

UNITED STATES NUCLEAR REGULATORY COMMISSION  
OFFICE OF INSPECTION AND ENFORCEMENT

REGION III

Report of Construction Inspection

IE Inspection Report No. 050-329/75-07  
IE Inspection Report No. 050-330/75-07

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 Licensee: PWR (B&W), Unit 1-650 MWe  
PWR (B&W), Unit 2-818 MWe

Type of Inspection: Routine, Announced

Dates of Inspection: October 23 and 24, 1975

Principal Inspector:

*I. T. Yin*  
I. T. Yin

10/30/75  
(Date)

Accompanying Inspectors: None

Other Accompanying Personnel: None

Reviewed By:

*D. W. Hayes*  
D. W. Hayes  
Senior Reactor Inspector  
Construction Projects  
Construction and Engineering  
Support Branch

10/30/75  
(Date)

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SUMMARY OF FINDINGS

Inspection Summary

Inspection on October 23 and 24, (Unit 1 75-07) and (Unit 2 75-07): Followup inspection on Unit 2 NSSS equipment onsite storage, previously identified unresolved matters and review of the engineering evaluation of auxiliary building rebar nonconformance.

Enforcement Items

None.

Licensee Action on Previously Identified Enforcement Items

None.

Other Significant Items

A. Systems and Components

The Unit 1 reactor vessel is scheduled onsite by October 26, 1975. As of October 24, 1975, the vessel has been unloaded from the barge and set on railroad cars 26 miles from the site.

B. Facility Items (Plans and Procedures)

None.

C. Managerial Items

An interview was held with the newly appointed Consumers Power Company's (CP's) Director of Project Quality Assurance Services Department (PQASD) Mr. F. Southworth. The topics discussed included: (1) past work experience, (2) nuclear plant construction and operation, (3) awareness of NRC regulations, (4) present plans (5) future departmental goals, and (6) planned site visit schedules.

D. Noncompliance Identified and Corrected by Licensee

None.

E. Deviations

None.

F. Status of Previously Reported Unresolved Items

1. Unit 2 NSSS Equipment Onsite Storage (RO Inspection Reports No. 050-329/74-11 and No. 050-330/74-11)

Removal of the Spraylat coating and the installation of tarpaulins have been completed for the major components. This item is considered resolved. (Report Details, Paragraph 2)

2. Item No. 6, in Appendix A, IE Inspection Reports No. 050-329/75-05 and No. 050-330/75-05

The PQASD of CP has issued summaries of CP, Bechtel Power Corporation (BPC) and Babcock and Wilcox Company (B&W) work programs and interfaces for the Midland project. The organizational structures, including QA work relations, are also included in a diagram.

Management Interview

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

Consumers Power Company (CP)

G. S. Keeley, Project Manager  
T. C. Cooke, Project Superintendent  
B. H. Peck, Field Supervisor  
H. W. Slager, Midland Project Quality Assurance Administrator  
J. L. Corley, Quality Assurance Superintendent

Bechtel Power Corporation (BPC)

T. C. Valenzano, Project Field Engineer  
G. L. Richardson, Lead Quality Assurance Engineer  
J. P. Connolly, Project Field Quality Control Engineer

Bechtel Associates Professional Corporation (BAPC)

J. L. Hurley, Assistant Project Engineer

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

1. The inspector stated that, he had reviewed the engineering analysis of the auxiliary building rebar nonconformance relative to the affect on structural integrity and had no further questions in regard to this matter. (Report Details, Paragraph 1)

2. The protection of Unit 2 NSSS equipment stored onsite has been a concern during previous inspections. To date, damaged Spraylat coating has been removed from major components and covers have been installed. Although some work remains to be completed this item is considered resolved. (Report Details, Paragraph 2)

## REPORT DETAILS

### Persons Contacted

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

#### Consumers Power Company (CP)

R. W. Rogness, Senior Engineer  
D. E. Horn, Field Quality Assurance Engineer - Civil

#### Bechtel Power Corporation (BPC)

W. F. Holub, Project Quality Assurance Engineer

#### Bechtel Associates Professional Corporation (BAPC)

M. El-Gaaly, Civil Discipline Engineer  
R. V. Regupathy, Civil Discipline Engineer

### Results of Inspection

#### I. Auxiliary Building Structural Rebar Nonconformance

It was reported by the licensee on August 21, 1975, that a number of tiebars had been left out during auxiliary building concrete pours. Bechtel Nonconformance Report NCR-326 identifies that the missing 42 sets of tiebars are located in the "Hk" line wall, between column lines 7.8 and 8.6. The approximate dimensions of the wall are 15' x 15' x 3.5', with an 8' diameter pipe tunnel opening. The original design called for 23 sets of double No. 6 ties for the horizontal concrete beam and 19 sets of double No. 6 ties for the vertical beam, above and on one side of the pipe tunnel. Instead, only single No. 6 ties had been placed during the pours.

In the original calculation, the wall was modeled as a thick plate with fixed edges only on three sides, since there is no structural continuity between the wall and the Unit 2 reactor containment building. The moments and shears caused by the saturated soil pressure (a static loading) were obtained from tables contained in "Moments and Reactions for Rectangular Plates", by W. T. Moody, published by the Bureau of Reclamation.

Results were modified with consideration of the open tunnel area which calls for additional local reinforcement. The dynamic effects were calculated, based on "Design of Earth Retaining Structures for Dynamic Loads", presented at the 1970 ASCE conference, by H. B. Seed. The static and dynamic loading combination was computed in accordance with the requirements indicated in Midland PSAR, Appendix 5A.

The evaluation of the existing condition for structural adequacy was performed, applying MRI/Stardyne 3, "Static and Dynamic Structural Analysis Systems", a computer program developed by Control Data Corporation. The use of a finite element analysis, instead of table values, means a large difference in design time and cost, but will likely prove that, with the missing tiebars, the design intent still will not be violated. The loading criteria, the nodal description and system modeling, based on the Martin Triangular Plate Elements (part of Stardyne 3) and the configuration (nodal coordination) were checked and verified by qualified engineers. The program output on bending moments, shears, and torsional moments were plotted for all critical wall sections. All calculated stresses, based on computer data, met allowables in stress categories of: (1) bending of edge beam, (2) torsion in the slab and edge beam, (3) shear in edge beam, (4) adequacy of stirrups (tiebars) around the hole, and (5) bend moment in the slab.

The computer program selection and loading conditions were considered to be appropriate. The computation and verification were handled in a professional manner, and documentation appeared to be sufficient. Based on this review together with a similar evaluation carried out by the licensee Engineering Department and corrective action to prevent recurrence, the inspector stated he had no further questions in regard to this matter at this time.

## 2. Unit 2 NSSS Equipment Protection for Onsite Storage

After removal of the damaged Spraylat coating from the reactor vessel, the two steam generators, the pressurizer, and the reactor cover head, custom designed tarpaulins were installed on these components with proper framing to prevent moisture condensation. The installation was considered to be in compliance with approved procedures. The tarpaulin material appeared to be strong and durable, the vessel internal moisture control was in effect, and the dunnage for supporting the equipment was in good condition. Although work remains to be completed for the primary piping, sufficient evidence exists to indicate protection of NSSS equipment onsite will continue and this item is considered closed.

3. Open Items Identified in RO/IE Inspection Reports Since 1970

The following open items, listed in the appendix of IE Inspection Reports No. 050-329/75-04 and No. 050-330/75-04, were resolved during this inspection. To date six of the 16 open items remain unresolved.

IE:III Report No.	CP's No.	IE:III Report Section	Summary of Open Items	Resolution
70-6	F	Summary 4 II-9-b	Concrete pour location QA and QC did not promptly identify and correct apparent deviations from the standards.	The additional QA/QC personnel training records were reviewed by the inspector. The present work performance is considered satisfactory.
70-6	J	Management Interview No. 7	Questionable practice of only having one signature appear on QA audit forms, i.e., same person requested by, audited, by, and reviewed by.	Records show that reviews of QA audits were performed by different people since then.
70-6	K	Management Interview No. 8 II-8-6 II-8-d	Incorrect concrete formula number on concrete transit ticket - steps will be taken to assure review of documentation Class 1 pours. Printout malfunction.	Field audit checklists had included formula number check as part of the review of batch plant tickets.
73-3	C	AEC Letter 6-21-73  Management Interview B-4 Results of Inspection 4-C	Perform evaluation of compliance of electroslag welding. Regulatory Guide 1.34. CP will followup on audit.	The application of Regulatory Guides in all disciplinary areas for Midland is presently under review by NRC-RL. This item is being removed from IE:III list of unresolved matters.

IE:III Report No.	CP's No.	IE:III Report Section	Summary of Open Items	Resolution
73-6	P	QAF-7	Requirements for receiving, inspection, storing, protecting and use of materials not included in Midland FIM.	Bechtel Quality Audit Findings No. 007 dated July 18, 1973, indicated that such requirements were included in Midland FIM Procedure G-1, paragraphs 2.5 and 3.10.
73-11	E	1-b-4	QA administrator on-site one day every two weeks.	Such activities had been documented. In view of present construction activities and licensee's and A-E's QA/QC performance, subject requirement is recommended but not considered mandatory.
74-10	D-1	Results of Inspection No. 5	Third party (2) review CP audits of contractor's performance to date.	Review of CP's QA Audit Reports had been performed by the GE Apollo team. The inspector reviewed the records and considers this item closed.