

QUALITY PLAN FOR
UNDERPINNING ACTIVITIES

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QUALITY PLAN FOR UNDERPINNING ACTIVITIES

1. GENERAL

All activities for the remedial soils work are covered by the existing Consumers Power Company and Bechtel Power Corporation Topical Reports CPC-1-A and BQ-TOP-1, Revision 1A, respectively. This Quality Plan provides a more detailed written description of the accomplishment of activities specific to certain soils remedial work. This Quality Plan was developed to describe how quality programmatic coverage is extended to encompass the underpinning subcontractors as required by the Quality Plan for Remedial Soils Work (MPQP-2).

The senior management, consisting of the Vice President of Projects, Engineering and Construction, Consumers Power Company, and the Midland Project Manager, Bechtel Power Corporation (CP Co's contractor for the Midland Nuclear Plant), reviews and approves major decisions and design concepts regarding underpinning work. For CP Co, a Midland Project Office Executive Manager and an Assistant Project Manager, and for Bechtel, a Bechtel Assistant Project Manager, will manage the underpinning work. The Bechtel Field Soils Manager manages overall soils activities including the underpinning work.

The Executive Manager of MPQAD and the Site QA Superintendent Remedial Soils will manage the MPQAD support of underpinning work with the overview of the Director of Environmental and Quality Assurance.

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2. SCOPE

This Quality Plan is applicable to the auxiliary building and service water structure underpinning tasks. The "Q" list for this work is all inclusive and, as such, covers activities, items and structures beyond the requirements provided by the FSAR. This extension to provide Quality Assurance Program coverage over and above the coverage for safety related items provides an additional assurance that the non-safety related activities will not have an adverse affect on safety related structures.

The following major categories of the underpinning work are specifically covered by this Quality Plan.

1. Underpinning of the Service Water Pump Structure as delineated by Specification 7220-C-194(Q).
2. Underpinning of Auxiliary Building (removal, replacement of fill, and underpinning beneath the feedwater isolation valve pit areas, auxiliary building electrical penetration areas, control tower, and beneath the turbine building) as delineated by Specification 7220-C-195(Q). (Reference MPQP-1)

Any activity or structure which will be excluded from Quality Assurance Program coverage shall be specifically documented on an exception basis. Assurance of NRC Region III authorization for any general exclusion from the Quality Assurance Program is required prior to conducting any work activities in the excluded area.

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Specifications, procurement documents, drawings and procedures are specific as to the design attributes and activities which require quality verification. The need for verification shall be dictated by the following principal:

The Quality Assurance Program shall provide control over activities affecting the quality of the identified structures, systems and components to an extent consistent with (a) their importance to safety; (b) their possible detrimental interaction or effect on safety related structures and items; or (c) assuring obtainment of the overall Project objectives.

3. UNDERPINNING WORK ORGANIZATIONS

Organizations involved with the underpinning are defined in the Functional Matrix, Attachment 1 and as follows:

CP Co Project Management

Sets policy, coordinates licensing review, and submittals to the NRC.

CP Co Safety and Licensing

Performs licensing reviews and coordinates FSAR revisions.

CP Co Design Production

Provides client design input and performs reviews of and comments on Bechtel Design Documents.

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CP Co Site Management

Provides overview and direction as necessary for underpinning activities for compliance with NRC commitments. Monitors underpinning activities with respect to commercial type items, construction activities (such as equipment care, labor and production), and implements site work authorization procedure. Provides overview and control of work releases for remedial soils activities for compliance with NRC commitments.

Bechtel Project Management

Coordinates with client and sets project policy for Bechtel organizations.

Bechtel Project Engineering

Establishes design criteria and reviews input from non-Bechtel sources. Originates and issues design documents for construction.

Bechtel Project Geotechnical Engineer

Functions as Project Engineering's Geotechnical representative on project. Performs geotechnical reviews related to design criteria and procedures. Interfaces with Geotech Services and Resident Geotechnical Engineer.

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Bechtel Site Management

Performs the overall on-site management of all construction activities including coordination between Bechtel, CP Co and Subcontractors.

Bechtel Site Management includes Construction Site Organization, Field Soils Organization, Field Document Control Center and Field Procurement Department. The Field Soils Organization (FSO) is responsible for all ASLB Board Order Work including coordinating the activities of the underpinning subcontractors.

Geotech Services

Provides design and field geotechnical services as requested by Project Engineering.

Resident Assistant Project Engineer

Represents Project Engineering and interfaces with the Field Soils Organization.

Resident Geotechnical Engineer

Performs foundation inspection and on-site geotechnical monitoring of underpinning activities. Interfaces with the Project Geotechnical Engineer.

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Resident Structural Engineer

Provides structural expertise for the underpinning activities. Receives and evaluates data from the underpinning instrumentation systems.

Midland Project Quality Assurance Department (MPOAD)

Provides quality assurance including quality assurance engineering (QAE) and quality control (QC) for all underpinning work including work done by Bechtel and Bechtel Subcontractors. Quality Assurance Engineering develops quality plans, reviews design documents, reviews construction procedures, performs overinspections and conducts pre-planned audits. Quality Control performs first-line inspection and verification, of items under the Quality Assurance Program, and reviews construction procedures, drawings and specifications for inclusion and establishment of inspection criteria.

Subcontractor

Perform construction activities as contracted for, within the framework of the Midland Project Quality Program.

Consultant

Provides advice to Bechtel Project Engineering or Bechtel Field Soils Organization on construction methods, design, instrumentation or geotechnical items.

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4. DESIGN CONTROL

Design Control for the underpinning of the Auxiliary Building (Electrical Penetrations and Control Tower Structure), Feedwater Isolation Valve Pit fill material replacement and Service Water Pump Structure underpinning will be provided by Project Engineering. Engineering Department Procedures (EDPs), Engineering Department Project Instructions (EDPIs), and Project Engineering Procedures (PEPs) provide the controls for Engineering activities which are responsive to the Quality Program requirements of MPQP-2.

Design criteria will be developed from input from consultants, the Midland Plant Safety Analysis Report, 50.54(f) responses submitted to the NRC staff, meetings with and submittals to the NRC staff, and testimony during the ASLB Soils hearing.

Design documents, including specifications, drawings and material requisitions, shall be specific as to what is required to ascertain that processes, activities and final products meet their design requirements.

Design documents, including specifications and drawings (as well as changes and revisions to these documents), will be reviewed and checked for compliance to design requirements by Bechtel Project Engineering.

Design documents will be reviewed by QC and QAE. The Quality Assurance Engineering review applies to all design documents. (MPQAD Procedure M-

11)

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Quality Assurance Engineering will act as the focal point for the assurance of the resolution of quality related comments.

Technical specifications and revisions thereof will be generated, reviewed, approved, and controlled by Bechtel Project Engineering in accordance with EDP 4.49. Initial specifications will also be reviewed by CP Co Design Production and comments submitted to Bechtel Project Engineering. Specification Change Notices (SCNs), used as interim change documents between revisions of the specification, will receive the same level of review and approval by Bechtel Project Engineering as the basic specifications. Specification Change Notices shall be administered and controlled in accordance with EDPI 4.49.1.

Project Engineering prepares, reviews, approves, issues and controls design drawings in accordance with EDP 4.46. Changes to engineering drawings receive the same level of review and approval as the basic drawing and are administered in accordance with EDP 4.47 and EDPI 4.47.1.

Bechtel design calculations are originated, checked, approved, controlled and documented by Project Engineering in accordance with EDP 4.37. All design calculations submitted by the consultant are checked, reviewed and approved by Bechtel Project Engineering in accordance with EDPI 4.25.2.

Bechtel Field Soils Organization shall request from or notify Project Engineering of change to design documents by Field Change Requests (FCRs) and Field Change Notices (FCNs), respectively. The FCRs will be reviewed, evaluated, dispositioned, controlled and administered in

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accordance with EDP 4.62. FCNs will allow the Bechtel Field Soils Organization to initiate field changes in design documents within the allowable guidelines of Field Procedure FPD-2.000 and Specification G-34 (Q) as provided by Project Engineering. FCNs will be reviewed, evaluated, dispositioned, controlled and administered according to EDP 4.62.

The design interface for the underpinning activities between Project Engineering, project groups, technical support groups and consultants shall be administered as illustrated in Attachment 2, Design Document Interface Flowchart. Geotech Services will receive design for review in accordance with PEP 4.25.2. The Subcontractor receives design documents from Bechtel Field Soils Organization in accordance with FID 1.100. The Resident Structural Engineers duties on site are defined in PEP 2.14.9.

Inspections are performed by Quality Control to verify that construction is being performed to the latest revisions of the design documents. Audits and/or overinspections are conducted by Quality Assurance Engineering. Field geotechnical activities, including subgrade acceptance, are accomplished in accordance with PEP 2.14.8.

5. PROCUREMENT AND RECEIVING

Procurement of items and services for the remedial underpinning work is performed by Bechtel employing the technical and quality requirements established in the specifications and drawings. Q-material requisitions are originated by Bechtel Field Soils Organization in accordance with

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FPG-8.000. The Bechtel Field Soils Organization is responsible for assuring that applicable Quality Program requirements, design bases, specifications, procedures and drawings are included and referenced in the material requisitions. Bechtel Field Procurement Department initiates formal purchase orders and will be responsible for ensuring that the procurement package conforms to the material requisition. Quality Assurance Engineering reviews and approves procurement documents in accordance with MPQAD Procedure M-5 to assure that necessary Quality Assurance Program requirements are included.

Upon receipt of material, inspections are performed by Quality Control in accordance with PSE G-5.1 to verify items comply with the procurement package requirements and quality verification packages are complete. Quality verification packages are reviewed for availability, traceability and legibility by Quality Control and audited by Quality Assurance Engineering (MPQAD Procedure F-1M). In addition, a technical review will be performed by Quality Control in quality verification packages for non-shop inspected items.

6. PREPARATION AND IMPLEMENTATION OF PROCEDURES/INSTRUCTIONS

Written instructions to the Subcontractor are in the form of engineering specifications, drawings, and approved changes thereto.

The G-321D form (controlled by EDP 4.58) attached to the specifications identify the procedures and other vendor submittals, which are the minimums required to be submitted by the Subcontractor prior to the start

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of fabrication and construction. These procedures are logged, controlled, and distributed by the Field Document Control Center and reviewed by Project Engineering and MPQAD. Project Engineering defines the specific quality attributes of each procedure. The procedures will be specifically reviewed by Quality Assurance Engineering for appropriate inclusion of quality requirements. (MPQAD Procedure M-10)

These procedures, when approved by MPQAD, and Bechtel Project Engineering, provides authorization for fabrication/construction to proceed.

7. INSPECTION, EXAMINATION, TEST AND CALIBRATION

Quality verification, inspection and testing of Subcontractor activities is performed by Quality Control, independent of the Subcontractor and Bechtel Field Soils Organization. Quality Control will prepare inspection plans (in accordance with PSP G-6.1) utilizing inputs from technical specifications, design drawings, Subcontractor procedures and shop drawings. Project Quality Control Instructions (PQCI) are prepared to cover all Subcontractor quality related activities. Existing PQCI are adapted for standard construction activities such as concrete batching, placement and testing, and reinforcing steel installation. Additional PQCI are developed as necessary to verify new underpinning activities such as temporary support installation, load transfer and threaded reinforcing connectors. All PQCI are subject to Quality Assurance Engineering review and approval according to MPQAD Procedure E-

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2M. In addition, inspection and test activities are monitored by Quality Assurance Engineering through the use of overinspection plans based on an independent evaluation of design and procurement documents per MPOAD Procedure E-1M. The Subcontractors are indoctrinated to quality control inspection practices to assure that hold points, included as an integral part of the Subcontractor's procedures, are adhered to. For site construction activities, the detailed implementing procedures shall utilize integrated construction planning, as follows:

- a) Hold points shall be clearly identified in the procedures.
- b) The procedures shall provide for QC/QAE signoff to record the completion of the inspection holdpoints prior to proceeding with the further execution of subsequent procedural steps.

Tests are performed to qualify, demonstrate or assure that the quality of procured items or completed construction is as defined in applicable engineering drawings and procurement documents.

Calibration, maintenance and control of measuring and test equipment is provided by an approved agency which will be pre-qualified by Quality Assurance Engineering. This agency provides for the traceability to national standards, the unique identification of each instrument or equipment requiring calibration, the maintenance of calibration frequencies, and the identification of calibration status. Calibration records are maintained by the agency and transmitted to Bechtel Field Soils Organization for review. At the completion of the subcontract,

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these records will be turned over to Quality Control. Performance and effectiveness of the agency is verified by Quality Assurance Engineering audits and/or overinspections in accordance with MPQAD Procedures F-1M and E-1M, respectively.

8. HANDLING AND STORAGE

All Q-list material is stored and handled in accordance with general Field Procedures FPG 4.000 and 5.000 and supplemented by the Subcontractor's procedure. Storage and handling of material and equipment is subject to Quality Control inspection and verification according to PSP G-5.1 and Quality Assurance Engineering overinspections and/or audits per MPQAD Procedures E-1M and F-1M, respectively.

9. DOCUMENT CONTROL AND QUALITY RECORDS

Subcontractor documents which are to be submitted for review and comment by Bechtel Project Engineering and MPQAD are controlled by the Field Document Control Center (FDCC) in accordance with Bechtel Field Procedure FPD 1.000. Prior to the start of work, the Subcontractor submits construction procedures, drawings, purchase orders, as required by the specifications, to Bechtel Field Soils Organization. Bechtel Field Soils Organization and the FDCC distributes the procedures for review and approval as defined in the Quality Plans included with specifications 7220-C-194 and C-195. Bechtel Project Engineering and/or Resident Engineering, as designated, is responsible for resolving review comments.

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All quality records are controlled by EDPs 5.16 and 5.24, Quality Control Procedure PSP G-7.1 and MPQAD Procedures F-11M and F-12M. These procedures prescribe the requirement for preparation, control, distribution and transmittal of all Q-related procedures, specifications, drawings and inspection records.

10. NONCONFORMING ITEMS AND CORRECTIVE ACTION

Nonconformances discovered during construction inspection activities are documented and controlled by Quality Control in accordance with PSP G-3.2 and Quality Assurance Engineering in accordance with MPQAD Procedure F-2M. These procedures provide for the identification and documentation of the nonconforming item, identify the authority for and disposition of the nonconforming condition, and provide for documenting the reinspection and closeout of the nonconformance. MPQAD will be involved in the specific wording of non-conformance reports to assure an accurate description of the condition. Dispositions to non-conformance reports will be reviewed by Quality Assurance Engineering to assure that the disposition is acceptable, that engineering rationale is adequately documented and that quality planning is available for the verification of the disposition. MPQAD will inspect and provide verification of disposition implementation prior to closing of the non-conformance report.

Within the Midland Project Quality Program, the identification of reportable items is accomplished by MPQAD through the review of

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nonconformance reports, supplier surveillances and quality assurance audits. Corrective action for quality problems will be controlled by Bechtel PSP G-3.2 and MPQAD Procedure F-3M.

In the design phase, investigation of cause and action taken to preclude recurrence of design deficiencies will be accomplished through EDP 4.65. Design deficiencies include those items which are not identified in the course of design development and which ultimately require changes.

11. AUDITS

Audits are performed by Quality Assurance Engineering to verify conformance to quality requirements. MPQAD Procedure F-1M includes provisions for the identification of deficiencies, the determination of corrective action, and the necessary follow up to verify that timely and effective action is taken.

12. TRAINING AND CERTIFICATION

All inspectors and quality auditors are trained and certified in accordance with MPQAD Procedures B-2M and/or B-3M. Subcontractor field supervisory, engineering personnel and crafts receive training (QA Indoctrination) to the Midland Project Quality Program. This training includes an introduction to the quality system, inspection activities, nonconformance control, NRC activities, field and engineering design changes and site organizations and interfaces. The training is initially completed prior to any Q-listed work proceeding. Additional training

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sessions will be scheduled by MPQAD to indoctrinate personnel which are assigned after the initial indoctrination. The Subcontractor is required to implement training for the procedures covering the Subcontractors Q-listed activities.

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LIST OF

APPLICABLE

PROCEDURES

MIDLAND PROJECT QUALITY ASSURANCE DEPARTMENT PROCEDURES

| | |
|-------|--|
| R-2M | Personnel Training |
| B-3M | Qualification and Certification of Inspection and Test Personnel |
| E-1M | Site Inspection Planning and Site Inspection |
| E-2M | Review of Site Inspection Planning Prepared by others than MPQA |
| F-1M | Audit |
| F-2M | Nonconformance Reporting, Corrective Action and Statusing |
| F-3M | Resolution of Significant Quality Problems |
| F-11M | Documentation Control |
| F-12M | Quality Records |
| M-5 | QA Review of Bechtel Field-Originated Procurement Documents |
| M-10 | MPQAD Review of Subcontractor Procedures and Instructions for Underpinning Related Activities |
| E-11 | MPQAD Review of Bechtel Design Specifications, Drawings and Procedures for Underpinning and Related Remedial Activities. |

List of Applicable Procedures

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ENGINEERING DEPARTMENT PROCEDURES

| | |
|------------|--|
| EDP - 4.37 | Design Calculations |
| EDP - 4.46 | Project Drawings |
| EDP - 4.47 | Drawing Change Notice |
| EDP - 4.49 | Project Specifications |
| EDP - 4.58 | Specifying and Reviewing Supplier Engineering and —Quality Verification Documentation |
| EDP - 4.62 | FCR/FCN |
| EDP - 4.65 | Design Deficiency |
| EDP - 5.16 | Supplier Document Control |
| EDP - 5.24 | Document Distribution Control Center |

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FIELD PROCEDURES

| | |
|-----------|--|
| FPG-8.000 | FMRs |
| FPD-2.000 | Field Change Request/Field Change Notice |
| FPG-4.000 | Storage Maintenance/Inspection of Equipment and Materials |
| FPG-5.000 | Maintenance/Inspection of Material and Equipment Released for Construction |
| FID-1.100 | Vendor Document Review |
| FPD-1.000 | Field Documentation of Correspondence Control |

PROJECT SPECIAL PROVISIONS

| | |
|-----------|---|
| PSP G-3.2 | Control of Nonconforming Items |
| PSP G-5.1 | Material Receiving and Storage Control |
| PSP G-6.1 | Inspection Planning |
| PSP G-7.1 | Document, Records and Correspondence Control |
| PSP G-8.1 | Qualification, Evaluation, Examination Training and Certification of Construction Quality Control Personnel |

ENGINEERING DEPARTMENT PROJECT INSTRUCTIONS

- EDPI - 4.1.1 Preparation of Design Requirements Verification
Checklist.
- PEP - 4.25.2 Interface Control Design Documents for Remedial Soils
Underpinning Operation.
- PEP - 4.25.3 Interface Control of Design Documents for Remedial
Soils and Related Other Work with Consumers Power
Company for Midland Job 7220.
- PEP - 4.47.1 Interim Drawing Change Notice for the Midland Project
7220
- EDPI - 4.49.1 Specification Change Notification

PROJECT ENGINEERING PROCEDURES

- PEP-2.14.8 Resident Geotechnical Engineer for Remedial Soils
Activities
- PEP-2.14.9 Resident Structural Engineer for Remedial Soils
Activities

PROJECT FUNCTIONAL MATRIX FOR UNDERPINNING ACTIVITIES

| | POLICY | | | | DESIGN | | | | PROCUREMENT | | | | INSTALLATION | | | | AUGTS | |
|-----------------------------|------------------|------------------|------------------|------------------|------------------------------|------------------------------|------------------------------|------------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|--|
| | ESTABLISH POLICY | ESTABLISH POLICY | ESTABLISH POLICY | ESTABLISH POLICY | PREPARE AND REVIEW DOCUMENTS | PREPARE AND REVIEW DOCUMENTS | PREPARE AND REVIEW DOCUMENTS | PREPARE AND REVIEW DOCUMENTS | REVIEW AND SELECT SUPPLIERS | REVIEW AND SELECT SUPPLIERS | REVIEW AND SELECT SUPPLIERS | REVIEW AND SELECT SUPPLIERS | REVIEW AND SELECT SUPPLIERS | REVIEW AND SELECT SUPPLIERS | REVIEW AND SELECT SUPPLIERS | REVIEW AND SELECT SUPPLIERS | REVIEW AND SELECT SUPPLIERS | |
| CPCo PROJ MGMT | | | | | | | | | | | | | | | | | | |
| BECHTEL PROJ MGMT | | | | | | | | | | | | | | | | | | |
| CPCo PRODUCTION ENGRG | | | | | | | | | | | | | | | | | | |
| BECHTEL MGMT ENGRG | | | | | | | | | | | | | | | | | | |
| BECHTEL PROJ ENGRG | | | | | | | | | | | | | | | | | | |
| BECHTEL QUALITY ENGRG | | | | | | | | | | | | | | | | | | |
| MIDMERCANTINE (USA) | | | | | | | | | | | | | | | | | | |
| WISS JANNEY (USA) | | | | | | | | | | | | | | | | | | |
| SPENCER, WHITE, AND PREMITS | | | | | | | | | | | | | | | | | | |
| GEOTECH SERVICES | | | | | | | | | | | | | | | | | | |
| BIP SUBCONTRACTORS | | | | | | | | | | | | | | | | | | |
| BECHTEL CONSTRUCTION | | | | | | | | | | | | | | | | | | |
| FRIEDSON & ORGANIZATION | | | | | | | | | | | | | | | | | | |
| QUALITY CONTROL | | | | | | | | | | | | | | | | | | |
| QUALITY ASSURANCE ENGRG | | | | | | | | | | | | | | | | | | |

● DIRECT INVOLVEMENT
 ○ INDIRECT ONLY

NOTE: This functional matrix represents the activities of both organizations described in the quality plan and those included in the quality plan of the technical specifications for underpinning.

DESIGN DOCUMENT INTERFACE FLOWCHART

