U. S. ATOMIC ENERGY COMMISSION
DIRECTORATE OF REGULATORY OPERATIONS

REGION III

Report of Construction Inspection

RO Inspection Report No. 050-329/73-05
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Licensee: Consumers Power Company
212 W. Michigan Avenue
Jackson, Michigan 49201

Midland Plant, Units 1 and 2
Midland, Michigan

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

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

Type of Inspection: Special, Announced
(Restart of construction)

Date of Inspection: June 26-28, 1973

Date of Previous Inspection: June 14-15, 1973

R.A. Rohrbacher

Principal Inspector: R. A. Rohrbacher 7-13-73 (Date)

C.M. Erb

Accompanying Inspector: C. M. Erb 7/13/73 (Date)

Other Accompany'ng Personnel: None

W.E. Vetter

Reviewed By: W. E. Vetter, Chief 7-16-73 (Date)
Reactor Construction Branch

SUMMARY OF FINDINGS

Enforcement Action

A. Violations

No violations of AEC requirements were identified.

B. Safety Matters

No significant safety items were identified.

Licensee Action on Previously Identified Enforcement Matters

No previously identified enforcement matter remained unresolved at the time of this inspection.

Design Changes

No design changes were identified.

Unusual Occurrences

No unusual occurrences were identified.

Other Significant Findings

A. Current Findings

1. Facility Status

The licensee estimated current project status as follows.

Activity	% Completion
Engineering	30-35%
Site construction	1-2%

2. Construction Work to be Performed During Period Ending September 30, 1973

a. Continue removal of temporary enclosures, removal of straw, and general site clean-up to allow construction activities to continue.

b. Continue clean-up and restoration, inspection of existing materials and complete approximately during the latter part of July 1973.

c. Batch plant operations to include check out and testing of equipment, calibrating of scales, and other weighing and measuring devices - also to include synchronizing mem-o-tizers and weights for print-outs.

d. Plant is expected to be ready for operation by mid-July. Mix designs and testing of materials will be accomplished after Pittsburgh Testing Lab. arrives at the site on or about July 9, 1973 for interim testing. All trucks presently at the site are expected to be checked out and in proper condition by mid-July 1973.

e. Waterproof membrane will be cleaned up, repaired or replaced as required. It is anticipated that this will take place in July.

f. Reactor Building No. 2 concrete activities during the reporting period will include form erection, rebar and embedded metal installation and placing concrete in the tendon access gallery and base slab.

g. Reactor Building No. 1 concrete activities for the reporting period will include form erection, embedded metal and rebar installation and placing concrete in the base slab.

h. Auxiliary Building concrete activities will include form erection, embedded metal and rebar installation and concrete placement from line D to line G, elevation 568' to elevation 573'.

i. Reactor Building No. 1 liner plate activities will include initiation and pursuance of erection of jigs and fabrication of the first lift from elevation 593' to elevation 673'.

k. The subcontract earthwork activities will include reconditioning of the NE dike, preparation and backfill for the laydown area and preliminary work on the access road modifications.

3. Licensee-Contractor QA/QC Personnel

The following quality assurance, quality control and quality-related personnel are expected to be at the Midland construction site during the period from July 1, 1973, to September 30, 1973.

a. Consumers Power Company

C. Q. Hills, Quality Assurance Administrator
R. E. Whitaker, Quality Assurance Engineer

W. E. Kessler, Project Manager
M. P. Hanson, Project Engineer
R. L. Teuteberg, Assistant Project Engineer
T. C. Cooke, Project Superintendent
B. H. Peck, Field Supervisor (Mechanical)
D. R. Keating, Field Engineer (Mechanical)
J. L. Corley, Civil Supervisor

b. Bechtel Corporation

E. E. Felton, Project Superintendent
J. I. Dotson, Project Quality Assurance Engineer
H. Lilligh, Quality Assurance Engineer
F. W. Joyce, Quality Control Supervisor
C. E. Kinney, Project Field Quality Control Engineer
T. C. Valenzano, Project Field Engineer
R. R. Grote, Lead Field Civil Engineer
K. F. Pulito, Lead Field Mechanical Engineer
J. P. Newcomb, Senior Engineer
H. L. Hondorp, Engineer (Metallurgist)

c. Changes

G. L. Richardson is to be assigned to the Midland Project prior to September 30, 1973, as a Quality Assurance Engineer for the Bechtel Corporation.

4. Nonconformances

Consumers Power Company did not issue any nonconformance reports during the month of June, 1973.

During the inspection, a need for issuance of nonconformance reports was not in evidence, and the licensee stated that no nonconformance reports were required or issued.

5. Present Activities

Although new construction had not begun during the current inspection, about 50 people are at the site doing preconstruction and restoration work in preparation for the restart of construction. The work in progress included the removal of protective enclosures and materials from existing concrete slabs and structures, site clean-up, preliminary non-Class I earthwork, renovation and testing activities at the concrete batch plant, inspection of construction work completed prior to construction shutdown in December of 1970, and the inspection of materials and components stored on, or near, the construction site during the construction shut-down period.

Both Consumers Power Company (CP) and the Bechtel Corporation (Bechtel) have established construction offices at the site.

B. Unresolved Matters

1. Restoration and Pequalification of Site Stored Components

Carbon steel components stored outside at the site have rusted to varying degrees. Work and quality control procedures are being developed by CP to verify that all components used will meet applicable requirements. This matter remains open pending review of completed procedures and an evaluation of procedure implementation. (Paragraph 1)

2. Evaluation of Rebar Tie Wire

Significant deterioration of some tie wire holding exposed reinforcing steel in place is such that the required support function during concrete placement is subject to question. Inspection of the wire and serviceability evaluation are planned by the licensee. This matter will be reviewed during a subsequent inspection. (Paragraph 2)

C. Status of Previously Reported Unresolved Matters

Bechtel Corporation Organization for the Midland Project (RO Inspection Reports No. 050-329/73-02 and 050-330/73-02)

In response to a request from RO:III during the referenced inspection, CP provided RO:III with a modified Bechtel organization chart. After a review of this chart (which was received by RO:III on May 7, 1973), and discussions with CP and Bechtel personnel during the current inspection, it was not clear to RO:III that all requirements of 10 CFR 50, Appendix B, Criterion I, were met. This matter remains open pending further clarification and/or changes. (Paragraph 5)

Management Interview

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

Consumers Power Company

W. E. Kessler, Project Manager
C. Q. Hills, Quality Assurance Administrator
T. C. Cooke, Project Superintendent
R. E. Whitaker, Field Quality Assurance Engineer

Bechtel Corporation*

E. E. Felton, Project Superintendent
J. I. Dotson, Project Quality Assurance
C. E. Kinney, Project Field Quality Control Engineer

*Part time

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

1. The present condition of the concrete structures placed prior to the cessation of construction activities in 1970 was discussed. The inspector stated that a visual inspection of placed concrete, currently exposed (some concrete is yet to be uncovered) for the Auxiliary Building and Reactor Buildings No. 1 and 2, was made and the results of this inspection, and conclusions on the part of the inspectors, were consistent with the results and conclusions contained in a Bechtel report on this subject. The inspector further stated that the concrete observed appeared to be in good condition and that additional existing concrete would be inspected when form removal and cleanup is completed. CP stated that specialists from Bechtel will be used on a continuing basis to examine and evaluate concrete and rebar.

   In response to a question concerning severe rusting of rebar tie wire, a representative of CP said that the tie wire would be inspected and that continued use of the wire would depend upon the results of inspection and evaluation.

2. Procedures to requalify rusted carbon steel components (plate, pipe, rebar, penetration, etc.) were discussed. CP stated that plans are being made to requalify these components. The liner plates are to be transported to a jig to facilitate cleaning and dimensional checks. The requalifying plan includes QC inspection prior to use or installation and, unless all applicable requirements are met, the plates are to be classified as nonconforming material and processed in accordance with 10 CFR Part 50, Appendix B.

3. The CP program covering soil analysis and stored material wipe sampling was discussed. CP stated that this program was started in 1970 but halted during the construction shutdown. CP further stated that this program would be reinitiated, and that full evaluation of results would be performed and documented.

4. In response to a request, CP indicated that copies of all reports related to the results of work performed to determine the affect of the environment on materials, components and structures during the construction delay would be sent to RO:III.

5. The current Bechtel organization for the Midland project was discussed with CP and Bechtel representatives. Following discussion, the inspector stated that he more fully understood the Bechtel organization chart but that it was not clear that all requirements of 10 CFR 50, Appendix B, Criterion I, were being met. Additional discussions on this matter are planned. (Paragraph 5)

6. In response to a question regarding concrete batch plant status, CP stated that Champion, Inc., personnel were reactivating and requalifying the plant, and that calibration of measuring equipment and evaluation of previously stored materials (such as fly ash) for suitability were in progress.

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

B. H. Peck, Field Supervisor (Mechanical)

Champion, Inc.

P. E. Schmansky, General Superintendent
L. P. McConnell, Electrical and Safety Engineer

Bechtel Corporation

H. L. Hondorp, Engineer (Metallurgist)
R. L. McDonald, Senior Corrosion Engineer

Results of Inspection

1. Restoration and Requalification of Site Stored Components

Carbon steel construction materials and components stored outside at the site have rusted to varying degrees. Extensive rusting was in evidence on surfaces where water had collected. The rust appears to be fairly uniform on the surface with no evidence of severe pitting. The licensee has arranged for specialists from Bechtel to inspect these components and to determine whether or not the components can be restored within the parameters of the original specification requirements.

The following Class I (Q-listed) components were visually examined by the RO inspectors during the inspection of yard storage areas.

a. Curved wall plates (containment liner) with attached reinforcing bars.

b. Containment penetration components.

c. Polar crane trolley.

d. Polar crane wall support steel and connecting track beams.

Surfaces of the above components to be installed within the containment building, with the exception of the outside surface of the liner plate, were coated with a protective coating (Carbozinc 11 or similar coating) prior to shipment to the site. This coating prevented, or greatly inhibited, rusting of the coated surfaces of these components.

Approximately 24 stainless steel pipe sections (2", 4", and 24" in diameter) were visually inspected in a warehouse. The pipe sections were free of surface dirt, end caps were in place, identification marks visible, and the pipe was covered with plastic sheets.

A representative of the licensee stated that all Q-listed materials and components stored at the site during the construction shutdown period are to be inspected, restored, and requalified prior to use in installation. The development of procedures to do the above work is in progress.

2. Evaluation of Rebar Tie Wire

The inspector noted that the tie wire used to hold the reinforcing steel bars in place contained varying amounts of surface rust. Rather severe rusting on some of these wires indicated possible weakness due to loss of material. A representative of the licensee stated that the subject wire would be examined and tested, as needed, to assure that, during construction activities including concrete placement, the required immobility of rebar would be maintained.

3. Soil Analysis and Wire Sampling Program

CP initiated the subject sampling program early in 1970. Data were collected in the Spring of 1970 and in the Summer of 1971. The intent of this program was to identify the existence, and amounts of, chloride and other airborne contaminants, which may have come into contact with stored metallic components during the construction shutdown. CP stated that this program would be brought up to date in terms of data analysis and continuing sampling.

4. Condition of Existing Structures and Stored Components

The status of the implementation of the CP program to determine the current quality of structures and components subject to environmental conditions during the construction shutdown appears in the attached Appendix A of this report.

5. Bechtel Organization for the Midland Project

Subsequent to the previous inspection (Management Meeting with CP on April 17, 1973), CP sent RO:III a modified Bechtel organization ch

for the Midland project. Although this modified chart was a little more detailed than the previous one, it was more confusing because six types of reporting and directing responsibility lines were used. Explanation and discussion of this chart with CP and Bechtel personnel during the current inspection provided some clarification. A Bechtel representative stated that the QA engineers do monitor and audit the work of the QC engineers. An explanation of the QA portion of the chart was fairly clear and appeared to meet the requirements of 10 CFR 50, Appendix B. However, the chart shows the Project Field QC Engineer (to whom the QC engineers report) reporting directly to the Project Superintendent. This Project Superintendent has cost and scheduling responsibilities. That is, he has construction (craft) superintendents, a materials supervisor and field engineers under his direction.

A representative of Bechtel stated that the QC engineers inspect, check and otherwise verify correctness of work performed by others (employees of subcontractors), but they also perform the same QC function for other Bechtel subgroups that ultimately report to the same project superintendent. Consequently, the QC engineers do not appear to be free from influence and control of groups doing the work. Conversely, a project superintendent who has QC engineers working for him does exercise some controlling and directing function over them. This remains an open issue to be resolved during the next site inspection, currently scheduled to performed on July 18 - 20, 1973.

APPENDIX A

Status of Implementation of Condition 1 of ALAB-106

1. Identification

Previously completed construction work related to nuclear safety (Q-listed) has been identified by CP, and the listing has been grouped under the following headings: Auxiliary Building, Reactor Building No. 1, Reactor Building No. 2, and Site Excavation and Backfill. It was determined from a visual inspection that this listing appears to represent the actual construction completed prior to the construction shutdown in late 1970.

Materials and components (Q-listed) stored at the site since cessation of construction have been categorized by the licensee. During the inspection of these stored Q-listed items, the inspectors determined that the listings appeared to be correct and that components were readily identified by reference to component markings. Stainless steel piping was observed to be stored under plastic in a warehouse.

2. Evaluation of Present Condition

a. Concrete Work

A report, titled "Interim Report on the Initial Examination of In-Place Materials, May 8 and 10, 1973" dated May 21, 1973, produced by F. W. Joyce, Supervising Civil Specialist, Bechtel (San Francisco) was reviewed. This report included the results of a visual inspection of the exposed structural concrete of the Auxiliary Building. A drawing, which mapped visually significant cracks, was examined also. A visual examination of the concrete structures and water stops included in the above report indicated that the report results and conclusions were consistent with conditions observed by the RO inspector.

An affidavit generated by F. W. Joyce, dated June 15, 1973, regarding a June 14, 1973, inspection of concrete in the Unit 1 Tendon Access Gallery, referencing an inspection performed by Joyce, R. Grote and F Kapla (all employeee of Bechtel) was reviewed. The results and conclusions in this affidavit were also in agreement with conditions observed and conclusions reached by the RO inspectors during the current inspection. That is, the cracks are of the normal shrinkage type and are not expected to adversely affect the structural soundness of the Unit 1 Tendon Access Gallery walls.

b. Concrete Batch Plant

The RO inspector observed that the concrete batch plant and concrete delivery trucks were in the process of renovation, testing, and requalification. Scales and other measuring devices were being checked and recalibrated. This work was being done by Champion, Inc., personnel. The licensee stated that test mixing is scheduled to be performed in early July, 1973, and that Pittsburgh Testing Laboratory personnel will be at the site at this time to sample and test the mixes.

c. Reinforcing Steel

The licensee stated that two specialists from the Bechtel San Francisco office were presently onsite to examine reinforcing steel (exposed embedded and stored) to determine the serviceability of the steel based on a determination of corrosion and material loss.

The RO inspectors visually examined the rebar in place for the Unit 2 Tendon Access Gallery walls. Except for surface rusting, the rebar appeared to be sound, free of severe pitting, and adequate for use. The licensee stated that inspection and testing of this (and other) rebar, as well as rebar tie wire, would be tested to verify that all applicable requirements are met prior to concrete placement in this area. To this end, the licensee stated that the CP chief metallurgist and chief civil engineer would be at the site during the week of July 2, 1973, to examine rebar, concrete and other materials.

d. Earth Work

The licensee stated that some soil borings were made during the week of June 11, 1973, by Soils Materials and Engineering, with representatives of Bechtel present, but that the results of soil analysis were not available yet. Some preliminary earth work (not Q-listed) has been started.

e. Containment Liner Plate Coating

A report titled "Interim Report on the Initial Examination of Liner Plate Coatings, May 1 and 2, 1973," dated May 18, 1973, by H. L. Hondorp, Engineer (Metallurgist), Bechtel, was reviewed. This report includes the results of an inspection by Messrs. Newcomb, Grote and Hondorp (all of Bechtel) and a Mr. Hinson (a Coating Specialist representing the Carboline Company) was reviewed in detail. A visual examination of about 25 liner plates by RO:III inspectors during the current inspection provide results consistent with the results, and

conclusions, contained in this report identified earlier in this paragraph; i.e, the protective coating inhibited rusting, all coated areas of the plates examined will require some surface preparation, and liner plates not examined will require examination to determine the extent of required rework.

f. Containment Liner Plate

The licensee indicated that only a preliminary examination of the containment liner plates had been completed. He added that all liner plates would be thoroughly reinspected and identified as restorable or reject. If determined to be restorable, the plate is to be requalified on the basis of a special QC inspection. Procedures to implement the above activity are being develcped.

g. Other Embedded and Stored Materials and Components

Components such as anchor bolts, polar crane supports, post-tensioning materials, cadweld material, are to be inspected, examined and measured, as appropriate, prior to use or installation.

During the inspection of the storage areas, it was observed that miscellaneous stored material and components were properly stacked off the ground and covered (if required).

It was further observed that new metal identification tags had been used to replace some plastic-over-paper tags which are becoming difficult to read.

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A. RO Inspection Report No. 050-329/73-05
050-330/73-05

Transmittal Date : July 16, 1973

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