liner plate have been joined by welding and "leak chase" channels have been attached. Four assemblies (pairs) have been sandblasted, and one assembly is being painted.

2. Nonconformance Report Review

Nonconformance reports received by RO from Consumers Power Company (CP), under cover letter dated February 22, 1974, were reviewed to ascertain their significance. From this review, eight nonconformance reports (NCR's) were selected for detailed review at the construction site. The results of this review are contained in Attachment A to this report.

B. Unresolved Matters

From a review of Bechtel Corporation (Bechtel) Quality Audit Finding No. C-3-3, dated January 29, 1974, it was not clear that the corrective action stated on this finding was adequate. This matter remains open pending review of possible modified corrective action. (Paragraph 4, Report Details)

C. Status of Previously Reported Unresolved Matters

1. Bechtel Audit of Erico Products, Incorporated (Erico) - (RO Inspection Reports No. 050-329/74-03 and No. 050-330/74-03; No. 050-329/74-04 and No. 050-330/74-04)

During a routine audit (on January 31, 1974) of Erico, the Cadweld components supplier, three deficient audit findings were identified by Bechtel. During subsequent reaudits of Erico, Bechtel determined that adequate, corrective action had been taken by Erico. In addition, Bechtel had determined that no safety problem was involved, relative to the Erico deficiencies, with respect to previously installed Cadweld splices. This matter is resolved. (Paragraph 1, Report Details)

2. Containment Building Tendon Trumplates (RO Inspection Reports No. 050-329/74-01 and No. 050-330/74-01; No. 050-329/74-03 and No. 050-330/74-03; and No. 050-329/74-04 and No. 050-330/74-04)

Corrective action is in progress. This matter remains open pending satisfactory completion. (Paragraph 2, Report Details)

3. Additional Work and Inspection Procedures (RO Inspection Reports No. 050-329/74-01 and No. 050-330/74-01; No. 050-329/74-04 and No. 050-330/74-04)

Work and inspection procedures are being developed and/or revised by Bechtel and reviewed by CP. Implementation is proceeding in a satisfactory manner and this matter is considered to be resolved. However, this matter will be reviewed during subsequent inspections. (Paragraph 3, Report Details)

4. Babcock and Wilcox Company (B&W) QA Program for the Midland Plant (RO Inspection Reports No. 050-329/73-06 and No. 050-330/74-06; and No. 050-329/74-04 and No. 050-330/74-04)

During the previous inspection, it was determined that the revised B&W QA documents (QA plans), covering Class 1 components to be supplied for the Midland Plant, appeared to be complete, properly approved by B&W, and no deficiencies were identified during a preliminary review of these B&W QA documents. A more detailed review of the B&W QA program for the Midland Plant will be made during a subsequent inspection.

5. Site Contamination Sampling Program (RO Inspection Reports No. 050-329/73-07 and No. 050-330/73-07; and No. 050-329/73-10 and No. 050-330/73-10)

A new site sampling (monitoring) program, previously developed by Bechtel, has been revised and was given to CP on April 18, 1974, for their review and comment. This matter will be reviewed during a subsequent inspection.

6. Site Requalification Activities (RO Inspection Reports No. 050-329/73-05 and No. 050-330/73-05; and No. 050-329/74-04 and No. 050-330/74-04)

Carbon steel construction materials and components, stored outside at the site during construction shutdown, have rusted to varying degrees. The licensee arranged for specialists from Bechtel to inspect these (and other) components and evaluate the results relative to restoration and requalification to meet specification requirements. This activity was started in May 1973; the work is continuing. This matter will be reviewed again during a subsequent inspection.

7. Contacts With Firms Having QA Expertise (RO Inspection Reports No. 050-329/74-01 and No. 050-330/74-01; and No. 050-329/74-03 and No. 050-330/74-03)

As stated in the referenced reports, CP personnel met with NUS Corporation (NUS) and three other firms having QA expertise.

The NUS team, assigned to review the Midland Plant QA program, have completed this work. The inspector did not identify any significant, adverse findings during a review of records relative to this NUS work. This matter is considered to be resolved. (Paragraph 5, Report Details)

Management Interview

- A. The following persons attended the management interview at the conclusion of the inspection:

Consumers Power Company

- T. C. Cooke, Project Superintendent
H. W. Slager, Project Quality Assurance Supervisor
J. L. Corley, Field Quality Assurance Engineer
* P. W. Koval, Attorney

-
- * Did not participate in management interview.

Bechtel Corporation

- Z. G. Tucker, Quality Control Supervisor
J. P. Connolly, Project Field Quality Control Engineer
J. F. Newgen, Project Field Superintendent
G. L. Richardson, Lead Quality Assurance Engineer

- B. Matters discussed and comments, on the part of management personnel, were as follows:

1. The inspector stated that he had reviewed the site records of several nonconformance reports, including the procedures used, the status and adequacy of the corrective action taken, and the type of deficiency or discrepancy involved. The inspector further stated that the significance, relative to AEC regulations, of some of these nonconformances would be discussed further by RO:III personnel subsequent to this inspection, and CP would be informed of the results of this additional review.
2. The differences between nonconformances (as reported in writing on standard forms by Bechtel and CP QA/QC personnel at the construction site) relating to deviations from construction specifications and/or other codes and standards, and nonconformances which involve AEC regulations were discussed. The inspector stated that materials and components that do not meet applicable requirements and are identified as such via nonconformance reports are not, in general, considered violations of AEC regulations, as such, if properly handled (repaired, replaced, etc.) subsequent to initial identification and prior to installation or use. However, the inspector further stated that, if work had been performed that is not in accordance with the provisions of AEC regulations, rules, conditions of license, etc., an AEC violation could be involved.

3. In regard to the Bechtel audits of Erico, the inspector stated that he had reviewed the Bechtel audit reports and the evaluation of existing Cadweld splices and had no further questions at this time.
4. The new site sampling (monitoring) program for the Midland Plant construction site was discussed. The licensee indicated that the program had been recently revised by Bechtel and had been given to CP for their review and comment.
5. The Bechtel master inspection plan, which includes requalification requirements (verification inspection) for the containment building liner plate, was discussed. The inspector stated that this plan appeared to be adequate and that he had no further questions at this time.

REPORT DETAILS

Persons Contacted

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

Consumers Power Company

R. E. Whitaker, Field Quality Assurance Coordinator
D. R. Keating, Field Quality Assurance Coordinator
D. E. Horn, Field Quality Assurance Coordinator

Bechtel Corporation

L. R. Albert, Lead Civil Quality Control Engineer

Results of Inspection

1. Bechtel Audit of Erico

During the current inspection, the Bechtel reaudit findings were reviewed. The results of the second audit (reaudit) conducted on March 5, 1974, established that two of the three previously identified audit findings had been satisfactorily corrected by Erico and closed out by Bechtel. During a second reaudit, conducted on March 18, 1974, the remaining Bechtel audit finding was closed out, and components on hold at Erico were released for shipment.

Prior to the resolution of the above audit findings, CP issued a stop work order (No. FSW-4, dated March 8, 1974) to assure that Cadweld splices would not be embedded in concrete prior to the resolution of this matter to the satisfaction of CP. This matter was resolved.

In regard to the Midland Plant safety implications of the above audit findings, the inspector reviewed the results of a report by the Bechtel Civil/Structural Staff (Gaithersburg) relative to this matter. The report, titled "Statistical Evaluation of Cadweld Splices, Midland Units 1 and 2, dated March 1974, by Dr. M. A. Suarez, was enclosed with a Bechtel letter, P. A. Martinez to M. P. Hanson (CP) dated March 15, 1974. The report includes the following conclusions:

- a. The statistical evaluation of samples tested (66 tensile tests out of 1,515 Cadweld splices) shows that the in-place population of Cadwelds splices (Midland Units 1 and 2) meets, or exceeds, the requirements contained in the Midland project specification at the highest possible level of confidence (99.999%).

- b. The statistical evaluation of sample size requirements for the above prediction shows that no more sampling or testing is required for this population.
- c. Finally, following a standard distribution for the population, it has been found that the number of splices giving less than the required minimum of 75,000 psi could be expected to be 9 in 10,000.

2. Containment Building Tendon Trumplates

Corrective action is in progress relative to several unresolved matters, previously identified, regarding tendon trumplate assemblies for Units 1 and 2. Grease vent plugs, previously missing, have been installed, and the bottom surface of the assemblies have been cleaned and painted.

Pinholes in trumplate assembly welds (Bechtel NCR No. 73) have been evaluated by Bechtel (SCN C-2-4001) and "use without repair" has been recommended. The inspector did not observe any problem as a result of this recommendation subsequent to a concrete pour made in this area for Unit 2, i.e., observation of a completed pour around the trumplate assemblies.

3. Additional Work and Inspection Procedures

Work and inspection procedures are continuing to be developed and/or revised by Bechtel and reviewed by CP. Implementation is considered to be adequate.

Quality verification inspections (requalification) of containment building liner plate are included in Bechtel Master Inspection Plan No. C-110 (a-d). This master inspection plan (MIP) was approved by Bechtel in February 1974 and issued for construction on March 14, 1974. This plan was reviewed and approved by CP site QA on March 22, 1974. The requalification and quality verification inspections include inspections for identification and marking, bends, pits, gouges, edge imperfections, surface condition, weld edge preparation and surface condition, and records of repairs. This MIP is considered to be adequate.

4. Bechtel Quality Audit Finding No. C-3-3

Bechtel QAF No. C-3-3, dated January 29, 1974, refers to Bechtel PSP No. 3, Section 4C, which deals with the responsibility for reviewing and approving field prepared requisitions for "Q" list materials. The statement of "corrective action taken" is not clear in that no procedure is available that defines the requirements of the review and approve responsibility. During a telephone call subsequent to this inspection, the licensee stated that this matter would be discussed with Bechtel in the near future. The inspector stated he would review this matter during the next routine inspection.

5. NUS Review of the Midland Plant QA Program

Records relative to the NUS study of the Midland Plant QA program were reviewed. The significant results of this study are included in a report enclosed with a letter, NUS to CP, dated February 14, 1974, and a letter, NUS to CP, dated March 4, 1974. The above references include the following conclusions and recommendations:

- a. The CP QA manual for the Midland Project is directly responsive to 10 CFR Part 50, Appendix B, but lacks implementing detail.
- b. The present CP QA organization for the Midland project is satisfactory.
- c. NUS does not recommend the use of a third party inspection organization at the construction site, in lieu of A-E personnel (Bechtel).
- d. An independent third party is recommended to lead a base-line (initial) audit of the adequacy of the QA program for the Midland project - of CP, Bechtel, and B&W (the NSSS supplier).
- e. CP QA staffing at the construction site is adequate at the present time.

6. Bechtel QC Training Program

Adequate implementation of the Bechtel training program for site QC personnel is continuing. About fifteen onsite training sessions, covering appropriate topics, were held from February 1, 1974, through April 5, 1974.

A new Bechtel training coordinator for the Midland construction site is to be available about the end of April 1974. Since January 1974, training activities have been handled on a part-time basis by the Bechtel lead civil QC engineer.

Attachment:

Attachment A

ATTACHMENT A

MIDLAND PLANT NONCONFORMANCE REPORTS

The nonconformance reports received by RO from CP under cover letter dated February 22, 1974, were reviewed to ascertain their significance. These nonconformances were identified during the normal performance of licensee-contractor QA/QC activities at the site. From this review, the nonconformance reports (NCR's) listed below were selected for more detailed review at the construction site. The selection was based on potential significance and/or lack of sufficient information on the NCR form.

Results of Inspection

Based on a review of records, discussions with CP and Bechtel personnel, and observations at the construction site, it was determined that these NCR's were adequately controlled (procedural requirements met) and that adequate corrective action had been initiated and/or completed.

1. Bechtel NCR No. C-4, Containment Building Liner Plate Weld Crack (September 28, 1973)

A weld crack was detected in liner plate S-1-5-2-1 during attachment of "leak chase" channels to the liner plate assembly. Bechtel field personnel recommended removing the defective weld by grinding and rewelding in accordance with Bechtel Specification No. C-50. The disposition of the NCR (repair weld) was rejected by Bechtel QC, because the stated disposition was not followed. NCR No. C-27 relates to the disposition rejection of NCR No. C-4. (See NCR No. C-27, below)

2. Bechtel NCR No. C-5, Tendon Trumplate Documentation (September 28, 1973)

Eighteen tendon trumplate assemblies, supplied by Inland-Ryerson Construction Products Company and received at the site, did not meet documentation requirements. Corrected and missing documentation was subsequently received and accepted by Bechtel and considered to meet the applicable requirements. This NCR was closed out by Bechtel on January 31, 1974.

3. Bechtel NCR No. C-16, Rust Inside Type B Cadweld Sleeves (November 16, 1974)

Although storage protection measures appeared to be adequate, rust was found by Bechtel inside some Cadweld sleeves during inspection prior to use. Bechtel engineering approved the cleaning method, and the disposition of this NCR was accepted by Bechtel QC. This NCR was closed out by Bechtel on January 14, 1974.

4. Bechtel NCR No. C-27, Disposition of NCR No. C-4 (December 5, 1973)

During visual inspection, following "leak chase" channel defective weld removal (NCR No. C-4), a defective liner plate area (laminations) was identified under the "leak chase" channel repair location. Since this liner plate defect was too large to repair by adding weld metal, a deviation from the stated disposition of NCR No. C-4 was required. This NCR was closed out by Bechtel on January 25, 1974.

5. Bechtel NCR No. C-29, Revision 1, Welding of Cadweld Sleeves to Liner Plate (December 12, 1973)

The welding procedure used to weld two Cadweld sleeves to the liner plate was not specified in Bechtel Specification No. C-111, but these welds were welded according to Bechtel Welding Procedure Pl-A-LH. NCR No. C-111 is being revised (by SCN C-111-4001 dated February 13, 1974) to include removal and replacement of Cadweld sleeves to liner plate assemblies. NCR No. C-29, Revision 1, was closed out on January 8, 1974, by Bechtel after engineering approval to use these sleeves as is.

6. Bechtel NCR No. C-42, Gallery Trumplate Assemblies (December 20, 1973)

Tendon trumplate assemblies do not conform to applicable requirements relative to grease vent plugs, protective coating, and exposed surface condition. Recommended disposition appears to be adequate. Corrective action is in progress, and some work has been completed. This matter is considered to be an unresolved matter by RO:III, pending completion of the required corrective action.

7. Bechtel NCR No. 50, Revision 1, Frequency of Aggregate Gradation Analysis (February 1, 1974)

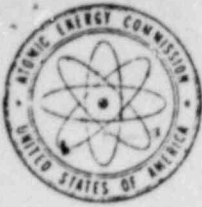
The site testing laboratory did not meet the frequency requirements for gradation of incoming concrete aggregate as stated in their QA manual during the period December 3, 1973, through January 16, 1974.

It was determined that the Midland Plant PSAR does not require gradation analysis of incoming aggregate, but aggregate sampling is required by applicable specifications (and made) at the batch plant prior to loading aggregate in the batch plant bins. Corrective action by Bechtel included the generation of SCN No. C-208-4403 (approved April 12, 1974) which modifies the applicable materials testing specification (Bechtel Specification No. C-208, Revision 2) to specify the type and frequency of incoming aggregate sampling. This change is to be reflected in the site testing laboratory contractor's QA manual. In addition, the Bechtel QC test laboratory supervisor is to audit the site testing laboratory logs of incoming aggregate on a weekly basis.

Bechtel QC concurrence with the disposition of this NCR is dated February 1, 1974.

8. CP Nonconformance Report No. QF-4 (January 16, 1974)

This nonconformance, welding of liner plate "leak chase" channels not in accordance with the applicable procedure, was considered to be a violation of AEC requirements (RO Inspection Reports No. 050-329/74-04 and No. 050-330/74-04). During the March 1974 RO Inspection, it was determined that the implementation of corrective action was adequate.



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A. RO Inspection Report No. 050-329/74-07 and 050-330/74-07

Transmittal Date : May 14, 1974

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

Transmittal Date : _____

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C. Incident Notification From: _____
(Licensee & Docket No. (or License No.))

Transmittal Date : _____

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