

UNITED STATES NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

REGION III

Report of Construction Inspection

IE Inspection Report No. 050-329/76-08
IE Inspection Report No. 050-330/76-08

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
- Unit 2 - 818 MWe

Type of Inspection: Announced, Special

Dates of Inspection: August 9 - September 9, and 23, 1976

Principal Inspector: *I. Yin*
I. T. Yin

10/18/76
(Date)

Accompanying Inspectors: None

Other Accompanying Personnel: E. L. Jordan

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

10/19/76
(Date)

8006250 415

SUMMARY OF FINDINGS

Inspection Summary

Inspection on August 9 through September 9, 1976, (Unit 1, 76-08) and (Unit 2, 76-08): Five week special inspection and surveillance program to evaluate overall site QA program effectiveness, and to observe field work performance relative to problems concerning placement of reinforcement steel. Inspection activities included: (1) Performance of pre-placement inspection with special emphasis on rebar installations, (2) review of concrete pour quality records, (3) review and observations relative to implementation of licensee commitments, (4) evaluation of Field Engineering procedures, (5) evaluation of the engineering document control logging system, (6) observation of Bechtel site training activities, (7) review and inspection of licensee actions on previously identified noncompliance items, deviations and unresolved matters. Three items of noncompliance were identified during the inspection relative to: (1) Field Engineering work procedures, (2) failure to document findings, and (3) failure to provide reasonable assurance to prevent damage and deterioration of post tensioning embedments.

Enforcement Items

Items of Noncompliance

Infractions

- A. Contrary to Criterion VI of Appendix B to 10 CFR Part 50, field engineering procedures and instructions were not classified, reviewed, and approved in accordance with the field engineering procedures or the Bechtel Corporation Nuclear Quality Assurance Manual. This infraction applies to both Unit 1 and Unit 2. (Paragraph 4, Report Details)
- B. Contrary to Criterion V of Appendix B to 10 CFR Part 50, deficiencies, relative to concrete form work, were not documented in accordance with QC Instructions following a pre-placement inspection performed on August 19, 1976. This infraction applies to Unit 2 only. (Paragraph 5, Report Details)
- C. Contrary to Criterion XIII of Appendix B to 10 CFR 50, revised measures established to control the site storage of post tension embedments are not sufficient to provide reasonable assurance that

damage or deterioration will be prevented. This infraction applies to both Unit 1 and Unit 2. (Paragraph 6, Report Details)

Licensee Action on Previously Identified Enforcement Items

Infraction items identified in IE:III Inspection Reports No. 050-329/76-02 and No. 050-330/76-02

A. Failure of the U.S. Testing Company Vice President of Engineering to Audit Test Reports Issued to Bechtel

Subject audit requirement is recorded in the previous U.S. Testing Company QA Manual. Since then, the QA Manual has gone through major revisions, and the subject requirement was changed. After reviewing the revised U.S. Testing QA Manual, this item is considered closed. (Paragraph 11, Report Details)

B. Corrective Actions Required by the Audit Findings Not Performed

The U.S. Testing Company has made major procedural revisions on audit and audit finding corrective action requirements. After reviewing the revised U.S. Testing QA Manual, this item is considered closed. (Paragraph 11, Report Details)

Infraction items identified in IE:III Inspection Reports No. 050-329/76-04 and No. 050-330/76-04

A. Inadequate Rebar Inspections

The inspector identified another instance of Infraction B.3 regarding inadequate QC inspection on rebar placement which occurred in April 1976. The licensee initiated nonconformance reports on the apparent rebar problem as a result of the IE inspection. This item remains open. (Paragraph 7, Report Details)

Other Significant Items

A. Systems and Components

The inspector performed a detailed concrete placement inspection for Containment Unit 2 Missile Shield Walls. (Paragraph 3, Report Details)

B. Facility Items (Plans and Procedures)

Unresolved Items

The authority and duties of field engineering personnel performing activities affecting the safety-related functions of structures,

systems, and components were not clearly established and delineated in writing. The licensee was found to have previously identified this problem and initiated corrective actions. (Paragraph 8, Report Details)

C. Managerial Items

None.

D. Noncompliance Identified and Corrected by Licensee

None.

E. Deviations

None.

F. Licensee Action on Previously Identified Deviations

Audits That Had Not Been Performed In Accordance With Approved Audit Schedules (IE Inspection Reports No. 050-329/76-04 and No. 050-330/76-04)

The licensee revised their field audits and surveillance procedure. The implementation was reviewed by the inspector and considered satisfactory. This matter is considered closed. (Paragraph 13, Report Details)

G. Status of Previously Unresolved Items

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

a. NSSS Storage Inspection

Bechtel QC omitted some storage inspection requirements for NSS materials and equipment. These requirements were subsequently added to their QC inspection plan. This matter is considered resolved. (Paragraph 14, Report Details)

b. Component Storage Protection

The deteriorated pipe covers and nozzle caps were removed or fixed by Bechtel. This matter is considered resolved.

c. IE:III Report No. 76-02 Comments Listed in Appendix A

A review of the U.S. Testing Company revised QA manual was performed by the inspector. The deficiencies recorded in Appendix A of IE:III Report No. 76-02 were corrected. The revised QA manual is considered satisfactory. (Paragraph 11, Report Details)

d. IE:III Report No. 76-02 Comments Listed in Appendix B

A review of the Champion, Inc., revised QA Manual was performed by the inspector. The deficiencies recorded in Appendix B of IE:III Report No. 76-02 were corrected. The revised QA Manual is considered satisfactory. (Paragraph 12, Report Details)

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

a. CP NCR QA-95, 96, and 100

The deficiencies identified in the subject CP nonconformance reports and their resolution were reviewed by the inspector. This matter is considered closed. (Paragraph 15, Report Details)

b. Drawing Change Notice (DCN) Control Log Problems

The use and control of Bechtel drawing and DCN monthly control log were questioned by the inspector. The matter remains open pending future review. (Paragraph 10, Report Details)

c. CP Project Engineering Control of Field Change Requests (FCRs)

Inadequate document control relative to filing FCRs by the licensee Project Engineer was identified by the inspector. Since then, new procedures were written to cover this area. The problem is considered resolved. (Paragraph 16, Report Details)

d. Abuse of NCRs to Document Engineering Changes

The use of NCRs to document engineering changes which affect completed work is no longer permitted in accordance with the revised Bechtel procedures. This matter is considered resolved. (Paragraph 17, Report Details)

Management Interview

A. The following personnel attended the management interview conducted at the site on September 23, 1976.

Consumers Power Company (CP)

S. H. Howell, Vice President
G. S. Keeley, Project Manager

F. M. Southworth, Director, Project Quality Assurance Services
T. C. Cooke, Project Superintendent
J. L. Corley, Quality Assurance Superintendent
H. W. Slager, Project QA Administrator
B. H. Peck, Construction Control Supervisor
D. R. Keating, Quality Assurance Engineer

Bechtel Power Corporation (Bechtel)

P. A. Martinez, Project Manager
J. F. Newgen, Project Superintendent
T. C. Valenzano, Project Field Engineer
A. J. Boos, Assistant Project Field Engineer
G. L. Richardson, Lead QA Engineer
J. P. Connolly, Project Field QC Engineer
H. D. Foster, Assistant Project Field QC Engineer

Bechtel Associates Professional Corporation (BAPC)

J. Milandin, QA Manager
J. C. Hink, Assistant Project Engineer
D. T. Long, Project Administrator

- B. Matters discussed and comments on the part of management personnel were as follows:
1. The IE:III Construction Branch Chief discussed the purpose, and scope of the intensified inspection program.
 2. The inspector discussed the specific areas inspected during the five week inspection and surveillance program. (Paragraph 1, Report Details)
 3. The inspector discussed the three infraction items identified during the inspection. (Enforcement Items, Summary of Findings)
 4. The inspector discussed and the licensee commented on the weaknesses or potential problems identified during this intensified inspection. (Paragraph 2, Report Details)
 5. The inspector stated that although Bechtel QA/QC had failed to identify certain rebar placement deficiencies during the special inspection interval, the Consumer's Power Company overlay inspection was found to assure identification and correction before concrete placement. (Paragraph 9, Report Details)

6. The IE:III Construction Branch Chief concluded the management exit interview by stating that the current rebar installation was found to be under control with the CP overlay inspections by Consumers Power Company representatives.

The most significant question remaining was identified by the IE representative as the analysis of possible omitted reinforcing steel which is identified as item 2.d, issue 17 from Mr. Howell's letter dated June 24, 1976. Licensee representatives stated that the inspection of exposed rebar had been completed and the analysis of the structure was in progress.

REPORT DETAILS

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)

R. E. Whitaker, Field QA Engineer
D. E. Horn, Field QA Engineer
R. Wollney, Field QA Engineer
R. Wheeler, Field Project Engineer
J. Slagel, Field Project Engineer

Bechtel Power Corporation (Bechtel)

F. G. Teague, Field Lead Civil Engineer
D. R. Scott, Field Civil Engineer
G. M. Hamblin, Field Civil Engineer
P. Neiswander, Field Civil Engineer
S. Grant, Field Area Engineer
J. P. Betts, Field Civil Engineer
J. A. Miller, Material Storage Engineer
B. T. Cheek, Lead Civil QC Engineer
M. Foote, Area QC Engineer
D. L. Osborn, Area QCE
E. Dutton, Field QC Engineer
R. Forrester, Field QC Engineer
T. Lied, Field QC Engineer

Bechtel Associates Professional Corporation (BAPC)

E. T. Cvikl, Civil Resident Engineer
D. T. Klett, Assistant Civil Engineer

Champion, Inc. (Champion)

P. E. Schmanski, Superintendent of Concrete Plant

Results of Inspection

1. Specific Areas Inspected

- a. Conducted concrete pour pre-placement inspections with special emphasis on rebar installations.

- (1) Containment Unit 2 Missile Shield Walls A, B, and C. Pour I.D. CC (607'.0")a. Poured on August 20, 1976.
 - (2) Auxiliary Building Structural Steel Embed Pourbacks, Pour I.D. A(633.2)a. Poured on August 20, 1976.
 - (3) Containment Unit 2 Equipment Hatch Pourback. Pour I.D. CC (662-11)6'. Poured on September 8, 1976.
- b. Reviewed concrete pour quality records.
- (1) Containment Unit 2 Missile Shield Wall A, B, and C. Pour I.D. CC (607.0)a. Poured on August 20, 1976.
 - (2) Bechtel QA Audit Report 18-1-2, Batch Plant, conducted July 8-22, 1976.
 - (3) Bechtel QA Audit Report 18-2-4, Testing Lab., (including cylinder testing), conducted July 14-22, 1976.
 - (4) Bechtel QA Audit Report 18-5-4, Cadwelding, conducted on April 26 - May 13, 1976.
- c. Reviewed licensee commitments and their implementation.
- (1) Commitment 1 - Time between design completion and construction.
 - (2) Commitment 2 - Drawing clarity and completeness.
 - (3) Commitment 3 - Design engineering review and approval of fabrication drawings and changes thereto.
 - (4) Commitment 5 - QC Inspection adequacy.
 - (5) Commitment 6 - QC control surveillance and inspection documentation.
 - (6) Commitment 10 - Formal assignment of QC assignments.
 - (7) Commitment 11 - Use of NCR to control design changes made after construction.
 - (8) Commitment 12 - Field Engineers should not be making design decisions.

- (9) Commitment 17 - Measures to give assurance that rebar is not missing elsewhere.
 - (10) Commitment 20 - CPCo Field Audits - Accomplishment of Schedule.
- d. Reviewed and Evaluated Field Engineering procedures:
- (1) General review of two volumes of field engineer procedures and instructions.
 - (2) Specific review of:
 - . FIG-25, Rev. 0, dated June 28, 1976, design changes to completed work.
 - . FIC-11, Rev. 0, dated June 29, 1976, Q-list Concrete Placement.
 - . FIC-9, Rev. 1, dated June 29, 1976, rebar detail drawings.
 - . FIC-10, Rev. 2, dated June 20, 1975, drawing review and installation.
 - . FPG-14, Rev. 1, dated June 30, 1976, procedure for preparation of field sketches.
 - . FIG-27, Rev. 0, dated June 29, 1976, field engineers actions related to design interpretations.
 - . FIG-26, Rev. 0, dated June 29, 1976, field engineering responsibilities related to design.
- e. Reviewed and evaluated project engineering control logging system:
- (1) Bechtel Ann Arbor Project Engineering office drawing control log computer printout for the months of July and August, 1976.
 - (2) Bechtel site discrepancy log (discrepancy identified between Project Engineering monthly register and site card file control system).
- f. Observed Bechtel site training activities:
- (1) Attended a QCE training session on August 10, 1976, Subject: FIM G-6, QC Inspection Plan; and SF/PSP G-6.1, Alternate Requirements to FIM Proc. G-6, Instructor, Mr. R. Condie.

- (2) Attended a QCE training session on August 19, 1976, Subject: WFMC-1, Welding Filler Metal Control, Instructor, Mr. R. Condie.
- (3) Attended a QCE training session on August 20, 1976, Subject: G-4 PSP 13, Calibration of Measuring and Test Equipment. Instructor, Mr. J. R. Behris.
- (4) Attended a QCE training session on August 23, 1976, Subject: Deficiency reports. Instructor, Mr. B. T. Cheek.
- (5) Attended a QAE training session on September 2, 1976, Subject: Circuit and Raceway Installation and Documentation. Instructor, Mr. W. Moring.
- (6) Attended a FE training session on September 8, 1976, Subject: Bechtel NQAM and BQAM, Instructors: Mr. G. L. Richardson and Mr. B. T. Stojkov.

g. Examined licensee actions on previously identified noncompliance items, deviations, and unresolved matters. Results of inspection recorded in summary section of this report.

2. Discussions with Licensee and Licensee Representatives on Weaknesses and Potential Problem Areas Identified During Inspection

- a. In the area of rebar and concrete placement, the inspector stressed that equal emphasis should be placed on other areas besides rebars and care should be exercised to protect installed safety related materials.
- b. The inspector had the following comments as the result of the inspection on licensee commitment implementation:

(1) Commitment 2 - Drawing Clarity and Completeness

Since FEs and QCEs are allowed to use Field Sketches and Vendor Drawings for installation and inspection, the following problems have been identified:

- (a) Conflicts between design drawings and Project Engineering approved vendor drawings.
- (b) Since IR drawings are made for rebar fabrication, the drawing arrangement and reference are not suitable for QC inspection in many cases. Also, the quality of IR drawing reproductions is a problem.

The licensee representative indicated that the site responsible personnel were familiar with the problems and corrective actions had already been initiated.

(2) Commitment 3 - Design Engineering Review and Approval of Fabrication Drawings and Changes Thereto

Although the Resident Engineer (RE) position for Midland project, as described in Bechtel Engineering Department Procedure Instruction, EDPI-2.1.4.1, is permanent, the current RE assignment at the site is temporary. An effective method to assure work continuity, as one RE leaves the site and another one is assigned to the site, was not apparent.

The licensee representative stated that the RE assignments will provide sufficient time overlap to ensure effective work continuity. The inspector concurred with the provision and had no further questions in this area.

(3) Commitment 5 - QC Inspection Adequacy

Rebar placement deficiencies continue to be identified by the licensee even with a significant increase of Bechtel Field Engineering and Quality Control inspection effort. Corrective measure to preclude repetition appears to be ineffective. CP overlay inspection has been effective.

(4) Commitment 6 - QC Surveillance Inspection Documentation

As a result of the inspection, Infraction 2 was identified in regard to the implementation of QC procedures. (Paragraph 5, Report Details)

(5) Commitment 17 - Measures to Give Assurance that Rebar is not Missing Elsewhere

A program to establish that rebar has not been omitted elsewhere and that the structure as built meets requirements is being developed.

- c. The inspector stated that, as a result of the evaluation of Field Engineering procedures and instructions, two Infraction Items and one Unresolved Item were identified (see paragraphs 4, 6 and 8 below).

- d. The inspector stated that he reviewed the Project Engineering Drawing Control Logging System and the findings are discussed in Paragraph 10, below.
- e. The inspector indicated that he observed the Bechtel site training activities, and considered them satisfactory. However, the inspector considered the following provisions could further improve the quality of the training program:
 - (1) Training notice to be distributed to the trainee in sufficient time in advance with details of the subject to be covered, complete with references and prerequisites.
 - (2) Attendance by need and maintenance for more meaningful training records.
 - (3) Sufficient hand-out materials for trainee's future use and reference.
- f. The inspector indicated that there is a possible abuse of Field Inspection Manual (FIM) supplementary procedures. The licensee indicated that they are in the process of using only Project Special Provision procedures for site QC inspection, and will delete the use of the FIM.
- g. The inspector pointed out the existence of certain unmeaningful wordings in regard to implementation in Bechtel specification and QA manual. The licensee indicated that there had been continuous effort in identifying and removing such wordings in all encountered specifications and QA manuals. The inspector verified that various changes for specification and manual procedure clarity had taken place in the past.

3. Detailed Concrete Placement Inspection

The inspector performed detailed concrete pre-placement, placement, and post-placement inspections for Containment Unit 2 Missile Shield Walls A, B, and C. Pour I.D. CC (607'-0")a. The concrete was placed on August 20, 1976. The pre-placement inspection included rebar installation, form conditions, aggregate and cement storage provisions, and Bechtel QC checklists. As a result of the pre-placement inspection, an infraction was identified (see paragraph 5 below). The placement inspection included concrete mix delivery and placement controls, batch plant operations, concrete material and test frequencies, equipment calibrations, and QC inspector's qualifications. No adverse conditions were identified. The post-placement inspection included curing controls, QC inspection records, material certifications, in-process concrete test reports, Bechtel QA audits for the batch plant and testing laboratory operations, and discrepancy reports written by the QC inspectors. The documents reviewed appeared to be in order.

4. Nonconforming Field Engineering Procedures

The process and issuance of field engineering procedures were identified not to be in compliance with procedural requirements established by Bechtel NQAM, and Field Procedure General, FPG-1, Rev. 4, dated May 12, 1975, "Procedure for Initiating and Processing Field Procedures and Instructions." Specific deficiencies were identified as follows:

- a. The inspector found differences of classification between Field Instructions (FIs) and Field Procedures (FPs) in the area of initiating, reviewing, and approval requirements contained in Bechtel NQAM, Section IV, Field Operation, Number 1, Quality Assurance Policy, Rev. 2, dated October 22, 1975, and the Bechtel FPG-1, Rev. 4, dated May 12, 1975. The NQAM requires FIs and FPs to be prepared and controlled in accordance with procedures identified as (1) general work plan, (2) standard work plan, and (3) specific work plan. However, the FPG-1 classifies FIs and FPs into Category 2 and 3 procedures which according to SPPG-1 (Special Work Process Procedure General), Rev. 2, dated May 5, 1976, Category 2 includes instructions on tool use, general rigging, and personnel safety, and Category 3 includes instructions for performance and inspection NDE, hydrotesting of Section III pipe, and cadwelding. The categories 2 and 3 are not compatible with the three work plans identified in the Bechtel NQAM.
- b. A majority of the FIs and FPs reviewed by the inspector were not classified in accordance with either NQAM or FPG-1 criteria and as a result, the initiating of procedures and instructions, the QC/QA review, the lead discipline engineer review, and the required levels of approval within the field engineering organization were inconsistent and nonconforming.

The lack of control of Bechtel FIs and FPs is considered in noncompliance with the requirements of Criterion VI of Appendix B to 10 CFR Part 50.

5. Failure of Bechtel Quality Control Engineer to Implement Instructions

The inspector examined rebar and form installation prior to concrete placement for the Containment Building Unit 2 Missile Shield Walls A, B, and C sections with Pour Identification No. CC (607.0)a'. Gaps, as wide as 3/8 inch, were identified in various locations between the wood forms. The gaps were created by shrinkage of the wood forms as a result of drying during the long delay of concrete placement after the forms were erected. Bechtel representatives stated that they had earlier found the gaps and had wet the forms to expand the wood and reduce the gap dimensions. The inspector subsequently concurred with the engineering justification (Bechtel

Project Engineer letter BEBC-1159, dated, August 19, 1976) that the reduced gap was acceptable, however, failure of the Quality Control Engineer (QCE) to document his original identification of the problem was considered to be in noncompliance with requirements.

The Bechtel QC Instruction No. 7220/C-1.20, Concrete Preplacement Inspection, Rev. 0, dated June 23, 1976 lists the following requirements:

a. Activity No. 2.1, Forms

Visually examine the construction of form work to check the following:

Form work meets the workmanship requirements. Workmanship includes such items as tight joints and forms, form surface cleanliness, and form alignment for successive placements.

b. Activity No. 7

Incomplete items and nonconforming items noted during these inspection activities shall be controlled to prevent inadvertent use or installation in accordance with SF/PSP G-3.2. The type of documentation generated shall depend on the nature of the item as described in SF/PSP G-3.2. Incomplete items which require documentation shall be recorded on Form QC DR-1.

The SF/PSP (Project Special Provision) G-3.2, Rev. 1, dated June 28, 1976, Section 3.2.2 added, that the Discrepancy Reports (DR-1) need not be documented if the deficiencies were corrected during the same work shift that they were discovered.

In this case the form joints were not tight and the deficiency was not corrected during the same work shift it was discovered. The failure of the Quality Control Engineer to document this nonconformance as required by the Bechtel QC Instruction is in noncompliance with Criterion V of Appendix B to 10 CFR Part 50. Furthermore, the failure of QCEs to document interim inspection or surveillance results was identified as one of the underlying causes contributing to repetitive rebar deficiencies that have occurred at Midland as documented in IE:III Inspection Report No. 76-04.

6. Inadequate Tendon Sheaths Storage Protection

During a previous IE:III site inspection, some tendon sheath end covers were observed blown off. The matter was considered unresolved as recorded in IE:III Inspection Reports. No. 050-329/76-02 and No. 050-330/76-02. Follow up inspection identified that the storage requirements were revised in Bechtel document

F-1-199 Rev. 3, dated July 21, 1976. The storage requirements for post tensioning embedments (semi-rigid) sheathing, couplers, trumpet assembly, and funnels are as follows:

1.0 Maintenance and inspection activities

1.1 Perform and document a visual inspection of storage conditions for compliance to storage level requirements and notes 2.1 through 2.3 at intervals not to exceed 30 days.

1.2 Correct and document any deficiencies

2.0 Notes

2.1 Semi-rigid sheathing shall be stored on dunnage in the as receiving condition. Protective caps or end covers installed by vendor may be removed or retained during the storage period.

2.2 Items received in cardboard boxes shall be stored outdoors and do not require protection from the rain or snow. Failed boxes shall be replaced.

2.3 Items in contact with soil or water are acceptable since this contact is not detrimental to the material.

Inland-Ryerson letter to Bechtel, dated June 11, 1974, Subject: Purchase Order 7200-C-2-AC, Post Tensioning System, recommends that ends of tendon sheath bundles should be covered by tarps during shipment and storage. The revised storage specification provides no protection to the tendon sheath bundle ends or other post tensioning embedments. The inspector determined that there is no engineering evaluation which justifies deviating from the manufacturer's recommendations.

The inspector determined that the licensee's storage and inspection procedures do not provide reasonable assurance that post tensioning embedments are protected from damage and material deterioration as required by Criterion XIII of Appendix B to 10 CFR 50.

7. Evaluation of Previous Rebar and Concrete Placement

Selected areas in Units 1 and 2 Containment and auxiliary buildings were inspected to review the licensee's efforts to provide assurance that no other rebar anomalies remained undetected. During this inspection the inspector examined some void areas in the concrete at the opening for the auxiliary building pressure relief panel. The spacing of rebars that were exposed within these void areas appeared to be inconsistent with ordinary placement practice. Further

investigation was conducted by the inspector by comparison of the installed rebar with design and vendor drawings and the following rebar placement deficiencies were identified:

- a. Void Areas 4.5 Line Wall Between "c" Line and Unit 1 Reactor Building
 - (1) At elevation 622' two adjacent bars were cut off and apparently only one has a corresponding splice bar. Also, the two bars that are cut off have less than the minimum space required by ACI 318, Section 7.4.1.
 - (2) Adjacent to the south side of the wall opening at elevation 622' on the inside face of the wall two adjacent rebars have been cut off and a third bar is continuous through the chipped out area.

- b. Exposed Vertical Rebars, Above the Void Areas, at the Construction Joint, at Elevation 632.25
 - (1) Design drawing C-285 revision calls for two rows of #11 rebar. Contrary to this, there is only one row and the other bars are in a random pattern. The bars that are in a row are not evenly spaced.
 - (2) Drawing C-285 revision calls for vertical #11 bars @ 12" spacing for each face of the wall at elevation 632.25'. Contrary to this, the spacing of the bar along both faces of the wall does not correspond with this requirement.

Reviewing the Bechtel QC inspection record of this wall pour, No. A (632.25)'e the concrete placement took place in April, 1976, and Field Inspection Plans No. C-231-4-885, Rev. 0; and No. C-231-7-915 had been signed off without noting the above discrepancies. The failure to identify the discrepancies is considered another instance of Infraction B.3 which was identified during the inspection documented in Reports No. 050-329/76-04 and No. 050-330/76-04.

Field Engineers Authority and Duties

The Bechtel field engineering organization, headed by the Project Superintendent, includes departments headed by the Project Field Engineer, the Field Superintendent, the Construction Contract Administrator, and the Cost and Schedule Supervisor. The general responsibility of the Project Superintendent, Project Field Engineer, and Field Engineers is described in Field Inspection Procedure G-1, Rev. 9, dated April 25, 1974, a part of the Bechtel Field Inspection Manual (FIM). According to FTR-G1 program criteria, Section 2.4,

"This manual (FIM) identifies responsibilities, specifies procedures, describes functions and tasks, and provides forms for onsite quality control inspection." The use of FIM to formally assign the field engineering responsibilities is considered inappropriate because it mixes field engineering and QC responsibilities. Furthermore, the specific authorities and duties of all levels of field engineers in charge of area construction activities or specializing in the various trades and technology were not addressed in Bechtel Nuclear QA Manual (NQAM) or in the departmental procedures. The lack of field engineering personnel job descriptions for Bechtel field engineering departments, headed by the Project Field Engineer, the Field Superintendent, and the Construction Contract Administrator was identified in CP Internal Correspondence, "Non-Manual Labor Study," File 0150.2, Serial 1469, dated May 20, 1976. This is an unresolved matter pending future review.

9. Continued Rebar Placement Deficiencies

During April and May, 1976, IE:III conducted several inspections (IE:III Report No. 76-04) to review Midland QA program implementation with special concern of omission of rebars in safety-related structures. Because of the inspection findings, CP and Bechtel initiated a significant number of corrective actions to prevent the problem from recurring. To date these corrective measures have not been fully effective in that rebar installation discrepancies continue to be identified during overlay inspections conducted after final review and acceptance by the normal first line QC inspection program (but before placement of concrete).

IE:III inspectors have conducted independent inspections to verify proper rebar placement. These inspections have not identified any instances where discrepancies have not been found and corrected prior to concrete placement.

Until confidence can be firmly established in the normal QC inspection program the overlay inspections conducted by the licensee will be continued.

CP Nonconformance Reports

- a. QF-110 and QF-111 dated July 26, 1976 and August 4, 1976, closed August 31, 1976: These NCRs resulted in a Field Stop Work order (FSW-9, issued on July 29, 1976, and partially lifted on August 10, 1976). Four major deficiency areas were identified relative to rebar placement for S-2 slab at 632'-6" in the auxiliary building.
- b. QF-113, dated August 31, 1976, closed September 28, 1976: Improper rebars had been installed for pour No. CC (592.5)a. 8 - #11 bars involved.

- c. QF-114, dated September 1, 1976, still open: For conditions identified in QF-113, inconsistent information appeared in Design Drawing and Vendor Drawing.
- d. QF-117, dated September 27, 1976, still open: Omission of one #6 tie bar for the equipment hatch pourback to 673'-1", Unit 2 Containment Building.

10. Inadequate Document Control

One of the unresolved matters identified in IE:III Inspection Report No. 76-04 concerns the monthly Drawing Change Notice (DCN) Control Log that is transmitted to the site document control group. Because of the size of these transmittals and the fact that the latest changes are not highlighted, the value of this logging system was questioned. The inspector determined that the DCN Control Log was contained within the Bechtel Ann Arbor Office Control Log System. It was identified that a large number of discrepancies exist in the Bechtel Ann Arbor Office Control Log System for drawings including Architectural, Civil, Electrical, Instrumentational, Hanger, and Mechanical drawings. When these drawing control logs were compared by Bechtel representatives with the Midland site card file control system records, discrepancies were identified in: (a) Q-classifications, (b) drawings listed in computer print-outs but not present at site, and (c) Revision Numbers. As of the register for the months of July and August 1976, eight and six typed pages of the above discrepancies were identified respectively.

During the management interview, the inspector was informed by the licensee representative that these logs are used by site engineering personnel for project and construction plannings and references, and are not to be used for document control purposes. The inspector stated that if the logs are not for controlling the status of drawings and DCNs, then they should be removed from the document control areas. The licensee agreed. This item remains open pending further review.

11. U.S. Testing Company QA Manual Review

As a result of subject Manual review during IE:III site inspection on March 16-18, and 24-26, 1976, (Report No. 76-02) two enforcement items were identified and a number of comments were listed in Appendix A to the report. Since then the U.S. Testing Company has revised their QA Manual, (Rev. 5, dated July 23, 1976.) Also, nine (9) new work procedures have been added. These new procedures are:

- . U.S.T. - Audit-1, Internal Audits, Rev. 3, dated July 23, 1976, approved August 23, 1976.
- . U.S.T.-CA-1, Internal Corrective Action, Rev. 3, dated July 26, 1976, approved August 23, 1976.
- . U.S.T.-CN-1, Change Notices, Rev. 0, dated June 23, 1976, approved August 19, 1976.
- . HL-101, Hoboken Laboratory Procedures for Testing Power Plant Construction Materials, Rev. 2, dated July 27, 1976, approved August 19, 1976.
- . HL-103, Calibration Procedures for Laboratory Equipment in the Hoboken, N. J. Office, Rev. 3, dated July 27, 1976, approved August 19, 1976.
- . QCP-4, Calibration Procedures for Laboratory Equipment in the On-Site Testing Laboratory, Rev. 1, dated July 29, 1976, approved August 19, 1976.
- . QCP-5, Receipt Inspection of Laboratory Material Equipment, Rev. 1, dated July 29, 1976, approved August 19, 1976.
- . QCP-6, Training of Personnel, Rev. 1, dated July 27, 1976, approved August 19, 1976.
- . U.S.T.-TQ-1, Training and Qualification of Inspection, Test and Audit Personnel, Rev. 7, dated July 26, 1976, Approved August 23, 1976.

In review of the new U.S. Testing Company QA Manual, the inspector considered the following:

- a. Infraction Item as identified in Report No. 76-02, that the U.S. Testing Company Vice President of Engineering Inspection did not audit test reports issued to Bechtel, is addressed in the new manual, Sections 3.5, and 2.3.1.
- b. Infraction Item 2 as identified in Report No. 76-02, that the U.S. Testing Company quarterly internal audit finding corrective actions had not been performed per requirements, is addressed in new manual sections 2.3.3 and 19, and also addressed in procedures U.S.T.-Audit-1, and U.S.T.-TQ-1.
- c. The U.S. Testing Company QA Manual review findings listed in Appendix A of Report No. 76-02 all were incorporated in the new manual.

As a result of the review of the revised QA Manual, the inspector considered the two infraction items and the one unresolved matter relative to U.S. Testing QA program as documented in Report No. 76-02 resolved. The other unresolved matter documented in the same report relative to the QA/QC personnel training activities at the U.S. Testing Company site laboratory is to remain open pending future inspection for its procedure implementation.

12. Champion, Inc., QA Manual Review

As a result of subject manual review during IE:III site inspection on March 16-18, and 24-26, 1976, (Report No. 76-02), a number of comments were listed in Report No. 76-02 Appendix B, and was considered an unresolved matter. Since then, Champion, Inc., has revised their manual to incorporate these comments. The inspector reviewed the QA Manual, Rev. 1, dated August 10, 1976, and considered it to be satisfactory. The unresolved matter relative to Champion, Inc., QA Manual Review as documented in Report No. 76-02 is resolved.

13. CP QA Audit Schedule Implementation

Contrary to the licensee ASLB hearing commitments, some of the QA audits had not been performed by the licensee in accordance with the approved audit schedules. This was considered as a deviation item recorded in IE:III Inspection Report No. 76-04. During this inspection, the inspector reviewed (1) CP Project QA Services Department (PQASD) Proc., No. 12 Field Audits and Surveillance, Rev. 4, dated February 19, 1976, Section 5.2, Field Audit and Surveillance Schedule, (2) Midland Project Field QA Activities reports for the months of July and August, 1976, and (3) Field QA report in September, 1976. The inspector considered that audits that were not performed per the schedule were properly identified, the reasons for not meeting the schedule given, and that the rescheduled audit was performed and documented. This item is considered closed.

14. NSSS Equipment Onsite Storage Requirements

During the IE:III site inspection on March 16-18, and 24-26, 1976, (Report No. 76-02), a number of inspection items for NSS equipment including (1) equipment support conditions, (2) tarp cover, tie rope, and spacer conditions, and (3) action to document any deficiencies identified and corrective actions taken, had not been included as part of routine QC maintenance and storage inspections. This was reported as an unresolved matter. During this inspection, the inspector reviewed the storage QC inspection requirements for the Unit 1 reactor vessel, head cover, and pressurizer, and Unit 2 reactor vessel, head cover, pressurizer, and the two steam generators, and found the above omitted requirements were added to the existing QC inspection plans, and had been properly implemented. This matter is considered resolved.

15. Discrepancies Identified in CP NCRs QF-95, QF-96, and QF-100

Following the licensee's interim 50.55(e) report on missing rebar dated April 21, 1976, additional rebar placement discrepancies were identified and recorded in CP NCRs QF-95, QF-96, and QF-100. This was considered an unresolved matter as described in IE:III Inspection Report 76-04. During this inspection, the inspector reviewed the status of these NCRs, the corrective actions taken and measures to prevent repetitions. As a result of the review, the inspector determined that appropriate action had been taken by the licensee, and considers this matter closed.

NCRs Reviewed

- a. QF-95, dated April 30, 1976, closed June 10, 1976: Bechtel QC Field Inspection Plan C-231-2-827, and inspection record had been changed.
- b. QF-96, dated May 3, 1976, closed June 11, 1976: Bechtel QA Field Inspection Plans C-231-2-827 and C-231-2-858 failed to identify that fifty-two bars were omitted.
- c. QF-100, dated May 4, 1976, closed June 14, 1976: Bechtel QCE failed to document nonconforming conditions as identified in CP QF-95, and 96.

16. CP Filing of Field Change Requests (FCRs)

One of the unresolved matters identified in IE:III Inspection Report No. 76-04 is that the adequacy of document control procedures relative to filing FCRs by the licensee's project office could not be determined. During this inspection, the inspector reviewed the Midland Project Procedures Manual, Procedure No. MPPM-5, Field Distribution and Review of Supplier Design and Procurement Documents, Rev. 1, dated May 12, 1976. The MPPM-5, Section 5.4, Drawing Control Procedure, was completely revised and the filing requirements for FCRs were added. The inspector reviewed these procedures, and considered the provision for proper filing control of FCRs adequate. This matter is closed.

17. NCRs to Document Design Changes

Bechtel Field Inspection Procedure, FIP G-3, Processing of Nonconforming Items, Section 4.1.3 stated: "Engineering changes which affect completed work shall require the initiation of an NCR." The use of NCRs to record design change, field change request, or deficiencies caused by design changes subsequent to the work completion appears to be inconsistent with NRC requirements.

This was identified as an unresolved matter in IE:III Inspection Report No. 76-04. The inspector reviewed Bechtel QC Project Special Provisions, PSP G-3.2, Rev. 1, dated June 28, 1976, Section 3.5, Engineering Changes to Completed Work, and Field Engineering Instruction, FIG-25, Rev. 0, dated June 28, 1976, Subject: Design Changes to Completed Work, and considered the matter resolved.