

U. S. NUCLEAR REGULATORY COMMISSION  
OFFICE OF INSPECTION AND ENFORCEMENT

REGION III

Report of Construction Inspection

IE Inspection Report No. 050-329/75-01  
IE Inspection Report No. 050-330/75-01

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

Midland Units 1 and 2  
Midland, Michigan

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

Type of Licensee: PWR (B&W)

Type of Inspection: Routine, Unannounced

Dates of Inspection: February 5-7, 1975

Dates of Previous Inspection: December 11-13, 1974 (Construction)

Principal Inspector: *T. E. Vandell*  
T. E. Vandell

2-25-75  
(Date)

Accompanying Inspectors: *I. T. Yin*  
I. T. Yin

2/28/75  
(Date)

*E. W. K. Lee*  
E. W. K. Lee

2/25/75  
(Date)

Other Accompanying Personnel: None

*D. W. Hayes*  
Reviewed By: D. W. Hayes, Senior Reactor Inspector  
Reactor Construction Branch

2/28/75  
(Date)

8006200 667

SUMMARY OF FINDINGS

Enforcement Action

A. Noncompliance

No noncompliance of NRC 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 remain unresolved.

Design Changes

None

Unusual Occurrences

None identified

Other Significant Findings

A. Current Project Status

1. Percent Facility Completion

Engineering - 37%  
Construction - 9.2%

2. Concrete Placed in Cubic Yards

Unit 1 - 5,783  
Unit 2 - 17,980

Auxiliary Building and common facility - 12,336

3. Percent Liner Plate Completion

Unit 1 - 34%  
Unit 2 - 61%

4. Delivery of Babcock & Wilcox Company (B&W) NSSS Components for Unit 2

Delivered at site - 2 steam generators  
1 pressurizer  
1 reactor vessel  
1 closure head  
All the primary coolant piping

5. Liner Plate Coating Status

a. Unit 1

First Lift	P*	Complete
(erected)	F*	One of the two coats done
Second Lift	P	None
	F	None

b. Unit 2

First Lift	P	Complete; possible fire damage
(erected)	F	None
Second Lift	P	Complete
	F	One of the two coats done

\*P - Prime coat, carbozinc 11

\*F - Finish coat, phenoline 305

B. Unresolved Matters

1. Unit 2 Containment Rebar Spacing

Review of documentation developed in connection with the containment rebar spacing nonconformance resulted in a request for additional information pertaining to design calculation parameters. (Report Details, Section I, Paragraph 1)

2. Long-Term NSSS Equipment Storage

The external surface protective coating (Spraylat) on some NSSS equipment was damaged and stripped off. This matter is considered unresolved upon conditions of repair work done. (Report Details, Section I, Paragraph 3)

3. Extended Long-Term NSSS Equipment Storage

Procedures for NSSS equipment that will be stored onsite for more than one year, due to prolonged construction schedule, were not available for review at the time of the inspection.

4. Discrepancy Between PSAR and Specification 7220-C-230

The slump criterion stated in the PSAR and specification 7220-C-230 appears to be discrepant. (Report Details, Section II, paragraph 3)

C. Status of Previously Reported Unresolved Matters

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

The licensee has not yet inspected and documented NSSS equipment internals "as received" conditions. This item was considered unresolved.

2. Water in Unit No. 1 Containment (RO Inspection Reports No. 050-329/74-11 and No. 050-330/74-11)

Unit No. 1 containment steel liner plate floor section welding had been completed. Nitrogen purge has been applied on all leak chase internals. The inspector reviewed CP Project QA Service Daily Log Sheet indicating: (1) observation on welding, (2) removal of water prior to welding, (3) welders's qualification check, and (4) proper procedures used. The matter was considered resolved.

Management Interview

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

Consumers Power Company (CP)

W. E. Kessler, Project Manager  
T. C. Cooke, Project Superintendent  
H. H. Slager, Project Quality Assurance Administrator  
J. L. Corley, Field Quality Assurance Engineer  
B. H. Peck, Field Supervisor

Bechtel Power Corporation (Bechtel)

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

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

1. The inspector stated that the corrections and resolution of the rebar spacing nonconformance appear to be adequate, with the exceptions of some questions raised relative to the design parameters used in the calculation of the structural integrity of the containment wall. The licensee indicated that additional information would be developed and that this would be expected to be completed by early March 1975.

2. The inspector stated that he had no further questions relative to the fire damage of Unit 2 containment. However, he urged that the engineering disposition of NCR No. 239 (for the liner coating repairs) show some considerations of possible adverse impact for an 18-month delay in completion of repair. The licensee indicated that it would be taken into consideration.
3. The inspector indicated his understanding that the licensee is planning to inform Region III by letter of the personnel changes affected by the curtailment of construction activities. The licensee indicated that a letter is presently being prepared and that, in addition, the Licensing Board will be informed, also by letter, in the near future.
4. The inspector indicated that present long-term NSSS equipment storage procedures and surveillance program appear to be in effect and adequate. (Report Details, Section I, Paragraph 3)
5. The inspector questioned the meaning of extended long-term storage of NSSS equipment onsite. The licensee responded that "extended long term" means more than a one-year period. The licensee has committed April 1, 1975, as a target date to complete their studies and furnish a workable procedure for the task.
6. The inspector stated that Unit No. 1 containment water problem during base plate welding has been resolved and that he had no further questions.
7. The inspector acknowledged the licensee's comments on the last inspection report (No. 050-329/74-11 and No. 050-330/74-11) and will record these comments in the next inspection report (Attachment A, this report).
8. The inspector stated that, during the review of concrete placement records for pours No. CC(622.25)a' and No. A(589.75)a', he established that there appears to be no systematic method of obtaining samples for slump, air, and strength tests relative to complying to the sampling frequency as stated in the PSAR and the specification. The licensee agreed to investigate and, if possible, establish a systematic method of obtaining samples.
9. The inspector stated, during the review of NCR's submitted by the licensee, the following areas appear to be possible generic problems:
  - a. A number of NCR's were initiated because of equipment and/or materials arriving at the job site without proper documentation.

b. NCR's do not appear to be closed out in a timely manner.

The licensee acknowledged the above comments and stated that the Bechtel "Procurement Inspection Department Manual" has been revised to improve item a. above. The licensee also stated that effort will be made to close out NCR's in a more timely fashion.

10. The inspector indicated that seven NCR's were reviewed for documentation and close out with no problem areas being identified.

## REPORT DETAILS

### Section I

Prepared By: I. T. Yin

#### 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)

D. J. Vokal, Field Engineer - Mechanical  
R. E. Witaker, Field Quality Assurance Coordinator  
D. R. Keating, Field Quality Assurance Coordinator - Mechanical  
C. A. Hunt, Executive Engineer  
R. W. Rogness, Senior Engineer

##### Babcock and Wilcox Company (B&W)

V. N. Asgaonkar, Site Representative

#### Results of Inspection

##### 1. Unit 2 Containment Liner Rebar Spacing Nonconformance

The inspector reviewed the rebar spacing calculations and indicated that there was insufficient information on documentation and justification of formulas chosen, design and analysis conditions assumed, and the allowables used. Verification checklists should also be a part of the report presentation. The licensee has committed March 15, 1975, as a target date to resubmit calculations for IE:III inspection review.

The inspector reviewed: (1) Bechtel QA to CP letter, dated January 24, 1975, transmitting Field Instruction Civil (FIC) No. 7, approved on January 23, 1975, to be used on rebar spacing inspections. This instruction detailed the reasonable, usual occurring deviations from spacing of rebars which can be allowed, and the others that must be documented and approved, and (2) Bechtel QC to CP letter, dated January 24, 1975, stating that a review indicated that proper rebar spacing had been maintained in accordance with FIC No. 7. The inspector was informed by the licensee that a training session had been held on January 27, 1975, regarding this method. The rebar spacing check procedures appeared to be satisfactory.

The Bechtel specification on rebar spacing requirements had been revised (No. 7220-C-231, Revision 6, dated January 23, 1975, for paragraph 8.7.1.c) to delete some of the less definitive wordings.

2. Fire in Unit 2 Containment

Documentation was reviewed by the inspector that established the acceptability of the containment liner and concrete of Unit 2 containment that was subjected to a fire on November 21, 1974. The results of testing and the engineering evaluation appeared adequate and acceptable. Documentation reviewed included:

- a. Bechtel NCR's No. 266 and No. 238.
- b. An engineering evaluation and disposition prepared by Bechtel design engineers dated January 9, 1975.
- c. A report, titled "Evaluation of Liner Plate Sample," No. GS 15-1, completed by the Bechtel Quality Control Services Group in San Francisco.
- d. A Bechtel interoffice memo outlining the results of rebar tests.
- e. A Bechtel interoffice memo outlining the results of concrete examination.
- f. Bechtel NCR No. 239, waiting final disposition by engineering, covering the repair of the metal liner coating.

3. Outside Storage of NSSS Equipment

The inspector reviewed Bechtel's Unit 2 NSSS equipment long-term storage requirements and considered that adequate, protective measurements had been taken. These procedures had been approved by B&W, the NSSS supplier.

The inspector inspected the Bechtel storage and maintenance and/or inspection records and considered that a proper surveillance program on Unit 2 NSSS equipment had been in effect. The settlement readings on the Unit 2 reactor, steam generators, and pressurizer were required by B&W and recorded by Bechtel Engineering Department.

The inspector also reviewed handling procedures on NSSS equipment, qualifications and testings of the lifting machine and hardware, and also the personnel training and checklists for handling the NSSS equipment. Documentation appeared to be adequate.



Documents reviewed:

- a. Bechtel File No. F-1-73, Revision 2, dated November 20, 1974, Long-Term Storage Requirement for Unit 2 Reactor Vessel.
- b. Bechtel File No. F-1-75, Revision 1, dated November 20, 1974, Long-Term Storage Requirement for Unit 2 Reactor Vessel Closure Head.
- c. Bechtel File No. F-1-62, Revision 5, dated December 30, 1974. Long-Term Storage Requirement for Unit 2 Steam Generator.
- d. Bechtel File No. F-1-83, Revision 2, dated November 20, 1974, Long-Term Storage Requirements for Unit 2 Pressurizer.
- e. Bechtel File No. F-1-1, Revision 2, dated November 13, 1974, Long-Term Storage Requirement for Unit 2 Reactor Coolant Piping.
- f. B&W Construction Procedure Review Index No. 8, dated November 11, 1974, on Bechtel NSSS Storage Procedures.
- g. Bechtel Procedure Reviews on QC Storage Inspection Requirements, dated November 13, 1974, and November 22, 1974.

## REPORT DETAILS

### Section II

Prepared By: E. W. K. Lee

#### Persons Contacted

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

##### Consumers Power Company (CP)

D. E. Horn, Quality Assurance Engineer  
D. R. Keating, Quality Assurance Engineer

##### Bechtel Power Corporation (Bechtel)

L. R. Albert, Lead Civil Quality Control Engineer  
A. L. Boulden, Quality Control Welding Engineer  
R. L. Bowren, Assistant Project Field Quality Control Engineer  
J. C. Fitzgerald, Civil Quality Control Engineer  
W. J. Key, Quality Assurance Engineer  
J. W. Miller, Quality Control Engineers (Documentation)  
R. E. Sevo, Quality Assurance Engineer

#### Results of Inspection

##### 1. Observation of Concrete Work Performance

The inspector observed concrete placement (pour No. C(601.92)a) for Unit 1 containment exterior wall, elevation 591' - 6" to 601' - 11", and column blockouts at elevation 591' - 6", and the following were determined:

- a. Forms appeared to be tight, strong, and clean.
- b. Rebars appeared to be spaced properly.
- c. Field Inspection Plans No. C-231-2-431, Revision 0, dated December 4, 1974 (log No. 1327) and No. C-231-3-459, Revision 0, dated December 31, 1974 (log No. 1430) were signed off, where appropriate, as acceptable.
- d. Slump and air tests and temperature were determined to be within the range as specified. The label on air content test

equipment (I.D. UST equipment No. 77) indicated calibration was current.

- e. Two (2) placement crews were performing the work. Each crew consisted of ten (10) persons, and seven (7) vibrators per crew were used.

2. Review of Records

The following documents were reviewed and appeared to be acceptable:

- a. Bechtel Specification 7220-C-231Q, Revision 4, dated November 14, 1973, "Technical Specifications for Forming, Placing, Finishing, and Curing of Concrete."
- b. Bechtel Procedure No. FIC-3, Revision 0, "Concrete Placing Instructions for the Placing Crew."
- c. Field Inspection Plan No. C-231-2-332, dated September 18, 1974 (log No. 939).
- d. Field Inspection Plan No. C-231-3-340, Revision 2, dated October 1, 1974 (log No. 998).
- e. Field Inspection Plan No. C-230-95, Revision 1, dated October 1, 1974 (log No. 997).
- f. Field Inspection Plan No. C-208-49, Revision 3, dated October 1, 1974 (log No. 996).
- g. Slump, air and strength test records for tickets No. 03337, No. 03342, No. 03353, No. 03369, No. 03387, No. 03404, No. 03419, and No. 03439.
- h. The following cement certifications from Martin Marietta:
  - (1) Ticket No. 74-08732, dated December 27, 1974.
  - (2) Ticket No. 74-08729, dated December 27, 1974.
  - (3) Ticket No. 74-08720, dated December 26, 1974.
  - (4) Ticket No. 74-08717, dated December 26, 1974.
  - (5) Ticket No. 74-08712, dated December 26, 1974.
  - (6) Ticket No. 74-08703, dated December 23, 1974.
  - (7) Ticket No. 500198, dated January 27, 1975.

- (8) Ticket No. 500043, dated January 20, 1975.
- (9) Ticket No. 500041, dated January 16, 1975.
- (10) Ticket No. 500060, dated January 7, 1975.
- (11) Ticket No. 500061, dated January 7, 1975.
- i. The following fly ash certifications from Michigan Ash Sales Company:
  - (1) Ticket No. 20678, dated December 27, 1974.
  - (2) Ticket No. 20672, dated December 23, 1974.
  - (3) Ticket No. 20519, dated November 25, 1974.
- j. United States Testing Company, Test Reports No. 66, dated January 15, 1975, and No. 67, dated January 16, 1975, for Type II cement, fly ash water and aggregates.
- k. The following admixture certifications from Master Builders:
  - (1) Lot No. LP-672-Y4, shipment date November 20, 1974.
  - (2) Lot No. LP-060-X4, shipment date October 14, 1974.
  - (3) Lot No. LS-578-Y4, shipment date November 20, 1974.
  - (4) Lot No. LS-488-X4, shipment date October 14, 1974.
- 3. Review of Bechtel Specification No. 7220-C-230, Revision 5, Dated November 22, 1974, Entitled "Technical Specification for Subcontract for Operating Onsite Batch Plant and Furnishing Concrete for the Consumers Power Company Midland Plant"

The inspector reviewed the referenced specification, and the following was established:

PSAR, page 5-6, paragraph 5.1.1.3.1, states, in part, that:  
". . . . a low slump of two or three inches are used . . . .".  
Table 9.1, of the above specification, has a slump rejection limit of 4 1/2" to 5" pending on the classification of concrete. CP stated that this discrepancy is due to the fact that the specification has an inadvertency margin, and the PSAR will be revised accordingly. This matter will be reviewed during the subsequent inspection.

Attachment:  
A

ATTACHMENT A

IE Inspection Report No. 050-329/74-11  
IE Inspection Report No. 050-330/74-11

Corrections

SUMMARY OF FINDINGS

Other Significant Findings

A. Current Project Status

1. Percent Project Status

Engineering - 46%  
Construction - 9.5%

Delete information under Percent Project Status.

5. Liner Plant Coating Status

Correct information shown in this report under the same heading.

REPORT DETAILS

Results of Inspection

4. Outside Storage of Class 1 Materials

Third paragraph, second sentence:

Procedures F-7220-C-61 and -101 were used . . . . .

These are subcontractor's number, not procedures.

5. Concrete and Rebar Quality Assurance

First paragraph, second to the last sentence:

Temperatures of concrete (allowable range of 45-65°F) are checked . . . . .

Specification No. C-230, Revision 5, allows minimum 40°F to 80°F during cold weather condition, depending on the size of the section and whether the concrete has fly ash or not.

Specification No. C-230, Revision 5, allows minimum as near 50°F as possible and maximum 85°F, depending on the size of the section poured for hot weather concrete.

7. Site Preparation (Lakes and Dams)

Second paragraph, first sentence:

There are six (6) main zones of soil, including surfaces, and the specification governing compaction is D1557-66T.

D1557-66T - incorrect  
Cohesive Soils - ASTM D1557-70  
Cohesionless Soils - ASTM D2049-69

8. Steel Liner for Unit No. 1 Containment

First paragraph, second sentence:  
One welder . . . . Procedure P1AA1H.

Should be P1AC-Lh.

Third paragraph, last sentence:

Radiography was not . . . .100% RT . . . . only 10% RT is required.

In both cases, RT should be MP.

ATTACHMENT A

3. Bechtel NCR No. 90 - Underweight Cement Placed in Auxiliary Building . . . .

Concrete that has five pounds less required cement.

4. Bechtel NCR No. 91 - Liner Plate Thickness Deviation

Liner plate warpage.

UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
OFFICE OF INSPECTION AND ENFORCEMENT  
REGION III  
799 ROOSEVELT ROAD  
GLEN ELLYN, ILLINOIS 60137

A. IE Inspection Report No. 050-329/75-01  
050-330/75-01

Transmittal Date : March 3, 1975

Distribution:  
IE Chief, FS&EB  
IE:HQ (5)  
DR Central Files  
Regulatory Standards (3)  
Licensing (13)  
IE Files

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IE:HQ (4)  
L:D/D for Fuels & Materials  
DR Central Files  
IE Files  
IE Chief, M&PPB  
L:D/D for Reactor Project

B. IE Inquiry Report No. \_\_\_\_\_

Transmittal Date : \_\_\_\_\_

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IE Files

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

Transmittal Date : \_\_\_\_\_

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