

10/29/82

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of)	
)	
CONSUMERS POWER COMPANY)	Docket Nos. 50-329 OM & OL
)	50-330 OM & OL
(Midland Plant, Units 1 and 2))	

NRC STAFF TESTIMONY OF JOHN W. GILRAY
RELATIVE TO THE QUALITY ASSURANCE PROGRAM FOR
THE MIDLAND PROJECT UNDERPINNING ACTIVITIES
OF THE SERVICE WATER PUMP STRUCTURE
AND AUXILIARY BUILDING

- Q. Will you please state your full name, employer, job title, and specifically your responsibilities relative to the Midland Project.
- A. John William Gilray, U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Division of Engineering, Quality Assurance Branch; Principal Quality Assurance Engineer.
- Q. Have you previously submitted a statement of your education and professional qualifications in this proceeding?
- A. Yes.
- Q. Has Consumers Power Company (CPC) submitted to NRC for review a QA plan for soils remedial work?
- A. Yes, on January 7, 1982, J. W. Cook of CPC submitted a letter to H. R. Denton and J. G. Keppler enclosing Midland Quality Plans for the remedial soils activities.

- Q. Describe the scope of these quality plans.
- A. These plans describe the basic quality assurance controls to be applied to items and activities associated with the soils remedial work which includes underpinning activities, service water pump structure underpinning activities and auxiliary building underpinning system and the feedwater isolation valve pit areas. These plans provide a commitment to follow the quality assurance program controls of the NRC previously approved Consumers Power Company's Quality Assurance Topical Report CPC-1A Revision 12 and Bechtel's Quality Assurance Topical Report BQ-TOP-1 Revision 1A.
- Q. Who in NRC was assigned the responsibility of reviewing these plans for acceptability?
- A. Dr. Ross Landsman of Region III and myself.
- Q. What were the results of your reviews?
- A. We found the Midland Quality Plans conditionally acceptable. The acceptance and conditions are described in the NRC D. Eisenhut letter to J. W. Cook dated May 25, 1982. (Attachment 1).
- Q. What were the conditions of acceptance of these quality plans?
- A. The conditions are that the quality plans are to apply to (1) all items and activities identified in the ASLB Memorandum and Order of April 30, 1982, and (2) all the to-go underpinning Q-listed and non-Q-listed work described in CPC's April 5, 1982 letter to J. Keppler (Attachment 2), except for work stated in attachment 1

of that letter. In addition we emphasized in the May 25, 1982 letter that the NRC interprets these quality plans to mean that the Midland Project Quality Assurance Department be activity involved in reviewing contractor's, sub-contractor's and consultant's quality assurance capabilities and assuring through review of procedures and verifications that hardware is built and work is performed in accordance with design, specifications, and procedural requirements.

- Q. Has Consumers Power Company revised the quality plans for remedial soils work to incorporate these conditions?
- A. Yes, the Consumers Power Company's letter of August 9, 1982 to H. Denton (Attachment 3) transmitted copies of the revised quality plans.
- Q. What are the results of NRC's review of these revised quality plans?
- A. The revised plans have been reviewed and found acceptable. See Chapter 17 of Supplement No. 2 of the Midland Safety Evaluation Report dated October 1982 (NUREG-0793).
- Q. Summarize the important elements of these quality plans.
- A. Midland Project Quality Plan 2, Revision 0 "Quality Plan for Remedial Soils Activities & Soils Related Work in Q Areas" describes the overall Consumers Power Company and Bechtel Power Corporation quality assurance plan for remedial soils activities whereas Midland Project Quality Plan 1, Revision 3, "Quality Plan for Underpinning Activities" describes in more detail the quality

assurance plans for the underpinning activities associated with the auxiliary building and service water pump structure. These plans, which apply to safety related and non-safety related remedial soils activities comply with the previously NRC approved quality assurance requirements described in Consumers Power Company's and Bechtel's Quality Assurance Topical Reports CPC-1-A, and BQ-TOP-1 Revision 1A respectively. The important areas covered by the quality plans are:

1. Underpinning of service water pump structure.
2. Removal, replacment of fill, and underpinning beneath the feedwater isolation valve pit areas, auxiliary building electrical penetration areas, control tower, and beneath the turbine building.
3. Installation of monitoring system and the monitoring of both permanent and temporary dewatering systems.
4. Dewatering systems. The installation, operation, and monitoring of both permanent and temporary dewatering systems.
5. Freeze wall.
6. BWST foundation repairs and tank releveling.
7. Underground service water and BWST piping rebedding or replacment.
8. Any placing, compacting, excavating, or drilling soil materials under or around safety-related structures and systems, as defined by Bechtel drawing C-45(Q).

The Consumers Power Company Midland Project Quality Assurance Department is responsible for the review of design documents, procurement orders and implementing procedures of Consumers Power Company, Bechtel and subcontractors to assure that the necessary quality requirements are specified. Throughout the implementation phase Midland Project Quality Assurance Department is also

responsible for overseeing and auditing the soils activities to verify that they are correctly being carried out in accordance with previously approved requirements.

These plans meet the conditions specified in the May 25, 1982 letter of D. Eisenhut to J. Cook and in the ASLB Memorandum and Order of April 30, 1982.

- Q. Will NRC be involved in reviewing and commenting on revisions to these quality plans prior implementing the revision?
- A. Yes, Consumers Power Company letter of August 9, 1982 to H. Denton provides the commitment to submit revisions of the quality plans to NRC for comment prior to implementation.
- Q. Have any additional QA improvements for the remedial soils areas been initiated since August 9, 1982?
- A. Yes. As a result of discussions between Consumers Power Company and NRC Region III office, Consumer Power Company submitted two letters to H. Denton and J. Keppler which address additional quality assurance improvements over and above those controls described in the quality plans.
- Q. What is the NRC review status of these two letters?
- A. As of October 19, 1982, NRC, (with NRR and Region III involvement), has not completed its review of the additional quality assurance improvements.



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

Attachment 1

MAY 25 1982

Docket Nos: 50-329 OM, OL
and 50-330 OM, OL

Mr. J. W. Cook
Vice President
Consumers Power Company
1945 West Parnall Road
Jackson, Michigan 49201

Dear Mr. Cook:

Subject: Completion of Soils Remedial Activities Review

In several meetings and discussions held during the months of April and May 1982, you were informed by the staff of the approach to be used for the review of the soils remedial activities at Midland Plant, Units 1 and 2. This approach is intended to make the review process more consistent with that followed by the staff for license applications and improve the efficiency of the staff review. Specifically, the previous staff practice of approving each individual construction step for each remedial measure as the review progresses will generally be discontinued by the staff. The staff intends to complete the entire review of the soils remedial activities and related matters as an integrated package and then proceed with ACRS meetings and hearing sessions in the normal fashion.

Although no activities directed to remedial actions for the soils deficiencies are expected to be approved prior to completion of the staff's integrated review, those for which staff review was substantially completed as of April 1, 1982, are, however, approved. These are discussed below.

On the basis of the staff technical review of documents listed in Enclosure 1, the staff concurs with your plan to proceed with Phase 2 underpinning activities (which involve excavation under the feedwater isolation valve pit and the turbine building) subject to the successful completion of conditions listed in Enclosure 2. Accomplishment of these conditions should be documented and Region III notified. Enclosure 3 provides a definition of Phase 2 on which the staff's approval is based, and further discusses the staff's understanding of approved quality assurance plans for this and other soils work.

We are further responding to your letter of May 10, 1982, which addresses certain soils construction work you believe had staff approval prior to the Licensing Board's Memorandum and Order of April 30, 1982. Staff comments and conclusions on Paragraphs I and II are provided in Enclosure 4.

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With respect to your Paragraph III, you note you are continuing with certain soils remedial work with full awareness and concurrence of the staff for which explicit written approval had not been obtained. You also noted that this work has been stopped in accordance with the Order and requested that the staff verify its concurrence so that the work can be reactivated. The three work items you identified in this category are:

- (1) installation of deep-seated benchmarks,
- (2) installation and operation of construction dewatering wells that were not previously operating, and
- (3) installation of monitoring system instruments and mounting.

Items (1) and (2) are conditionally approved as addressed by Enclosure 5 and 6, respectively. With respect to item (3), your letter notes that work on the monitoring system instruments and mounting for the auxiliary building is presently stopped because Region III concurrence has not been obtained. We are advised that Region III will provide explicit written confirmation of NRC approval following resolution of existing QA deficiencies.

Your letter of May 10, 1982, also forwarded Drawing 7220-C-45 for purposes of defining which soils at the Midland site are safety related (i.e., are considered to be under and around safety-related structures and systems). During a May 5, 1982, conference telephone call with the Licensing Board and hearing parties, Consumers proposed to use this drawing to define the bounds for the term "around" in Sections VI(1)(a), (b) and (c) of the Board's April 30, 1982, Memorandum and Order. The Board's subsequent Memorandum and Order of May 7, 1982, requested the staff to advise the Board of the results of its review of Drawing 7220-C-45. The results of our review are presented in Enclosure 7; and, on the basis of your commitments to modify the drawing, we find this drawing to be acceptable for the purpose of defining areas around safety-related structures and systems.

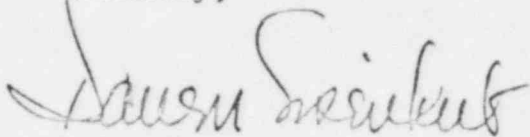
In addition, Enclosure 8 lists the information required by the staff to conclude its review of the soils remedial work. This list is based upon staff review of information provided by your letter of March 31, 1982, and earlier submittals. Certain of the information needs may already have been transmitted by you. You are requested to provide your response schedule within seven (7) days of receipt of this letter. Once your schedule is received, the staff will develop the review completion schedule for this effort.

Mr. J. W. Cook

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The reporting and/or recordkeeping requirements contained in this letter affect fewer than ten respondents; therefore, OMB clearance is not required under P.L. 96-511.

Sincerely,

A handwritten signature in cursive script, appearing to read "Darrell G. Eisenhut".

Darrell G. Eisenhut, Director
Division of Licensing

Enclosures:
As stated

cc: See next page

MIDLAND

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LISTING OF ENCLOSURES

- Enclosure 1 - "Basis for Staff Concurrence for Start of Phase 2"
- Enclosure 2 - "Conditions for Staff Acceptance of Phase 2"
- Enclosure 3 - "Definition of Phase 2 Underpinning Activities and Quality Assurance Plans for Soils Activities"
- Enclosure 4 - "Staff Comments on Continuing or Planned Soils Activities Previously Approved by the Staff"
- Enclosure 5 - "Installation of Deep Seated Benchmarks"
- Enclosure 6 - "Construction Dewatering Wells"
- Enclosure 7 - "Staff Evaluation of Drawing 7220-C-45"
- Enclosure 8 - "Additional Information Required to Complete Staff Review of Soils Remedial Work"

ENCLOSURE 1

BASIS FOR STAFF CONCURRENCE FOR START OF PHASE 2

1. Letter to R. Vollmer from R. T. Hamilton, dated July 8, 1975, transmitting Bechtel quality assurance topical BQ-TOP-1, Revision 1A
2. Letter to H. R. Denton from J. W. Cook, dated September 30, 1981, Submitting the Auxiliary Building Dynamic Model, Technical Report on Underpinning the Auxiliary Building and Feedwater Isolation Valve Pits
3. Letter to H. R. Denton from J. W. Cook, dated November 16, 1981, on Response to the NRC Staff Request for Additional Information Pertaining to the Proposed Underpinning of the Auxiliary Building and Feedwater Isolation Valve Pits
4. Hearing testimony by CPC witnesses (Johnson, Burke, Gould, Corley and Sozen) on remedial underpinning work for the Midland Auxiliary Building, November 19, 1981
5. Hearing testimony of D. Hood, J. Kane and H. Singh concerning the Remedial Underpinning of the Auxiliary Building Area, dated 11/20/81
6. Hearing testimony of F. Rinaldi, dated 11/20/81
7. Letter to H. R. Denton from J. W. Cook, dated 11/24/81 on Test Results, Auxiliary Building, Part 2, Soil Boring and Testing Program
8. Letter to H. R. Denton from J. W. Cook, dated December 3, 1981, with Addendum to Technical Report On Underpinning the Auxiliary Building and Feedwater Isolation Valve Pits
9. Letter to H. R. Denton from J. W. Cook, dated January 6, 1982, on Auxiliary Building Underpinning - Freezeway; Effects of Freezeway on Utilities and Structures
10. Letter to H. Denton and J. Keppler from J. W. Cook, dated January 7, 1982, transmitting general Quality Plan for underpinning activities and Quality Plans and Q-Listed activities for SWPS and Auxiliary Building Underpinning
11. Design audits of January 18-20, 1982 (Summary dated March 10, 1982); February 1-5, 1982; March 16-19, 1982; and meeting of February 23-26, 1982, (Summary dated March 12, 1982)
12. Letter to H. R. Denton from J. W. Cook, dated February 4, 1982, on Auxiliary Building Access Shaft - Augering Method for Soldier Pile Holes

13. Letter to J. W. Cook from R. L. Tedesco, dated February 12, 1982, on Staff Concurrence for Activation of Freezeway
14. Letter to H. R. Denton from J. W. Cook, dated March 10, 1982, on Protection of Excavation Face - Auxiliary Building Underpinning Shaft
15. Summary of March 8, 1982 Telephone Conversation Regarding Soil Spring Stiffnesses for Auxiliary Building Underpinning and Phase II Construction, dated March 11, 1982
16. Letter to H. R. Denton from J. W. Cook, dated March 31, 1982, on Response to the NRC Staff Request for Additional Information Required for Completion of Staff review of Phases 2 and 3 of the Underpinning of the Auxiliary Building and Feedwater Isolation Valve Pits
17. Letter to J. Keppler from J. W. Cook, dated April 5, 1982, describing Quality Assurance for Remedial Foundation Work
18. Letter to H. Denton from J. W. Cook, dated April 26, 1982, transmitting quality assurance topical CPC-1-A, Revision 12

Enclosure 2

CONDITIONS FOR STAFF ACCEPTANCE OF PHASE 2

1. Deep-seated bench marks DSB-AS1 and DSB-AS2. DSB-AS1 and DSB-AS2 shall be installed at a distance not to exceed 5-feet from the wall of the main auxiliary building which is founded at Elevation 562. Actual locations of these installed bench marks and any modifications in tolerance criteria required on Drawing C-1493(Q) due to changes from the original DSB-AS locations shall be documented.
2. Monitoring instrumentation required to be installed. The following deep seated benchmarks and relative-absolute measurement devices identified on audited drawings shall be properly installed and operating for at least 7 days prior to drifting under the turbine building or Feedwater Isolation Valve Pit (FIVP):

Deep-Seated Benchmarks

DSB-1W
DSB-1E
DSB-2W
DSB-2E
DSB-3W
DSB-3E

DSB-AS1
DSB-AS2
DSB-AN

Relative-Absolute Measurement Devices

DMD-1W
DMD-1E
DMD-11
DMD-12
DMD-13

3. Strain gauge installation. Revisions shall be made to the proposed instrumentation shown in drawing C-1495, "Instrumentation - Elevation 695 - 0 5/16" for Building Settlement Monitoring". On the sectional view at the wall at Column Lines 7.4 and 7.8, change the orientation of proposed lower strain gauges between Elevations 584 to 614 to be perpendicular to the orientation shown on Drawing C-1495, Figure 3 in the March 31, 1982 submittal. On this same sectional view, add an additional strain gauge between Elevations 646 to 659 at an inclination similar to the above recommended orientation. Also, correct the labeling of column lines H and G which is reversed on the copy of the sectional view submitted to the staff.
4. Pier load test procedures. The following modifications and additions shall be made to the pier load test procedures provided by the April 22, 1982 submittal from J. Cook to H. Denton, "Response to the NRC Staff Request for Additional Information Required for Completion of Staff Review of the Borated Water Storage Tank and Underpinning of the Service Water Pump Structure." (Consumers Power Company (CPCo) stated that, although the procedures were submitted for underpinning work for the service water pump structure, the procedures are applicable to the pier load test to be conducted during Phase 2 underpinning work for the auxiliary building.)

- a. The maximum required test load should be equal to 1.3 times the maximum anticipated design load. As an alternative, should there be structural difficulties in developing the required reaction load for the prior test, the staff would accept a procedure where the maximum test load for the pier load test was equal to 90 percent the maximum anticipated design load and a plate load test (ASTM D1194) was performed to a maximum test load equal to 130 percent of the maximum anticipated design load. (See Page 12 of submittal).
 - b. Significant modifications to the specified ASTM D1143-81 test procedures, as may be appropriate, require advanced notification and approval of the Region III Office. (See Page 12 of submittal.)
 - c. The rate of settlement shall not exceed 0.005 inch per hour when controlling the length of time that the 90% test load increment is to be maintained. (See Page 12 of submittal).
 - d. In order to provide a more positive reduction of skin friction, plywood sheeting coated with 1/8-inch thick bitumen (or equivalent) shall be installed on all test pier sides prior to performing the pier load test as a replacement for the plastic sheeting proposed by CPCo. (See Page 12 of submittal).
 - e. To permit correlation with the previously approved measures proposed by CPCo to demonstrate the adequate foundation capacity of the other installed piers, a minimum of two in situ density tests and five cone penetrometer tests shall be performed on the soil at the bottom of the pier selected for test loading.
5. Construction dewatering. During underpinning of the auxiliary building area, the upper phreatic surface shall be maintained a minimum of 2 feet in depth below the bottom of any underpinning excavation at any given time. The final plan for the dewatering system shall be established and implemented in advance of drifting under the turbine building or FIVP. The dewatering plan should include the locations and depths of the dewatering wells and piezometers (observation wells). Criteria for monitoring loss of soil particles due to pumping shall be the same as those previously approved by the staff for the construction dewatering of the service water pump structure (R. Tedesco letter of April 2, 1982) or for the permanent dewatering wells (R. Tedesco letters of June 18, September 2, and October 22, 1981).
6. Monitoring movement of FIVPs. Jacking of the FIVP back to its original position shall be required if the relative settlement between the reactor containment and the FIVP reaches a total settlement of 3/8-inches since the time piping connections were made.

ENCLOSURE 3

DEFINITION OF PHASE 2 UNDERPINNING ACTIVITIES AND QUALITY ASSURANCE PLAN
FOR SOILS ACTIVITIES

Phase 2 construction activities for the Midland auxiliary building underpinning are defined by Bechtel drawing C-1418-1(Q) Revision A, "Auxiliary Building - Underpinning Construction Sequence", and associated plan and logic drawing C-1418(Q), Revision A, both issued for information 3/19/82 and provided to the staff during an audit meeting on that date.

With respect to quality assurance requirements for Phase 2 work, CPCo's letter to H. Denton/J. Keppler dated January 7, 1982, transmitted a general Quality Plan for underpinning activities along with quality plans for the service water pump structure underpinning system and for the auxiliary building underpinning system and FIVPs. These plans describe the basic QA program controls to be applied to items and activities associated with the soils remedial work. We find these plans, including the QA programs described in Revision 12 of Consumer's QA Topical Report CPC-1A and Bechtel's QA Topical Report BQ-TOP-1, Rev. 1A, acceptable for the soils remedial work. However, a condition for this finding is that these quality assurance plans and programs are to apply to 1) all items and activities identified in the ASLB Memorandum and Order of April 30, 1982, and 2) all of the to-go underpinning Q-listed and non Q-listed work described in your April 5, 1982 letter to J. Keppler, except that work stated in attachment 1 of that letter. We interpret these plans and program to mean that the Midland Project Quality Assurance Department will be actively involved in reviewing contractor's, sub-contractor's, and consultant's quality assurance capabilities and assuring thorough review of procedures and verifications that hardware is built and work is performed in accordance with design, specification, and procedural requirements. Accordingly, we conclude that the above referenced Quality Plan is acceptable for implementation as described above. Since the foregoing conforms to the April 30, 1982, Board Order, any deviations must be reported to the staff.

ENCLOSURE 4

STAFF COMMENTS ON CONTINUING OR PLANNED SOILS ACTIVITIES PREVIOUSLY
APPROVED BY THE STAFF

The following comments are provided to clarify the staff's prior approvals of remedial soils activities at the Midland Plant. Each listed item in paragraphs I and II of CPCo's May 10, 1982, letter is presented and addressed.

"I.a. Phase I Work (Auxiliary Building Underpinning)"

The specific activities for Phase I work referred to in our letter of concurrence (Reference 5) for installation of the vertical access shafts were those defined by Consumer's Drawing "Underpinning Auxiliary Building Construction Sequency Logic" dated January 20, 1982.

"I.b. Access Shaft (Auxiliary Building Underpinning)"

This item is included in the staff's definition of "Phase I work" and is discussed under paragraph I.a. above.

"I.c. FreezeWall Installation, Underground Utility Protection, Soil Removal, Cribbing and Related Work in Support of the FreezeWall Installation, FreezeWall monitoring and FreezeWall activation"

References 5 and 7 provided staff concurrences for freezeWall installation and activation, respectively. These approvals were based upon CPCo's plan to eliminate the inducement of stresses to the conduits and piping because of heaving by excavating the soil directly beneath affected utilities within the projected area of influence of the freezeWall before ground freezing begins. The approvals also recognized your commitments (1) to demonstrate to the staff's satisfaction that recompression of the foundation soils beneath the piping or ducts has been completed before backfilling the excavation, and (2) to notify Region III personnel prior to drilling near seismic Category I underground utilities and structures. The approval was further contingent upon the successful audit by the NRC Regional Office III of the implementation procedures for excavation and monitoring.

The information which provided the basis for staff review and approval was provided by CPCo's letters of November 16 and 24, 1981, and January 6, 1982, and by hearing testimony of your consultant, J. P. Gould.

Consequently, the staff agrees that prior explicit concurrence for the activities listed by paragraph I.c. of CPCo's letter, May 10, 1982 had been obtained from the staff prior to the April 30, 1982 Order, except for the ambiguous phrase you included "and related work in support of...". Therefore, the staff did not approve "related work" in its letters of concurrence or other records.

"I.d. Installation and Operation of the Permanent Site Dewatering System"

The identity and location of the 65 permanent dewatering wells approved by the staff are given in References (1), (2) and (4). Installation and monitoring aspects of the permanent site dewatering system, excluding seismic aspects, was to be performed as Q-listed activities following staff review and approval of associated quality assurance and quality control documents.

"I.e. Operation of Existing Construction Dewatering Wells"

The only construction dewatering wells approved by the staff are those identified by References (6) and (10). This item is further discussed in Enclosure 6. As noted therein, however, construction wells installed and monitored to procedures equivalent to those for permanent wells may be considered acceptable.

"I.f. FIVP Proof Load Test"

The staff has no record or recollection of concurrence for a FIVP proof load test. Therefore, this test is not approved.

"II.a. Installation and Activation of Dewatering System for the Service Water Pump Structure"

Staff approval was indicated by Reference (10), subject to certain committed changes specified therein.

"II.b. The Repair of Cracks in the Borated Water Storage Tank Ring Wall"

Staff approval was indicated by Reference (9), which noted your commitment to pressure grout at least all cracks with widths in excess of 10 mils. This activity follows the completion of the valve pit surcharge programs which were also the subjects of prior staff approvals (References (3) and (8)).

In summary, ambiguity associated with CPCo's use of the terms "Phase I work" and "related [freeze wall] work" preclude confirmation of specific prior approval of these activities. Similarly, failure by CPCo to identify the particular existing construction dewatering wells precludes us from determining whether previous staff concurrence had been indicated. No description or discussion is provided for a "FIVP proof load test" and no record of prior staff approval can be located. Consequently, continuation of these activities in conformance with the foregoing staff comments will be in accordance with the Board Memorandum and Order of April 30, 1982. Any deviations must be reported and approved by the staff.

- References:
- (1) R. Tedesco letter of June 18, 1981, "Staff Concurrence on Installation of Twelve Backup Dewatering Wells"
 - (2) R. Tedesco letter of September 2, 1981, "Staff Concurrence on Installation of Eight Backup Dewatering Wells"
 - (3) R. Tedesco letter of September 25, 1981, "Staff Concurrence on Surcharging of Valve Pits for Borated Water Storage Tank Foundations"
 - (4) R. Tedesco letter on October 22, 1981, "Staff Concurrence on Installation of Permanent Dewatering Wells and Request for Additional Information"
 - (5) R. Tedesco letter of November 24, 1981, "Staff Concurrence for Construction of Access Shafts and Freezeway in Preparation for Underpinning the Auxiliary Building and Feed-water Isolation Valve Pits"
 - (6) R. Tedesco letter of December 28, 1981, "Staff Concurrence for Five Temporary Dewatering Wells"
 - (7) R. Tedesco letter of February 12, 1982, "Staff Concurrence for Activation of Freezeway"
 - (8) R. Tedesco letter of February 26, 1982, "Staff Concurrence on Removal of Surcharge from Borated Water Storage Tank Valve Pits"
 - (9) R. Tedesco letter of March 26, 1982, "Staff Concurrence for Grouting of Cracks in Concrete Foundations of Borated Water Storage Tanks"
 - (10) R. Tedesco letter of April 2, 1982, "Staff Concurrence for Installation and Operation of Construction Dewatering and Observation Wells for the Service Water Pump Structure"

ENCLOSURE 6

CONSTRUCTION DEWATERING WELLS

In the past Consumer's position with respect to temporary or construction dewatering has been that this work was not permanent, it was being conducted to enable performance of construction activities and, therefore, the work did not require staff approval. Consumers did not provide the details of the construction dewatering design and installation and did not seek staff approval for these activities.

More recently the staff has concluded that certain aspects of construction dewatering activities related to underpinning the service water pump structure (SWPS) and auxiliary building could potentially affect the foundation stability of these nearly completed structures. The staff has actively reviewed the temporary construction dewatering plan for the SWPS and has reached agreement with CPCo on an acceptable plan (April 2, 1982 letter with enclosures from R. Tedesco to J. Cook, Staff Concurrence for Installation and Operation of Construction Dewatering and Observation Wells for the Service Water Pump Structure). The staff has not presently obtained or evaluated the final plan for construction dewatering during auxiliary building underpinning but has specified conditions for Phase 2 concurrence (Enclosure 3).

It is the staff's position, with respect to the remaining construction dewatering wells that are already installed and operating, that these wells be monitored for the loss of soil particles due to pumping similar to the requirements agreed upon and recorded in Enclosure 3 to the April 2, 1982 letter.

The specifications for a construction dewatering well are dependent upon the specific application. Consequently, approval for typical field practices, on other than a case-by-case basis is not meaningful. Therefore, for the future, the design and installation details of construction dewatering wells that have not yet been operated or installed should be addressed on a case-by-case basis following appropriate notification of the staff by the CPCo. This procedure will permit an assessment of the safety significance of the proposed well. However, any construction well for which the procedures for installing and monitoring the loss of soil particles are equivalent to those previously approved for permanent dewatering wells (which was in accord with a staff approved quality assurance plan) may be considered acceptable, provided also that the upper phreatic surface is maintained two feet below the bottom of any excavation or as otherwise approved in advance by Region III.

ENCLOSURE 7

STAFF EVALUATION OF DRAWING 7220-C-45

Staff requirements for this drawing were provided by the staff on May 7, 1982, to Messrs J. Mooney, J. Schaub and others of CPCo. These were:

- (1) The seismic Category I retaining wall to the east of the service water pump structure is shown to be located in the non-Q zone. CPCo should revise the drawing to provide for Q-listed control in the vicinity of this wall.
- (2) The drawing should be revised to provide for Q control of soils activities for the emergency cooling water reservoir (ECWR), the concrete service water discharge lines, and the perimeter and baffle dikes adjacent to the ECWR.
- (3) CPCo should implement Q controls for certain aspects of work outside the Q zone of Drawing 7220-C-45 which could impact safety related structures and systems. Examples include potential removal of fines by dewatering wells, improper location of borings near the Q boundary, and soil excavations at the boundary involving both Q and non-Q areas.
- (4) CPCo should re-confirm that no seismic Category I underground utilities extend beyond the Q area bounds of the drawing.

CPCo's letter of May 10, 1982 notes the intent to revise the drawing to address the ECWR components and other appropriate areas. CPCo has also identified during the May 7 telephone discussion additional measures being implemented to assure proper location for drillings.

On the basis of CPCo's commitment to extend the controls of soils activities to incorporate these staff requirements, the staff approves the use of Drawing 7220-C-45 for defining the areas around safety-related structures and systems within which the restrictions and requirements of the April 30, 1982, Memorandum and Order shall apply.

ENCLOSURE 8

ADDITION INFORMATION REQUIRED TO COMPLETE STAFF REVIEW OF
SOILS REMEDIAL WORK


1. Provide the following information regarding the Auxiliary Building and Feedwater Isolation Valve Pits:
 - 1.1 redesign of stiffened bulkhead against earth pressures during drift excavation to install needle beam assembly
 - 1.2 revise report on crack evaluation to include consideration of the effects of multiple cracks
 - 1.3 analysis of the construction condition using a subgrade modulus of 70 KCF and provide results
 - 1.4 allowable differential settlements for Phase 3 (based on 1.3 above)
 - 1.5 horizontal movement acceptance criteria for Phase 3 for instruments at top of EPAs and control tower
 - 1.6 as-built report with confirmatory detail on underpinning in FSAR upon completion of construction
 - 1.7 acceptance criteria for strain monitors for Phase 3
 - 1.8 acceptability of 1.5 FSAR SSE versus SSRS as bounding design
 - 1.9 method to be followed for transfer of jacking load into permanent wall
 - 1.10 complete design analyses of permanent underpinning wall
 - 1.11 updated construction sequence for Phases 3 and 4
 - 1.12 settlement monitoring program to be required during plant operation with action levels and remedial measures identified (Tech. Spec.). Include RBA, EPA and Control Tower
 - 1.13 plans and details for permanently backfilling underpinning excavations including compaction specifications for granular fill under FIVP
 - 1.14 procedure to be required for detecting extent of planar openings uncovered in drift excavations and controls to minimize their effects.

2. Provide the following information regarding the Service Water Pump Structure:
 - 2.1 acceptability of 1.5 FSAR SSE versus SSRS as bounding design
 - 2.2 sliding calculation using site-specific response spectra (SSRS) seismic loads and provide results with basis for assumed soil input parameters
 - 2.3 stress condition for existing parts of structure:
 - (a) Maximum stresses
 - (b) Critical combinations
 - (c) Identify true critical elements based on actual rebar

- 2.4 calculation for determining lateral earth pressures under dynamic loading
 - 2.5 settlement monitoring program to be required during plant operation with action levels and remedial measures identified (Tech. Spec.)
 - 2.6 as-built report with confirmatory data on underpinning in FSAR upon completion of construction
 - 2.7 report on crack evaluation to include consideration of the effects of multiple cracks.
3. Provide the following information regarding the Borated Water Storage Tanks:
- 3.1 adequacy of governing load combination used in design
 - 3.2 acceptability of 1.5 FSAR SSE versus SSRS as bounding design
 - 3.3 settlement monitoring program to be required during plant operation with action levels and remedial measures identified (Tech. Spec.)
 - 3.4 as-built report with confirmatory data in FSAR on completed construction
4. Provide the following information regarding underground pipes:
- 4.1 basis for modeling of the piping inside the building in the terminal end analyses
 - 4.2 controls to be required during plant operation to prevent placement of heavy loads over buried piping and conduits
 - 4.3 as-built report with confirmatory data in FSAR on completed construction
 - 4.4 justification why the BWST lines are not to be rebudded from the tank farm dike to the auxiliary building
 - 4.5 a list of all penetrations for underground seismic Category I piping. Revise and submit your pipe monitoring program to include periodic measurements of rattelspace for plant operating life. Provide justification for all exceptions.
 - 4.7 justification for the high (beyond limits) reported settlement stresses
5. Provide the following information regarding the Diesel Generator Building:
- 5.1 a structural reanalysis considering:
 - (a) Presurcharge conditions
 - (b) Conditions during the surcharge
 - (c) 40-year settlement effects
 - (d) The combined effects of (a) through (c) above
 - 5.2 a structural reanalysis assuming reduction in soil spring stiffnesses between bays 3 and 4 on the south side and beneath adjacent cross wall
 - 5.3 a statistical evaluation of settlements to evaluate impact of survey inaccuracies versus actual differential settlements which have been experienced

- 5.4 acceptability of 1.5 X SSE (FSAR) versus SSRS for bounding design
 - 5.5 criteria relating crack width and spacing to reinforcing steel stress
 - 5.6 settlement monitoring program to be required during plant operation with action levels and remedial measures identified (Tech. Spec.)
 - 5.7 evaluation of effect of past and future differential settlements to diesel lines from the day tank to the diesels.
6. Provide a settlement monitoring program to be required during plant operation with action levels and remedial measures identified (Tech. Spec.) for the underground Diesel Fuel Oil Storage Tanks.
 7. Provide the following information regarding the permanent dewatering system:
 - 7.1 results of the dewatering recharge tests
 - 7.2 technical specification requirements on the permanent dewatering system.
 - 7.3 a summary dicussion of your contingency plans which would be implemented in the event groundwater levels at critical locations exceed limits in the technical specifications.
 8. Provide a settlement monitoring program to be required for structures founded on natural soils and plant fill which have not been identified above with action levels and remedial measures identified. (Tech. Spec.)

Attachment 2


Consumers
Power
Company

James W Cook
Vice President - Projects, Engineering
and Construction

General Offices: 1945 West Parnall Road, Jackson, MI 49201 • (517) 788-0453

April 5, 1982

Mr J G Keppler
Regional Administrator
US Nuclear Regulatory Commission
Region III
799 Roosevelt Road
Glen Ellyn, IL 60137

MIDLAND PROJECT - DOCKETS 50-329 AND 50-330
QUALITY ASSURANCE FOR REMEDIAL FOUNDATION WORK
FILE 0.4.9.20.6 SERIAL 16161

Reference 1: Letter from Mr D Hood, dated March 12, 1982 on the subject:
"Summary of March 10, 1982 Meeting Concerning Quality
Assurance to be Applied to Remedial Foundation Work"

On March 30, representatives from Consumers Power Company (Messrs J W Cook, J A Mooney, B W Marguglio, et al) met with representatives from the NRC (Messrs C E Norelius, W Little, E G Adensam, D S Hood, et al) in the Region III office in Glen Ellyn, Illinois to discuss the Quality Assurance Program for the Midland Remedial Foundation Work. The purpose of this letter is to document the conclusions and commitments that were made at that meeting and subsequently discussed during several telephone conversations on April 2, 1982.

The major conclusion reached at the meeting was the Consumers Power Company commitment to place essentially all of the to-go underpinning work under the coverage of the Quality Plan For Underpinning Activities, MPQP-1, which had previously been discussed with the staff, most recently at the March 10, 1982 meeting in Bethesda as summarized in the correspondence cited as Reference 1. This expansion of the QA program coverage for the underpinning work is effective immediately, but recognizes specific exceptions to cover previously completed non-Q-listed work and certain future work as identified in Attachment 1 to this letter. Expansion of QA program coverage is in recognition not only of the importance of this work to public health and safety but also to the overall success of the Midland Project. As a result, the program is being applied to both safety-related and nonsafety-related items and activities without any further attempt to resolve prior discussions as to the exact definition and boundaries of safety-related as applied to each individual aspect of the underpinning work.

Certain other concepts related to the extended application of the QA program to the underpinning work were discussed at the prior meeting on March 10 (Reference 1) and reaffirmed in the discussion at our meeting on March 30.

~~ABC~~

Both parties agreed that the Quality Assurance Program for Remedial Foundation Work will be applied to the multitude of underpinning items and activities to the extent commensurate with the importance of the individual items. This will be implemented by identifying the specific quality requirements that apply to each of the items and activities now covered by the program so that all parties whether carrying out or inspecting the work will have a clear understanding of what the actual quality requirements are for each item and activity.

As the underpinning work progresses, any new exceptions to the coverage under the QA program which are considered appropriate will be communicated in writing to Mr C E Norelius of the NRC Region III such that it is received at least five working days prior to the scheduled start of the affected work. It was agreed that this communication mechanism will provide NRC with sufficient time to review any such requests and respond to Mr J A Mooney of Consumers Power Company prior to the scheduled start of the affected work.

With regard to the exception list, subsequent to the March 30 meeting, discussions have been held with the NRC Region III staff on April 2 during which the NRC raised questions about the Q-list status of two items: (1) the rock bolts and rock and earth anchors, and (2) the connecting piping for the permanent dewatering system. In response to the first item, program coverage will be extended to all rock bolts and rock and earth anchors to be installed after April 2, 1982 which includes all permanent installations. With regard to the second item, the exception list as provided during the March 30 meeting, included the permanent dewatering system. However, this item has been deleted from the attached exception list because it is not a part of the underpinning work. It should also be noted that the non-Q classification of the permanent dewatering system, except for the installation of wells and the monitoring of fines, had been specifically resolved previously with the NRR staff.

In order to facilitate communications between Consumers Power Company and NRC Region III personnel during the course of the underpinning work, a number of agreements were reached as to communication channels. Dr R B Landsman has been designated as the Region III lead inspector for underpinning work with Mr R J Cook to assist in his capacity as resident inspector at the site. Consumers Power Company designated Messrs J R Schaub and D E Horn as the prime contacts for Dr Landsman and Mr Cook to obtain whatever specific detailed information they required for this work. In addition, we agreed to provide Region III, through normal distribution, weekly or biweekly reports (frequency to be determined) summarizing the results of the just completed work and describing the schedule of work for the immediate forthcoming period. All of the above information is in addition to the existing transmittal of nonconformance reports and other documents to Region III.

We believe that the results of the March 30 meeting as summarized above addresses all outstanding items in the staff's review of the Quality Assurance Program for the Remedial Foundation Work. We would appreciate a written confirmation of this conclusion.

We also discussed, as part of our March 30 meeting, Consumers Power Company's request that the NRC's lead inspector for the underpinning work spend as much time on the site as practicable in order to be thoroughly conversant with all current and short-term planned activities. We believe this is essential in order that we may be responsive to whatever additional information and discussions he wishes to pursue and to minimize the possibility of any misunderstandings. In order to facilitate the NRC's inspection planning, we will provide shortly and continue to provide updated overall underpinning schedule information and our specific recommendations of which aspects of this work the NRC should consider including in their inspection plan.

James W. Cook

JWC/BWM/kdz

Attachment 1: Exceptions to the Project Quality Assurance Program
Coverage for Underpinning

CC: Atomic Safety & Licensing Appeal Board

Director - Office of Inspection & Enforcement
Att: Mr Richard C DeYoung, US NRC

Director - Office of Management Information & Program Control, US NRC

CBechhoefer, ASLB
MMCherry, Esq
RJCook, Midland Resident Insp
FPCowan, ASLB
RSDecker, ASLB
HRDenton, US NRC
JHarbour, ASLB
DSHood, US NRC
CENorelius, US NRC
WLittle, US NRC

JDKane, US NRC
Wotto, US Army Corps of Engineers
WHMarshall
SJPoulos
FRinaldi, US NRC
HSingh, US Army Corps of Engineers
MSinclair
BSTamiris

Exceptions to the Project Quality Assurance Program Coverage for Underpinning:

1. Freeze wall, other than for the protection of Category I utilities which are covered;
2. Auxiliary building access shaft activities above elevation 609 and soldier piles; . .
3. The procurement of soldier pile material; tools and equipment (such as torque wrenches, jacks, gauges and threading machines - but their calibrations are covered); steel and wood logging; backpacking material; rock bolts and rock and earth anchors already installed for temporary installations; and glue.



Consumers
Power
Company

attachment 3

James W Cook
Vice President - Projects, Engineering
and Construction

General Offices: 1945 West Parnall Road, Jackson, MI 49201 • (517) 788-0453

August 9, 1982

Mr Harold R Denton, Director
Office of Nuclear Reactor Regulation
Division of Licensing
US Nuclear Regulatory Commission
Washington, DC 20555

MIDLAND NUCLEAR COGENERATION PLANT
MIDLAND DOCKET 50-329, 50-330
FEEDWATER ISOLATION VALVE PIT (FIVP)
LOAD VERIFICATION
FILE: 0485.16, 0.4.9.20.6, 5.17 SERIAL: 18421

- REFERENCE: (1) LETTER D G EISENHUT TO J W COOK, COMPLETION
OF SOILS REMEDIAL ACTIVITIES REVIEW,
DATED MAY 25, 1982
- (2) LETTER W P HAASS TO J W COOK, NRC ACCEPTANCE OF
REVISED CP CO QUALITY ASSURANCE TOPICAL REPORT,
DATED MAY 19, 1982

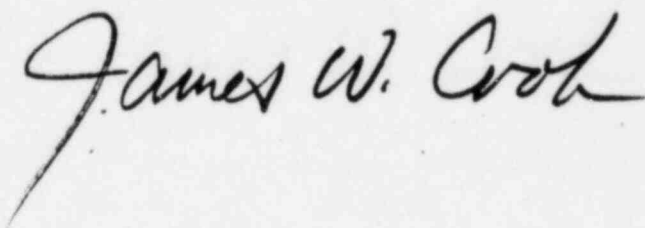
Attached are copies of (1) the Midland Project Quality Plant for Underpinning Activities (MPQP-1, Revision 3) and (2) the Midland Project Quality Plan for Remedial Soils Activities and Soils Related Work in Q Areas (MPQP-2, Revision 0). These plans have been previously reviewed by Dr Ross Landsman and Mr John Gilray, as indicated in the attached Summary of CP Co-NRC Meeting between W R Bird and J Gilray on July 6, 1982. (Attachment 3).

On August 3, 1982, Mr J A Mooney was advised that NRR desired a submittal of the enclosed Quality Assurance Plans to formally document the material previously reviewed with Mr Gilray and Dr Landsman. This submittal meets that request.

It is anticipated that minor revisions of the Quality Assurance Plans or of the topical reports referenced above may occasionally be necessary. The Company intends to submit proposed revisions to the Quality Plans bearing on the work covered by the April 30 Board Order for approval by NRR before putting such revisions into effect. Changes to the Topical Report will be continued to be handled as per the approved CPC-1A Topical as given by NRR

3001

letter of May 19, 1982 (Reference 2). It would be very helpful if the NRR Staff could act promptly in such circumstances so that necessary revisions can be made and implemented in a timely fashion.



JWC/WRB/bjw

- Attachments:
1. Midland Project Quality Plan for Underpinning Activities (MPQP-1, Revision 3)
 2. Midland Project Quality Plan for Remedial Soils Activities and Soils Related Work in Q Areas (MPQP-2, Revision 0)
 3. Summary of CP Co-NRC Meeting between W R Bird and J Gilray on July 6, 1982

CC: Atomic Safety and Licensing Appeal Board
CBechhoefer, ASLB
MMCherry, Esq
FPCowan, ASLB
RJCook, Midland Resident Inspector
RSDecker, ASLB
SGadler
JGilray, USNRC
JHarbour, ASLB
GHarstead, Harstead Engineering
DSHood, USNRC
DFJudd, B&W
JDKane, USNRC
FJKelley, Esq
RBLandsman, USNRC
WHMarshall
JPMatra, Naval Surface Weapons Center
Wotto, Army Corps of Engineers
WDPaton, Esq
SJPoulos, Geotechnical Engineers
FRinaldi, USNRC
HSingh, Army Corps of Engineers
BStamiris

BCC AJBoos, Bechtel
JEBrunner, M-1079
MLCurland, Midland
PJGriffin, P-24-513
RWHuston, Washington
BWMarguglio, Midland
JKMeisenheimer, P-14-208
JAMooney, P-14-115A
DBMiller, Midland
MIMiller, IL&B (3)
JARutgers, Bechtel
JRSchaub, P-14-305
PPSteptoe, IL&B, Chicago
TJSullivan/DMBudzik, P-24-624A
LASutkus, Bechtel
FCWilliams, IL&B, Washington
NRC Correspondence

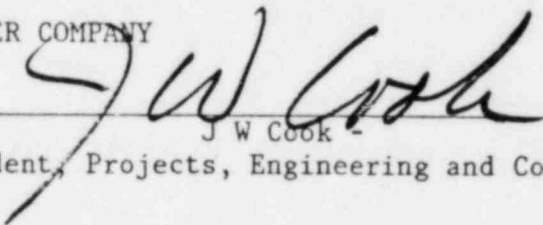
CONSUMERS POWER COMPANY
Midland Units 1 and 2
Docket No 50-329, 50-330

Letter Serial 18045 Dated August 5, 1982

At the request of the Commission and pursuant to the Atomic Energy Act of 1954, and the Energy Reorganization Act of 1974, as amended and the Commission's Rules and Regulations thereunder, Consumers Power Company submits a request to release the remaining soils remedial work. This letter delineates the scope of the remedial soils work including the acceptance criteria.

CONSUMERS POWER COMPANY

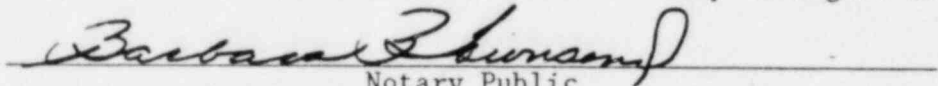
By



J. W. Cook

Vice President, Projects, Engineering and Construction

Sworn and subscribed before me this 9 day of August 1982



Notary Public

Jackson County, Michigan

BARBARA P. TOWNSEND

Notary Public, Jackson County, MI
My Commission Expires Sept. 8, 1984

ATTACHMENT 1

QUALITY PLAN FOR
UNDERPINNING ACTIVITIES

Effective Date July 26, 1982

Approved

Walter Bird
Manager MPQAD

Approved

Alan Boos
Bechtel Assistant Project Manager

Approved

Amcomby
Midland Project Office

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 Site Manager manages overall field activities including the underpinning work.

The Manager of MPQAD and the Civil Section Head will manage the MPQAD support of underpinning work with the overview of the Director of Environmental and Quality Assurance.

QUALITY PLAN FOR UNDERPINNING ACTIVITIES

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 concurrence with any general exclusion from the Quality Assurance Program is required prior to conducting any work activities in the excluded area.

QUALITY PLAN FOR UNDERPINNING ACTIVITIES

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.

QUALITY PLAN FOR UNDERPINNING ACTIVITIES

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).

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.

QUALITY PLAN FOR UNDERPINNING ACTIVITIES

Bechtel Site Management

Performs the overall on-site management of all construction activities including coordination between Bechtel, CP Co and Subcontractor. Includes a Construction Remedial Soils Group who is responsible for coordinating the activities of the underpinning subcontractors.

Geotech Services

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

Resident Geotechnical Engineer

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

Resident Structural Engineer

Represents Project Engineering on site and provides structural expertise for the underpinning activities. Receives and evaluates data from the underpinning instrumentation systems.

Bechtel Quality Control (QC)

Performs first-line inspection and verification, of items under the Quality Assurance Program. Reviews construction procedures, drawings and specifications for inclusion and establishment of inspection criteria.

QUALITY PLAN FOR UNDERPINNING ACTIVITIES

Midland Project Quality Assurance Department (MPQAD)

Provides the quality assurance for all underpinning work including work done by Bechtel and Bechtel Subcontractors. Develops quality plans, reviews design documents and construction procedures. Performs over-inspections and pre-planned audits.

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 Construction on construction methods, design, instrumentation or geotechnical items.

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.

QUALITY PLAN FOR UNDERPINNING ACTIVITIES

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 Quality Control and MPQAD. The MPQAD review applies to all design documents. (MPQAD Procedure M-11)

MPQAD 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.

QUALITY PLAN FOR UNDERPINNING ACTIVITIES

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 Construction shall request from or notify Project Engineering of changes 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 accordance with EDP 4.62. FCNs will allow Bechtel Construction 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 EDPI 4.25.2. The Subcontractor receives design documents

QUALITY PLAN FOR UNDERPINNING ACTIVITIES

from Bechtel Construction in accordance with FID 1.100. The Resident Structural Engineers duties on site are defined in PEP 2.14.9.

Inspections are performed by Bechtel QC to verify that construction is being performed to the latest revisions of the design documents. Audits and/or overinspections are conducted by MPQAD. Field geotechnical activities, including subgrade acceptance, are accomplished in accordance with EDPI 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 Construction in accordance with FPG-8.000. Bechtel Construction 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. MPQAD 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 Q-material, inspections are performed by Quality Control in accordance with PSP G-5.1 to verify items comply with the procurement package requirements and quality verifications packages are complete.

QUALITY PLAN FOR UNDERPINNING ACTIVITIES

Quality verification packages are reviewed for availability, traceability and legibility by Bechtel QC and audited by MPQAD (MPQAD Procedure F-1M). In addition, a technical review will be performed by Bechtel QC 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 minimum required to be submitted by the Subcontractor prior to the start of fabrication and construction. These procedures are logged, controlled, and distributed by the Field Document Control Center and reviewed by Project Engineering, Bechtel QC and MPQAD. Project Engineering defines the specific quality attributes of each procedure. The procedures will be specifically reviewed by MPQAD for appropriate inclusion of quality requirements. (MPQAD Procedure M-10)

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

QUALITY PLAN FOR UNDERPINNING ACTIVITIES

7. INSPECTION, EXAMINATION, TEST AND CALIBRATION

Quality verification, inspection and testing of Subcontractor activities is performed by Bechtel Quality Control, independent of the Subcontractor and Bechtel Construction. Bechtel QC will prepare inspection plans (in accordance with PSP G-6.1) utilizing inputs from technical specifications, design drawings and Subcontractor procedures. 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 MPQAD review and approval according to MPQAD Procedure E-2M. In addition, inspection and test activities are monitored by MPQAD through the use of overinspection plans based on an independent evaluation of design and procurement documents per MPQAD Procedure E-1M. The Subcontractor is indoctrinated to Bechtel QC and MPQAD procedures and inspection planning 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.

QUALITY PLAN FOR UNDERPINNING ACTIVITIES

- b) The procedures shall provide for QC/QA 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 MPQAD. 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 Construction for review. At the completion of the subcontract, these records will be turned over to Bechtel Quality Control. Performance and effectiveness of the agency is verified by MPQAD audits and/or overinspections in accordance with MPQAD Procedures F-1M and E-1M, respectively.

c. 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 Bechtel QC inspection and verification according

QUALITY PLAN FOR UNDERPINNING ACTIVITIES

to PSP G-5.1 and MPQAD 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, Bechtel QC 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 Construction. Bechtel Construction 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.

All quality records are controlled by EDPs 5.16 and 5.24, Bechtel QC 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 Bechtel QC in accordance with PSP G-3.2 and MPQAD in accordance with MPQAD Procedure F-2M. These procedures provide

QUALITY PLAN FOR UNDERPINNING ACTIVITIES

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. Bechtel QC and/or 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 MPQAD 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. Bechtel QC and/or 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 Bechtel QC and MPQAD through the review of 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.

QUALITY PLAN FOR UNDERPINNING ACTIVITIES

11. AUDITS

Audits are performed by MPQAD 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 PSP G-8.1 or MPQAD Procedures B-2M and/or B-3M. Subcontractor field supervisory and engineering personnel are indoctrinated to the Midland Project Quality Program. This indoctrination includes an introduction to the quality system, inspection activities, nonconformance control, NRC activities, field and engineering design changes and site organizations and interfaces. The indoctrination is initially completed prior to any Q-listed work proceeding. Additional training 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.

. LIST OF
APPLICABLE
PROCEDURES

List of Applicable Procedures

MIDLAND PROJECT QUALITY ASSURANCE DEPARTMENT PROCEDURES

B-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 Staturing
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
M-11	MPQAD Review of Bechtel Design Specifications, Drawings and Procedures for Underpinning and Related Remedial Activities.

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

List of Applicable Procedures

EDP - 5.16

Supplier Document Control

EDP - 5.24

Document Distribution Control Center

List of Applicable Procedures

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 - 2.14.8	Resident Geotechnical Engineer for Midland Remedial Underpinning Operation.
EDPI - 4.1.1	Preparation of Design Requirements Verification Checklist.
EDPI - 4.25.2	Interface Control Design Documents for Remedial Soils Underpinning Operation.
EDPI - 4.47.1	Interim Drawing Change Notice for the Midland Project 7220
EDPI - 4.49.1	Specification Change Notification

PROJECT ENGINEERING PROCEDURES

PEP-2.14.9

Resident Structural Engineer for Midland Remedial
Underpinning Operation

PROJECT FUNCTIONAL MATRIX FOR UNDERPINNING ACTIVITIES

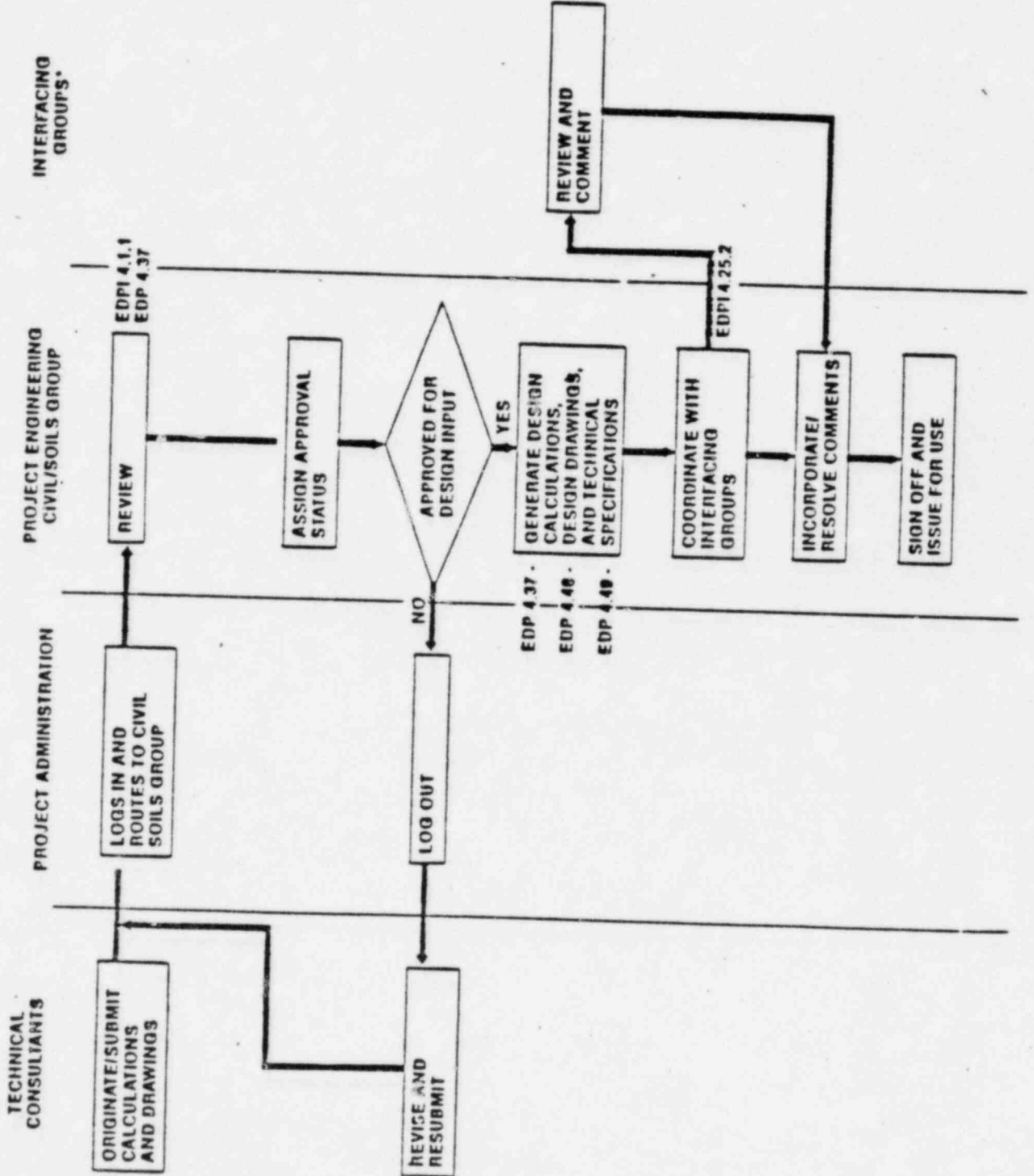
ATTACHMENT 1
TO UNDERPINNING
MINI-TOPICAL

	POLICY				DESIGN				PROCUREMENT				INSTALLATION				AUDITS	
	ENGR POLICY ESTABLISHMENT	ESTABLISHMENT AND IMPLEMENTATION OF DESIGN CRITERIA (PERMANENT STRUCTURE)	ESTABL AND IMPLEMENTATION OF DESIGN CRITERIA (TEMPORARY STRUCTURE)	DESIGN CONTROL INTERFACE ESTABLISHMENT	PREPARATION OF ENGINEERING DOCUMENTS	DESIGN REVIEW AND VERIFICATION	PREPARATION AND CONTROL OF DESIGN CHANGES (INCLUDING FIELD)	SUPPLIER EVALUATION AND SELECTION	PROCUREMENT (PURCHASE ORDERS)	INSPECTION AND AUDIT OF OFFSITE ORGANIZATIONS	RECEIVING INSPECTION	PREPARATION AND IMPLEMENTATION OF DRAWINGS/TEST PROCEDURES	QUALITY VERIFICATION INSPECTION AND TESTING STATUS INDICATORS	NONCONFORMANCE CONTROL	CORRECTIVE ACTION	QUALITY RECORDS		
CPCo PROJ MGMT	●																	
BECHTEL PROJ MGMT																		
CPCo PRODUCTION ENGRG																		
BECHTEL MGMT ENGRG																		
BECHTEL PROJ ENGRG																		
BECHTEL QUALITY ENGRG																		
MRJDMERGENTINE (TSA)																		
WISS JANEY (TSA)																		
SPENCER, WHITE, AND PRENTIS																		
GEOTECH SERVICES																		
VIP SUBCONTRACTORS																		
BECHTEL CONSTRUCTION REMEDIAL SOILS GROUP																		
BECHTEL QUALITY CONTROL																		
MIDLAND PROJECT QUALITY ASSURANCE																		

● DIRECT INVOLVEMENT
○ INPUT ONLY

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

DESIGN DOCUMENT INTERFACE FLOWCHART



ATTACHMENT 2

QUALITY PLAN FOR
REMEDIAL SOILS ACTIVITIES
and
SOILS RELATED WORK IN Q AREAS

Effective Date July 26, 1982

Approved

Walter R. Bird
Manager MPQAD

Approved

Walter R. Bird
Bechtel Assistant Project Manager

Approved

J. M. Cooney
Midland Project Office

QUALITY PLAN FOR REMEDIAL SOILS ACTIVITIES AND SOILS RELATED WORK IN Q-AREAS

6. BWST foundation repairs and tank releveling.
7. Underground service water and BWST piping rebedding or replacement.
8. Any placing, compacting, excavating, or drilling soil materials under or around safety-related structures and systems, as defined by Bechtel drawing C-45 (Q).

GENERAL

This Quality Plan is applicable for all aspects of the above defined work and as such the activities and materials associated with this work is deemed to be "Q-listed." It is recognized that this "Q-listing" covers activities, items and structures beyond the requirements provided by the FSAR. This extension to provide Quality Assurance Program coverage over and above strictly safety related items will provide an additional assurance that no activity will have an adverse effect on safety related structures.

REQUIREMENTS

1. The activities included in the scope will be done to approved design documents and procedures; where existing procedures developed under the requirements of the topical reports do not provide specific coverage, additional procedures will be developed. Design documents will be reviewed by MPQAD to assure that quality planning is in place to support the verification of requirements. Procedures will be reviewed by MPQAD to assure that appropriate quality requirements are included. Specifica-

QUALITY PLAN FOR REMEDIAL SOILS ACTIVITIES AND SOILS RELATED WORK IN Q-AREAS

assure that appropriate quality requirements are included. Specifications, procurement documents, drawings and procedures shall be 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.

2. MPQAD will be involved in the review of work activities to 1) determine the extent of QC inspections and QA overinspection, 2) assure the adequacy or detail of implementing procedures/instructions, and 3) to determine the extent of quality records. The MPQAD reviews will be documented in accordance with MPQAD Department procedures.
3. An excavation procedure shall be in place to control excavation, drilling and pile driving in Q-listed soils as defined on Bechtel drawing C-45 (Q).
4. A specific Quality Plan will be developed for providing Quality Program coverage of underpinning subcontractors who do not have their own Nuclear Quality Assurance Programs. (Reference MPQP-1)

QUALITY PLAN FOR REMEDIAL SOILS ACTIVITIES AND SOILS RELATED WORK IN Q-AREAS

5. Any activity or structure or item or procurement in support of the remedial soils work which will be excluded from Quality Assurance Program coverage will be done on an exception basis. Concurrence of NRC Region III is required prior to conducting any work activity in the excluded areas.

QUALITY PLAN FOR REMEDIAL SOILS ACTIVITIES AND SOILS RELATED WORK IN Q-AREAS

GENERAL

All activities performed by Consumers Power Company or Bechtel Power Corporation and their subcontractors for the remedial soils work and work within the area covered by C-45Q is 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 such work.

SCOPE

This Quality Assurance Plan is applicable to those activities associated with the following:

1. Underpinning of service water pump structure. (Reference MPQP-1)
2. 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. (Reference MPQP-1)
3. Installation of monitoring system and the monitoring of structural response to underpinning activities.
4. Dewatering systems. The installation, operation, and monitoring of both permanent and temporary dewatering systems.
5. Freeze wall.

ATTACHMENT 3

SUMMARY OF CP CO - NRC MEETING
W R BIRD AND J GILRAY
ON JULY 6, 1982

Mr Bird met with Mr Gilray at the Bethesda Office on July 6, 1982, to present draft copies of a revised MPQP-1 and of a new MPQP-2 for coordination with Mr Gilray. Mr Gilray and Dr Landsman had previously been provided copies of these draft documents via mail. A detailed discussion was held on these documents, and specifically for MPQP-2, a comparison of the wordings and understandings of the ASLB Memorandum and Order of April 30 was conducted. Several wording changes and recommendations to assure clarity were made by Mr Gilray, which are incorporated in the document.

From the NRR Offices, a phone call was made by Mr Bird to Mr Schaub to assure the acceptability of the revisions. In addition, another phone call was made to Dr Landsman to go through the document to see if he had any comments of his own, and to inform him of the changes agreed to by Mr Bird and Mr Gilray. The end result was that the documents, as marked up, were agreed to.

Note: Subsequent to the July 6 meeting and phone calls, some additional comments were generated on MPQP-1 and MPQP-2. These additional comments were coordinated by phone on July 16 and July 19 with Dr Landsman and Mr Gilray, respectively and their concurrence on the changes was obtained. The actual signoff and release of the Quality Plans occurred on July 26, 1982.