

UNITED STATES NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

REGION III

Report of Construction Inspection

IE Inspection Report No. 050-329/76-09
IE Inspection Report No. 050-330/76-09

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

Midland Plants
Units 1 and 2
Midland, Michigan

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

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

Type of Inspection: Routine, Announced

Dates of Inspection: November 16-19, 1976

Principal Inspector: I. T. Yin

I. T. Yin
12/15/76
(Date)

Accompanying Inspector: C. M. Erb

D. W. Hayes
12/16/76
(Date)

Other Accompanying Personnel: None

Reviewed By: D. W. Hayes, Chief
Projects Section

D. W. Hayes
12/16/76
(Date)

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SUMMARY OF FINDINGS

Inspection Summary

Inspection on November 16-19, 1976, (Unit 1, 76-09) and (Unit 2, 76-09): Inspection of welding activities, reinforcing steel installation, site storage and document revision control. Review of safety related piping procedures relative to installation and welding. Followup on previously identified unresolved matters and deviation at the Bechtel Associates Professional Corporation (BAPC), Ann Arbor, Michigan office and at the Midland Construction site. Two items of noncompliance were identified relative to the handling of nonconforming rebars and the protection of reactor hold down studs.

Enforcement Items

Items of Noncompliance

Infraction

- A. Contrary to Criterion XVI of Appendix B to 10 CFR, Part 50, and Consumers Power Company Quality Assurance Policy No. 15, a Non-conformance Report was not written to identify the reinforcing steels that were broken due to bending for equipment installation access. This infraction applies to Units 1 and 2. (Paragraph 1, Section I, Report Details)
- B. Contrary to Criterion XIII of Appendix B to 10 CFR, Part 50, and Consumers Power Company Quality Assurance Program Procedure No. 18-2, hold down studs for the reactor vessel skirt were not protected, following installation of the embedments. This infraction applies to Unit 1 only. (Paragraph 1, Section II, Report Details)

Licensee Action on Previously Identified Enforcement Items

None reviewed.

Other Significant Items

- A. Systems and Components
 1. Bechtel design engineering office and Bechtel site construction document control appeared to be in good order. (Paragraph 2, Section I, Report Details)
 2. Unresolved Item - Quantities of wood were piled in the reactor pedestal area and in the approximately 36" diameter pipe which has an open end to the reactor pit. This item will be checked in a future inspection.

B. Facility Items (Plans and Procedures)

None.

C. Managerial Items

None.

D. Deviations

None.

E. Status of Previously Identified Deviations

Lack of BAPC Quality Assurance Training For The Working Level Design Engineers (IE Inspection Reports No. 050-329/76-04 and No. 050-330/76-04)

A new indoctrination and training procedure has been written for the design engineers. The inspector considered this new procedure acceptable. The procedural implementation will be inspected during a future inspection. This item remains open. (Paragraph 3, Section I, Report Details)

F. Status of Previously Identified Unresolved Items

1. IE Inspection Reports No. 050-329/76-02 and No. 050-330/76-02:

U.S. Testing Company (UST) Laboratory Personnel Training and Indoctrination

The activity was performed in accordance with UST revised procedures. This item is considered resolved. (Paragraph 4, Section I, Report Details)

2. IE Inspection Reports No. 050-329/76-04 and No. 050-330/76-04:

a. Bechtel QA Trend Analysis

The procedure for the subject matter and its implementation were reviewed by the inspector and the item is closed. (Paragraph 5, Section I, Report Details)

b. BAPC Using Department Standards to Replace or Supplement Engineering Department Procedure (EDP) and PSAR

BAPC decided to abandon the use of one of the Standards but to maintain two other ones. Further review of this matter is planned. (Paragraph 6, Section I, Report Details)

c. Bechtel QC Inspection Plan Submittal and Approval

Procedural requirement for the subject matter has since been revised. Bechtel resolution of this matter is considered acceptable. (Paragraph 7, Section I, Report Details)

d. Bechtel NCRs Without Sufficient Detail and/or Clarification

The new procedural provision for the preparation of NCRs appeared to be satisfactory. (Paragraph 8, Section I, Report Details)

3. IE Inspection Reports No. 050-329/76-06 and No. 050-330/76-06:

a. Onsite Storage of Pipe Spools

Laydown outside storage of safety related piping spool pieces has begun in the newly prepared area. There are no questions at this time on storage in this area.

b. Crane Platform Supports

Added dunnage has been laid to shore up the reactor building crane platform, and this item is considered resolved.

c. The Lifting and Placing of Heavy Components

The inspector discussed the engineering requirements for lifting heavy equipment. Immediate concern is the lifting of the Unit 2 containment liner dome. This matter remains open pending further review. (Paragraph 9, Section I, Report Details)

Management Interview

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

Consumers Power Company (CP)

- T. C. Cooke, Project Superintendent
- B. H. Peck, Construction Control Supervisor
- H. W. Slager, Project QA Administrator
- J. L. Corley, QA Superintendent
- D. R. Keating, QA Engineer

Bechtel Power Corporation (Bechtel)

P. A. Martinez, Project Manager
J. B. Newgen, Project Superintendent
J. M. Klacking, Project QA Engineer
G. L. Richardson, Lead QA Engineer
H. D. Foster, Assistant Project Field QC Engineer
B. T. Cheek, Lead Civil QC Engineer

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

1. The inspector discussed the infraction items identified during the inspection. (Enforcement Items, Summary of Findings)
2. The inspector stated that he had reviewed the Bechtel design office and site document revision control and they appeared to be adequate and effective. (Paragraph 2, Section I, Report Details)
3. The inspector discussed the status of some of the previously identified unresolved items. (Other Significant Items, Paragraph F, Summary of Findings)
4. The inspector stated that he had witnessed the welding and reviewed radiographs of several welds. The piping butt joints were made using the open butt method, and the radiography was acceptable. However, there was some lack of uniformity in the root. The inspector stated that every effort should be made to keep the root of welds of uniform contour which will be subject to inservice ultrasonic inspection. Also any grinding necessary on the weld outside reinforcement should be performed prior to plant criticality, as weld dressing after criticality in areas of high radiation is not practicable. The licensee stated they understood the importance of weld preparation prior to the preservice UT and PT examination.
5. The inspector stated that he reviewed storage conditions for certain electrical and instrumentation components and considered them good. The warehouse is controlled for temperature, humidity and air particulate content. The items in this area were Control Rod Drive units from Diamond Power Company, electrical panels from ITE and instruments from Bailey Meter.
6. The inspector stated that he examined two main steam penetration sleeves together with a number of embedments. The inspector stated that in some cases of outside storage the identification, painted numbers, had deteriorated and rust had also affected

the impression stamping for some components. He stated that where legibility of numbers is borderline identification should be renewed.

7. The inspector stated that he had examined the certifications for seismic Class 1 building beams, columns, bolts and nuts used in fabrication and found them to be in accordance with procurement and erection specifications.
8. The inspector said that he had found the 96 studs which will hold down the reactor vessel skirt, to be in some cases, unprotected from damage and two of them were minus any covering at all in the thread area. The licensee QC representative verified that this was true and stated that for some reason the transfer from a procedure governing storage to one governing "after installation" had not been performed. Subsequent to the inspection, the licensee was informed that this was considered to be contrary to the requirements of Criterion XIII of 10 CFR Part 50, Appendix B, and would be identified as an infraction in our report. (Paragraph 1, Section II, Report Details)

REPORT DETAILS

Section I

Prepared by I. T. Yin

Persons Contacted

In addition to the individuals listed under the Management Interview section of this report, the following persons were contacted:

Consumers Power Company (CP)

D. E. Horn, Field QA Engineer
J. Slagel, Field Project Engineer

Bechtel Power Corporation (Bechtel)

T. C. Valenzano, Project Field Engineer
F. G. Teague, Field Lead Civil Engineer
J. P. Connolly, Project Field QC Engineer

Bechtel Associates Professional Corporation (BAPC)

E. Rumbaugh, Manager of Engineering
J. Milandin, QA Manager
R. Castleberry, Project Engineer
J. C. Hink, Assistant Project Engineer
M. G. O'Mara, Quality Engineering Supervisor
R. Baltazar, Assistant Project Quality Engineer
D. T. Long, Project Administrator
J. C. Broome, Quality Engineer - Training Coordinator
G. Barduhn, Drafting Supervisor - Civil and Structural
A. Lutz, Document Coordinator

Results of Inspection

1. The Handling of Nonconforming Reinforcing Steels

10 CFR, Part 50, Appendix B, Criterion XVI, states, in part, "Measures shall be established to assure that conditions adverse to quality such as nonconformances are promptly identified...."

The CP Quality Assurance Policy, No. 15, Rev. 3, dated December 1, 1975, "Nonconforming Items," states, in part, "Items, services, or activities which are deficient in characteristic, documentation, or procedure which renders the quality unacceptable or indeterminate

and which is considered significant to safety, are identified as nonconformances. Nonconforming items (structures, systems components, parts, materials) are identified by marking, tagging, segregating, or by documentation. Nonconforming items are controlled to prevent their inadvertent installation or use."

In addition, Bechtel Power Corporation QC Notices Manual, SF/PSP G-3.2, Rev. 1, dated June 28, 1976, titled "Control of Nonconforming Items" Paragraph 3.2 Control of Nonconforming Items, Paragraph 3.2.4 (Partial) "Nonconformances discovered after final verification inspection of completed work shall be reported, controlled and dispositioned by the use of a Nonconformance Report....."

Paragraph 3.4 Installation and Further Work on Nonconforming Items, "Nonconforming items documented on a nonconformance report may be released for installation or further work subject to the following condition:"

(1).....

(2) "Traceability and identification as a nonconforming item are maintained by tagging or other appropriate methods so that the item can be removed or corrected at a later date prior to use."

Contrary to the above requirements, the inspector observed that two No. 11 rebars and one No. 8 rebar were broken because of bending for equipment installation access at east and west sides of the Engineering Safeguards rooms in the Auxiliary Building, Floor Elevation 586'-0". The identification and documentation were not available for review at the time of inspection. This is considered a noncompliance item that requires resolution by the licensee.

2. Bechtel and BAPC Document Control

The site and BAPC (design office) document control systems were inspected to verify that up-to-date documentation was maintained for the construction activities. On November 16, 1976, at the BAPC, Ann Arbor, Michigan office, the inspector reviewed: (1) Engineering Department Procedure, EDP 5.4, Rev. 0, dated May 17, 1974, entitled "Communication" (Types and Preparation), Paragraph 4.0, "Transmittals"; (2) Manager of Engineering Directive, MED 5.4-0, Rev. 3, dated September 8, 1976, entitled "Communication." The EDP 5.4 is to provide procedural guidance for transmitting design office specification, drawings, etc., and the MED 5.4-0 is for transmitting supplier documentation. Both procedures were considered to be satisfactory. Further, the inspector randomly selected, a list of current documents from the files controlled

by the Project Document Control Center and Design Engineering. The list included 25 drawings, six specifications, nine Field Change Requests (FCRs), and six Drawing Change Notices (DCNs). This list was then compared with the site control card files and no variation was identified. In addition, the inspector reviewed one questionable item discussed in IE:III Report No. 76-08, Details Section, Paragraph 10, concerning the deficiencies identified in BAPC drawing control logging system. The procedural requirement for the drawing control log is contained in EDP 3.10, Rev. 0, dated January 3, 1975, entitled, "Engineering Planning and Control," and is described as a part of the Bechtel Control Engineering Budget and Schedule (CEBUS) program. The control log is to provide engineering planning and cost control at the design office and at the site. The log has been checked for correctiveness at the site every month, and the record keeping extended to the logs of the last six months. The inspector determined that document control was being handled properly, and stated he had no further questions at the time.

3. BAPC Design Engineers Training Activities

The lack of BAPC Quality Assurance Training for the working level design engineers was disclosed during a previous IE:III inspection at the BAPC, Ann Arbor, Michigan office. Since then BAPC has prepared a new Engineering Department Project Instruction, EDPI-5.34.1, Rev. 0, dated August 9, 1976, entitled, "Midland Quality Program Indoctrination and Training." During this inspection, the inspector reviewed EDPI-5.34.1 in the areas of: (1) scope; (2) completeness of the procedure; (3) identification of implementation responsibility; and (4) Training and indoctrination program adequacy, and did not have any adverse comments. However, it is more appropriate to perform the inspection of procedural implementation at a later date when the entire program that is being carried out will be more visible, and the effectiveness of the training activities can be better demonstrated.

4. UST Laboratory Personnel Training and Indoctrination

Since the issuance of IE:III Report No. 76-02 in March, 1976, UST has made major revisions to their QA Manual. The new QA Manual which contains an additional nine (9) work procedures including procedures for training and indoctrination was reviewed and was considered to be adequate. (Midland IE Inspection Report No. 76-08)

During this inspection, the inspector reviewed the Bechtel Power Corporation (Bechtel) audit report No. 25-2-3, performed November 15-22, 1976. The UST personnel audited included the Laboratory

Chief, and six members of the work group. Audit findings identified certification and indoctrination deficiencies. The procedures to be checked for implementation included UST-TQ-1, Training and Qualification of Inspection, Test and Audit Personnel, Rev. 7, dated July 26, 1976, approved August 23, 1976. The Bechtel audit checklist, the qualification of the auditor and the audit performance were considered to be consistent with requirements. The UST training and indoctrination procedure was implemented in a timely manner.

5. Bechtel QA Trend Analysis

The lack of Bechtel QA trend analysis was previously discussed in IE:III Inspection Reports No. 76-04, Paragraph 4.d, Details Section; and No. 76-05, Paragraph 2, Section I, Details Section. During this inspection, the Bechtel Lead QA Engineer presented a new procedure contained in Bechtel Quality Assurance Department Procedure, Section C, No. 101, Rev. 0, issued on November 1, 1976, entitled "Project QA Quality Trend Analysis." The inspector reviewed this procedure in the areas of: (1) definitions; (2) problem area coverage; (3) methodology; (4) followup measure; and (5) documentation. The new procedure is considered to be adequate and satisfactory. The inspector also reviewed the trend analysis logs for various nonconformances and audit report findings, and the quality trend numerical analysis charts, and considered the records to be in order. The inspector further examined the trend analysis program assignments, and found total involvement of the entire site QA staff and the Project QA Engineer at the Ann Arbor office. This matter, a previously identified unresolved item, is closed.

6. Usage of BAPC Department Standards

The use of BAPC C-501, Civil Design Criteria and C-502, Civil Group Procedure to supplement the EDPs and PSAR was a concern previously expressed by the inspector and was recorded in IE:III Inspection Report No. 76-04 as an unresolved item. During this inspection, the inspector was informed by the licensee that they had visited BAPC on August 26, 1976, to review the Bechtel positions relative to C-501, C-502 and one other engineering procedure, the Plant Design Group's Procedures for On Project Coordination of Isometric, of a similar nature, disclosed during the visit. Subsequently, BAPC has abandoned the use of C-502, and maintained the use of the other two documents. While the licensee's position was in concurrence with BAPC's justification for using these two remaining supplementary types of documentation, they have tentatively scheduled an audit of C-501 against commitments of Midland PSAR for December 7-9, 1976. Further review of this matter is planned by the inspector.

Documents Reviewed:

- a. CP Ltr. to BAPC, HWS 73-76, dated September 8, 1976, recorded findings and unresolved matter as result of the visit.
- b. BAPC Ltr. to CP, HQA-797, dated October 12, 1976, addressed HWS 73-76, unresolved matters.
- c. BAPC Inter-office Memorandum (IOM), dated September 2, 1976, from Project Engineer (PE) to Project Quality Assurance Engineer (PQAE).
- d. BAPC IOM, dated October 6, 1976, from PE to PQAE.
- e. BAPC IOM, dated October 12, 1976, from PE to PQAE.
- f. BAPC IOM, dated October 6, 1976, from Civil Group Supervisor to Civil Group, indicated discontinue use of C-502.
- g. CP Ltr, to BAPC, HWS 91-76, dated November 15, 1976.
- h. CP Ltr. to BAPC, RLM 65-76, dated November 15, 1976, subject: "Audit of Bechtel - Ann Arbor QA Activities for Midland Plant Units 1 and 2."

7. Bechtel QC Inspection Plan Submittal and Approval

It was identified by the inspector and recorded in IE:III Inspection Report No. 76-04, that the practice of having the QCE submit inspection plans directly to the Field Coordinator did not appear to be consistent with paragraph 3.1 of the Bechtel Project Special Provision (PSP) No. 16, Rev. 0, dated October 2, 1974. Followup review of this matter disclosed that PSP No. 16, was subsequently replaced by SF/PSP G 6.1, Rev. 2, dated September 24, 1976, entitled, "Inspection Planning." Paragraph 8.0, Field Implementation, of the PSP G 6.1 outlined the revised procedures for Bechtel QC inspection plan submittal and approval. This matter is considered resolved.

8. Clarification of Bechtel NCRs

Previous review of Bechtel NCRs indicated that some of the NCRs were unclear or they did not provide sufficient detail such that the exact nature of the discrepancy was not apparent. Since then, Bechtel and CP have developed procedural provisions to control and review the contents of the NCRs to prevent deficiency recurrence. The procedures included:

- a. SF/PSP No. G 3.2, Rev. 1, dated June 28, 1976, entitled "Control of Nonconforming Items."
- b. Bechtel QA Department Procedure, Section C, No. 101, Rev. 0, dated November 1, 1976, entitled "Project QA Quality Trend Analysis."
- c. CP Midland Project QA Procedure M-9, Rev. 1, dated August 19, 1976, entitled "Review of Bechtel Nonconformances."

The above procedures were reviewed by the inspector and were considered satisfactory. This matter is closed.

9. The Lifting and Placing of Large Safety Related Components

The requirements for lifting and placing of large safety related components including the containment liner domes and NSSS equipment were discussed in a previous inspection, IE:III Inspection Report No. 76-06, Paragraph 5, Section I, Report Details. During this inspection, the discussion was focused on lifting and placing of Unit 2 liner plate dome which were scheduled for the later part of December, 1976. According to the CP and Bechtel engineering staff presentation, the lifting of the dome will be handled by two Manitowac 4100 cranes. The dead weight of the dome including attached piping and duct work was calculated to be 185 tons. The dynamic lifting load factor was 0.15 and 15 mph wind load was taken into design loading consideration. The concrete blocks to be used for equipment lift testing consists of one 10-ton block and eight 25-ton blocks, a total of 210-ton loading. The dome will be lifted onto a intermediate location before final lifting to the top of the containment structure. The inspector indicated that although he agreed that sufficient engineering provision had been considered for the subject activities, the review and audit of Reliance Truck Company (Reliance) QA programs were still necessary steps before start of work activities. This matter was considered unresolved at the time of inspection. Subsequent to the inspection, the inspector was informed by the licensee that CP will review and audit the existing Reliance QA Manual based on criteria contained in the following ANSI Standards:

- a. ANSI N 45.2, Sections 2, 3, 6, 7, 10, 13, 14, 16, 17 and 18.
- b. ANSI N 45.2.2, Sections 1.3, 2.2, 2.3, 2.5, 7 (except 7.3.4), and 8.
- c. ANSI N 45.2.10.

The inspector indicated that followup review of the subject matter will be conducted during the next site inspection.

REPORT DETAILS

Section II
Prepared by C. M. Erb

Persons Contacted

In addition to the individuals listed under the Management Interview section of this report, the following persons were contacted:

Consumers Power (CP)

R. Whitaker, Field QA Engineer

Bechtel Power Corporation (Bechtel)

H. D. Foster, Assistant Project QC Engineer
J. Finley, Structural Superintendent
A. Boulden, Lead Welding QC Engineer
W. Pardee, Non-destructive Testing - QC
W. Grubich, Materials Supervisor

Results of Inspection

1. Hold down Studs - Reactor Vessel Skirt

Two concentric rings of studs which will hold down the reactor pressure vessel skirt after setting of the vessel were not uniformly protected from corrosion or damage from falling objects. These seismic Class 1 studs were installed in the embeds and surrounding concrete. In two studs the threads were open to the environment with no protection. Of the remaining 94 studs some were covered with tape and others with a netting material. The contractor had instituted a storage level of "C" before installation for these studs which required either inside storage or outside covered storage and surveillance every 30 days. After installation, a continuing program for corrosion protection and other protection, as required, should have been instituted but was not.

In addition to not meeting the requirements of Criterion XIII, Appendix B of Part 50, surveillance by Quality Assurance did not conform to Quality Assurance Program Procedure No. 18-2, paragraph 5.2 which states that Consumers Power Company will perform audits and have surveillance of onsite Principal Suppliers and their lower tier suppliers when onsite activities affecting quality are being implemented.

2. Auxiliary Building

Procedures and certifications for building materials were examined and found to be acceptable. Bechtel Specification, 7220-C-304Q Rev. 0, Field Fabrication, Repair and Erection of Structural Steel governed the bolting and AWS D1.1.72 the welding required for the building. Connecting bolts and nuts were certified to meet ASTM A325 and A-490.

3. Penetrations and Structural Steel

Two penetrations R-27-A and R-26-R which are Class 2 and supplied by Delta Southern Company were examined. The steel for these penetrations was supplied by Armco and was procured to ASME SA516. The certification indicated Charpy V notch tests had been made and met the requirements of Section III, 1968 edition, paragraph N-330. Nonconformance Report Nos. 557, 549, 587 and 583 were examined and found to indicate control of nonconforming items such as improper fillets, out of dimension and reentrant angles.

4. Welding and NDT Q-listed Pipe

The inspector witnessed one weld No. F-10 in 3 inch stainless piping at the fit up and first pass stage. The essential variables in this weld were properly controlled and met procedure No. P8-AT-Ag Rev. 0.

Radiographic results on the following welds were examined and found to be acceptable.

<u>weld No.</u>	<u>size</u>	<u>welder</u>	<u>Material</u>	<u>Requirement</u>	<u>RT Procedure</u>
FW38	4"x.120	P63	stain. steel	Sect. III NB5320	I-PRT-140-2303 Rev. A
FW25	12"x.375	P-7	stain. steel	Sect. III NB5320	I-PRT-140-2302 Rev. A
FW135RI	3"x.216	P-43	stain. steel	Sect. III NB5320	I-PRT-140-2303 Rev. A
FW14	10"x.365	P-77	carbon steel	Sect. III NB5320	I-PRT-140-2303 Rev. A

QA procedures for receipt, storage and nonconformance have been established for piping. The welding and NDT results are inspected by a Kemper Insurance representative, Mr. Prem LaHoti.