Request 5

Midland Nuclear Plant
Units 1 and 2

Docket Number: 50-329
50-330

Independent Assessment of Underpinning: 90-Day Report

Prepared for

Consumers Power Company

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SUMMARY

Consumers Power Company, the applicant for an operating license for the Midland Nuclear Plant, has been engaged since 1978 in a comprehensive program to resolve soils-related issues identified during plant construction. To assist in this program Stone & Webster Michigan, Inc. (Stone & Webster) was retained to provide an independent assessment of the underpinning work being performed by the Contractor, Bechtel Power Corporation, at the Midland Nuclear Plant. Stone & Webster retained the services of Parsons Brinckerhoff Michigan, Inc. to assist in the assessment of this work. This report details the findings of the independent assessment for the first 90 days of underpinning construction.

The Assessment Team found that during the 90-day assessment period--December 13, 1982 through March 12, 1983--underpinning work at the Midland Nuclear Plant was performed in accordance with design intent. During this period, four access pits, approximately 60 feet of access drifts, and excavation and concrete placement for two 35-foot deep piers was completed. In addition, load transfer at one of the piers was near completion and excavation of two additional piers was well underway. Construction procedures and practices were in accordance with project documents, and, with the exception of the few instances described below,

in accordance with good industry practices. The quality of the final products was also in keeping with the standards defined by project documents. Instrumentation monitoring of the structures being underpinned has shown that there has been no detrimental structural movement.

The Assessment Team believes that the Contractor must avoid the lengthy delays that plagued the installation and load transfer at the first two piers. Specifically, the belled areas of these piers were both open for periods of approximately 3 weeks and load transfer was not accomplished until nearly 1 month after pier concrete placement. These time lapses are not in keeping with good underpinning practice. The intent should be to minimize the time a structure is without support at a particular location. The quality of the final product can be improved by modifying the installation procedures for lagging spacing and backpacking.

The Assessment Team is satisfied with the qualifications, training, and ability of the Midland Plant Quality Assurance Department (MPQAD)-soils personnel. This group has a good understanding and appreciation of the intent and philosophy of quality assurance and quality control. In addition, implementation of the MPQAD inspection plans and reports has been satisfactorily accomplished.

The work completed to date, 2 piers out of a total of 57 piers, does not represent a sizable or extensive enough portion of the total underpinning activity to allow a complete assessment of underpinning operations. The Assessment Team, therefore, recommends that its surveillance activities be continued until the load transfer to at least the first grillage beams has been completed. By that time, the Contractor will have installed several critical piers in addition to the grillages.

SECTION 1

PURPOSE AND SCOPE

The purpose of this report is to provide the results of an independent assessment of the first 90 days of underpinning work being performed by Bechtel Power Corporation (Contractor) for Consumers Power Company (CPCo) of Michigan relating to remedial actions necessary to correct foundation problems for several safety-related structures at its Midland Nuclear Plant. To assist in this independent assessment, Stone & Webster Michigan, Inc. (Stone & Webster) retained the services of Parsons Brinckerhoff Michigan, Inc. to provide expertise in underpinning procedures. The scope of work for the independent assessment is described in CPCo Specification CC-100, which is included as Appendix A.

The Assessment Team started work on September 20, 1982, with an original scope of work that included only the auxiliary building underpinning. Upon the request of the Nuclear Regulatory Commission (NRC), the scope of work was increased on February 24, 1983 to include all underpinning work performed at the Midland Nuclear Plant while the Stone & Webster contract was in effect. At this time, the service water structure is the only other structure that is being underpinned. The specific

additional scope of work items that were added to the original scope of work are:

- Provide a quality assurance (QA) overview and assessment of the design work packages to ensure accuracy and adequacy. This overview is to ensure conformance tc procedural and programmatic requirements.

- Provide a QA overview and assessment of the quality control inspector requalification and certification program.

- Provide a QA overview and assessment of the training conducted for all personnel in the soils remedial work effort.

- Expand the work contract to include an assessment of all underpinning work on safety-related structures on which underpinning work is done while the contract with Stone & Webster is in effect.

The Assessment Team was required to submit weekly reports on its activities and findings directly to the NRC. In addition to the weekly reports, the Assessment Team was also required to issue Nonconformance Identification Reports to CPCo.

The CPCo specification also required the Assessment Team to issue a report summarizing its findings during the first 90 days of underpinning construction. With underpinning construction starting on December 12, 1982, this 90-day period was completed on March 12, 1983. This report complies with this requirement.

- The companies or individuals shall not have been previously hired by the owner to perform design, construction, or QA work relative to the soils remedial program.

- The individuals shall not have been previously employed by the owner within the last 3 years.

- The individuals shall not have present household members employed by the owner.

- The individuals shall not have any relatives employed by the owner in a management capacity.

- The individuals shall not own or control significant amounts of owner stock.

Affidavits attesting to corporate and individual compliance with these independence criteria are included in Appendix C.

During the period September 20, 1982 through December 12, 1982, 215 person-days were spent reviewing drawings; specifications; procedures, training, and certification of personnel; and in surveillance of fabrication and testing facilities. Since December 12,

SECTION 2

ASSESSMENT TEAM

The independent assessment of the underpinning work at the Midland Nuclear Plant required an Assessment Team consisting of personnel with expertise in the area of geotechnical engineering, structural engineering, construction, underpinning, and quality assurance (QA). In order to provide staff with direct experience in underpinning, Stone & Webster Michigan, Inc. (Stone & Webster) retained Parsons Brinckerhoff Michigan, Inc. (Parsons Brinckerhoff) as Subcontractor for the assessment. The Assessment Team was organized as shown in Figure 2-1. Resumes for each member of the Assessment Team are included as Appendix B of this report.

Corporate and individual independence was an important requirement of the Consumers Power Company (CPCo) specification for the assessment. The criteria established by CPCo in Specification CC-100 (included as Appendix A of this report) are:

- The companies or individuals shall not have had any direct previous involvement with the Midland activities that they will be reviewing.

1982, the date on which underpinning construction started, about 265 person-days have been spent reviewing site operations.

In addition to the onsite assessment work at the Midland site, both Stone & Webster and Parsons Brinckerhoff have provided headquarters support to the Assessment Team. This support has included consultation with specialists on specific items and Management review of the Assessment Team findings. A Management Review Team visited the site after underpinning construction had started and has reviewed and approved this 90-day report.

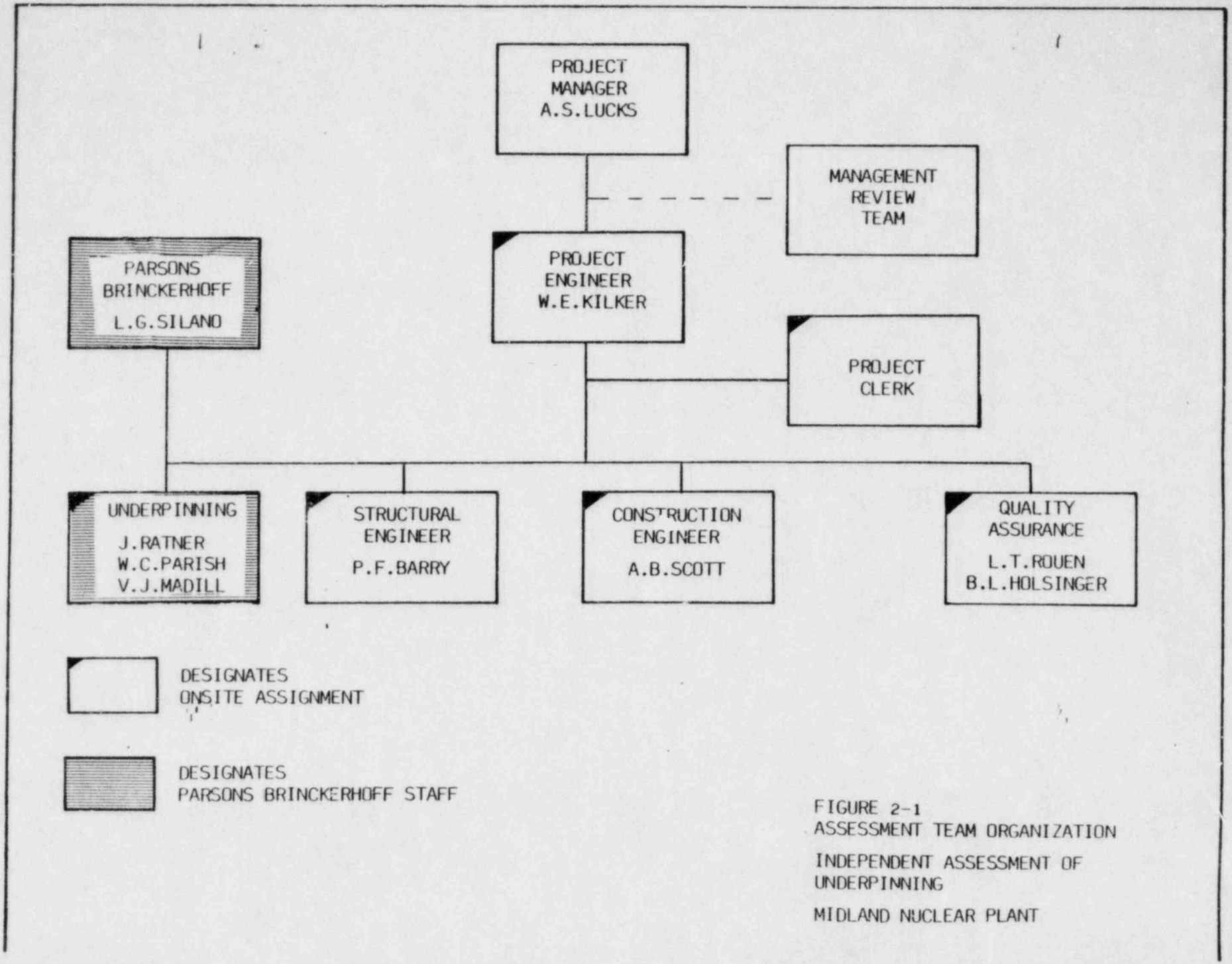

FIGURE 2-1
ASSESSMENT TEAM ORGANIZATION

INDEPENDENT ASSESSMENT OF
UNDERPINNING

MIDLAND NUCLEAR PLANT

SECTION 3

ASSESSMENT PLAN

The assessment of the underpinning required the development of an assessment plan that would provide the basis of operations for the Assessment Team. The assessment plan consisted of two major components: familiarization with the underpinning design, procedures and training of construction and quality assurance (QA) personnel; and assessment of underpinning construction and compliance with construction and quality procedures. These two aspects of the assessment plan are described below.

3.1 FAMILIARIZATION WITH UNDERPINNING DESIGN, PROCEDURES, AND TRAINING

The Assessment Team arrived at the Midland site on September 20, 1982. As a prerequisite to the start of the auxiliary building underpinning, the Nuclear Regulatory Commission (NRC) in late September stipulated that the entire soils remedial QA organization be recertified, and that all other underpinning-associated individuals receive QA training. This process involved the preparation of new guidelines as well as lesson plans and classroom presentations of QA and technical procedures. In addition, written examinations and proficiency demonstrations were

required for certification. This process required 2 months to accomplish. The auxiliary building underpinning started December 13, 1982.

In the interim, Assessment Team members read published background information, such as the Soil-Related Issues Report[1] and the NRC's Supplemental Safety Evaluation Report No. 2[2] on underpinning design. Assessment Team members also established the assessment plan and became familiar with project specifications, drawings, technical procedures, and QA and quality control (QC) procedures.

Through the process of familiarization with project documents, the Assessment Team raised numerous questions and concerns that were presented to Bechtel's Field Soils Organization (FSO) for resolution. For the most part, the Assessment Team comments were resolved by various FSO individuals. Assessment Team comments or concerns that were not satisfactorily resolved resulted in modifications to project documents.

Assessment Team members attended QA training sessions and several of the training sessions on technical procedures. Briefings were given to the Assessment Team on in-place installations, such as the freeze wall, instrumentation and crack monitoring, deep-seated benchmarks, and the feedwater isolation valve pit (FIVP) superstructure supports. Assessment Team members visited the fabrication shop, the material

testing laboratory, and the offsite concrete batch plant. In addition, a scale model of the auxiliary building underpinning was made available. The Team observed a pier mock-up excavation/installation that included lagging, bell forming and support, reinforcement placement, and concreting. The Assessment Team also observed the construction of form-work for an above-grade pier bell and the placement of concrete in the form. The concrete placement simulated the in-situ pier bell in terms of geometry, reinforcement in-place, concrete properties, and free-fall of concrete. The purpose of the mock-up concrete placement was to evaluate the concrete flow without vibration.

Between late October and mid-December, the Assessment Team performed inspections of the materials storage area and the calibration of testing and settlement monitoring devices.

The Assessment Team met with the NRC on two occasions during this period. On September 28, 1982, Assessment Team members were introduced to NRC Region III staff responsible for the Midland Nuclear Plant and the proposed assessment plan discussed. On November 5, 1982, in Bethesda, Maryland, the Assessment Team qualifications, the assessment plan, and the work performed as of that date by the Assessment Team were discussed with NRC staff.

Throughout the 12-week period, the Assessment Team issued weekly reports to the NRC describing their activities and observations. Since there was no construction activity during this period, the reports were limited in scope. They essentially described the familiarization process with project documents, site personnel, and ancillary installations, such as shops, labs, and the instrumentation monitoring system.

In order to present a more complete record of Assessment Team activities, minutes of daily meetings held between Assessment Team members, site engineering, and QA personnel, beginning with Weekly Report No. 8, were included as part of the weekly reports.

In summary, this 12-week time period provided ample opportunity for Assessment Team members to become thoroughly familiar with project documents, site personnel and organizations, and various subsidiary site installations.

3.2 ASSESSMENT OF UNDERPINNING CONSTRUCTION

Once auxiliary building underpinning construction commenced on December 13, 1982, with the access pit to pier W12, Assessment Team efforts were directed to surveillances of construction activities and to implementation of procedures issued by the Contractor, Subcontractor,

and Midland Plant Quality Assurance Department (MPQAD). Assessment Team members observed daily construction activities, performed independent overviews, and witnessed the evaluation of construction activities by field engineers and QC inspectors.

Generally, three or four Assessment Team members were onsite every working day since work started. Assessment Team members witnessed portions of every phase of the underpinning effort, including the monitoring of structure settlement, concrete crack monitoring, establishment of survey control points, access pit and drift excavation and shoring, removal of existing concrete, placing of mud-mat concrete, pier shaft excavation and lagging, pier bell excavation and support, groundwater level determination and control, pier subgrade evaluation, placement of reinforcing steel, placement of pier concrete, leveling and bearing plate installation, jackstand and jack placements, and load transfer. Numerous surveillances were made at the materials fabrication areas, such as the subcontractor's lagging, drift set, and reinforcing shops located at the Poseyville Yard and at the concrete batch plant in Midland. In addition, Assessment Team members witnessed both FIVP proof jacking operations.

Throughout the 90-day period, the Assessment Team performed surveillances and evaluations of the MPQAD Soils Organization. Assessment Team activities included witnessing the performance of

inspections by QC personnel, verifying the proper completion of inspection reports, verifying that QA "over-inspection" was being performed, checking various project documents for adequacy, verifying the maintenance of current documents at control stations, observing training techniques and records, witnessing proficiency demonstrations of QA/QC personnel, and evaluating the issuing and disposition of nonconformance reports.

With respect to both the construction and quality-related activities, Assessment Team members completed daily reports, which, in turn, became the basis for the weekly reports (Appendix D).

Starting with the first week that the Assessment Team was onsite, there were daily meetings with site engineering, construction, and QA personnel. These meetings provided a forum for Assessment Team members to ask questions, request information, and, when deemed appropriate, to discuss observations or findings. In addition, the meetings provided Contractor personnel an opportunity for forwarding information to the Assessment Team on upcoming activities. The minutes of the meetings are included in Weekly Reports 8 thru 25.

Assessment Team members attended other scheduled meetings as well, such as the weekly project soils meetings, instructional sessions on particular upcoming field activities, and procedural review sessions.

Notice of the Assessment Team's presence at these meetings is included in the weekly reports.

During this phase of the assessment the Senior Level Management Review Team from Stone & Webster Michigan, Inc. and Parsons Brinckerhoff Michigan, Inc. visited the site. The notes of this visit are included as an attachment to Weekly Report No. 23.

References

1. Consumers Power Company. Summary of Soils-Related Issues at the Midland Nuclear Plant. April 19, 1982.

2. U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Evaluation. Safety Evaluation Report Related to the Operation of Midland Plant, Units 1 and 2. NUREG-0793, Supplement Number 2. Docket Numbers 50-329, 50-330. September 1982.

SECTION 4

DOCUMENTATION

4.1 WEEKLY REPORTS

Assessment Team activities and observations were documented in weekly reports, which were issued directly to the Nuclear Regulatory Commission (NRC). They are included as Appendix D. The format of the weekly reports is generally as follows:

Personnel Onsite

The onsite dates for the respective week are tabulated for various Assessment Team members from Stone & Webster Michigan, Inc. (Stone & Webster) and Parsons Brinckerhoff Michigan, Inc. (Parsons Brinckerhoff). The Assessment Team was represented by a total of five engineers from Stone & Webster and three engineers from Parsons Brinckerhoff.

Meetings Attended

Scheduled meetings attended by Assessment Team members are tabulated on a weekly basis. A brief explanation of the purpose of each meeting is

included. Discussions held with site personnel to obtain information are not included.

Activities

The construction activities portion of each weekly report presents a summary of the field activities for the week. It is not written specifically to describe the activities of Assessment Team members with respect to the construction effort. However, with Assessment Team members onsite every day since construction began in December 1982, the summary does describe the activities that were observed by the Assessment Team.

The activities described in the weekly report under the heading of Quality Control, Documentation, and Records are the specific activities that Assessment Team members witnessed or verified during the week. The Assessment Team's intent was to periodically verify the quality assurance/quality control (QA/QC) type activities, not to witness or verify all of the Midland Plant Quality Assurance Department (MPQAD) activities.

Observations

Assessment Team observations of construction activities are described as to the Contractor's compliance with project documents and how the Assessment Team perceives the work is being performed.

Assessment Team observations of QA/QC-related activities are directed at the adequacy of instructions and on the performance level of the QA/QC group.

Expanded Scope

As of February 24, 1983, the Assessment Team's scope of work was expanded to include:

- An overview and assessment of design packages submitted to the NRC by the Consumers Power Company (CPCo) prior to the work release

- An overview and assessment of the QC inspector certification program

- An overview of the training of all other personnel in the soils remedial work

- An assessment of all other underpinning work on safety-related structures

The first of these expanded scope items is included in Weekly Report No. 25.

4.2 NONCONFORMANCE IDENTIFICATION REPORTS

Nonconformance Identification Reports (NIRs) were issued by the Assessment Team for deficiencies (material, technical, or procedural) identified by the Assessment Team, but which had not been identified by MPQAD or the Contractor's organization. NIRs were signed by the reporting Assessment Team member and the Stone & Webster Project Manager. NIRs were then sent directly to the NRC with a copy to CPCo. A tabulation of open NIRs is maintained in the weekly reports. NIRs were dispositioned by requiring the responsible party to answer a Nonconformance Report (NCR) or quality action request issued by MPQAD in response to the NIR. Once the NCR was satisfactorily dispositioned, the NIR was closed out.

Five NIRs were issued by the Assessment Team during the 90-day period. Copies of these NIRs are included in Appendix E. Four of the five NIRs have been closed out to the satisfaction of the Assessment Team.

SECTION 5

FINDINGS

The Assessment Team's findings are based upon the results of their review of the construction documents and observation of the construction.

5.1 QUALITY ASSURANCE

5.1.1 Requalification and Certification

The Midland Plant Quality Assurance Division (MPQAD) has established an effective training group specifically charged with developing, presenting, and overseeing the testing of the inspection staff. The Assessment Team feels that the MPQAD training program results in personnel with a thorough understanding and knowledge of the duties necessary to carry out their job.

5.1.2 Procedures

The Quality Control Inspection and Quality Assurance Plan Procedural reports were reviewed by the Assessment Team. The inspection and hold

points within the procedures were then compared to the respective technical procedure upon which it was based. The Assessment Team believes that these procedures contain more than an adequate number of inspection and hold points to make them acceptable quality control documents.

5.1.3 Performance

The Assessment Team performed a variety of surveillance activities to evaluate the on-going effectiveness of the quality assurance/quality control (QA/QC) organization. The Assessment Team witnessed QC personnel performing inspections on various items, including:

- lagging installation
- bolt torquing
- concrete placement
- reinforcement steel fabrication and installation
- reinforcement coupler installation
- pier belling and size verification

- structural steel fabrication

- feedwater isolation valve pit (FIVP) proof jacking

- pier load transfer

The Assessment Team reviewed completed QC inspection reports for thoroughness and accuracy on a number of items, e.g., FIVP proof jacking, excavation/lagging, reinforcing steel couplers, steel fabrication and reinforcing steel installation, and pier subgrade evaluation. QC inspector qualifications to perform certain inspections were also verified at random. Calibration records for the onsite materials testing lab and offsite concrete batch plant were reviewed by Assessment Team members. Location survey data provided by the Contractor and independent surveyor were verified by the Assessment Team as were the structural settlement data and related plots.

In the opinion of the Assessment Team the entire MPQAD organization -- through its process of personnel selection, training and certification, procedure preparation and implementation, field inspections, and final documentation -- has functioned in such a manner to ensure that the quality of the underpinning has been accomplished in accordance with design intent.

5.2 AUXILIARY BUILDING UNDERPINNING

5.2.1 Design Packages

The Assessment Team did not actively participate in the assessment of design work packages for the auxiliary building that were submitted to the NRC prior to February 24, 1983, the date on which the scope of work for the independent assessment was expanded to include overviews of design packages. However, based upon the expanded scope of the assessment, the Assessment Team will perform an overview assessment of future work packages prior to submittal to the Nuclear Regulatory Commission.

5.2.2 Construction Documents

The basic construction documents consist of Contractor drawings and specifications, which in turn are supported by Subcontractor drawings and administrative, safety, and technical procedures. Upon arrival at the site in September 1982, the Assessment Team reviewed the drawings, specifications, and procedures pertinent to the phase of construction. Questions, observations, and concerns raised by Assessment Team members were addressed by various responsible individuals. Generally, items were resolved or clarified by discussion, but some modifications to documents were made as a result of Assessment Team concerns.

The Assessment Team has observed that the number of revisions to drawings and procedures, and the number of changes documented by Field Change Requests (FCRs), and Design Change Notices (DCNs) have been somewhat excessive. Now that the construction cycle is nearly complete on the first piers, a reduction in the number of FCRs and DCNs is expected. The Assessment Team anticipates that the recently activated constructibility review group's effort will result in greater clarity and completeness of the documents.

5.2.3 Instrumentation

Prior to the arrival of the Assessment Team onsite, a sophisticated and comprehensive building displacement monitoring system for the auxiliary building and FIVP structure had been installed and activated. This system includes settlement measurements relative to deep-seated benchmarks, relative displacement measurements between adjacent structures, strain measurements on selected walls, and a crack monitoring program.

Instrumentation installed to date as part of the actual underpinning has been limited to telltales at piers E/W12. Of these, only the telltales at pier W12 have been activated. The Assessment Team observed the fabrication, installation, and performance of these devices for pier W12.

The Assessment Team believes the instrumentation systems have operated as intended and provide accurate and reliable data.

5.2.4 Construction

A total of four access pits, each 9 feet deep, have been constructed. Horizontal wood lagging was installed to act as earth support. Wood spacers were used to separate the boards to allow backpacking. Excelsior was placed between the boards to act as a drainage filter. Concrete mud-mats were installed in the floor of each pit. For the pier E/W12 access pits, there was some minor groundwater seepage that entered the excavations. The E/W9-11 access pits were dry. The Assessment Team judges the access pit construction was accomplished in accordance with the design documents. The Assessment Team also believes that, in the future, excelsior use should be restricted to those areas where water seepage is present.

Approximately 60 linear feet of access drifts have been completed. The sides are supported with steel drift sets and wood lagging backpacked with soil as required. The drift roof is formed by the bottom of the building foundations. Unreinforced concrete was removed as stipulated in the design drawings. Concrete mud-mats have been installed throughout a major portion of the drifts. Minor perched groundwater seepage was restricted to the drifts to piers E/W12.

In the opinion of the Assessment Team, the drift construction was done in accordance with design intent and, in general, in accordance with good industry practice. However, as in the case of the access pits, the Contractor should restrict the use of excelsior to those areas where water seepage is present. Also, coordination of materials fabrication and field construction activities must be improved to reduce the drift completion times.

The installation of piers E/W12 was complete except for load transfer to pier E12. As of March 13, 1983, the excavation of piers E/W9 had progressed to 20 feet below access drift level. The installation procedure at all piers has been essentially the same. The soil is hand-excavated and the excavation is supported by steel lagging as work proceeds. Care has been taken in avoiding unnecessary over-excavation of the pier shafts. Generally, the gap behind the installed lagging has been no more than 1 or 2 inches. Granular material has been used to backpack these spaces behind the lagging. Once the design level of the bell is reached, the soil support system changes with the degree of support dictated by the ground conditions. At pier W12 there was minor but steady groundwater seepage that required almost complete bell support with braced steel plates. At pier E12, with no water seepage, the bell excavation required only the minimum channel support.

Following completion of the bell excavation and engineering approval of the subgrade; a concrete mud-mat, reinforcing steel, embedments, instrumentation, and concrete were installed at piers E/W12.

The installation of the reinforcing steel with Fox-Howlett couplers was performed efficiently and properly. Telltale instrumentation installation was well executed after a lengthy delay in fabrication.

A concrete mix previously approved for the plant construction was used for pier E/W12 construction. The concrete mix originally intended for this work containing a super plasticizer could not be used because of problems satisfying approval requirements. The placement techniques used ensured a good quality final product. Concrete was vibrated throughout the entire placement. The load transfer activity at pier W12 was well planned and executed after long delays caused by fabrication problems with the bearing plates and jackstand components.

The Assessment Team believes the pier excavation and installation have met the intent and requirements of the design documents. It is also the Assessment Team's opinion is that modifications to the Contractor's schedule and technique are necessary. The most significant modification required is a major reduction in the time period from the start of bell excavation to load transfer. For piers E/W12 the bell excavations were left open for approximately 3 weeks prior to concreting; after concrete

was placed, approximately 1 month elapsed before load transfer was achieved. Also, the Assessment Team has observed that in order to adequately accomplish and inspect the backpacking of the lagging, a minimum spacing on the order of 1 1/2 inches should be maintained between lagging sets. The Contractor presently can use spacers down to 1/2-inch size. These modifications will ensure that even if adverse conditions are encountered as the work advances, the underpinning will be of the highest quality and in accordance with good underpinning practice.

5.3 SERVICE WATER STRUCTURE

The Assessment Team's scope of work was expanded on February 24, 1983 to include the service water structure. The Assessment Team is currently becoming familiar with the design and procedures for this work. The only assessment that has been completed to date is the overview of a design work package for rebar mapping and core drilling. The Assessment Team's overview determined the need for clarification and final Project Engineering approval to an FCR and an additional permit stamp.

SECTION 6

CONCLUSIONS

The following conclusions are based upon Assessment Team findings and observations made during the 26-week period that the Assessment Team was onsite:

- The Midland Plant Quality Assurance Department (MPQAD) has demonstrated its ability to perform as an effective quality organization.

- MPQAD training and recertification have been satisfactory.

- MPQAD procedures have been developed to properly accomplish the work.

- MPQAD inspection plans are adequate.

- The design documents (drawings, specifications, and procedures) are sufficient to properly accomplish the underpinning. Cross-referencing and section detail improvements are need to facilitate easier understanding of the drawings.

- The parts of the underpinning that have been constructed to date are in compliance with design documents and are of high quality. Great care had been taken by the construction force in excavating and supporting the drifts and piers. Minor modifications to future lagging installation, such as using a minimum spacing of 1 1/2 inches between lagging, would improve the overall quality of the work.

- The underpinning work has been frequently delayed by fabricated materials not being available when required. Good underpinning practice requires that the work proceed as quickly as possible. Ideally, quantities of fabricated materials in excess of those required for any given operation should be available when the work starts. This allows the freedom to discard any materials not fully meeting criteria. In addition, backup tools and equipment used in the work should be on hand to prevent delay or interruption of vital stages of the underpinning because of equipment malfunction. Conditions have been such that these delays have not impacted the quality of the work to date.

- Most of the nonconformances that have been identified by the various organizations have not been serious in nature. The only trend that has been noticeable to the Assessment Team

exists in terms of the number of citations issued in the welding area. An evaluation of this trend will be undertaken.

SECTION 7

RECOMMENDATIONS

The Assessment Team has the following recommendations with respect to future underpinning work and with respect to their continuing assessment work:

- The Contractor should coordinate and plan steel fabrication so that materials are available when required. If possible, all of the materials required for a particular operation should be released prior to operation startup.

- The procedure for lagging should be changed to require a 1-1/2 to 2 inch space between lagging unless ground conditions (such as running ground) require closing up the spaces completely.

- The Contractor should make sure that excelsior is used only when groundwater seepage is encountered. Excelsior should not be excessively compacted between lagging.

- Once pier construction begins, good underpinning practice dictates that the pier be completed and the load transferred as

quickly as possible. In particular, delays after excavation of the bell should be avoided.

- Nonconformance reports should be dispositioned more quickly thus reducing the delays in pier construction.

- The Contractor must perform the mix design and testing for superplasticized concrete in strict accordance with the design code before the approval for use in underpinning is given.

- A comprehensive evaluation of experience gained to date by all parties involved in the underpinning may help in avoiding future delays and problems.

- The role of Project Engineering is vital to the timely completion of this underpinning work. This group must produce specifications and drawings that fulfill the intent of the quality commitments to the Nuclear Regulatory Commission, yet at the same time not hinder the Construction and/or Quality Assurance groups by unnecessarily rigid or strict requirements or interpretations of standards on certain less critical or crucial aspects of the work. Project Engineering must increase its participation in not only supporting the ongoing daily site effort, but in providing the construction and quality assurance

organizations with documents that will produce the desired high quality product without unreasonable restrictions.

The Assessment Team will continue their observations of the underpinning work until at least mid-June 1983. By that time, Assessment Team Members should have had an opportunity to observe most of the operations necessary for underpinning.

The Assessment Team will begin to address the items included in the expanded scope of the assessment. In particular, the following tasks will be undertaken:

- Overviews of work packages completed for upcoming phases of the soils remedial construction.

- An indepth review of welding procedures, practices, and inspections.

- Familiarization and review of the service water pump structure underpinning.

- Overview of the training, requalification, and recertification of inspection personnel.

On the completion of the next 90-day period, the Assessment Team will update this report to include their findings and observations made during this extended period. A recommendation will be made with respect to the need for continuation of the assessment.

APPENDIX A

CONSUMERS POWER COMPANY SPECIFICATION

This appendix contains Consumers Power Company Specification CC-100. This specification establishes the purpose and scope of the independent assessment of the auxiliary building underpinning work being performed at the Midland Nuclear Plant.

MIDLAND PLANT UNITS 1 AND 2

SOILS REMEDIAL CONSTRUCTION

INDEPENDENT ASSESSMENT

OF AUXILIARY BUILDING UNDERPINNING

CONSUMERS POWER COMPANY
DESIGN PRODUCTION DEPARTMENT
MIDLAND PROJECT

SPEC NO CC-100

REV 1 DATE January 11, 1983

PREPARED BY [signature]

APPROVED BY [signature]
Design Production Dept

APPROVED BY [signature] 1/17/83
MPQAD

mi0982-2624a141

MIDLAND PLANT
SOILS REMEDIAL CONSTRUCTION
INDEPENDENT ASSESSMENT
OF AUXILIARY BUILDING UNDERPINNING

CONTENTS

m10982-2626a143

MIDLAND PLANT

SOILS REMEDIAL CONSTRUCTION

INDEPENDENT ASSESSMENT

OF AUXILIARY BUILDING UNDERPINNING

1.0 GENERAL

1.1 Background

Owner (Consumers Power Co) is engaged in a comprehensive program to resolve soils-related issues identified during plant construction.

Excessive settlement of the diesel generator building (DGB), resulting from inadequately compacted plant fill, was identified in July 1978. Since then, extensive exploratory tests and studies have been conducted to determine the exact cause and extent of this problem. Subsequently, other soils related problems have been identified.

In addition to the soils related issues, remedial actions are necessary to correct a design problem affecting the two borated water storage tank (BWST) foundations.

On April 30, 1982 the ASLB issued an order further defining the total scope of the soils project.

1.2 Remedial Action

The following remedial actions of soils related issues are being implemented at the plant site.

a. The settlement problem of the DGB has been essentially resolved by preloading the area in and around the building to achieve accelerated consolidation of plant fill which supports the building.

b. Inadequately compacted fill under portions of the auxiliary building and feedwater isolation valve pit (FIVP) will be resolved by constructing underpinning under the auxiliary building and replacing the existing backfill under the FIVP. When completed, the new foundations will carry the loads to the undisturbed natural soils underlying the site. These new foundations will meet newly established seismic design criteria promulgated by the NRC.

c. Inadequately compacted fill under the overhang portion of the service water pump structure will be resolved by constructing underpinning similar to that under the auxiliary building.

d. Design problems associated with the BWST foundation will be resolved by the preload of the valve pit, which has been completed, reinforcing the old ring beam with a new concentric ring beam, and releveling the tank for Unit 1.

e. Potential liquefiable pockets of backfill supporting some Seismic Category I structures and utilities will be resolved by providing a permanent plant dewatering system.

f. The adequacy of all underground Seismic Category I utilities will be ensured by a variety of actions ranging from acceptance of existing facilities to complete replacement.

1.3 Identification of Contractors

Bechtel Power Corporation (BPC) is under contract to the Owner for construction of the total plant including the soils remedial work. BPC has subcontracted the underpinning of the auxiliary building to Mergentime Corporation. The design and operation of the underpinning instrumentation for the auxiliary building and the service water pump structure has been subcontracted to Wiss, Jenney, Estener and Associates. The service water pump structure underpinning and some associated underground pipe work has been subcontracted to Spencer White and Prentiss. Remaining soils remedial construction will be performed by BPC and others.

2.0 SCOPE OF WORK

2.1 Consultant's Scope

The Consultant shall perform an independent assessment of construction activities related to the auxiliary building and feedwater isolation valve pit remedial work at the Midland site.

Rev

The scope of work involved in this independent assessment consists of the following.

a. Development of an assessment program and preparation of a Project Quality Plan.

b. Overview of the design and construction documents to gain familiarity with the work.

c. Evaluation of the adequacy of technical and related administrative construction and quality procedures.

d. Evaluation of the degree of compliance with technical and administrative construction and quality procedures.

e. Daily reviews with the Owner and his contractor to obtain any clarifying information and project documents that are needed to carry out this assessment. The Owner and the consultant will establish a specific communication plan at the start of the assessment.

f. Submittal of any nonconformance reports to the NRC with a copy to the Owner.

g. Submittal of brief weekly progress reports and a final report to the NRC with a copy to the Owner.

h. The final report shall be overviewed by a senior level Consultant management and technical team.

i. The Consultant and its subcontractors shall not be responsible for implementation of corrective action, however their professional opinion may be requested.

j. In the event the Owner desires to expand the scope of work, a written description of said scope revision shall be submitted to the Consultant and shall become effective upon issuance thereof; however, the Consultant may reject any such revision by mailing written notice of such rejection to the Owner within 10 day after receipt of the scope revision. Rev 1

2.2 Owner's Scope

To support the independent assessment, the following information and facilities will be made available by the Owner.

a. Design and construction drawings, specifications, and procedures.

b. Building and pier monitoring data.

c. Test results.

d. Construction schedules.

e. Any and all other information and access to facilities needed by the Consultant and it's approved subcontractors.

f. On-site office facilities.

2.3 Schedule

The duration of the assessment will be determined by the assessment team.

The Owner's commitment to the NRC is that the program will cover, at a minimum, the next three months of the auxiliary building underpinning work as authorized by the NRC. The assessment shall continue until the assessment team concludes that not only is the design intent being implemented but, also that the construction is consistent with industry standards. The assessment will further assure that the QA Program is being implemented in accordance with the construction documents.

Mobilization of the Consultant is required to start during the week of September 20, 1982.

3.0 ORGANIZATION

The Consultant shall provide overall management of the program. The Project Engineer and other key individuals shall be assigned on a full time basis. | Rev 1

The Consultant shall hire Parsons, Brinkerhoff, Quade and Douglas, Inc as a subcontractor to assist in the assessment and to provide specialized technical expertise for the underground and underpinning work. The Consultant shall provide technical and on-site office personnel as required. Prior to their assignment to the work, the resumes of all technical persons shall be submitted to the Owner to document the professional competence of the assessment team. If additional subcontractors are needed, advance permission from the Owner is required.

4.0 QUALITY ASSURANCE REQUIREMENTS

4.1 Quality Assurance Program

Stone & Webster shall have a QA Topical Report which is approved by the NRC and which complies with the requirements of ANSI N45.2 as endorsed by USNRC Regulatory Guide 1.28 (6/72). As applicable to the scope of this contract, Stone & Webster shall implement this Topical Report.

4.2 Access to Facilities and Records

At anytime throughout the contract period, Stone & Webster shall provide access to the Owner, the Owner's representatives and the NRC, to all facilities and work records related to the scope of this contract.

4.3 Project Quality Plan

Stone & Webster shall prepare a Project Quality Plan which will be implemented for this contract. The Plan shall address, at a minimum, the following:

a. The project organization and authorities and responsibilities of each organizational element;

b. The control of suppliers;

c. The qualification of personnel performing assessment;

d. The reporting of non-conformances to the Owner and the NRC.

4.4 Document Submittals

4.4.1 Stone & Webster shall submit the QA Topical Report and the Project Quality Plan for Consumers Power review and approval.

Written Consumers Power concurrence shall be obtained prior to the start of any appraisal activities. In addition, any revisions to the Project Quality Plan shall be submitted for CP Co concurrence prior to implementation.

The above submittals, plus those identified in Section 2.1 shall be submitted to:

Consumers Power Company

1945 West Parnall Road

Jackson, MI 49201

Attention: J A Mooney

5.0 INDEPENDENCE CRITERIA

The following independence criteria shall apply to the Consultant's, its subcontractors and all its employees assigned to this task.

a. The companies or individuals shall not have had any direct previous involvement with the Midland activities that they will be reviewing.

b. The companies or individuals shall not have been previously hired by the Owner to perform design, construction or quality work relative to the soils remedial program.

c. The individuals shall not have been previously employed by the Owner within the last three years.

d. The individual shall not have present household members employed by the Owner.

e. The individuals shall not have any relatives employed by the Owner in a management capacity.

f. The individuals shall not own or control significant amounts of Owner stock.

In addition to the above considerations, the following procedural guidelines will be used to assure independence:

An auditable record will be provided of all Owner comments on draft or final reports, procedures or other documents, any changes made as result of such comments, and the reasons for such changes.

The Consultant shall include these criteria in all subcontracts with certification of compliance provided to the Owner.

APPENDIX B

TEAM RESUMES

The resumes for Assessment Team members are included in this appendix as follows:

Stone & Webster Michigan, Inc.

A.S. Lucks

W.E. Kilker

P.F. Barry

A.B. Scott

L.T. Rouen

B.L. Holsinger

Parsons Brinckerhoff Michigan, Inc.

T.R. Kuesel

L.G. Silano

J. Ratner

W.C. Parish

V.J. Madill

June 1982

LUCKS, A. STANLEY

CHIEF GEOTECHNICAL ENGINEER
GEOTECHNICAL DIVISION

EDUCATION

Heriot-Watt University, Edinburgh, Scotland B.Sc. in Civil Engineering
Imperial College, London, England - D.I.C. in Civil Engineering/Soil Mechanics
Massachusetts Institute of Technology, Cambridge, Massachusetts - Ph.D. in Civil Engineering/Soil Mechanics

EXPERIENCE SUMMARY

Dr. Lucks, Chief Geotechnical Engineer, joined Stone & Webster Engineering Corporation (SWEC) in June 1972 and has 16 years experience in the areas of geotechnical engineering and earth dam design. He has managed the geotechnical work on several power plant projects, including site selection, licensing, and construction. These projects have included major hydroelectric, fossil, and nuclear power plants requiring extensive geotechnical, seismological and geotechnical investigations and studies. He has worked on the design of reservoirs for the storage of fuel, oil, gypsum tailings, and phosphatic slimes as well as reservoirs for the storage of water and has been responsible for the design of cellular and embankment types cofferdams. His experience also includes responsibility for several slope stability studies for both natural and man-made slopes. His experience in foundation engineering has included the design of pile foundations and the supervision of pile load tests, the design of dewatering schemes, and the design of earth support systems.

Dr. Lucks is also experienced in the design and installation of soil instrumentation for monitoring pore water pressures, stresses, strains, and horizontal and vertical movements.

Prior to joining SWEC, Dr. Lucks was employed as a Project Soils Engineer with Lambe Associates Inc., and as a Civil Engineer with R. H. Cuthbertson & Associates, Scotland. In addition to working in the United States and the United Kingdom, he has worked on projects in Venezuela, Iran, and Greenland. During 1980 he was a member of a four man delegation that spent one month inspecting and reviewing the designs for major hydroelectric projects in the Peoples Republic of China.

LICENSES AND REGISTRATIONS

Professional Engineer - Massachusetts

PROFESSIONAL AFFILIATIONS

American Society of Civil Engineers - Member; Embankment Dams and Slopes Committee - Member; Publications Committee - Member
Boston Society of Civil Engineers Section - Member;

Chairman, Energy Committee
Institution of Civil Engineers, London - Associate Member
International Society of Soil Mechanics and
Foundation Engineering - Member

PUBLICATIONS

"Seismic Hazard in Northeastern United States," International Conference on Soil Dynamics and Earthquake Engineering, Southampton, England, July 1982.

"Cofferdams, Demolition, and Rock Excavation, Rock Island Second Powerhouse," American Power Conference, Chicago, Illinois, April 1981 (Co-Authors, C. Alan Foster, Tracy J. Lyman, J. Lyndon Rosenblad, Robert J. Conlon, Ralph G. Kurtz)

"Effect of Change in Effective Stress on SPT-N Values, Tenth International Conference on Soil Mechanics and Foundation Engineering, Stockholm, June 1981 (Co-author, W. E. Kilker)

"Seismically Induced Sliding of Massive Structures," Journal of the Geotechnical Engineering Division, ASCE, December 1979 (Co-authors, E.A.Kausel, L. Edgers, W. F. Swiger, and J. T. Christian)

"Lateral Earth Pressures: Nuclear Power Plant Design," ASCE-BSCES Geotechnical Lecture Series on Lateral Earth Pressures, Boston, 1976

"Stress Conditions in the NGI Simple Shear Test," Journal of the Soil Mechanics and Foundations Division, ASCE, January 1972 (Co-authors, J. T. Christian, G. E. Brandon, and K. Hoeg)

"The Influence of Particle Shape on the Shear Strength of Granular Material," Ph.D. Thesis, M.I.T., June 1970

"Design of Shear Testing Equipment for the Lunar Surface," Paper presented at ASCE Annual Meeting, Chicago, October 17, 1969 (Co-author, Leslie G. Bromwell)

"The Measurement of Construction Pore Pressures in Earth Dams," Student paper, Institution of Civil Engineers, London, 1966

"Engineering Properties and Weathering Characteristics of London Clay," D.I.C. dissertation, Imperial College, London, 1964

"The California Bearing Ratio Test and Ultimate Bearing Capacity," B.Sc. dissertation, Heriot-Watt University, Scotland, 1963

DETAILED EXPERIENCE RECORD
LUCKS, A. STANLEY 54570

STONE & WEBSTER ENGINEERING CORPORATION, BOSTON, MA (June 1972 to Present)

Appointments:

Chief Geotechnical Engineer - Apr 1978
Assistant Chief Geotechnical - Nov 1976
Group Supervisor and Senior Soils Engineer - Nov 1973
Soils Engineer - June 1972

Geotechnical Division Staff (Nov 1973 to Present)

As CHIEF GEOTECHNICAL ENGINEER (Apr 1978 to Present), responsible for managing the Geotechnical Division staff and facilities. Division responsibilities include geology, seismology, soil mechanics, rock mechanics, foundation engineering, embankment dams, underground facilities, and groundwater hydrology. Geotechnical staff involved in fossil, nuclear, and hydroelectric power projects and studies for advanced technologies, including nuclear waste disposal and energy storage. He directed a feasibility study for a 13 MW high head hydroelectric project located above the Arctic Circle. The project conceptual design called for power tunnels and shafts in permanently frozen rock. Division facilities include a 3,000-sf Geotechnical Testing Laboratory and an extensive computer program library.

As ASSISTANT CHIEF GEOTECHNICAL ENGINEER (Nov 1976-Apr 1978), responsible to the Chief Geotechnical Engineer for control of geotechnical engineering work conducted by Division staff and control of the Geotechnical Testing Laboratory. Served as Division Licensing Representative for the review and approval of Safety Analysis Reports for nuclear power projects.

As GROUP SUPERVISOR (Nov 1973-Nov 1976), was responsible for the supervision of:

The geotechnical design and preparation of specifications for the construction of Rock Island Second Powerhouse. Work included cellular and embankment type cofferdams and controlled blasting for powerhouse excavation, grouting, and earthwork.

Geotechnical work for North Anna Nuclear Power Station, Units 1, 2, 3, and 4. Work included liquefaction studies, design, and construction of drilled caissons, design and installation of dewatering systems.

Geotechnical work for Beaver Valley Nuclear Power Station - Unit No. 2. Work included in situ densification using compaction piles.

Preparation of excavation, backfill and cofferdam specifications, and bid evaluation for Millstone Nuclear Power Station construction. Geologic work included the mapping of excavations and fault investigations.

Siting Study, New York Generation Study Group (Aug 1973-Sept 1973)

As LEAD GEOTECHNICAL ENGINEER, responsible for geotechnical evaluation of several potential nuclear power plant sites in New York State.

Canal Site, Philadelphia Electric Company (June 1972-Mar 1973)

As SOILS ENGINEER, assisted in site investigation for nuclear power station including preparation of soils report.

Turners Falls Project, Northeast Utilities Service Company, (July 1972-Dec 1972)

As LEAD GEOTECHNICAL ENGINEER, responsible for geotechnical aspects of FPC safety inspection of Turners Falls power canal, dams, and generating stations.

Montague Nuclear Power Station, Northeast Utilities Service Company, (Feb 1973-Sept 1974)

As LEAD GEOTECHNICAL ENGINEER, carried out studies for site selection and investigation for nuclear power plant. Preparation of geotechnical section of PSAR. Work included extensive structural geologic investigation.

Effingham Unit 1, Savannah Electric Power Company (Oct 1972-June 1973)

As LEAD GEOTECHNICAL ENGINEER, prepared of soils report and foundation evaluation for Effingham Unit 1, a fossil fuel power plant. Work included evaluation of bids for piles and setting up pile driving inspection program, design of intake and discharge structures, and unloading dock.

Soils investigation and recommendation of foundation design parameters for 72 miles of transmission lines. Conducted pile load tests to confirm foundation design parameters.

LAMBE ASSOCIATES INC., CONCORD, MA (May 1970-May 1972)

University of Massachusetts, Columbia Point Campus, Boston Bureau of Building Construction

As PROJECT SOILS ENGINEER, author of report on settlement of buildings constructed on a sanitary landfill. Contributed to a report on the problem associated with the generation of methane within sanitary landfills and the design of gas protection systems.

Piney Point Reservoir, Borden Chemical Company, Plant City, FA

As PROJECT SOILS ENGINEER, inspected gypsum tailing dams and phosphatic slime settling ponds. Prepared reports giving design recommendations for new embankments and the maintenance and repair of existing embankments.

Parque Central, Delpre C.A. Caracas, Venezuela

As PROJECT SOILS ENGINEER, participated in the design of earth retaining structures for deep excavation for the construction of the foundations for high-rise buildings in central Caracas. Inspected construction and monitored the performance of slurry trench and sheet pile anchored walls.

140 Federal Street Building, Employers - Commercial Union Insurance Company Boston MA.

As PROJECT SOILS ENGINEER, evaluated a bracing scheme for a deep excavation and determined cause of movements and damage to adjacent structures.

Fort Mead Mine, Cities Service Company, Tampa, FA

Evaluated the stability of four phosphatic slime-settling ponds and investigated the cause of a major failure of an embankment. Designed instrumentation system for critical areas. Author of two reports giving results of evaluation and recommendations for repair.

Freetown SNG Plant, Algonquin Gas Transmission Company, Boston, MA

As PROJECT SOILS ENGINEER, responsible for the site investigation for an SNG plant. Work included an on-site water storage reservoir, two 200,000-barrel naphtha storage tanks, and a barge off-loading facility in addition to the process plant foundations. Author of three reports giving results of site investigation and making recommendations for foundation design and reservoir siting.

Angra Dos Ries Nuclear Power Plant, Furnas Centrals Electrica, Brazil

As SOILS ENGINEER, prepared technical specifications for construction of diaphragm cutoff wall, dewatering, excavation, backfill, and compaction for nuclear power plant.

T. WILLIAM LAMBE & ASSOCIATES, CAMBRIDGE, MA (June 1967-May 1970)

Amuay Refinery, Creole Petroleum Corporation, Caracas, Venezuela

As CONSULTING SOILS ENGINEER, assisted with design of oil storage reservoir (FORS-3). Performed deformation and stability analyses for embankment and abutment.

Responsible for survey of condition of unstable cliffside and co-author of report making recommendations for stabilizing critical sections where refinery structures were threatened. Design surveillance instrumentation for cliffside.

Designed horizontal drainage system for stabilizing cliffside. Prepared specification for installation of drains.

Participated in surveillance program to monitor performance of earth structures within the refinery including three storage reservoirs. Instrumentation included piezometers, inclinometers, strain meters, load cells, temperature sensors, and settlement platforms. A remote data acquisition system was used for data collection.

R. H. CUTHBERTSON & ASSOCIATES, EDINBURGH, SCOTLAND (June 1964-June 1966)

Clunas Reservoir, Nairn Joint Water Board, Scotland

As PROJECT ENGINEER, responsible for initial design of reservoir system including hydrology, hydraulics, and geotechnical aspects. Earth dam required 100-ft deep alluvial grouted cutoff. Supervised design of hydraulic model of spillway and soil testing for embankment.

Adam Bridge, Marquis of Bute Estates, Scotland

As PROJECT ENGINEER, author of report on evaluation and recommendations for the repair of the Adam Bridge built in 1740 and subsequently damaged by mining subsidence.

Creightons Green Reservoir, Holywood Water Board, Northern Ireland

As PROJECT ENGINEER, responsible for investigation of leakage through earth dam. Prepared a report giving details of remedial work required.

Black Esk Reservoir, Dumfries County Council, Scotland

As CIVIL ENGINEER, responsible for maintenance and data collection and handling for soil instrumentation installed in earth dam.

West Water Reservoir, West Lothian Water Board, Scotland

As ASSISTANT CIVIL ENGINEER, assisted with installation and responsible for data processing and evaluation for soil instrumentation in earth dam.

North of Scotland Hydroelectric Board, Scotland
Lochan Breaclaich Hydroelectric Scheme

As ASSISTANT CIVIL ENGINEER, assisted with preparation of hydraulic calculations for claim due to flooding of power station. Conducted inspection of 54 in dia steel pipeline.

Holy Loch Submarine Base, U.S. Navy, Holy Loch, Scotland

As ASSISTANT CIVIL ENGINEER, assisted with design and survey for river gage and pump house for water supply to Polaris depot ship. Assisted with letting of contract for installation of PVC pipeline.

WHATLINGS LTD., GLASGOW, SCOTLAND (Apr 1962-Oct 1962)

Firth of Forth Suspension Bridge, Forth Road Bridge Authority

As ASSISTANT FIELD ENGINEER on the construction of the approaches to the Firth of Forth suspension bridge, Inspected construction of reinforced concrete bridges and calculated payment quantities.

BALFOUR BEATTY & COMPANY LTD., EDINBURGH, SCOTLAND (Apr 1961-Oct 1961)

As ASSISTANT FIELD ENGINEER on the construction of two 600-ft transmission towers, responsible for inspection of foundation installation. Foundations included the driving of 120 ft long precast concrete piles. In charge of survey work for transmission line.

March 1982

KILKER, WAYNE E.

SENIOR SOILS ENGINEER
GEOTECHNICAL DIVISION

EDUCATION

University of Minnesota, Minneapolis - B.S. in Civil Engineering 1964
Arizona State University, Tempe, Arizona - M.S. in Soil Mechanics 1970

LICENSES AND REGISTRATIONS

Professional Engineer - Minnesota and Maine

EXPERIENCE SUMMARY

Mr. Kilker, a Senior Soils Engineer in the Geotechnical Division, joined Stone & Webster Engineering Corporation (SWEC) in June 1974. He has over 17 years' experience in Civil Engineering including an advanced degree in soil mechanics, and over 12 years of this experience are in soil and foundation engineering.

As Project Geotechnical Engineer on several coal-fired power plants, Mr. Kilker has been responsible for site investigations, foundation design and coal storage, runoff pond, and ash disposal area design parameters.

As a Lead Geotechnical Engineer for two nuclear power plant sites at Long Island, New York, his responsibilities included supervision of soil engineers in performing site studies, field liaison work, laboratory testing, specification preparation, analytical studies, and report writing. Mr. Kilker was Principal Soils Engineer in charge of evaluating soil conditions and preparing reports on a nuclear power plant site along the Hudson River in New York State.

Mr. Kilker has also performed siting studies for nuclear and hydroelectric facilities, as well as proposal preparation for nuclear/fossil power plants and industrial facilities. He was responsible for modifying specifications for drilling and logging of test holes in deep-seated salt formations.

His experience includes geotechnical work for airports, highways, pipelines, building excavations, retaining structures, and offshore installations. He has evaluated excavation and backfilling operations, piling and drilled pier installations, in situ densification, sand drain placement and groundwater pump tests.

Prior to joining SWEC, Mr. Kilker was also responsible for special investigations such as structural damage claims due to soil conditions, vibrational and impact sources, and fire-related structural distress. He has performed as an expert witness in court, defending several of these studies.

WEK

PROFESSIONAL AFFILIATIONS

American Society of Civil Engineers
Boston Society of Civil Engineers
International Society for Soil Mechanics and Foundation Engineering

PUBLICATIONS

"Effect of Change in Effective Stress on SPT N-Values," International Conference on Soil Mechanics and Foundation Engineering, Stockholm, 1981.

DETAILED EXPERIENCE RECORD
KILKER, WAYNE E. 48903

STONE & WEBSTER ENGINEERING CORPORATION, BOSTON, MA (June 1974 to Present)

Appointments:

Senior Soils Engineer - June 1978
Soils Engineer - Sept 1975
Engineer (Soils) - June 1974

MacInnes Power Station, Tampa Electric Company (Oct 1981 to Present)

As PROJECT GEOTECHNICAL ENGINEER, responsible for development of site geotechnical investigation.

Permian Basin Project, Office of Nuclear Waste Isolation (Aug 1981-Sept 1981)

Tailored drilling and logging specifications for use in deep hole studies of salt formations.

Beaver Valley Power Station - Unit 2, Duquesne Light Company (Dec 1981)

Inspection of pile installation for office building.

Indian Point Units Nos. 2 and 3, Consolidated Edison Company (Sept 1981 to Present)

As PROJECT GEOTECHNICAL ENGINEER, responsible for geotechnical input to alternate conceptual designs and cost estimates of angled fish screens.

Malakoff Lignite Generating Station, Houston Light and Power Company (Mar 1981-May 1981)

Responsible for settlement prediction calculation for main plant structures.

Patriot Station, Indianapolis Power and Light Company (Jan 1981-Apr 1981)

Performed pile foundation study including evaluation of pile capacity, pile quantities, and engineering order-of-magnitude cost estimate. Prepared a pile load test program and production pile procurement and installation specification.

Millinocket Mill Coal Utilization Project, Great Northern Paper Company (Apr 1980-Sept 1981)

As PROJECT GEOTECHNICAL ENGINEER, responsible for site geotechnical investigation report and geotechnical design criteria. Evaluated site conditions for foundations, coal storage, coal pile runoff pond, and ash disposal areas. Prepared settlement and lateral earth pressure calculations and assisted in off-site development studies.

Butner, North Carolina Site, Vevey Engineering Works (Mar 1980-July 1980)

Prepared an Engineering Scope of Work for the site geotechnical investigation and coordinated with consultant's activities throughout the work.

AFB Pilot plant, Tennessee Valley Authority, Padukah, Kentucky (Feb 1980-June 1980)

Prepared site development plan specification. Estimated earthwork, roadway, and drainage quantities.

Sears Island Fossil Power Plant Site, Central Maine Power Company (Dec 1979-Jan 1980)

Performed site reconnaissance, prepared conceptual plan, and estimated quantities for development of an off-site ash disposal area.

Patriot Station Site, Indianapolis Power and Light Company (Dec 1979-Apr 1980)

Performed slope stability analysis. Prepared a conceptual design of a braced sheet pile/tieback excavation for a pump house and intake pipe installation. Assisted in preparation of the geotechnical report on the riverfront area of the site.

Mason Station, Central Maine Power Company (Nov 1979-Dec 1979)

Reconaissance of several possible ash disposal sites. Assisted in preparation of site layout and quantity estimates. Responsible for structural evaluation of existing wooden docking facilities.

Yugoslavian Siting Proposals, Departments of Croatia & Slovenia (Sept 1979-Nov 1979)

Responsible for the preparation of the geotechnical portion of reports describing the methodology of siting nuclear power plants as well as presentations to the client.

Site Evaluation Study, Salt River Project, Arizona (Oct 1978-Feb 1979)

PRINCIPAL ENGINEER in charge of evaluating geotechnical characteristics of various sites being considered for pumped storage hydroelectric facility.

Jamesport Nuclear Power Station, Long Island Lighting Company, Long Island, NY (Jan 1977-Dec 1979)

As LEAD GEOTECHNICAL ENGINEER, responsible for the preparation of geotechnical design criteria, groundwater studies, and preparation of specifications. Directed pumping-recharge well test and groundwater cutoff wall feasibility boring investigation. Responsible for design of pumping-injection wall field, groundwater cutoff wall, and deep well-wellpoint dewatering system.

Shoreham Nuclear Power Station, Long Island Lighting Company, Long Island, NY (Mar 1976 to Present)

As LEAD GEOTECHNICAL ENGINEER, responsible for all geotechnical related site activities. Directed field investigations, liquefaction and stability analysis, settlement evaluation, and intake structure stability analysis. Reviewed offshore pipeline installation procedures and inspected backfill operations. Prepared chemical grout and Vibroflotation installation specifications. Responsible for coordination of in situ densification program and verification of adequacy of the installation. Prepared recommendations for intake canal erosion protection by filter cloth and stone. Evaluated quarry stone proposed for canal slope protection. Observed armor and bedding stone installations. Designated subgrade preparation procedures for plant roads.

Montezuma Pumped Storage, Salt River Project, Arizona (Dec 1975-Feb 1976)

Performed economic study of alternate schemes for reservoir, shaft, and cavern size and location. Used finite element technique to study stress-deformation characteristics of rock due to underground cavern construction.

Mushare - Darkuvin Sites, Atomic Energy Organization of Iran Khuzistan, Iran (Oct 1975-Nov 1975)

Test boring and layout survey specification review. Directed boring layout and site boring program.

Rijkswaterstat, Deltadienst - Holland (July 1975-Sept 1975)

Performed stability study using finite element technique for granular soils underlying proposed concrete box caissons subject to repeated wave action.

North Anna Power Station, Virginia Electric and Power Company, Mineral, VA (June 1975)

Directed backfill placement study, optimizing degree of compaction and placement time.

Fossil and Nuclear Plant Sites - New York Station, Power Authority of the State of New York (July 1974-June 1975)

Authored sections of Public Service Commission and Preliminary Safety Analysis Reports describing site soil conditions and the relationship of these soils to the proposed structures. Authored scope of work outlining required laboratory testing of site soil and rock. Managed off-site borrow study for procurement of granular fill. Performed relative cost analysis for alternate foundation schemes. Performed slope stability and settlement analyses of on-site soils. Supervised preparation of soil-cement installation specification.

Charlestown Nuclear Power Plant - Rhode Island, New England Power Company (Aug 1974-Oct 1974)

Prepared test procedure and interpreted field permeability test results. Evaluated sheetpiling feasibility. Prepared specification for installation and test pumping of water well.

TWIN CITY TESTING & ENGINEERING LABORATORIES, ST. PAUL, MN (July 1970-June 1974)

Responsible for geotechnical design criteria for installations such as footings, mats, deep foundations, retaining walls, embankments, airports, and roadways. Inspected excavation and compaction operations, drilled pier caissons, piling, in situ densification, and soil borings. Investigated structural damage claims due to vibrating equipment or blasting. Monitored vibrations. Investigated soils related damage claims such as settlement, floor, and wall failures. Tested structural units such as column forms and airplane wings for certification.

ARIZONA STATE UNIVERSITY, TEMPE, AZ (Jan 1969-June 1970)

As GRADUATE ASSISTANT supervised laboratory sections of soil mechanics and structural mechanics classes. Advised students on course content and problems.

PEACE CORPS, COLOMBIA, SOUTH AMERICA (June 1966-Sept 1968)

Taught the engineering laboratories at a technical university. Planned and directed construction of engineering projects such as secondary roads and simple span bridges in rural Colombia. Received formal training in Spanish language and employed Spanish in daily communications.

ARIZONA HIGHWAY DEPARTMENT, PHOENIX, AZ (Jan 1965-June 1966)

ASSISTANT ENGINEER in highway materials group. Inspected embankment soil placement during construction of a section of Interstate Highway.

TWIN CITY TESTING AND ENGINEERING LABORATORIES, ST. PAUL, MN (Sept 1963-Dec 1964)

Part time

Inspected compacted fills for roadways and foundations. Performed laboratory tests on soils and various construction materials.

December 1982

BARRY, PAUL FRANCIS

STRUCTURAL ENGINEER
STRUCTURAL DIVISION

EDUCATION

Tufts University - Bachelor of Science, Civil Engineering (Cum Laude) 1971

LICENSES AND REGISTRATIONS

Professional Engineer - Massachusetts and Indiana

EXPERIENCE SUMMARY

Mr. Barry has more that 11 years experience in both fossil and nuclear fueled power projects. He is currently assigned as the Structural Engineer for the independent assessment team the the Midland Plant Units 1 and 2. In addition, he is the Lead Structural Engineer in Operation Services Projects for the retirement of L-Street Steam Station and the Michigan City Generating Station, and is conducting an investigation of brick stack liners for the Petersburg Generating Station Unit 4. His responsibilities at the Midland Plant require an assessment of the underpinning construction activities for the auxiliary building. As a Lead Engineer he is responsible for the structural specifications and design drawings required for revisions to an existing plant.

Mr. Barry's past assignment included Lead Structural Engineer on coal conversion and synthetic fuel feasibility studies, and more than six years as an engineer on nuclear power plants.

Since joining Stone & Webster Engineering Corporation (SWEC), he has completed the Career Development Program and has been licensed as a Registered Professional Engineer in the Commonwealth of Massachusetts and the State of Indiana.

DETAILED EXPERIENCE RECORD
BARRY, PAUL F. 03675

STONE & WEBSTER ENGINEERING CORPORATION, BOSTON, MA (July 1971 to Present)

Appointments:

Structural Engineer, Structural Division - Sept 1979
Engineer, Structrual Division - Aug 1973

Midland Plant - Units 1 and 2, Consumers Power Company (Sept 1982 to Present)

STRUCTURAL ENGINEER for an independent assessment of the underpinning of the auxiliary building. Responsible for a review of the construction specification, procedures, and methods to assess their compatibility to NRC and industry standards.

Petersburg Generating Station - Unit 4, Indianapolis Power & Light Company (Nov 1982 to Present)

STRUCTRUAL ENGINEER for a study of the adequacy of acid resist brick and mortar liners.

Brayton Point Coal Conversion - Units 1, 2, and 3, New England Power Service Company (Apr 1982-Sept 1982)

As STRUCTURAL ENGINEER, responsible to review precipitator vendor's effort to redesign steel plate ductworks to eliminate internal ductwork trusses that were limiting boiler output.

South Meadow Coal Gasification/Repowering Feasibility Study, Northeast Utilities Service Company (June 1982-Dec 1982)

LEAD STRUCTURAL ENGINEER for a study to determine the technical and economic feasibility to repower the South Meadow Station by integrating coal gasification with a combined cycle gas turbine. Work includes developing a site plan, structural modifications necessary in the existing powerhouse, coal handling, foundation requirement, order of magnitude estimate, and schedules.

Operation Services
Michigan City - Unit 12, Northern Indiana Public Service Company
(Dec 1979 to Present)

LEAD STRUCTURAL ENGINEER for shoring support of existing heater to precipitator gas duct.

LEAD STRUCTURAL ENGINEER for replacement of existing air heater to precipitator gas duct with a new high velocity gas duct. Responsible for the preparation of contract specifications and supervision of designers necessary to install new steel plate ductwork.

LEAD STRUCTURAL ENGINEER for addition of the boiler room ventilation fan silencer encloser.

LEAD STRUCTURAL ENGINEER for a feasibility study of the addition of man-safe dampers in the gas ductwork.

LEAD STRUCTURAL ENGINEER for a study of a new stack for Units 2 and 3. Responsible for the preliminary ductwork and stack sizing, arrangement, support, order of magnitude cost, and construction schedule.

Operation Services
Somerset Station Coal Conversion, EAU Service Corporation
(Sept 1981-Jan 1982)

LEAD STRUCTURAL ENGINEER for a study to determine the technical and economic feasibility to reconvert the Somerset Station to coal. Work includes developing structural arrangements, schedules, and capital cost for the coal yard, particulate collection system, and the fly and bottom ash system.

Operation Services
Retirement of L-Street Steam Station, Boston Edison Company
(Sept 1981 to Present)

LEAD STRUCTURAL ENGINEER for the modification required for the retirement of the L-Street Steam Station and the equipment necessary to replace its function. Work includes preparation of specifications and the supervision of designers for the preparation of concrete, steel, and architectural drawing to support an auxiliary boiler and exhaust stack, and for enclosures around existing equipment.

Production of High Grade Solid Fuels from Wood Waste and Peat, E. Koppleman
(Oct 1980-Nov 1981)

LEAD STRUCTURAL ENGINEER for a study to determine the technical and economic feasibility to convert wood waste and peat into a high grade solid fuel. Work included developing a site plan, conceptual layouts of plant structures, wood handling, peat harvesting, cost estimate, and engineering and construction schedules.

Higgins Gasification/Repowering Project, Florida Power Corporation
(Oct 1980-Dec 1981)

LEAD STRUCTURAL ENGINEER for a study to determine the technical and economic feasibility to repower the existing Higgins Station by integrating coal gasification with a combined cycle gas turbine. Work includes developing a site plan, conceptual layout of plant structure, coal handling cost estimate, and engineering and construction schedules.

North Anna - Units 3 and 4, Virginia Electric and Power Company
(Aug 1975-Nov 1979)

Structural engineering for the service building and control room.

Structural engineering for caisson foundations, grating and stair tread purchase orders, electrical structures, and architectural details.

Civil Engineering

Structural Engineering for water treatment building

Structural responsibility for plant security

Maine Yankee Atomic Power Station, Maine Yankee Atomic Power Company
(Jan 1975-Aug 1975)

Stuctural engineering for circulating water diffuser system, including design of supplementary pipe diedown stuctural system and construction liaison.

Engineering and specification for design and construction of seismeic wall in circulating water pumphouse.

(May 1975-Aug 1975)

Assisted equipment specialist in preparing master specification for purchase and installation of circulating water pipe.

Koshkonong Nuclear Power Plant, Wisconsin Electric Power Company
(June 1974-Jan 1975)

Stuctural engineering for the ultimate heat sink, including the service water pumphouse.

Structural engineering for circulating ater system, including the circulating water pumphouse, natural draft ooling towers, and circualting water piping.

Wrote the structural portions of the Description of Work.

Provided structural input for the Preliminary Estimate.

Structural responsibility for plant security.

Jamesport Nuclear Power Station, Long Island Lighting Company
(Aug 1973-June 1974)

As SUPPORT ENGINEER, worked on Description of Work, wrote sections for PSAR, developed service building layout, and engineered the access-egress drawings and coordination for the Design Criteria.

Career Development Program in Structural Division (July 1971-Aug 1973)

Completed 6 months as a Quality Control Inspector at Shoreham Nuclear Power Station, Long Island Lighting Company.

Completed 1 month as a Field Engineer on a transmission line for Blackstone Valley Electric Company.

Completed 1 month as an aide in Geotechnical Division.

Assisted in economic studies for environmental report for River Bend Project, Gulf States Utilities Company.

Assisted in seismic design of Radwaste Building at Haddam Neck, Connecticut Yankee Atomic Power Company.

Designed steel for precipitator support and miscellaneous concrete for Canal Electric Company.

Designed and checked transmission towers and foundations for Savannah Electric and Power Company, Canal Electric Company, Duquesne Light Company, and Baltimore Gas and Electric Company.

March 1982

SCOTT, ALFRED B, JR.

CHIEF CONSTRUCTION ENGINEER
CONSTRUCTION DEPARTMENT

EDUCATION

University of Wisconsin - Bachelor of Science in Mechanical and Metallurgical Engineering 1948

EXPERIENCE SUMMARY

Mr. Scott has 34 years experience in the engineering industry. Currently, as Chief Construction Engineer at River Bend Station, Gulf States Utilities Company, LA, he is responsible for concrete selection, procurement, batching, and overall quality.

Since joining Stone & Webster Engineering Corporation (SWEC) in 1976, he has been assigned to River Bend Station as Assistant Resident Engineer and as Chief Construction Engineer. Special assignments have included handling of erosion problems, supervision of all crafts on Off-Plot Area and Temporary Facilities, and responsibility for closing of engineering and design construction reports for the Structural Department.

Prior to joining SWEC, Mr. Scott was a Senior Field Engineer for Bechtel Power Corporation, CA, where he was responsible for the field engineering and installation of an emergency gas pipeline and for engineering of a tank farm. He was also in charge of all subcontract work.

DETAILED EXPERIENCE RECORD
SCOTT, ALFRED B., JR.

STONE & WEBSTER ENGINEERING CORPORATION, BOSTON, MA (Nov 1976 to Present)

Appointments:

Chief Construction Engineer - May 1980
Assistant Resident Engineer - Nov 1976

River Bend Station, Gulf States Utilities Company (Nov 1976 to Present)

As CHIEF CONSTRUCTION ENGINEER, responsible for concrete selection, procurement, batching, and overall quality. Also responsible for closing engineering and design construction reports for Structrual Department, and for supervising all crafts on Off Plot Area and Temporary Facilities.

As ASSISTANT RESIDENT ENGINEER (Nov 1976-Oct 1980), responsible to Resident Engineer for all site engineering of a nuclear power plant in St. Francisville, LA.

BETCHEL POWER CORPORATION, SAN FRANCISCO, CA (June 1972-Sept 1976)

Appointment:

Senior Field Engineer - June 1972

As SENIOR FIELD ENGINEER, responsible for field engineering and installation of an emergency gas pipeline and engineering of a tank farm for Willow Glen No. 5 Unit, Gulf States Utilities Company, LA. Responsible for the mechanical discipline in the construction of the Number 5 generating unit. Also responsible for all subcontract work, and for all field engineering work for 1 year.

VAN DEUSEN AND COMPANY, PORTLAND, OR (Jan 1971-June 1972)

Appointment:

Field Engineer - Jan 1971

As FIELD ENGINEER, responsible for management and inspection of work performed by subcontractors in construction of a Methanol and Phenol Chemical Complex for the Georgia Pacific Corporation.

GULF COAST ALUMINUM CORPORATION, LAKE CHARLES, LA (Aug 1970-Jan 1971)

Appointment:

Superintendent - Aug 1970

As SUPERINTENDENT, responsible for construction of the Carbon Paste Plant for Plant Services Construction Company.

ABS Jr.

MCCARTY CORPORATION, BATON ROUGE, LA (Aug 1968-June1970)

Appointment:

Contract Engineer - Aug 1968

As CONTRACT ENGINEER, responsible for estimating, bidding, and managing work for insulation contracting.

BECHTEL POWER CORPORATION, SAN FRANCISCO, CA (Mar 1951-July 1968)

Appointments:

Chief Engineer - Aug 1967
Job Engineer - Nov 1966
Supervisor Field Engineer - May 1966
Chief Field Engineer - Oct 1964
Construction Supervisor - Nov 1962
Assistant Superintendent - June 1961
Chief Field Engineer - Mar 1958
Supervisor Field Engineer - Jan 1956
Senior Field Engineer - Mar 1951

Grass Roots Refinery, Antar Oil Company, Valenciennes, France (Aug 1967 - July 1968)

As CHIEF FIELD ENGINEER, responsible for field engineering and management of subcontracts, using four national groups.

Grass Roots Refinery, Texaco Oil Company (May 1966-July 1967)

As SUPERVISOR FIELD ENGINEER (May 1966-Nov 1966), responsible for field engineering.

As JOB ENGINEER (Nov 1966-July 1967), responsible for all job engineering.

Grass Roots Ammonia Plant, Continental Oil Company (Feb 1965-May 1966)

As CHIEF FIELD ENGINEER, responsible for field engineering.

Home Office Assignment (Feb 1963-Oct 1964)

As CHIEF FIELD ENGINEER, responsible for work planning schedules, human resources studies, critical path studies, and rigging diagrams.

Grass Roots Refinery, Regent Oil Company, Pembrokeshire, Wales, U.K. (Nov 1962-Oct 1964)

As CONSTRUCTION SUPERVISOR, responsible for construction of all off-plot facilities and all permanent buildings.

ABS Jr.

Grass Roots Chemical Plant, Tenneco Chemical Company (Jan 1962-Nov 1962)

As ASSISTANT SUPERINTENDENT, responsible for construction of all off-plot facilities.

Grass Roots Plastic Manufacturing Plant, Amoco Chemical Corporation (June 1961-Jan 1962)

As ASSISTANT SUPERINTENDENT, responsible for construction of all phases of plant.

Grass Roots Chemical Plant, Hercules Power Company (Dec 1959-June 1961)

As CHIEF FIELD ENGINEER, responsible for field engineering.

Refinery Expansion, Continental Oil Company (June 1959-Dec 1959)

As CHIEF FIELD ENGINEER, responsible for field engineering.

Refinery Expansion, Imperial Oil Company, Calgary, Alberta, Canada (Mar 1958-June 1959)

As CHIEF FIELD ENGINEER, responsible for field engineering.

Titanium Plant, U.S. Industrial Chemical Corporation (Nov 1957-Mar 1958)

As SUPERVISOR FIELD ENGINEER, coordinated extra work requested by Client with construction forces, and performed jobsite engineering.

Zirconium Sponge Plant, U.S. Industrial Chemical Corporation (Sept 1957-Nov 1957)

As SUPERVISOR FIELD ENGINEER, coordinated all activities to make plant operable.

Butadiene Plant Expansion, Petro-Tex Chemical Corporation (Jan 1956-Sept 1957)

As SUPERVISOR FIELD ENGINEER, responsible for all field engineering and startup.

Refinery Expansion, Tidewater Associated Oil Company (July 1955-Jan 1956)

As SENIOR FIELD ENGINEER, responsible for field engineering in construction of off-plot facilities and pipelines.

Grass Roots Refinery, Shell Oil Company (May 1955-July 1955)

As SENIOR FIELD ENGINEER, completed construction of administration complex.

Catalytic Reformer Unit, Standard Oil Company (Sept 1954-May 1955)

As SENIOR FIELD ENGINEER, responsible for field engineering.

ABS Jr.

Thermo Catalytic Reforming Unit, General Petroleum Corporation (Aug 1953-Sept 1954)

As SENIOR FIELD ENGINEER, responsible for field engineering.

Propyl Polymerization and Treating Units, Gulf Oil Corporation (Oct 1952-Aug 1953)

As SENIOR FIELD ENGINEER, responsible for field engineering.

Natural Gas Compressor Station, Tennessee Gas Transmission Company (July 1952-Oct 1952)

As SENIOR FIELD ENGINEER, responsible for field engineering.

Water Treating and Condensate Filtration Units, Union Oil Company (Nov 1951-July 1952)

As SENIOR FIELD ENGINEER, responsible for field engineering.

Natural Gas Compressor Station, Pacific Gas & Electric Company (Mar 1951-Nov 1951)

As SENIOR FIELD ENGINEER, responsible for field engineering.

TEXAS ILLINOIS NATURAL GAS PIPELINE COMPANY, CHICAGO, IL (Sept 1950-Mar 1951)

Appointment:

Chief Inspector - Mar 1951

As CHIEF INSPECTOR, supervised the activities of pipeline inspectors on Spread 7 and Spread 9 for construction and installation of a 30-inch natural gas pipeline from Texas to Illinois.

TEXAS GAS TRANSMISSION COMPANY, OWENSBORO, KY (Feb 1950-Sept 1950)

Appointment:

Construction Engineer - Sept 1950

As CONSTRUCTION ENGINEER, responsible for writing engineering procedures for material control, concrete specifications, piping specifications, building specifications, and material take-off, and for requisitioning for added construction.

ABS Jr.

STONE & WEBSTER ENGINEERING CORPORATION, BOSTON, MA (Feb 1949-Feb 1950)

Appointment:

Field Engineer - Feb 1949

As FIELD ENGINEER, responsible for field engineering, preparation of engineering reports, material take-offs requisitioning, craft scheduling and work planning for the lead melting facilities at the TetraEthly Lead Plant, LA.

As FIELD ENGINEER, responsible for field engineering and related problems in the construction of a natural gas compressor station for Texas Gas Transmission Company, LA.

AMERICAN STEEL FOUNDRIES, CHICAGO, IL (Feb 1948-Nov 1948)

Appointment:

Research Metallurgist - Feb 1948

As RESEARCH METALLURGIST, performed research of foundry sands, cereals, and resinous and plastic core binders. Studied causes and remedies of faulty castings.

U.S. ARMY SIGNAL CORPS (Feb 1943-Mar 1946)

Sergeant Radar Mechanic-Construction and Maintenance - Honorable Discharge

January 1983

ROUEN, LAWRENCE T.

SENIOR QUALITY ASSURANCE ENGINEER
QUALITY ASSURANCE DEPARTMENT

EDUCATION

University of Missouri (Columbia) - Bachelor of Science in Civil Engineering 1973
Various SWEC Continuing Education Courses

LICENSES AND REGISTRATIONS

Professional Engineer in Civil Engineering - Louisiana
ACI/ASME Level III Inspection Engineer

EXPERIENCE SUMMARY

Mr. Rouen has nine years' experience in the nuclear power plant construction industry. Currently, as Senior Quality Assurance Engineer, he is responsible for quality review and input to technical documents, procedure review and development, and the preparation/review of QA inspection plans. He is also responsible for the development of training programs for Level I and II ASME concrete inspectors and for certification of those inspectors.

Since joining Stone & Webster Engineering Corporation (SWEC) in 1973, he has gained in-depth experience in testing and inspection of structural activities and in overall quality assurance functions on several nuclear power plant projects.

DETAILED EXPERIENCE RECORD
ROUEN, LAWRENCE T. 78274

STONE & WEBSTER ENGINEERING CORPORATION, BOSTON, MA (Sept 1973 to Present)

Appointments:

Senior Quality Assurance Engineer - Mar 1982
Quality Assurance Engineer - May 1979
Quality Control Engineer - Oct 1975
Assistant Quality Control Engineer - Sept 1973

Midland Nuclear Project, Consumers Power Co. (Sept 1982 to Present - Temporary Assignment)

As LEAD QA REPRESENTATIVE, responsible for assessment of activities associated with the underpinning of the auxiliary building, such as soil settlement monitoring, excavation of pits and drifts, construction of piers, load transfer and other typical construction activities.

Clinch River Breeder Reactor Plant, US Dept. of Energy (June 1981 to Present)

As SENIOR QUALITY ASSURANCE ENGINEER, responsible for performance of ASME Section III, Division 2, Level III functions such as approvals of test and inspection procedures and development of training and certification programs for concrete inspectors, plus the duties performed as Quality Assurance Engineer.

As QUALITY ASSURANCE ENGINEER, responsible for quality review and input to technical documents, procedure review and development and the preparation/review of QA inspection plans.

River Bend Station, Gulf States Utilities Co. (May 1979-June 1981)

As QUALITY ASSURANCE ENGINEER, responsible for review and approval of QA inspection plans, vendor QA manuals, specification changes, and nonconformance dispositions. Also performed surveillance and audit activities to assure functional and programmatic compliance with project, corporate, client, and regulatory requirements.

Millstone Unit III, Northeast Utilities Service Co. (May 1978-May 1979)

As QUALITY CONTROL ENGINEER, responsible for supervision of the inspection programs for concrete, structural steel, protective coatings, and earthwork.

River Bend Station, Gulf States Service Co. (Oct 1975-May 1978)

As QUALITY CONTROL ENGINEER, responsible for field and laboratory testing of concrete and soils.

LTR

Shoreham Nuclear Power Station, Long Island Lighting Co. (Sept 1973-Oct 1975)

As ASSISTANT QUALITY CONTROL ENGINEER, tested and/or inspected concrete, cadwelds, soils, and aggregate.

DEPARTMENT OF PUBLIC WORKS, KANSAS CITY, MO (May 1973-Aug 1973 and May 1972-Aug 1972)

As ENGINEERING AIDE, supervised road repair and kept force accounts of work performed.

January 1982

HOLSINGER, BARRY L.

QUALITY ASSURANCE ENGINEER
QUALITY ASSURANCE DIVISION

EDUCATION

Stone & Webster Management Studies Program, North Anna Power Station 1974
Stone & Webster Radiological Safety Refresher, North Anna Power Station 1974
Stone & Webster Radiological Safety School, North Anna Power Station 1973
Virginia Department of Highway Troxler Training School, Staunton District, Staunton, VA 1969

EXPERIENCE SUMMARY

Mr. Holsinger has performed various functions in the Quality Control and Quality Assurance Department on nuclear power plant construction for the past 11 years.

In 1970, Mr. Holsinger joined the Stone & Webster Quality Control Division as an Inspector performing inspections and tests for the Civil/Structural Discipline at North Anna Power Station, Mineral, Virginia.

During 1976, Mr. Holsinger becase a supervisor assigned to training inspectors and technicians; plan and schedule inspection and testing within the Civil/Structural Discipline at Millstone Unit 2 Nuclear Power Station, Waterford, Connecticut.

Mr. Holsinger was assigned to a TMI modification in 1980 where he assisted in establishing the Quality Assurance (QA) Program requirements, performed the inspection and testing and established files for maintaining those documents required at Prairie Island Nuclear Power Station, Redwing, Minnesota.

In 1981, Mr. Holsinger joined the Quality Assurance Division to develop and implement a surveillance plan that would ensure that the QA Program was implemented and consistent with company policies for the nuclear power plant construction at Nine Mile Unit 2 Nuclear Power Station, Lycoming, New York.

DETAILED EXPERIENCE RECORD
HOLSINGER, BARRY L. 42176

STONE & WEBSTER ENGINEERING CORPORATION, BOSTON, MA (Sept 1970 to Present)

Appointments:

Quality Assurance Engineer - Mar 1981
FQC Engineer - Oct 1980
Senior Inspector - Mar 1976
FQC Inspector/Senior Inspector - Oct 1974
FQC Inspector - July 1972
Quality Control Technician - Sept 1970

Nine Mile Unit 2 Nuclear Power Station, Niagara Mohawk Power Corporation
(Mar 1981 to Present)

As QUALITY ASSURANCE ENGINEER, assigned at the site to assist Project QA Manager in monitoring, controlling, and reporting on all site QA activities. Responsibilities include reviewing Engineering and Design Coordination Reports and Nonconformance and Disposition Reports for quality requirements, quality engineering of Civil/Structural activities, interface Client QA concerns and evaluate the effectiveness of the Stone & Webster Program.

Prairie Island Nuclear Power Plant, Northern States Power Company
(Oct 1980-Feb 1981)

As FQC ENGINEER, assigned to the Northern States Power Company's Prairie Island Nuclear Power Plant in Redwing, Minnesota to develop a QA Program and perform inspection in the Civil/Structural Discipline for the Auxiliary Building post-TMI modifications. Major activities included developing client relations, developing inspection plans for batch plant, drilled-in anchors, structural steel, AWS welding, concrete preplacement and placement inspection, purchasing and receiving, developing and maintaining files of records generated.

Millstone Nuclear Power Station, Northeast Utilities Service Company
(Apr 1977-Oct 1980)

As FQC ENGINEER, responsible for planning, scheduling, training, and supervision, ensuring inspection criteria conformed to job specifications and codes (NRC Regulatory Guides, ANSI, ACI, AWS, AISC, and ASTMs) for the Civil/Structural Discipline. Major activities within the Civil/Structural Discipline included concrete laboratory (mix designs), concrete/aggregate testing, batch plant inspection and testing, reinforcing steel inspection and testing, structural steel inspection, AWS welding inspection, and ANSI painting inspection and testing.

BLH

Millstone 3 Nuclear Power Station, Northeast Utilities Service Company
(Oct 1974-Apr 1977)

As SENIOR INSPECTOR (Mar 1976-Apr 1977), responsible for the supervision of nine inspectors within the FQC Structural Discipline. Responsibilities include: site lab, concrete and soils test, inspection and documentation

As FQC INSPECTOR/SENIOR INSPECTOR (Oct 1974-Feb 1976), responsible for all site FQC laboratory functions. Duties included initial startup of the site lab, and calibration of field and lab concrete and soils testing equipment. Also trained personnel for lab testing, prepared the lab for CCRL certification, compiled and revised documentation and records, and supervised one inspector and three technicians.

North Anna Power Station, Virginia Electric & Power Company
(Aug 1974-Oct 1974)

Participated in Stone & Webster's management studies program.

Surry Nuclear Power Station, Virginia Electric & Power Company
(May 1974-Aug 1974)

As FQC INSPECTOR, audited Stone & Webster's Geotechnical Division soils investigation program for Units 3 and 4; audit included splitbarrel sampling, Hvorsley tube sampling, Vibrofloation Corporation's densification probes, and Professor J. H. Schmertmann's static core penetrometer soundings.

North Anna Power Station, Virginia Electric & Power Company (May 1974)

As FQC INSPECTOR, supervised concrete and soils testing laboratory onsite.

River Bend Stations 1 and 2, Gulf States Utilities (Jan 1974-Mar 1974)

As FQC INSPECTOR, audited Stone & Webster's Geotechnical Division soils densification test program.

North Anna Power Station, Virginia Electric & Power Company
(Sept 1970-June 1974)

As FQC INSPECTOR (Sept 1973-June 1974), performed soils and concrete tests at the site laboratory. Concrete tests consisted of air content, slump, fresh unit weight, cylinder compressive strength, sieve analysis and specific gravity. Soil tests consisted of moisture-density relationship, atterberg limits, hydrometer analysis, sieve analysis and specific gravity.

As FQC INSPECTOR (July 1972-Sept 1973), performed soil tests and inspection of the service water reservoir. Tests include the Troxler, sand cone, sieve analysis and sampling from test panels. Inspection included subcontractors compliance to specifications and drawings. Assisted and inspected in the Geotechnical Division in the installation of piezometers, rock blasting and rock bolting operations for Units 3 and 4 containment.

As QUALITY CONTROL TECHNICIAN (Sept 1970-July 1972), performed soil tests and inspection for North Anna Power Station roads and bridges, dam, and dikes. Tests include Troxler Nuclear Gauge, sand cone and inspection subcontractors to ensure compliance to specifications and drawings.

GREER BROS. & YOUNG, LOUISVILLE, KY (Aug 1970-Sept 1970)

As FOREMAN, responsible for supervision and installation of drain pipes for highway construction.

VIRGINIA DEPARTMENT OF HIGHWAY, VERONA, VA (June 1969-July 1970)

Responsible for soils testing for interstate highway construction.

JAMES WHITMORE, WOODSTOCK, VA (May 1969-Jun 1969)

Received training as a surveyor. Duties included Rodman, Levelman, Chainman, Transitman, calculations for and plotting survey plats.

AILEEN MFG. COMPANY, EDINBURG, VA (Feb 1969-Apr 1969)

Received training as plant engineer. Primary duty was operational cost studies.

UNITED STATES ARMY (Jan 1966-Dec 1968)

Company Clerk, rank E-4. Honorably discharged in 1968.

VIRGINIA DEPARTMENT OF HIGHWAY, EDINBURG, VA (Sept 1964-Nov 1965)

Responsible for soils testing for interstate highway construction.

THOMAS R. KUESEL
Senior Vice President
Partner, Principal Professional Associate
Structural Engineer

Education
Yale University, B.E., 1946; M. Eng., 1947

Societies
National Academy of Engineering
American Society of Civil Engineers
American Consulting Engineers Council
The Moles (honorary tunneling fraternity)
British Tunnelling Society
Structural Engineers Association of California
Charter Member, U.S. National Committee on Tunnel Technology (1972-74)

Licenses
New York, New Hampshire, Massachusetts, Connecticut, Pennsylvania, Delaware, Maryland
District of Columbia, Virginia, South Carolina, Georgia, Florida, Texas, Ohio, Illinois, Michigan,
Colorado, California, Washington, Hawaii
National Bureau of Engineering Registration, Certificate of Qualification

Mr. Kuesel, who joined Parsons Brinckerhoff in 1947, became a partner and officer of the firm in 1968. He has over 35 years of experience on major structural projects including long-span and movable bridges, tunnels, and complex structures. He has participated in over 90 tunnel projects on five continents. His present responsibilities in the direction of major underground projects include the nine-mile Rogers Pass Tunnel in British Columbia, the Glenwood Canyon Tunnels in Colorado, and the Mt. Lebanon Tunnel in Pittsburgh.

Among Mr. Kuesel's past projects are:

- Hard Rock Tunnels: NORAD Combat Operations Center, Colorado Springs; Peachtree Center Station, MARTA transit system, Atlanta, Georgia; Potomac River Tunnel, Washington, D.C., Metro transit system.

- Soft Ground Tunnels: Anacostia River Tunnel, Lexington Market Tunnels, Baltimore transit system; 7th Street Tunnels (Section F-F-2), Washington, D.C., Metro transit system; Red Hook Tunnel, Brooklyn, New York.

- Cut-and-cover Tunnels: Harvard Square and South Cove Stations, Boston transit system, Massachusetts; Lexington Market Station, Baltimore Transit System; Waterfront Station, Washington, D.C., Metro transit system.

- Immersed Tube Tunnels: Fort McHenry Tunnel, Baltimore, Maryland; Second Downtown Elizabeth River Tunnel, Norfolk-Portsmouth, Virginia; Second Hampton Roads Tunnel, Hampton-Norfolk, Virginia; 63rd Street Tunnel, New York City; BART Trans-Bay Tube, San Francisco, California.

- Served as Chairman of the Seismic Advisory Boards, as well as Senior Technical Advisor, for the Stanford Linear Accelerator Positron-Electron Project and the San Francisco Ocean Outfall Project.

- From 1963 to 1968, directed the design of the San Francisco Bay Area Rapid Transit (BART) System. For four of these years, he was assistant manager of engineering for Parsons Brinckerhoff-Tudor-Bechtel — general engineering consultants for BART — and for one year, he served as project manager based in the San Francisco office of Parsons Brinckerhoff. Mr. Kuesel developed BART's civil and structural design criteria, which included unique provisions for resistance to earthquakes. He also reviewed and approved all plans and specifications for heavy construction contracts.

Mr. Kuesel is presently a special advisor to the Underground Technology Research Council Committee on Tunnel Lining Design. He is also active in efforts to improve contracting practices for underground construction.

LOUIS G. SILANO
Vice President
Technical Director, Major Structures
Principal Professional Associate

Education
Columbia University, B.S.C.E., 1951; M.S.C.E., 1955

Societies
American Society of Civil Engineers, Fellow
Tau Beta Pi, Alpha Phi Delta
Column Research Council
Prestressed Concrete Institute

Licenses
New York, Rhode Island, Virginia, Georgia

Since he joined the firm in 1951, Mr. Silano has engineered and managed many complex multidisciplinary projects. As manager of the Structures Division and currently as technical director for major structures, Mr. Silano is responsible for structural projects including design of tunnels; movable, fixed, and long-span bridges; bridge rehabilitation; port structures; and mass transit structures.

Mr. Silano has held major responsibility for the following notable engineering projects:

Tunnels

- Project manager and project engineer for the Second Hampton Roads Bridge-Tunnel Crossing, including a 7,000-foot-long immersed tube tunnel, two ventilation buildings constructed on man-made islands, 1,500 feet of open approaches, and 8,800 feet of trestle approaches connecting Hampton and Norfolk, Virginia.

- Project manager responsible for the preliminary engineering design of a 2,300-foot immersed tube tunnel, including ventilation buildings, for a crossing of the Chao Phya River in Bangkok, Thailand.

- Project manager responsible for the preliminary engineering design of a high-level bridge and sunken tube tunnel alternate for a crossing of Bolivar Roads in Galveston, Texas.

- Project engineer for the preliminary engineering design of a 2,100-foot sunken tube tunnel, including ventilation buildings, for Project One in Kakogawa, Hyogo, Japan, for Kawasaki Heavy Industries, Ltd.

- Principal-in-charge of the design of a 1,700-foot-long prestressed concrete water intake tunnel constructed by the sunken tube method in Bahrain, in the Persian Gulf, for Hyundai Construction Co. Ltd.

- Participated in the design efforts for the following immersed tube tunnels: 63rd Street Tunnel, New York City; Second Downtown Elizabeth River Tunnel between Portsmouth and Norfolk, Virginia; Brisbane River Tunnel Crossing in Brisbane, Australia; and the Trans-Bay Tubes in San Francisco, California, part of the Bay Area Rapid Transit System.

- Participated in the design efforts for the following projects, all of which included bored tunnels through rock: subway section design for the Washington, D.C. Metropolitan Area Transit Authority's Metro; water circulating tunnels at the TUSI Power Plant, Somerville County, Texas; and a tunnel boring machine feasibility study for the New York City Transit Authority.

Bridges

- Project manager for the Fremont Bridge, Portland, Oregon. He was responsible for engineering of this project, including the design and erection of both the foundation and the superstructure of the world's largest three-span stiffened tied arch. The Fremont Bridge is a double-decked, eight-lane structure having an orthotropic upper deck and a main span 1,200 feet long. The structure received worldwide acclaim for the unique methods employed in erecting the main span and was awarded the AISC Prize Bridge Award in the long-span category for 1974.

- Project engineer for the Newport Bridge, Narragansett Bay, Rhode Island. He was responsible for the engineering design and preparation of the contract plans for New England's largest suspension bridge. This 1,600-foot suspension span employs many novel features unique to suspension bridges. Among these are shop-prefabricated parallel-wire strands, pipe-frame anchorages, plastic cable wrap and all-welded steel towers.

Mr. Silano's experience also includes participation in the design of many large bridges, including the Arthur Kill Bridge, Staten Island, New York; Savannah River Crossing, Georgia; Fleming Park Bridge, Pittsburgh, Pennsylvania; Myrtle Avenue Overpass, Jacksonville, Florida; and the Prospect Expressway, Brooklyn, New York. Prior to joining the firm in 1951, he was employed by the Port Authority of New York and New Jersey.

Teaching Experience
The Cooper Union, New York—Strength of Materials Laboratory.

Publications

- Coauthor, "Record Span for Record Lift – The Fremont Bridge," awarded first prize by the James F. Lincoln Arc Welding Foundation, 1974.

- "Newport Bridge Superstructure," Structural Division, Proceedings of the ASCE.

- "Design of the Fremont Bridge," Preprint ASCE National Structural Engineering Meeting, Portland, Oregon, 1970.

- "Newport Bridge Foundations," *Civil Engineering*. October 1968.

JERROLD RATNER
Manager of Cost Estimating for Parsons Brinckerhoff Construction Services

Education
New Jersey Institute of Technology, B.S. Engineering, 1979

Societies
National Society of Professional Estimators
American Association of Cost Engineers
Municipal Engineers of the City of New York

Licenses
Certified by the National Society of Professional Estimators

Mr. Ratner has more than 25 years of estimating, design, and supervisory experience in the construction field, including port facilities, bridges, rail and highway tunnels, highways, transit systems, and hydroelectric plants and power lines. His assignments in cost estimating and in review for constructability and scheduling include:

- Tunnels: Moffat railroad tunnel, Colorado; the Ft. McHenry Tunnel, Baltimore, Maryland; the Second Downtown Tunnel under the Elizabeth River, Portsmouth, Virginia; the Mt. Lebanon Tunnel for light rail transit, Pittsburgh, Pennsylvania; the Kaohsiung Harbor Tunnel, Taiwan; a tunnel for the Caracas Metro, Venezuela; and cut-and-cover sections for Westway in New York City, and for other roads and transit systems.

- Highways: Westway, New York City; the New Jersey Turnpike; the Hiawatha Corridor, Minneapolis, Minnesota; and the Portsmouth Interchange, Portsmouth, Virginia.

- Bridges: The Sunshine Skyway cable-stayed bridge, Tampa, Florida; the Bangkok Bridge, Thailand; the West Seattle Freeway Bridge, Seattle, Washington; and other, smaller bridges.

- Rapid transit projects: sections of the Washington (D.C.) Metropolitan Area Transit Authority system (section F4, the Anacostia River Tunnel); sections of the Pittsburgh (Pennsylvania) Light Rail Transit system, including a maintenance garage; and a tunnel for the Caracas (Venezuela) Metro.

- Port facilities: Jourdan Road, a new port facility for the Port of New Orleans, Louisiana; a proposed marine liquefied natural gas terminal, Cook Inlet, Alaska; and rehabilitation of Port Suez, Egypt, where Mr. Ratner provided cost estimates and recommendations for the rehabilitation of this major port facility at the tip of the Suez Canal.

- Coal unloading facilities: Sparrows Point, Maryland; Chesapeake, Virginia; St. Francisville, Louisiana; and Portsmouth, Virginia.

- Housing: Roundhouse Place, Savannah, Georgia; housing units for the elderly, Waterbury, Connecticut; Barnum House, Bridgeport, Connecticut; a hotel converted to housing units for the elderly—Mr. Ratner acted as owner's representative during rehabilitation and was responsible for estimating, cost changes, scheduling, payments, and permits; and Firehouse Block redevelopment project, Concord, New Hampshire, a construction project of housing units for the elderly.

- Hydroelectric plant: Great Falls of the Passaic, Paterson, New Jersey, a small hydropower plant fitted to existing structures in an historic site.

- Airport: Albany Airport, New York.

Previous Experience

- Officer, chief estimator, and head of the Civil Engineering Department for a heavy electrical contracting company. Duties included estimating, scheduling, and supervision of all field personnel for projects, including subaqueous oil-o-static cables; and the Niagara River power line from Canada to New York City for the New York State Power Authority.

- Estimator and designer of underpinnings for the Second Avenue subway, including projects such as the Brooklyn Bridge, the Queens Midtown Tunnel, the Manhattan Bridge, the Queens 59th Street Bridge, and large office structures such as the Cocoa Exchange Building in New York.

- Project engineer on construction of the Crossbay Bridge, Queens, New York, including dredging, underwater demolition and blasting, and erection of the country's largest precast concrete bridge beams.

- Project manager for dock and crane rail construction at Port Elizabeth and Port Newark, New Jersey, for the Port Authority of New York and New Jersey.

- Project engineer on construction of the Bowline Point Power Plant offshore fuel unloading facilities in Haverstraw, New York and on offshore fuel- and coal-unloading facilities in Bridgeport, Connecticut. Both projects included dredging and new dock facilities.

- Engineer in charge of coordinating building construction for the 1964 New York World's Fair.

WALTER C. PARISH
Civil/Structural Engineer

Education
Georgia Institute of Technology, B.S.C.E., 1957
College of William and Mary, Graduate Studies

Licenses
Maryland

Mr. Parish's experience includes design for support systems for underground and open-cut excavating, support for buildings, utilities, railroads, highways, streets, and spans; and consultant to contractors. Currently Mr. Parish functions as administrator of geotechnical services for the Pittsburgh Light Rail Transit System. He is project engineer for the Mt. Lebanon Tunnel portion of the LRT and supports the structural department in soil loading and bearing values in the department's design of box and station structures. He also serves as the contract administrator for building protection in the central business district.

Other projects to which he has brought his skills include:

- Design of support systems for underground and open-cut excavations as well as support for buildings, utilities, railroads, highways, and streets in the Washington, D.C. area.

- Project engineer for construction projects in Maryland, South Dakota, Georgia, and Puerto Rico ranging in value to $10 million. These include: marine construction at Calvert Cliffs, Maryland; nuclear plant and construction of channel, harbor, and landfill for Sun Oil petrochemical complex, Yabucoa, Puerto Rico.

- Responsibility for engineering of various projects, including construction of four artificial islands and excavation and backfill of tunnel trenches for the Chesapeake Bay Bridge-Tunnel Crossing. Enlarging and deepening portions of the Chesapeake and Delaware Canal near Summit, Delaware.

- Management of shop fabrication scheduling for most economic use of steel shops required for structural units of buildings and bridges.

- Design of embankment support, temporary bridges, and support piers for three high speed AMTRAK to N.Y. rail lines at New Carrollton Metro Station.

- Participation in the design of underground support systems on about 50 percent of all Washington, D.C. Metro contracts, involving cut-and-cover construction. Designed support system passage of Metro subway under Rock Creek. Designed several re-support systems for contractors on D.C. Metro where failure had occurred in existing system. Designed rock support systems for open cuts at Metro's Cleveland Park, Van Ness, and Bethesda Stations. Designed bridges, support piles, embankment, and utility duct support for two Conrail lines, leading from D.C. to Virginia, at the intersection with the Metro structure.

- Design of pipe insertion cofferdam for L.N.G. terminal at Cove Point, Maryland.

- Design of plug and 4-pipe hydraulic bypass for existing 18-foot square sewer tunnel in Chicago, Illinois.

- Design of cofferdams for construction of abutments for B&O Railway bridge over future extension of Maryland Route 28 in Rockville, Maryland.

- Design of decking and temporary bridges for street and highway support over open-cut excavations throughout the Washington Metropolitan area.

- Numerous analyses and independent studies made in conjunction with other designs.

VINCENT J. MADILL
Senior Estimator/Scheduler

Education
Rensselaer Polytechnic Institute, B.C.E., 1947

License
New York

Mr. Madill, a member of the construction management team of Parsons Brinckerhoff, has 32 years of construction background and experience with a nationally known firm specializing in foundations, underpinning, heavy construction, and subway work. During his previous employment he advanced progressively from field engineer, field superintendent, design engineer, senior engineer, district manager to company representative. His experience covers a wide range of construction techniques including installation of sheeting bracing, tiebacks, shoring, underpinning, slurry walls, piles and caissons. Prior to civilian employment Mr. Madill gained construction experience during World War II as an ensign in the Civil Engineer Corps, United States Naval Reserve. He served with the 10th and 61st construction battalions, Philippine Islands, and later was attached to the Public Works Office, 3rd Naval District, in New York City. The following is a summary of projects and assignments that he has participated in since joining the firm:

- Consultant for the Philadelphia Rail Corp. on interface between existing structures and new construction for the Philadelphia City Center Rail commuter connection.

- Estimating, reviewing, and scheduling of work for the Pittsburgh Light Rail System including underpinning, maintenance and protection of traffic, decking, temporary support systems and dewatering.

Prior to joining the firm, he was involved in the following projects:

- Underpinning and support of existing operating railroad structures during construction of the Christie St. subway, N.Y.C. Transit Authority Contract C-124 and N.Y.C. Transit Authority Contract Route 131-D, Section 5, Archer Ave., Queens.

- Underpinning in connection with remedial work during construction of the Shrine of the Immaculate Conception, Washington, D.C., and for underpinning, support and pick up of part of the elevated West Side Highway during construction of the New York City Water Tunnel.

- Preparation of competitive bid estimates, and design as required, for underpinning work in connection with the New York City, San Francisco, Washington, Atlanta, Philadelphia, Boston and Caracas, Venezuela subway systems.

- Construction involvement with heavy caisson foundation work including 140 Broadway and the U.S. Steel Building, N.Y.C., which is founded on drilled-in-caissons with a capacity of up to 3,700 tons per single unit.

- Port Authority contracts including work on construction of the World Trade Center and the 179th St. vehicular underpass at the George Washington Bridge.

- Excavation, sheeting, bracing, and foundation contracts including Mt. Sinai Hospital, Worth Street Telephone Building, Irving Trust Building, Chase Manhattan, Phase II, N.Y.C.; Jordan Marsh Department Store, Boston; Inland Steel Building, Chicago; Mutual Benefit Insurance, Newark, N.J.; University Teaching Hospital, Syracuse, N.Y.; and the Sullivan Square Underpass, Charlestown, Mass.

- Pile driving, including specialized inside, limited headroom, pile installations at Seaman Brothers Warehouse, Bronx, N.Y.; Stein Davies, Brooklyn, N.Y.; and General Motors, Tarrytown, N.Y.

- Prime N.Y.C. Transit Authority contracts including rock tunneling for the 42nd street escalator connection between the Queens subway and the Lexington Avenue line and for the platform extensions for the Broadway–7th Ave., I.R.T.

- Slurry wall construction in connection with the Sears, Roebuck Inc. Building, Chicago; and the North River Pollution Control Plant, N.Y.C. At the N.Y.C. site a 1,500-ton load test was conducted successfully for the prime constructor on a 36" diameter drilled-in-caisson.

- Waterfront construction projects at Groton, Conn., Electric Boat Division; Portsmouth, New Hampshire, U.S. Navy Submarine Base; and Albany, New York wharf reconstruction.

APPENDIX C

AFFIDAVITS

This appendix contains Assessment Team member affidavits. They are provided as verification of the independent credentials of each Assessment Team member.

STONE & WEBSTER MICHIGAN, INC.

P.O. BOX 2325, BOSTON, MASSACHUSETTS 02107

Mr. J. G. Keppler
Administrator, Region III
U. S. Nuclear Regulatory Commission
799 Roosevelt Road
Glen Ellyn, IL 60137

February 14, 1983

J.O. No. 14358
MPS-7

RE: DOCKET NO. 50-329-330
MIDLAND PLANT - UNITS 1 AND 2
INDEPENDENT ASSESSMENT OF AUXILIARY BUILDING
UNDERPINNING
INDEPENDENCE OF ASSESSMENT TEAM

Consumers Power Company Specification CC-100 originally issued on September 20, 1982, sets forth the criteria for independence for the Assessment Team. Stone & Webster Michigan, Inc., determined that the Corporation and the individual members of the Team satisfy the requirements of the Specification. We have also determined that our subcontrctor, Parsons Brinckerhoff Michigan Inc. meet these requirements as set forth in a letter signed by Thomas R. Kuessel, Senior Vice President of Parson Brinckerhoff Michigan Inc., dated November 4, 1981.

In particular both Corporations satisfy the following criteria:

- The Corporations or individuals assigned to this work do not have any direct previous involvement with Midland activities that they will be reviewing.
- The Corporations or individuals assigned to this work have not been previously hired by the Owner to perform design, construction, or quality work relative to the soils remedial program.
- The individuals assigned to this work have not been previously employed by the Owner within the last 3 years.
- The individuals assigned to this work do not have present household members employed by the Owner.
- The individuals assigned to this work do not have any relatives employed by the Owner in a management capacity.
- The Corporations and individuals assigned to this work do not control a significant amount of Owner stock.

Under separate cover we are sending signed affidavits for each member of the Assessment Team. If you have any questions, please contact Mr. A. Stanley Lucks at (617) 589-2067.

P. A. Wild
Vice President

Sworn and subscribed to before me on this 14th day of February, 1983.

Catherine G. Trabucco
Notary Public
Suffolk County Massachusetts
My Commission Expires November 8, 1985.

Catherine Trabucco
NOTARY PUBLIC
For the Commonwealth of Massachusetts
My Commission Expires Nov. 8, 1985

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	Docket No. 50-329 OM
CONSUMERS POWER COMPANY	50-330 OM
(Midland Plant, Units 1 and 2	Docket No. 50-329 OL
	50-330 OL

February 14, 1983

AFFIDAVIT OF _____

My name is A.S. Lucks. I am employed by Stone & Webster Engineering Corporation as Project Manager.

I am currently assigned to the team which is conducting an independent assessment of soils work at the Midland Nuclear Plant site. Prior to being given this assignment, I have never worked on any job or task associated with the Midland Project, or any job or task for or on behalf of Consumers Power Company, Bechtel, or the Mergentime Company relating to soils of underpinning. I have never been employed by Consumers Power Company, Bechtel, or Mergentime Company. I do not own any shares of Consumers Power Company, Bechtel, or Mergentime stock. Mutual funds or other funds in which I may have a beneficial interest, but over which I have no control, may own shares of Consumers Power Company, Bechtel, or Mergentime stock, of which I am unaware. A list of such funds in which I have an interest are attached. I have no relatives which are or have been employed by Consumers Power Company, Bechtel, or Mergentime Company.

Sworn and Subscribed Before Me This 14th Day of February 1983

Catherine C. Trabucco

Notary Public
Suffolk County, Massachusetts

My Commission Expires November 8, 1985

Catherine Trabucco
NOTARY PUBLIC
For the Commonwealth of Massachusetts
My Commission Expires Nov. 8, 1985

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	Docket No. 50-329 OM
CONSUMERS POWER COMPANY	50-330 OM
(Midland Plant, Units 1 and 2	Docket No. 50-329 OL
	50-330 OL

February 14, 1983

AFFIDAVIT OF W. E. Kilker

My name is W.E. Kilker. I am employed by Stone & Webster Engineering Corporation as Project Engineer.

I am currently assigned to the team which is conducting an independent assessment of soils work at the Midland Nuclear Plant site. Prior to being given this assignment, I have never worked on any job or task associated with the Midland Project, or any job or task for or on behalf of Consumers Power Company, Bechtel, or the Mergentime Company relating to soils of underpinning. I have never been employed by Consumers Power Company, Bechtel, or Mergentime Company. I do not own any shares of Consumers Power Company, Bechtel, or Mergentime stock. Mutual funds or other funds in which I may have a beneficial interest, but over which I have no control, may own shares of Consumers Power Company, Bechtel, or Mergentime stock, of which I am unaware. A list of such funds in which I have an interest are attached. I have no relatives which are or have been employed by Consumers Power Company, Bechtel, or Mergentime Company.

Sworn and Subscribed Before Me This 14th Day of February 1983

Catherine A. Trabucco

Notary Public
Suffolk County, Massachusetts

My Commission Expires November 8, 1985

Catherine Trabucco
NOTARY PUBLIC
For the Commonwealth of Massachusetts
My Commission Expires Nov. 8, 1985

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CONSUMERS POWER COMPANY
(Midland Plant, Units 1 and 2)

Docket No 50-329 OM
50-330 OM
Docket No 50-329 OL
50-330 OL

February 11, 1983

AFFIDAVIT OF Paul F Baury

My name is PAUL F BAORY. I am employed by STONE + WEBSTER ENGINEERING CORP as a STRUCTURAL ENGINEER

I am currently assigned to the team which is conducting an independent assessment of soils work at the Midland Nuclear Plant site. Prior to being given this assignment, I have never worked on any job or task associated with the Midland Project, or any job or task for or on behalf of Consumers Power Company, Bechtel, or the Mergentime Company relating to soils or underpinning. I have never been employed by Consumers Power Company, Bechtel, or Mergentime Company. I do not own any shares of Consumers Power Company, Bechtel, or Mergentime stock. Mutual funds or other funds in which I may have a beneficial interest, but over which I have no control, may own shares of Consumers Power Company, Bechtel, or Mergentime stock, of which I am unaware. A list of such funds in which I have an interest are attached. I have no relatives which are or have been employed by Consumers Power Company, Bechtel, or Mergentime Company.

Sworn and Subscribed Before Me This 11th Day of Feb 1983 ~~1982~~ AP

Patricia A Puffer
Notary Public
~~Jackson~~ Bay County, Michigan

My Commission Expires 3-4-86

af0283-0349a100

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

In the Matter of
CONSUMERS POWER COMPANY
(Midland Plant, Units 1 and 2)

Docket No 50-329 OM
50-330 OM
Docket No 50-329 OL
50-330 OL

February 11, 1983

AFFIDAVIT OF A B Scott

My name is A.B. Scott. I am employed by Stone & Webster as Engineer.

I am currently assigned to the team which is conducting an independent assessment of soils work at the Midland Nuclear Plant site. Prior to being given this assignment, I have never worked on any job or task associated with the Midland Project, or any job or task for or on behalf of Consumers Power Company, Bechtel, or the Mergentime Company relating to soils or underpinning. I have never been employed by Consumers Power Company, ~~Bechtel~~, or Mergentime Company. I do not own any shares of Consumers Power Company, Bechtel, or Mergentime stock. Mutual funds or other funds in which I may have a beneficial interest, but over which I have no control, may own shares of Consumers Power Company, Bechtel, or Mergentime stock, of which I am unaware. A list of such funds in which I have an interest are attached. I have no relatives which are or have been employed by Consumers Power Company, Bechtel, or Mergentime Company.

Sworn and Subscribed Before Me This 14th Day of Feb ~~1982~~ 1983

Patricia A Puffer
Notary Public
~~Jackson~~ Bay County, Michigan

My Commission Expires 3-4-86

I was employed by Bechtel Corporation from March 1951 to July 1968 and from June 1972 to September 1976. AB

af0283-0349a100

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

In the Matter of
CONSUMERS POWER COMPANY
(Midland Plant, Units 1 and 2)

Docket No 50-329 OM
50-330 OM
Docket No 50-329 OL
50-330 OL

February 11, 1983

AFFIDAVIT OF Lawrence T. Rouen

My name is Lawrence T. Rouen I am employed by Stone and Webster Engr. Corp. as Senior Quality Assurance Engineer.

I am currently assigned to the team which is conducting an independent assessment of soils work at the Midland Nuclear Plant site. Prior to being given this assignment, I have never worked on any job or task associated with the Midland Project, or any job or task for or on behalf of Consumers Power Company, Bechtel, or the Mergentime Company relating to soils or underpinning. I have never been employed by Consumers Power Company, Bechtel, or Mergentime Company. I do not own any shares of Consumers Power Company, Bechtel, or Mergentime stock. Mutual funds or other funds in which I may have a beneficial interest, but over which I have no control, may own shares of Consumers Power Company, Bechtel, or Mergentime stock, of which I am unaware. A list of such funds in which I have an interest are attached. I have no relatives which are or have been employed by Consumers Power Company, Bechtel, or Mergentime Company.

Sworn and Subscribed Before Me This 11th Day of Feb 1983 ~~1982~~

Patricia A Pfeffer
Notary Public
~~Jackson~~ Bay County, Michigan

My Commission Expires 3-4-86

af0283-0349a100

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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COMSUMERS POWER COMPANY
(Midland Plant, Units 1 and 2)

Docket No. 50-329 OM
50-330 OM
Docket No. 50-329 OL
50-330 OL

February 11, 1983

AFFIDAVIT OF _____

Barry L. Holsinger

My name is Barry L. Holsinger. I am employed by Stone & Webster as QA Engineer.

I am currently assigned to the team which is conducting an independent assessment of soils work at the Midland Nuclear Plant site. Prior to being given this assignment, I have never worked on any job or task associated with the Midland Project, or any job or task for or on behalf of Consumers Power Company, Bechtel, or the Mergentime Company relating to soils or underpinning. I have never been employed by Consumers Power Company, Bechtel, or Mergentime Company. I do not own any shares of Consumers Power Company, Bechtel, or Mergentime stock. Mutual funds or other funds in which I may have a beneficial interest, but over which I have no control, may own shares of Consumers Power Company, Bechtel, or Mergentime stock, of which I am unaware. A list of such funds in which I have an interest are attached. I have no relatives which are or have been employed by Consumers Power Company, Bechtel, or Mergentime Company.

Barry L. Holsinger

Sworn and Subscribed Before Me This ___ Day of _____ 1983

_____
Notary Public

NANCY S. NOBLE
Notary Public in the State of New York
Qualified in Onon. Co. No. 34-2297710
My Commission Expires March 30, 19__

My Commission Expires _____

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

In the Matter of
CONSUMERS POWER COMPANY
(Midland Plant, Units 1 and 2)

Docket No 50-329 OM
50-330 OM
Docket No 50-329 OL
50-330 OL

February 11, 1983

AFFIDAVIT OF Thomas R. Kuesel

My name is Thomas R. Kuesel. I am employed by Parsons Brinckerhoff Quade & Douglas, Inc. as Senior Vice President.

I am currently assigned to the team which is conducting an independent assessment of soils work at the Midland Nuclear Plant site. Prior to being given this assignment, I have never worked on any job or task associated with the Midland Project, or any job or task for or on behalf of Consumers Power Company, Bechtel, or the Mergentime Company relating to soils or underpinning. I have never been employed by Consumers Power Company, Bechtel, or Mergentime Company. I do not own any shares of Consumers Power Company, Bechtel, or Mergentime stock. Mutual funds or other funds in which I may have a beneficial interest, but over which I have no control, may own shares of Consumers Power Company, Bechtel, or Mergentime stock, of which I am unaware. A list of such funds in which I have an interest are attached. I have no relatives which are or have been employed by Consumers Power Company, Bechtel, or Mergentime Company.

Sworn and Subscribed Before Me This 14 Day of Feb 1983

James L Boyd
Notary Public
~~Jackson County, Michigan~~

My Commission Expires _____

* From 1963 to 1967 I was employed by Parsons Brinckerhoff-Tudor-Bechtel, General Engineering Consultants for design and construction management of the San Francisco Bay Area Rapid Transit System, in the capacity of Assistant Manager of Engineering.

af0283-0349a100

UNITED STATES OF AMERICA
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CONSUMERS POWER COMPANY
(Midland Plant, Units 1 and 2)

Docket No 50-329 OM
50-330 OM
Docket No 50-329 OL
50-330 OL

February 11, 1983

AFFIDAVIT OF _____

My name is Louis G. Silano I am employed by Parsons Brinckerhoff Quade & Douglas, Inc. as Technical Director - Major Structures.

I am currently assigned to the team which is conducting an independent assessment of soils work at the Midland Nuclear Plant site. Prior to being given this assignment, I have never worked on any job or task associated with the Midland Project, or any job or task for or on behalf of Consumers Power Company, Bechtel, or the Mergentime Company relating to soils or underpinning. I have never been employed by Consumers Power Company, Bechtel, or Mergentime Company. I do not own any shares of Consumers Power Company, Bechtel, or Mergentime stock. Mutual funds or other funds in which I may have a beneficial interest, but over which I have no control, may own shares of Consumers Power Company, Bechtel, or Mergentime stock, of which I am unaware. A list of such funds in which I have an interest are attached. I have no relatives which are or have been employed by Consumers Power Company, Bechtel, or Mergentime Company.

Sworn and Subscribed Before Me This 14 Day of Feb 1983

_____
Notary Public
~~Jackson County, Michigan~~

My Commission Expires _____

af0283-0349a100

UNITED STATES OF AMERICA
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In the Matter of
CONSUMERS POWER COMPANY
(Midland Plant, Units 1 and 2)

Docket No 50-329 OM
50-330 OM
Docket No 50-329 OL
50-330 OL

February 11, 1983

AFFIDAVIT OF Jerrold Ratner

My name is Jerrold Ratner. I am employed by Parsons Brinckerhoff, Quade and Douglas as Manager, Construction.

I am currently assigned to the team which is conducting an independent assessment of soils work at the Midland Nuclear Plant site. Prior to being given this assignment, I have never worked on any job or task associated with the Midland Project, or any job or task for or on behalf of Consumers Power Company, Bechtel, or the Mergentime Company relating to soils or underpinning. I have never been employed by Consumers Power Company, Bechtel, or Mergentime Company. I do not own any shares of Consumers Power Company, Bechtel, or Mergentime stock. Mutual funds or other funds in which I may have a beneficial interest, but over which I have no control, may own shares of Consumers Power Company, Bechtel, or Mergentime stock, of which I am unaware. A list of such funds in which I have an interest are attached. I have no relatives which are or have been employed by Consumers Power Company, Bechtel, or Mergentime Company.

Sworn and Subscribed Before Me This 14th Day of Feb 1983 ~~1982~~

Patricia A Pulliam
Notary Public
~~Jackson~~ Bay County, Michigan

My Commission Expires 3-4-86

af0283-0349a100

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

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CONSUMERS POWER COMPANY
(Midland Plant, Units 1 and 2)

Docket No 50-329 OM
50-330 OM
Docket No 50-329 OL
50-330 OL

February 11, 1983

AFFIDAVIT OF W C Parish

My name is W C. PARISH. I am employed by Parsons Brinckerhoff Quade & Douglas as Structural Engineer.

I am currently assigned to the team which is conducting an independent assessment of soils work at the Midland Nuclear Plant site. Prior to being given this assignment, I have never worked on any job or task associated with the Midland Project, or any job or task for or on behalf of Consumers Power Company, Bechtel, or the Mergentime Company relating to soils or underpinning. I have never been employed by Consumers Power Company, Bechtel, or Mergentime Company. I do not own any shares of Consumers Power Company, Bechtel, or Mergentime stock. Mutual funds or other funds in which I may have a beneficial interest, but over which I have no control, may own shares of Consumers Power Company, Bechtel, or Mergentime stock, of which I am unaware. A list of such funds in which I have an interest are attached. I have no relatives which are or have been employed by Consumers Power Company, Bechtel, or Mergentime Company.

Sworn and Subscribed Before Me This 11th Day of Feb 1983 ~~1982~~ pp

Patricia A Pupper
Notary Public
~~Jackson~~ Bay County, Michigan

My Commission Expires 3-4-86

af0283-0349a100

UNITED STATES OF AMERICA
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In the Matter of
CONSUMERS POWER COMPANY
(Midland Plant, Units 1 and 2)

Docket No 50-329 OM
50-330 OM
Docket No 50-329 OL
50-330 OL

February 11, 1983

AFFIDAVIT OF Vincent J. Madill

My name is Vincent J. Madill I am employed by Parsons Brinckerhoff Quade & Douglas, Inc. as Senior Engineer.

I am currently assigned to the team which is conducting an independent assessment of soils work at the Midland Nuclear Plant site. Prior to being given this assignment, I have never worked on any job or task associated with the Midland Project, or any job or task for or on behalf of Consumers Power Company, Bechtel, or the Mergentime Company relating to soils or underpinning. I have never been employed by Consumers Power Company, Bechtel, or Mergentime Company. I do not own any shares of Consumers Power Company, Bechtel, or Mergentime stock. Mutual funds or other funds in which I may have a beneficial interest, but over which I have no control, may own shares of Consumers Power Company, Bechtel, or Mergentime stock, of which I am unaware. A list of such funds in which I have an interest are attached. I have no relatives which are or have been employed by Consumers Power Company, Bechtel, or Mergentime Company.

Sworn and Subscribed Before Me This 14 Day of Feb 1983 ~~1982~~

Notary Public
~~Jackson County, Michigan~~

My Commission Expires

af0283-0349a100

APPENDIX D

WEEKLY REPORTS

This appendix contains the weekly reports issued to the Nuclear Regulatory Commission during the period September 20, 1982 through March 12, 1983.

J.O.No. 14358
Midland Plant
Units 1 and 2
Independent Assessment
Auxiliary Building Underpinning

Weekly Report No. 1

September 19 through 26, 1982

Personnel on Site

Stone & Webster Engineering Corporation (SWEC)

W. E. Kilker	9/20/82-9/26/82
P. Barry	9/20/82-9/23/82
L. T. Rouen	9/20/82-9/24/82
B. Holsinger	9/20/82-9/26/82
A. Scott	9/20/82-9/26/82
A. S. Lucks	9/21/82-9/23/82

Parsons, Brinkerhoff, Quade, & Douglas (PBQD)

P. Parish	9/21/82-9/24/82
J. Ratner	9/22/82-9/24/82

Activities

This report summarizes the first week of activities and observations of the SWEC independent assessment team (including the PBQD personnel). The team, which at the present time consists of seven engineers representing Geotechnical, Structural, Construction, and Quality Assurance disciplines, arrived at the site between September 20 and September 22.

The assessment team has established separate on-site office space and has contracted for clerical assistance.

Introductions of all team members were made to on-site personnel representing Bechtel Engineering and Construction; Consumers Power Company Quality Assurance and Quality Control; Wiss, Janney & Elstner (WJ&E) Instrumentation Monitoring; and Mergentime Construction. Tours and briefings of the various areas and activities related to the underpinning were given throughout the week at the request of the assessment team. Included in these tours and briefings were the in-place access shafts and FIVP superstructure supports, the deep-seated benchmarks and relative motion measurement stations, the extensometer and strain gage instrumentation installations, the crack mapping, the WJ&E instrumentation monitoring and data recording station, the lagging and reinforcing bar fabrication shops, and the material testing laboratory.

Also, the assessment team periodically observed the work on the mock-up pier (located near the Outage Building) and the jacking stand mock-up (located adjacent to the lagging fabrication shop). All lagging and shoring were in place on the mock-up prior to the team's arrival on site, but observations

were made of the reinforcement installation and the placement of concrete in the lower half of the pier. Three members of the assessment team entered the pier for firsthand observations of the installation. The Quality Control activities and documentation prepared prior to release for concrete placement were described and/or provided as requested by the team members.

Daily meetings were held starting September 21 between personnel representing the assessment team, Bechtel Engineering and Construction, and Consumers Power Company Engineering and Quality Assurance. These meetings provided a format for the assessment team to request information and clarification as well as to discuss observations.

Members of the team have read the Summary of Soils-Related Issues Report and are reviewing applicable specifications, drawings, construction, and Quality Control procedures, instrument monitoring procedures, and plant Quality Assurance documents.

An assessment team Project Manual has been prepared that includes the Project Organization Quality Assurance Plan and reporting and documentation procedures.

Meetings

Date	Represented	Purpose
9/20/82	Stone & Webster Consumers Power Co. Bechtel Mergentime	Introduction to Site Personnel
9/21/82 through 9/25/82	Stone & Webster Parsons Consumers Power Co. Bechtel	Daily Meeting

Observations

The assessment team received full cooperation of on-site personnel. Independent office space and telephone communication have been provided. Consumers Power Company and Bechtel personnel have complied with team requests for access to existing installations, briefings, documents, and records.

Project Engineer

Project Manager

J.O.No. 14358
Midland Plant
Units 1 and 2
Independent Assessment
Auxiliary Building Underpinning

Weekly Report No. 2

September 27 through October 3, 1982

Personnel on Site

Stone & Webster Engineering Corporation (SWEC)

W. E. Kilker	9/27/82-10/1/82
P. Barry	9/27/82-10/1/82
L. T. Rouen	9/27/82-10/1/82
B. Holsinger	9/27/82-10/1/82
A. Scott	9/27/82-10/1/82
A. S. Lucks	9/27/82-9/29/82

Parsons, Brinkeroff, Quade, & Douglas (PBQD)

P. Parish	9/27/82-10/1/82
J. Ratner	9/29/82-10/1/82

Activities

The assessment team continued their review of the reports, specifications, drawings and procedures in order to gain familiarity with the initial phases of the pending underpinning work. The review concentrated on issued excavation, lagging, ground stabilization and concrete placement procedures. Discussions to resolve any questions concerning these procedures were held with Bechtel and Consumers Power site personnel. The plant QA program and Quality Control procedures on concrete and reinforcement were reviewed by QA team members.

The Assessment team and representatives of Consumers Power Company met with NRC representatives. The role of the assessment team and the interaction with the various site groups, and the methods of reporting the team findings were discussed in this meeting.

Two of the team members attended a public meeting of the NRC and Consumers Power Company. The discussion focused on the establishment of the Midland Plant QA program under Consumers Power Company administration and control and the certification of QC inspectors under the Consumers Power Company program.

Meetings Attended

Date	Represented	Purpose
9/28/82	Stone & Webster Consumers Power Co. U.S. Nuclear Regulatory Commission	Introduction of USNRC and Assessment Team. Discussion of Assessment Team's role.
9/29/82	Stone & Webster Bechtel USNRC Public	Public Meeting - Discussion of QA Administration and QC Certification.
9/30/82	Stone & Webster Consumers Power Co. Bechtel	Presentation of Underpinning model.
10/1/82	Stone & Webster Consumers Power Co. Bechtel Mergentime	Weekly Soils Review Meeting
9/27/82 through 10/1/82	Stone & Webster Consumers Power Co. Bechtel	Daily Meeting

Observations

The Assessment Team has continued to receive cooperation of on-site personnel. Team members observations, questions or suggestions have been given prompt and complete attention by the appropriate site personnel.

Wayne Kilbee
Project Engineer

for Project Manager

J.O.No. 14358
Midland Plant
Units 1 and 2
Independent Assessment
Auxiliary Building Underpinning

Weekly Report No. 3

October 3 through October 9, 1982

Personnel on Site

Stone & Webster Engineering Corporation (SWEC)

W. E. Kilker	10/5/82-10/8/82
P. Barry	10/4/82-10/8/82
L. T. Rouen	10/4/82-10/8/82
B. Holsinger	10/5/82-10/8/82
A. Scott	10/4/82-10/8/82

Parsons, Brinkerhoff, Quade, & Douglas (PBQD)

P. Parish	10/4/82-10/8/82
J. Ratner	10/4/82-10/8/82

Activities

The start of the underpinning work has been delayed pending the recertification of the Soils Remedial Quality Control Inspectors. In the interim, the Assessment team members have completed the review of several of the construction specifications and procedures associated with the initial phases of the underpinning work. Team member questions or observations have been presented to site personnel for resolution.

Several of the team members toured the off-site concrete batch plant and received a briefing on the plant lay-out and production procedures. A general interest tour of the Auxiliary Building and Reactor Containment Structure was given to all of the team members by site engineers.

Observations were made of the underpinning contractor performing routine backpacking maintenance with sand and excelsior on the access shafts' lagging.

Meetings Attended

Date	Represented	Purpose
10/8/82	Stone & Webster Consumers Power Co. Bechtel Mergentime	Weekly Soils Review Meeting
10/4/82 through 10/8/82	Stone & Webster Consumers Power Co. Bechtel	Daily Meeting

Observations

Familiarization with the specifications, drawings, and construction procedures associated with the initial phase of construction is generally complete. Observations and questions from the team members on the construction documents have been discussed with site personnel.

Wayne Kilker
Project Engineer

for Project Manager

J.O.No. 14358
Midland Plant
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Auxiliary Building Underpinning

Weekly Report No. 4

October 10 through October 16, 1982

Personnel on Site

Stone & Webster Engineering Corporation (SWEC)

W. E. Kilker	10/12/82-10/15/82
P. Barry	10/12/82-10/15/82
L. T. Rouen	10/11/82-10/15-82
B. Holsinger	10/11/82-10/15/82
A. Scott	10/11/82-10/15/82

Parsons, Brinckerhoff, Quade, & Douglas (PBQD)

J. Ratner	10/11/82-10/15/72

Activities

The Assessment Team completed the review of all construction specifications and procedures associated with the initial phases of the underpinning. Familiarization with the drawings and Quality Assurance/Quality Control procedures continued. Discussions with site personnel were held to resolve questions and observations on the various construction documents.

Team members read the portions of the NRC's Supplemental Safety Evaluation Report No. 2 applicable to the Auxiliary Building Underpinning.

The team members attended the site Soils Training Classes on quality plans, soils work permits and coordination forms.

Meetings Attended	Represented	Purpose
10/11/82 through 10/15/82	Stone & Webster Consumers Power Bechtel	Daily Meetings
10/14/82 and 10/15/82	Stone & Webster Consumers Power Bechtel Mergentime	Soils Remedial Training Program Courses
10/15/82	Stone & Webster Consumers Power Bechtel Mergentime	Weekly Soils Review Meeting

Observations - None

Project Engineer

Project Manager

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Midland Plant
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Weekly Report No. 5

October 17 through October 23, 1982

Personnel on Site

Stone & Webster Engineering Corporation (SwEC)

W.E. Kilker	10/18 - 10/20
P. Barry	10/18 - 10/22
L.T. Rouen	10/18 - 10/22
B. Holsinger	10/20 - 10/22
A. Scott	10/20 - 10/22

Activities

The focus of the Assessment Team effort was the disposition of numerous questions that had been raised over the past 3 weeks with respect to the pending underpinning construction specifications, drawings and procedures. To this end, the team members had meetings and discussions with site engineering and construction personnel and resolved the majority of the items. Pending items will be resolved within the next two weeks.

Team Members attended a critique meeting on the placement of reinforcing and concrete in the mock-up pier. The team was also represented at discussions of recently recorded settlement date.

Meetings Attended

Date	Represented	Purpose
10/18 through 10/22	Stone & Webster Consumers Power Bechtel	Daily Meeting
10/19	Stone & Webster Consumers Power Bechtel Mergentime	Settlement Monitoring Records
10/19	Stone & Webster Consumers Power Bechtel Mergentime	Critique of Mock-Up Pier-Reinforcing Steel and Concrete Placement
10/20	Stone & Webster Bechtel Mergentime	Discussion of Excavation and Lagging Procedure
10/20	Stone & Webster Bechtel Mergentime	Training Sessions on Excavation and Lagging, Jacking, and Soil Stabilization

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Auxiliary Building Underpinning

Meetings Attended

Date	Represented	Purpose
10/22	Stone & Webster Bechtel	Resolution of Observations and Questions on Construction Specifications and Procedures

Observations

The Assessment Team has completed the review of the reports and construction documents applicable to the initial phase of the underpinning work. Most questions have been resolved by discussion with site personnel.

The team will, commencing October 25, scale down it's presence on the site until actual start of construction.

Nonconformance Identification Reports

NIR No. 1 - Issued 10/21/82 - The Mergentime Procedure for splicing reinforcing bars did not address a specification requirement.

Project Engineer Project Manager

J.O. NO. 14358
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Weekly Report No. 6

October 24 through October 30, 1982

Personnel on Site

Stone & Webster Engineering Corporation (SWEC)

B. Holsinger	10/25 - 10/28
W. Kilker	10/28 - 10/29
L.T. Rouen	10/25 - 10/29
A. Scott	10/25 - 10/29

Parsons Brinckerhoff quade & Douglas (PBQD)

J. Ratner	10/25 - 10/28

Activities

Team representatives performed assessments of the contractor's conformance to project and ANSI requirements for receipt inspection of quality controlled materials. An inspection was made of the storage area containing such material as steel lagging, ethafoam, reinforcing steel and steel plate. Also a check of various document control stations was done to compare the documents with those retained at central document control.

Surveillance of calibration records of the concrete testing and settlement monitoring subcontractors was initiated.

Meeting Attended

Date	Represented	Purpose
10/25 through 10/29	Stone & Webster Consumers Power Bechtel	Daily Meeting
10/27	Stone & Webster Consumers Power Bechtel NRC	Presentation of Re-Certification Program
10/26 through 10/28	Stone & Webster Bechtel	Resolution of Observations and Questions on Back-packing of Lagging

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Observations

The Assessment Team surveillance indicated compliance with project and industry standards on the materials receiving and storage activities. On the other hand sampling of controlled documents at various control stations revealed missing change notices on specifications and drawings at two of three control stations. (Refer to NIR section of this report).

The initial observations of the concrete testing and settlement monitoring subcontractor indicated the respective pieces of equipment were calibrated. Additional surveillance of these activities will resume once the remedial work commences.

Staffing of the project by the Assessment Team has be reduced to 2 members pending the start of construction activities.

Non-Conformance Identification Reports

NIR No. 2 - Issued 10/29/82 - MPQAD and QC Document Control stations did not have all the latest specifications and drawing change notices.

Project Manager Project Engineer

Weekly Report No. 7

October 31 through November 6, 1982

Personnel on Site

- Stone & Webster Engineering Corporation (SWEC)

W. Kilker	11/1 - 11/2
A.B. Scott	11/1 - 11/5

Activities

Team representatives resolved those observations and questions on procedures still pending from Report No. 5 that were previously submitted to Bechtel.

Inspections were made at the concrete testing facilities on concrete test performed for the determination of strength of concrete for mudmats. Also the training for grout placing for jacking base plates was observed.

Meetings Attended

Date	Represented	Purpose
11/1 through 11/5	Stone & Webster Consumers Power Bechtel	Daily Meeting
11/1	Stone & Webster Consumers Power Bechtel	Presentation by Bechtel to Consumers Power Co. of Building Settlement Records.
11/5	Stone & Webster Consumers Power Government Accountability Project NRC	Review of the Independent Assessment Team qualifications and scope of work. (Meeting held at the NRC office in Bethesda, MD.)

Observations

The start of the underpinning work has been further delayed pending resolution of the re-certification and settlement items.

The Assessment Team observation of the grouting training for jacking base plates indicated that the grouting produced a homogeneous filling under the plate.

Project Manager

Project Engineer for WEK

J.O. No. 14358
Midland Plant
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Weekly Report No. 8

November 7 through November 13, 1982

Personnel on Site

Stone & Webster Engineering Corporation (SWEC)

A.B. Scott	11/8 - 11/12
A.S. Lucks	11/10

Parsons, Brinckerhoff, Quade & Douglas (PBQD)

W. Parish	11/9
F. Balsamo	11/9 - 11/11

Activities

The testing of mudmat mix designs was monitored at the concrete test facility. The mixes were designed to achieve 300 psi compressive strength within three (3) hours.

Cleaning and thread protection work on reinforcing steel was observed at the Poseyville Yard storage area.

Attended QC Training sessions on Welding and Excavation and Lagging.

Meetings Attended

Date	Represented	Purpose
11/8 through 11/12	Stone & Webster Parsons, Brinckerhoff Quade & Douglas Consumers Power Bechtel	Daily Meeting
11/12	Stone & Webster Consumers Power Bechtel Mergentime	Weekly Soils Review Meeting

Observations

At this time the mudmat mix designs have not achieved the goal of 300 psi in three hours.

Reinforcing steel was being thoroughly cleaned and the thread protection

was a significant improvement over the previously used plastic mesh sleeve in that corrosion of threads is also prevented.

Wayne Kilber — Project Engineer

W. Kilber for A.S. [illegible] — Project Manager

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Weekly Report No. 9

November 14 through November 20, 1982

Personnel on Site

Stone & Webster Engineering Corporation (SWEC)

A.B. Scott	11/15 - 11/19
W.E. Kilker	11/15 - 11/19
L. Rouen	11/15 - 11/19

Parsons Brinckerhoff Quade & Douglas

J. Ratner	11/15 - 11/17
V. Madill	11/15 - 11/19

Activities

Team members continued monitoring the results of test mix designs for mudmat concrete. A surveillance was made of the performance of the slump testing, fabrication and testing of the concrete cylinders. The review was conducted of the implementation of the MPQAD Precedure on Qualification and Certification of Inspection Test Personnel.

A QC training session for general welding was attended.

A CPCo Quality Assurance performed an audit of SWEC compliance with the CPCo Specification CC-100.

Meetings Attended

Date	Represented	Purpose
11/15 through 11/19	Stone & Webster Parsons, Brinckerhoff Quade & Douglas Consumers Power Bechtel	Daily Meeting
11/16	Stone & Webster Consumers Power Bechtel	Update on Quality Control Recertification
11/17	Parsons, Brinckerhoff Quade & Douglas	ASLB Soils Hearings (Midland Co. Court House)
11/19	Stone & Webster Consumers Power Bechtel Mergentime	Weekly Soils Review Meeting

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Observations

The surveillance of the concrete testing indicated that testing was being performed in accordance with the respective ASTM procedures. The review of certification activity indicated the procedure was being properly implementated.

The CPCo audit of SWEC implementation of the CPCo specification for an independent assessment resulted in one finding on cataloging of project documents. The Project Precedure 7-2 will be revised based upon this finding.

Non-Conformance Identification Reports

No New Issues.

Status of previous issues:

NIR No.	Date	Status
1	10/21/82	Open
2	10/29/82	Open

W E Kelberlau — Project Engineer
A. S. Lucks — Project Manager

J.O. NO. 14358
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INDEPENDENT ASSESSMENT TEAM MEETING WITH BECHTEL

Date: November 15, 1982

Attendees:

SWEC	Bechtel	CPCo	MPQAD
A.B. Scott	C. Cvikl	G. Murray	B. Sevo
W. Kilker	J. Fisher		
	D. Lavelle		
	R. Weight		

1. J. Fisher introduced D. Lovelle, Field Soils Manager, and R. Weight, direct hire supervisor on soils remedial work.

2. J. Fisher described to new personnel the role of Assessment Team to date.

3. Meeting today at 10 A.M. on QC re-certification, being chaired by A. Boos.

4. J. Fisher gave E. Cvikl copies of Assessment Team questions on Soil Stabilization. J. Fisher will provide answers to be forwarded to P. Parish, originator of discussion items on soil stabilization.

5. Bob Sevo said CPCo feels welding will have to be qualified by the 1980 AWS D 1.3 standard for the soils remedial work. This requirement will apply to the 12 gage lagging. Discussion with Bechtel Engineering will ensue.

6. Question by A. Scott on receiving materials without certified QC inspectors B. Sevo and J. Fisher replied that Bechtel QC people not associated with Soils Remedial presently receive the materials but that no material can be turned-over to subcontractor until re-certification is accepted.

7. Testing of concrete mixes for mudmats continues. Goal is to obtain a 300 psi strength in 3-4 hours. Engineering and field to resolve the issue if this requirement is not workable.

8. Assessment team comment items still open (exclusive of the soil stabilizati comments) are those that will produce a procedure (3 items) or specificatio (4 items) change.

9. G. Murray said CPCo feels re-certification is the only restraint on work release. Issues of QA records and EPA settlement appear near resolution.

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INDEPENDENT ASSESSMENT TEAM MEETING WITH BECHTEL

Date: November 16, 1982

Attendees:

SWEC	FBQD	Bechtel	CPCo	MPQAD
A. Scott	J. Ratner	J. Fisher	G. Murray	R. Sevo
W. Kilker	V. Madill	E. Cvikl		
L. Rouen		D. Lavelle		
		R. Weight		

1. J. Fisher stated the intent is to start the Auxiliary Building Underpinning with one 10 hour shift on 11/22/82. No work would be done 11/25 through 11/28. One shift schedule will continue until QC can support 2 shifts, probably the first part of December.

2. N. Swanberg is pursuing effect implementation of 1980 AWS code on lagging welding.

3. Some lagging materials are presently on-hold that need release prior to use. B. Sevo will resolve.

4. Daily meeting time will change once the actual underpinning work commences.

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INDEPENDENT ASSESSMENT TEAM MEETING WITH BECHTEL

Date: November 17, 1982

Attendees:

SWEC	FBQD	CPCo	Bechtel	MPQAD
A. Scott	J. Ratner	R. Wieland	J. Fisher	R. Sevo
W. Kilker	V. Madill		E. Cvikl	
L. Rouen			D. Lavelle	

1. J. Fisher stated that Field Engineering is still planning on a 11/22/82 start. Materials will be brought to the access shaft locations this week so actual work can start Monday pending receipt of written NRC approval.

2. B. Sevo said MPQAD is completing close-out on release of lagging that had previously been tagged. Coupons and welding have been tested and approved.

3. Once construction commences the new daily meeting time will be 9:30 AM.

4. Any construction procedure modifications being made now will not offset the start of construction according to J. Fisher.

5. E. Cvikl is checking with consultants as to:
   A. Which ones and
   B. How they want to review Field Change Requests (FCR) to specification.

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INDEPENDENT ASSESSMENT TEAM MEETING WITH BECHTEL

Date: November 18, 1982

Attendees:

SWEC	FBQD	Bechtel	CPCo	MPQAD
A. Scott	V. Madill	J. Fisher	R. Wieland	R. Sevo
W. Kilker		E. Cvikl		
L. Rouen				

1. Lagging hold issue should be closed out by the end of this week.

2. Welding issue still pending. Lagging and drift sets can apparently be welded by 1972 or 1974 code. Project Engineering is presently holding these drawings but will likely release them now that they have been checked out.

3. Tuesday, November 23, a mock-up of a bell pier will be constructed and concreted to assess flow of concrete into corners through rebar without vibration.

INDEPENTENT ASSESSMENT TEAM MEETING WITH BECHTEL

Date: November 19, 1982

Attendees:

SWEC	FBQD	CPCo	Bechtel	MPQAD
A. Scott	V. Madill	R. Weiland	E. Cvikl	R. Sevo
W. Kilker				
L. Rouen				

1. E. Cvikl confirmed that consultants receive copies of the specification documents once they are revised and signed-out.

2. The underpinning work will not start on Monday 11/22/82.

3. Discussion on status of settlement monitoring.

4. Mock-up of bell still scheduled to be completed on 11/23/82. Assessment Team will observe placement of concrete.

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Midland Plant
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Weekly Report No. 10

November 21 through November 27, 1982

Personnel on Site

A.B. Scott 11/22 - 11/23

Activities

Observed the performance of concrete placement at the mock-up pier bell simulation within the Poseyville Storage Yard. The intent of the concrete placement in the pier bell mock-up was to demonstrate the effectiveness of flow of the concrete to all portions of the bell and the consolidation of the concrete without use of vibration.

Meetings Attended

Date	Represented	Purpose
11/22 and 11/23	Stone & Webster Bechtel Consumers Power	Daily Meeting
11/22	Bechtel Consumers Power Stone & Webster	Update on items requiring resolution to start of construction - Specification: Procedures, PQCI's, QC training

Observations

Our observations indicated that the flow of concrete in the pier bell was not hindered by the presents of reinforcing steel. On November 27, 1982, the forms will be removed in order to assess the degree of consolidation.

Non-Conformance Identification Report

No new issues.

Status of previous issues:

NIR NO.	Date	Status
1	10/21/82	Open
2	10/29/82	Open

W.E. Kelley Jr. Project Engineer A.S. Fuchs Jr. Project Manager

INDEPENDENT ASSESSMENT TEAM MEETING WITH BECHTEL

Date: November 22, 1982

Attendees:

SWEC	Bechtel	CPCo	MPQAD
A.B. Scott	J. Fisher E. Civkl R. Weight	R. Weiland	R. Sevo

1. J. Fisher directed E. Cvikl to have a meeting with J. Meisenheimer of QA to discuss the impact on the QC program if there were any minor changes to design documents.

2. R. Sevo was to provide answer on the hold now on lagging due to the Photon Lab issue. Hold tags were to be removed this date per R. Sevo.

3. RE: Weld code year. E. Cvikl was to contact Project Engineering to issue a SCN to limit the welding to fillet welds on the steel lagging.

4. A concrete placement was scheduled for November 23, 1982, to demonstrate the pouring of a pier bell without vibration.

5. A meeting was scheduled at 10:00 AM today to review all items that were outstanding and required per directives given to CPCo by the NRC prior to start of work for piers E/W 12, (and to schedule completion dates).

INDEPENDENT ASSESSMENT TEAM MEETING WITH BECHTEL

Date: November 23, 1982

Attendees:

SWEC	BECHTEL	CPCO	MPQAD
A.B. Scott	E. Cvikl	R. Weiland	R. Sevo

1. E. Cvikl reported that the meeting with J. Meisenheimer of QA concerning minor changes to design documents had not taken place.

2. R. Sevo reported all hold tags (due to Phanton issue) had been removed from steel lagging.

3. Mock-up of pier bell concrete placement was to be made at 12 noon.

4. It was reported that all outstanding items required for pier E/W 12 construction were listed and responsible parties were to provide completion dates by November 24, 1982.

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Weekly Report No. 11

November 28 through December 4, 1982

Personnel on Site

Stone & Webster Engineering Corporation (SWEC)

A. B. Scott 12/1 - 12/3

Parsons, Brinckerhoff, Quade & Douglas (PBQD)

J. Ratner 11/29 - 12/3

Activities

Observed the results of a bell mock-up concrete pour done on November 23, 1982, at the Poseyville Storage Yard.

Reviewed the latest revision of the Auxiliary Building and FIVP Underpinning specification.

Meetings Attended

Date	Represented	Purpose
11/30 through 12/02	Stone & Webster(12/1-12/2) Bechtel Parsons, Brinckerhoff, Quade & Douglas(11/30-12/1) Consumers Power	Daily Meeting
12/2	Stone & Webster Bechtel Parsons, Brinckerhoff Quade & Douglas Consumers Power Mergentime	Update on items requiring resolutions to start construction-- Specification, Procedur PQCI's, and QC Training
12/3	Stone & Webster Bechtel Parsons, Brinckerhoff Quade & Douglas Mergentime Consumers Power	Weekly Soils Review

Observations

The concreted mock-up of a belled pier showed no significant voids or evidence of separation between fine and course aggregates.

J.C. No 14358
Midland Plant
Units 1 and 2
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Non-Conformance Identification Report

No new issues.

Status of previous issues:

NIR No.	Date	Status
1	10/21/82	Open
2	10/29/82	Open

W E Kilker
Project Engineer

A S Boos WEK
Project Manager

INDEPENDENT ASSESSMENT TEAM MEETING WITH BECHTEL

Date: November 29, 1982

No Meeting held this date. No representatives from Stone & Webster or Parsons Brinckerhoff present on site at meeting time.

INDEPENDENT ASSESSMENT TEAM MEETING WITH BECHTEL

Date: November 30, 1982

Attendees:

PBQD	Bechtel	CPCo	MPQAD
J. Ratner	J. Fisher E. Cvikl	R. Weiland	L. Kettren

1. Fisher stated that the letter to the NRC from CPCo notifing the agency that CPCo is ready to start work may be transmitted to NRC early part of next week, at the earliest.

2. Upon approval to start work, contractor will start both East and West number 12 Piers on a single shift basis.

3. Contractor will start bringing material to work areas after letter to NRC requisting permission to start is sent.

INDEPENDENT ASSESSMENT TEAM MEETING WITH BECHTEL

Date: December 1, 1982

Attendees:

FBQD	CPCO	Bechtel	MPQAD
J. Ratner	R. Weiland	J. Fisher	L. Kettren
		E. Cvikl	
		D. Lavelle	

1. J. Fisher stated that they are proceeding on schedule to complete their review in order that CPCo can advise the NRC on Monday, December 6, 1982, that the underpinning work is ready to be started.

INDEPENDENT ASSESSMENT TEAM MEETING WITH BECHTEL

Date: December 2, 1982

Attendees:

SWEC	PBQD	CPCO	Bechtel
A. Scott	J. Ratner	R. Weiland	J. Fisher
			E. Cvikl
			D. Lavelle

1. J. Fisher stated that CPCo is continuing on schedule to send letter to NRC requesting permission to start underpinning. Tentive schedule:
   a. Send Letter to NRC Monday, December 6, 1982.
   b. NRC to come to site Wednesday, December 8, 1982, to review CPCo.
   c. Start work pier 12 Monday, December 13, 1982.

2. Bechtel will test mud mat mix with a higher temperature water (but no accelerator) in order to attempt to reduce time to obtain 300 psi.

3. J. Fisher will find out the Holiday schedule for working during the Christmas and New Year holidays.

INDEPENDENT ASSESSMENT TEAM MEETING WITH BECHTEL

-Date: December 3, 1982

No meeting was held this date. Meeting cancelled by Bechtel Corporation.

J. O. NO. 14358
Midland Plant
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Weekly Report No. 12

December 5 through December 11, 1982

Personnel on Site

Stone & Webster Engineering Corporation (SWEC)

A. B. Scott	12/6 - 12/10
W. Kilker	12/6 - 12/10

Activities

Reviewed and where necessary, updated status of drawings, procedures and specifications on file.

Meetings Attended

Date	Represented	Purpose
12/7 through 12/10	Stone & Webster Bechtel Consumers Power	Daily Meeting
12/6	Stone & Webster Bechtel Consumers Power Mergentime	Pier 12 request for Authorization Letter
12/10	Stone & Webster Bechtel Mergentime Consumers Power	Weekly Soils Review

Observations

On December 9, 1982 the NRC released the work activities for piers E/W 12. Work is expected to commence on W 12 and E 12 on December 13 and 20, respectively.

Non-Conformance Identification Report

NIR No. #3 - Issued December 8, 1982 - Project requirements for testing temperature of tapered threaded connectors does not conform to ASME III, Division 2 requirements.

Status of previous issues:

NIR No.	Description	Date (OPEN)	(CLOSED)
1	Mechanical Splicing Procedure	10/21/82	12/8/82
2	Document Control Surveillance	10/29/82	

W E Kelley
Project Engineer

A. S. Locke
Project Manager

INDEPENDENT ASSESSMENT TEAM MEETING WITH BECHTEL

Date: December 6, 1982

No meeting this date at the request of Bechtel Corporation.

INDEPENDENT ASSESSMENT TEAM MEETING WITH BECHTEL

Date: December 7, 1982

Attendees:

SWEC	Bechtel	MPQAD
W. Kilker	E. Cvikl	L. Kettrom
A. Scott	J. Fisher	

1. Full review of outstanding pier 12 items completed yesterday. CPCo letter to go to NRC today.

2. J. Fisher asked if SWEC/FBQD can support present plan to start work on 12/13/82. W. Kilker replied that assessment team will support any schedule that is set for the remedial work.

INDEPENDENT ASSESSMENT TEAM MEETING WITH BECHTEL

Date: December 8, 1982

Attendees:	Bechtel	Stone/Webster	MPQAD
	J. Fisher	W. Kilker	L. Kettren
	E. Cvikl	A. Scott	R. Wieland

1. R. Wieland agreed to verify the status of the two outstanding SWEC NIR'S.

2. Assessement team is issueing NIR #3 concerning level of temperature testing of Fox Howlett couplers. At issue is ASME code requirements verses project project procedure requirements.

INDEPENDENT ASSESSMENT TEAM MEETING WITH BECHTEL

Date: December 9, 1982

Attendees:

SWEC	CPCo	MPQAD	Bechtel
W. Kilker	R. Wieland	L. Kettren	J. Fisher
A. Scott			E. Cvikl

1. W. Kilker advised that NIR #1 and #2 replies had been recieved and will be closed out.

2. NIR #3 was issued on 12/8/82.

3. Assessment team is updating it's files on Specifications, Procedures and Drawings.

INDEPENDENT ASSESSMENT MEETING WITH BECHTEL

Date: December 10, 1982

Attendees:	Bechtel	Stone/Webster	MPQAD	CPCo
	E. Cvikl	W. Kilker	L. Kettren	R. Wieland
	J. Fisher	A. Scott		

1. J. Fisher advised that the NRC letter on work authorization was received. Bechtel will start work when a work permit from CPCo is sent. Tentatively set for December 13, 1982.

2. Use of the confined entry space permit was reviewed.

3. W. Kilker inquired as to what resulted from the settlement presentation to the NRC regarding monitored building movements. J. Fisher and E. Cvikl replied that no written opinion had been expressed by the NRC but that data is constantly updated and available.

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Weekly Report No. 13

December 12 through December 18, 1982

Personnel on Site

Stone & Webster Engineering Corporation (SWEC)

B. Holsinger	12/15 - 12/18
W. Kilker	12/13 - 12/17
L. Rouen	12/13 - 12/16
A. Scott	12/13 - 12/18

Parsons, Brinckerhoff Quade and Douglas (PBQD)

J. Ratner	12/13 - 12/17

Meetings Attended

Date	Represented	Purpose
12/13 through 12/17	Stone & Webster Bechtel Consumers Power Parsons (12-16/12-17)	Daily Meeting
12/17	Stone & Webster Bechtel Mergentime Consumers Power	Weekly Soils Review

Activities

Construction - Assessment Team Members observed the soil excavation and lagging installation in the pier W 12 access pit commencing at El 609 and extending down to approximate El 600. The excavated soils varied from a brown sand in the upper 2 ft. - 3 ft. to a mixture of gray sandy clay and brown sand in the bottom 6 ft. - 7 ft. A minor quantity of perched water was encountered in the upper portion of the excavation. A concrete "mud mat" extending out from the turbine building wall was removed by chipping and 2 electrical grounding cables encountered in the pit area were rerouted to the perimeter of the lagged pit.

The installed lagging consisted of 8 levels of 4" x 12" wood planking separated by 2" spacers. Granular excavated material was backpacked where required and excelsior was placed between the lagging boards.

A wooden yoke was placed at the face of the access drift to the pier followed by removal of the lagging from that face. Within a few inches of excavating into the drift, a formed vertical face of concrete was encountered, encompassing nearly the entire face of the drift.

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Using a hydraulic rock splitter to dislodge the concrete, the contractor advanced approximately 1.5 ft.

Quality Control, Documentation, and Records - Surveillances were made of the following item and activities:

1. Insurance and use of work permits, drill permits for concrete removal, work authorization for steel fabrication and confined entry safety permits.

2. Update plots of the settlement monitoring data.

3. Use of controlled copies and latest approved revisions of relevant procedures and drawings.

4. Training of QC inspectors and performance testing in excavation/lagging and steel fabrication.

5. Survey documentation including independent survey records.

Observations

Construction - The workmanship involved in construction of the access pit meets the requirements of the project documents. The contractor limited the excavating to no more than 18 inches below the previously installed level of lagging. Care was taken in shaving the vertical faces of soil to insure a good fit for the lagging. Jacks were used to temporarily hold the lagging as each level was excavated. Backpacking was done, where required, as the excavation progressed.

Prior to each of the upper levels of lagging, excelsior was placed prior to excavating for the next level. The Assessment Team recommended to the contractor that unless groundwater is seeping into the area, the excelsior placement be delayed somewhat to allow better access to the soil behind the lagging, in case the soil tended to unravel as the excavation progressed. Observation of the subsequent work indicated that the soil was remaining in place.

Quality Control, Documentation, and Records - The Assessment Team found that the contractor had obtained the required work and safety permits. Records of the previous week's settlement monitoring data had been updated and plotted. Records were verified showing that a location survey had been done and checked by an independent surveyor.

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The surveillance indicated that the drawing and procedures being used by the contractor in the field were "controlled" copies that had been fully signed-out and were the latest revisions containing all change notices.

The team was satisfied with the QC training being conducted. Quality assurance engineers were performing full-time inspection of all activities - in this case the excavating/lagging and some shop modification to a steel drift set. In addition to the actual inspection work, the QA engineer was training a Quality Control Inspector on the respective procedure. The "on site" training culminated in performance evaluations of the QC inspectors.

Non-Conformance Identification Reports

NIR #2 - Closed as a result of a response by CPCo on December 8, 1982 notifying the team of the updating of the drawings at the MPQAD document control stations. Subsequently, a team member verified the incorporation of the previously missing drawings.

Status of previous issues: (NIR numbers no longer listed have been closed-out during previous weeks.)

NIR NO.	Description	Date (Open)	(Closed)
2	Document Control Surveillance	10/29/82	12/14/82
3	Coupler Testing Temperature	12/14/82	

Project Engineer

Project Manager

INDEPENDENT ASSESSMENT TEAM MEETING WITH BECHTEL

Date: December 13, 1982

Attendees:	Bechtel	Stone/Webster	MPQAD	CPCo
	J. Fisher	W. Kilker	L. Kettren	G. Murray
	E. Cvikl	A. Scott		
		L. Rouen		

1. J. Fisher reported that the work permit was signed and work was underway.

INDEPENDENT ASSESSMENT TEAM MEETING WITH BECHTEL

Date: December 14, 1982

Attendees:	Bechtel	Stone/Webster	MPQAD	CPCo
	J. Fisher	W. Kilker	L. Kettren	G. Murray
	E. Cvikl	A. Scott		
		L. Rouen		

1. J. Fisher reported that work on the access pit stopped on Monday PM after a "mud mat" was encountered protruding 6" - 12" out from the turbine building wall into the pit. A concrete removal permit has been issued to allow removal of the mat today.

2. G. Murray advised that additional monitoring gauges are proposed for the FIVP and that conduit runs should proceed into the access shaft as soon as permission from the NRC is obtained.

INDEPENDENT ASSESSMENT TEAM MEETING WITH BECHTEL

Date: December 15, 1982

Attendees:	Bechtel	Stone/Webster	MPQAD	CPCo
	J. Fisher E. Cvikl	W. Kilker	L. Kettren	G. Murray

1. J. Ratner stated that, in his view, the initial backpacking was relying too much on the placement of excelsior but that the methodology had now been modified to increase the use of excavated material to fill in behind the lagging.

2. W. Kilker confirmed that to date (EL605) the work in the view of the assessment team has been performed according to the plans & procedures.

INDEPENDENT ASSESSMENT TEAM MEETING WITH BECHTEL

Date: December 16, 1982

Attendees:	Bechtel	Stone/Webster	MPQAD	CPCo
	J. Fisher	W. Kilker	L. Kettren	G. Murray
	E. Cvikl	A. Scott		R. Wheeler

Parsons
J. Ratner

1. W. Kilker advised that the assessment team had no technical concerns about the work performed to date. A. Scott inquired as to the state of the steel set needed to start the drift to pier W 12.

2. J. Fisher described need to modify first steel set because of turbine building mat extending to El 607.3 ft. not El 608 ft. as anticipated.

3. J. Fisher reminded QA/QC of the FIVP load verification requirement.

4. R. Wheeler said that the QA training of the QC personnel in "performance" on Pier W 12 will serve to qualify sufficient personnel for pier E 12.

INDEPENDENT ASSESSMENT TEAM MEETING WITH BECHTEL

Date: December 17, 1982

Attendees:	Bechtel	Stone/Webster	MPQAD	CPCo
	R. Bradford	W. Kilker	L. Kettren	K. Razdan
	E. Cvikl	A. Scott		
		Parsons		
		J. Ratner		

1. W. Kilker described the team activities - evaluation of QA/QC inspection within the pit and at the fabrication yard, surveillance of the construction activities. The team was satisfied with the activities performed.

2. L. Kettren reported that QC was covering the fabrication change of the first steel set.

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Weekly Report No. 14

December 19 through December 25, 1982

Personnel on Site

Stone & Webster Engineering Corporation (SWEC)

B. Holsinger	12/20 - 12/23
W. Kilker	12/21 - 12/22
A. Scott	12/20 - 12/21

Parsons, Brinckerhoff, Quade and Douglas (PBQD)

J. Ratner	12/21 - 12/22

Meetings Attended

Date	Represented	Purpose
12/20 through 12/23	Stone & Webster Bechtel Consumers Power Parsons (12-21/12-22)	Daily Meeting
12/21	Stone & Webster Consumers Power (MPQAD) NRC Parsons	Discussion of assessment Team activities and MPQAD role in implementation of underpinning design
12/21	Stone & Webster Bechtel Consumers Power NRC	Discussion of requirements for vibration of concrete in pier bells, update on settlement monitoring data, and NRC restriction on non - auxiliary building underpinning activities.

Activities

Construction - The advancement of the pier W12 drift excavation was restricted to removing approximately 1 foot of concrete at the toe of the face to about 4 ft. at the top of the drift.

The concrete was removed by initially advancing 2 inch diameter drill holes space at 1 ft. - 1½ ft. centers to a depth of 1 ft. - 2 ft. and subsequently a hydraulic rock splitter was utilized to dislodge the concrete.

Minor quantities of perched groundwater entered the excavation in the northeast corner of the pier W12 access drift along a narrow band of soil between the access pit lagging and the lean concrete encountered under the turbine building. The seepage was not sufficient to cause instability or loss of ground in the soil mass. The water was controlled by directing it to a sump hole in the access pit and then removed by pumping.

Construction was initiated on the pier E12 access pit. The 6 ft. x 8 ft. pit was excavated from E1 609½ to E1 601. Lagging, similiar to that used in the pier W12 access pit, was installed on three sides of the pit as the excavation progressed. A formed vertical face of concrete was encountered on the south side of the pit immediately under the turbine building foundation mass. Once the pit reached E1 601 lagging boards were also installed on the south face. Backpacking and excelsior placement procedures were similar to those employed to complete the pier W12 access pit.

Minor perched groundwater seepage, estimated at less than 0.1 gpm, entered the pit between the lower levels of the east side lagging. A sump hole was dug in the pit to collect the seepage and the water was then pumped out.

Quality Control, Documentation and Records -

1. Observed the methodology of proficiency testing of the Quality Control Inspectors by the QA engineers on the access pit and drift excavation/lagging and anchor bolt installations.

2. Reviewed Quality Control Instructions on excavation/lagging, field fabrication of miscellaneous items for lagging, miscellanous steel and steel sets.

Observations

Construction - The removal of the mass lean concrete in the W12 pier access rift proceeded according to project requirements. Perched groundwater seepage was properly controlled. Careful observations were maintained by the contractors of the stability of a narrow band of soil between the access pit and lean concrete mass.

Quality Control, Documentation and Records -

The Assessment Team considered the QA methodology of proficency training of inspectors to date to be quite adequate. An addition, the quality inspector procedures reviewed by the team will, (when implemented) assure adequate control of the activity.

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Non-Conformance Identification Reports

Status of previous issues: (NIR numbers no longer listed have been closed-out during previous weeks.)

NIR NO.	Description	Date (Open)	(Closed)
3	Coupler Testing Temperature	12/14/82	

W. E. Killian
Project Engineer

J. S. Lewis
Project Manager

INDEPENDENT ASSESSMENT TEAM MEETING WITH BECHTEL

Date: December 20, 1982

Attendees:	Bechtel	Stone/Webster	MPQAD	CPCo
	J. Fisher	A. Scott	L. Kettren	R. Weiland
	E. Cvikl	B. Holsinger		

1. J. Fisher mentioned visit of the NRC with Assessment Team on December 21, 1982.

2. B. Holsinger discussed concerns with stainless steel to carbon steel welding qualification procedure.

3. J. Fisher mentioned that Bechtel would have a daily 4:30 PM meeting between Bechtel and Mergentine to clear up problems of the day & prepared for next day work.

INDEPENDENT ASSESSMENT TEAM MEETING WITH BECHTEL

Date: December 21, 1982

Attendees:	Bechtel	Stone/Webster	MPQAD	CPCo
	R. Bradford	W. Kilker A. Scott B. Holsinger	-----	------

1. A. Scott requested that R. Bradford expedite the team request for Mergentime prints.

2. A. Scott requested results of recent tests on the "mud-mat" mix.

INDEPENDENT ASSESSMENT TEAM MEETING WITH BECHTEL

Date: December 22, 1982

Attendees:	Bechtel	Stone/Webster	MPQAD	CPCo
	R. Bradford	W. Kilker	------	------
	E. Cvikl	B. Holsinger		
		Parsons		
		J. Ratner		

1. J. Ratner asked two questions on which E. Cvikl referred him to M. Lewis for clarification.

   A. Does 2 ft. of groundwater level below excavation restriction apply in the present access pit advancement.

   B. Can the top of the drift advance more than 9" beyond the 1st drift set even though the work is in the concrete.

2. B. Holsinger advised that an NIR will be issued on a procedure vs AWS code conflict on stainless to carbon steel welding.

INDEPENDENT ASSESSMENT TEAM MEETING WITH BECHTEL

Date: December 23, 1982

Attendees:	Bechtel	Stone/Webster	MPQAD	CPCo
	R. Bradford E. Cvikl	B. Holsinger	S. Jagdish	G. Murray

1. G. Murray advised that the NRC will continue to require a one-week lag-time between piers W12 and E12 once the concrete removal is complete. CPCo will issue a memorandum.

2. E. Cvikl noted that if Bechtel's action is required on any of the Assessment Team issued NIR's, MPQAD or SMO should see to it they recevie a copy at the earliest possible date.

3. B. Holsinger observed that in his opinion the Soils Remedial/MPQAD group is now functioning better organizationally than upon his arrival on-site in September 1982.

4. M. Lewis has answered the two questions of J. Ratner (see notes of December 22, 1982.)

   A. Groundwater encountered in pit is perched and does not need to be maintained 2 ft. below working level.

   B. The top of the drift can be advanced to the location of the next drift set but the bottom can only go 9 inches beyond the first drift set location.

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Weekly Report No. 15

December 26, 1982 through January 1, 1983

Personnel on Site

Stone & Webster Engineering Corporation (SWEC)

W. Kilker	12/27 - 12/30
L. Rouen	12/27 - 12/30

Parsons, Brinckerhoff, Quade and Douglas (PBQD)

P. Parish	12/28 - 12/30

Meetings Attended

Date	Represented	Purpose
12/27 through 12/30	Stone & Webster Bechtel Consumers Power Parsons (12-28/12-30)	Daily Meetings

Activities

Construction - The pier W12 drift excavation continued mainly through lean concrete and was advanced to completion, a total distance of approximately 9 ft. from the turbine building north wall. The second steel set was installed and drift lagging was placed along the east side where a zone of backfill soil formed the excavation surface. The quantity of perched groundwater entering the excavation has reduced to a trickle.

The pier E12 access pit has been completed and removal of the lean concrete and soil in the access drift was advanced an average of 2½ ft. Perched groundwater flowing into the excavation was minor and was controlled by sump pumping.

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Quality Control, Documentation and Records -

1. Reviewed the Quality Control Documentation on the modification of the first steel set including certification of the inspector and identification marks of the structural members.

2. Verified tne completion of Inspection Reports by MPQAD for the east access pits.

Observations

Construction - The construction of the piers W12 and E12 access pits and drifts has been advanced according tc the project requirements. The contractor has maintained accurate survey control, groundwater has been efficiently collected and pumped from the excavation, concrete removal has been careful and deliberate, and the steel set and lagging installation were done in accordance with the project documents and good industry practice.

Quality Control, Documentation and Records - The documentation of the steel set modification was accomplished in accordance with project procedures. The final Inspection Reports on the access shaft had been properly completed.

Non-Conformance Identification Reports

NIR #4 - Issued December 29, 1982 - Project procedure on allowable variances in weld rod size and electrical current do not conform to AWS codes.

Status of previous issues: (NIR numbers no longer listed have been closed-out during previous weeks.)

NIR No.	Description	Date (Opened)	(Closed)
3	Coupler Testing Temperature	2/12/82	
4	Welding Qualification Procedure	12/29/82	

W E Fillers
Project Engineer

K. J. Swindlehurst
Project Manager

INDEPENDENT ASSESSMENT TEAM MEETING WITH BECHTEL

Date: December 27, 1982

Attendees:	Bechtel	Stone/Webster	MPQAD	CPCo
	R. Bradford	W. Kilker	L. Kettren	G. Murray
	E. Cvikl	L. Rouen		

1. R. Bradford reported the first steel drift set installation was nearing completion and that the removal of concrete on pier W12 would now proceed.

2. E. Cvikl said the work on shop modification of the steel set was released by QC after field engineering had reviewed the shop drawing last Wednesday December 22, 1982.

INDEPENDENT ASSESSMENT TEAM MEETING WITH BECHTEL

Date: December 28, 1982

Attendees:	Bechtel	Stone/Webster	MPQAD	CPCo
	R. Bradford E. Cvikl	W. Kilker	L. Kettren	G. Murray

Parsons

Pete Parish

1. Discussion of engineering and QC interpretation of "construction aids." ON-going discussions with respect to what level of "construction aids" are required on drawings.

2. L. Kettren described the on-going process of QC certification. The excavation in concrete has had only minor impacts on progress of certification.

INDEPENDENT ASSESSMENT TEAM MEETING WITH Bechtel

Date: December 29, 1982

Attendees:	Bechtel	Stone/Webster	MPQAD	CPCo
	R. Bradford	W. Kilker	R. Oliver	G. Murray
	E. Cvikl	L. Rouen		

Parsons

P. Parish

1. R. Oliver reported that MPQAD and FSO have met with respect to resolving issue of defining what is considered a "construction aid" and therefore not required to be shown on a drawing. A procedure will likely be developed to target the responibility for decision making and possibly field markings will be used to distinquish "contruction aids" from structural members.

2. L. Rouen inquired as to who is responsible for tracking the Commitment Punchlist and how the procedure works. G. Murray said SMO uses the list constantly, but that it is developed in CPCo (Jackson.)

3. W. Kilker reminded R. Bradford that P. Parish questions from October on MCP 18, Ground Stabilization, had not been addressed. R. Bradford will take action.

INDEPENDENT ASSESSMENT TEAM MEETING WITH BECHTEL

Date: December 30, 1982

Attendees:	Bechtel	Stone/Webster	MPQAD	CPCo
	J. Fisher R. Bradford E. Cvikl	W. Kilker	R. Sevo	G. Murray

Parsons

P. Parish

1. J. Fisher is looking into need for lagging against excavated surfaces in concrete. Will verify.

2. R. Bradford said MCP 18 on soil stabilization is now in Rev 5. The questions by P. Parish were based on Rev 3. W. Kilker will verify to see if all questions apply. Will notify R. Bradford.

3. J. Fisher & R. Sevo discussed need for jack calibration certification. MPQAD is going to vendor laboratory early in January for auditing and performance testing.

4. R. Sevo reminded E. Cvikl that when pier loading procedure is implemented, engineering must support QC in the effort.

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Weekly Report No. 16

January 2, 1983 through January 8, 1983

Personnel on Site

Stone & Webster Engineering Corporation (SWEC)

W. Kilker	1/5 - 1/8
L. Rouen	1/4 - 1/8
A. Scott	1/3 - 1/8

Parsons, Brinckerhoff, Quade and Douglas (PBQD)

J. Ratner	1/3 - 1/8

Meetings Attended

Date	Represented	Purpose
1/4 through 1/8	Stone & Webster Bechtel Consumers Power Parsons	Daily Meetings

Activities

Construction - Excavation and lagging of the 3 ft. x 6 ft. pier W12 was advanced approximately 5 ft. to El 595. The excavated material consisted of a mixture of sandy clay and fine sand fill. No groundwater was encountered. Five sets of metal lagging were installed including 2 sets of spreader lagging.

The pier E12 access drift was advanced to an average distance of 5 ft. under the turbine building. The face excavation was mainly in lean concrete with a wedge of soil in the lower right quadrant. The second steel set location was modified slightly to avoid interference between a tank sump foundation wall reinforcement bar and an anchor bolt. Very minor perched groundwater seepage continued to enter the access pit sump area.

Quality Control, Documentation and Records-

1. Witnessed the performance of the QC welding inspection for the bracing channel in the pier W12 drift. Reviewed the associated documentation.

2. Conferred with CPCo on the purpose and use of the computerized Soils Commitment Punchlist. The list is a tool used to assure all commitments to the NRC are tabulated, responsibility assigned, and items closed out as accomplished.

3. Tracked the progress of an observation by MPQAD of an inadequacy noted in the subcontractors procedure on welding.

4. Verified the issuing and use of concrete drill permits for pier E12 lean concrete removal and anchor bolting.

5. Verified the QC inspection of torquing the bolts on a spreader set of lagging.

Observations

Construction - The Team found the construction practice employed to advance the respective pier and drift excavation to be satisfactory with the exception of backpacking a portion of the lagging on the west side of the E12 access drift between the first and second steel set. In this area void spaces of ½"-1" were encountered behind the lagging. However, the lagging was subsequently removed in order to reset the second steel set. After replacement, the backpacking was judged to be satisfactory. In general, the methods of excavating and lagging installation have been acceptable and in accordance with good industry practice.
Quality Control, Documentation and Records - The Quality Control methods surveyed were in accordance with the project procedures as were the issuance and use of the drill permits.

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Auxiliary Building Underpinning 3

Non-Conformance Identification Reports

Status of previous issues: (NIR numbers no longer listed have been closed-out during previous weeks.)

NIR No.	Description	Date (Opened)	Date (Closed)
3	Coupler Testing Temperature	12/2/82	
4	Welding Qualification Procedure	12/29/82	

Project Engineer

Project Manager

INDEPENDENT ASSESSMENT TEAM MEETING WITH BECHTEL

Date: January 3, 1983

No meeting was held on this date.

INDEPENDENT ASSESSMENT TEAM MEETING WITH BECHTEL

Date: January 4, 1983

Attendees:	Bechtel	Stone/Webster	MPQAD	CPCo
	J. Fisher E. Cvikl	A. Scott	None	None

Parsons

J. Ratner

1. List of shop drawings requiring Project Engineering approval as outlined in Item 1 of the December 30, 1982 Assessment Teams Meeting Notes. The forecast date was moved from January 3, 1983 to January 5, 1983.

2. Requested by J. Fisher to ask P. Parish if the comments on "Soil Stabilization" are still valid.

3. A. Scott asked if a concrete "mud-mat" for Pier W12 access shaft would be placed where lean concrete fill had been removed.

INDEPENDENT ASSESSMENT TEAM MEETING WITH BECHTEL

Date: January 5, 1983

Attendees:	Bechtel	Stone/Webster	MPQAD	CPCo
	J. Fisher	A. Scott	L. Kettren	G. Murray
	E. Cvikl	L. Rouen		
		Parsons		
		J. Ratner		

1. A. Scott requested that Bechtel review the Coordination of "Hold" on the drawings regarding the access to piers 13 and 14 (East and West), from pier 12 access (East and West.) Drawing 1430 Rev. 3, shows a "Hold" in this area. Drawing 1427-4 does not indicate a "Hold" in the same area. J. Fisher stated he would look into this matter.

2. A. Scott requested that the Team be on the Uncontrolled Distribution List of design drawings. J. Fisher stated that he would put them on the Distribution List. J. Fisher requested that the Team update the list by use of the Bechtel Control Drawing.

3. J. Ratner stated he talked with P. Parish. The comments on MCP 28.000 are still valid.

INDEPENDENT ASSESSMENT TEAM MEETING WITH BECHTEL

Date: January 6, 1983

Attendees:	Bechtel	Stone/Webster	MPQAD	CPCo
	R. Bradford	A. Scott L. Rouen W. Kilker	L. Kettren	G. Murray

1. General discussion on aspects of pier W12 construction that have caused delays or problems (permits, drawing modification, inspection, etc.)

2. MPQAD will present update on QC training schedule at weekly soils meeting.

INDEPENDENT ASSESSMENT TEAM MEETING WITH BECHTEL

Date: January 7, 1983

Attendees:	Bechtel	Stone/Webster	MPQAD	CPCo
	F. Cvikl	W. Kilker	L. Kettren	G. Murray
	J. Fisher	A. Scott		
		J. Ratner		
		L. Rouen		

1. W. Kilker asked for verification of independent survey in W12 drift prior to initiating excavation of the pier. J. Fisher confirmed the survey had been completed.

2. J. Fisher requested that the subcontractor and Quality groups submit any comments as a result of work performed to date for incorporation into future revisions.

3. J. Fisher presented answers to Assessment Team questions on "Soil Stabilization, "MCP 28.000. J. Ratner will forward to P. Parish for verification of adequacy of responses.

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Midland Plant
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Independent Assessment
Auxiliary Building Underpinning

Weekly Report No. 17

January 9, 1983 through January 15, 1983

Personnel on Site

Stone & Webster Engineering Corporation (SWEC)

W. Kilker	1/10 - 1/15
L. Rouen	1/10 - 1/14
A. Scott	1/10 - 1/15
S. Lucks	1/10 - 1/11

Parsons, Brinckerhoff, Quade and Douglas (PBQD)

J. Ratner	1/10 - 1/14

Meetings Attended

Date	Represented	Purpose
1/10 through 1/14	Stone & Webster Bechtel Consumers Power Parsons	Daily Meetings
1/14	Stone & Webster Bechtel Consumers Power	Weekly Soils Review

Activites

Construction - Pier W12 was excavated and lagged to El 581. The excavated material consisted of a mixture of brown sand and clay fill above El 586 and natural gray clay below El 586. Perched groundwater entered the excavation near El 586 at a rate of 50-60 gallons/day. The water was encountered on January 12 and as of January 15, the rate of flow had remained relatively constant. The water was controlled by sump pumping from the bottom of the excavation during periods when the hole was not being advanced. During the excavating operation the water was simply removed as part of the excavated material. Because the seeping water was creating "muddy" working conditions in the bottom of the pier excavation, the subcontractor devised a plastic pipe trough attached to the lagging near El 585 to divert the water directly to a collection barrel rather than allowing the water to drain to and disturb the clay at the bottom.

The excavation was alternately excavated approximately 18 inches and lagged throughout the fill material. Below the elevation of the natural clay, the excavation was advanced approximately 3½ ft. prior to initiating lagging placement.

Backpacking of the lagging was done after the installation of each set in the fill and after installation of each spreader set (every 4th set) in the natural clay. The backpacking material was either the excavated brown fine sand fill or an imported medium grained sand.

The degree of backpacking required was minor since the excavated surfaces were being trimmed smooth and no collasping of the soil was occurring. Exclesior was not used except near the southwest corner of the excavation, between E1 588 and 585 where the seepage of water between the lagging had begun to wash out a very minor quantity of fine sand. When the collection trough was installed a portion of the excelsior was removed and a cement grout packed into the lagging separation zone directly above the trough.

On January 14, a 4-6 inch thick concrete mud-mat was installed in the access pit and drift excavation of pier W12.

The access drift of pier E12 was advanced to completion - approximately 9 ft. under the outside edge of the turbine building. The excavation was mainly in lean mix concrete except for a wedge of clay fill along the west side. The concrete at the top of the drift was chipped away to the level of the turbine mat structural concrete, as determined by examination of core samples. Along the west side of the drift, the "stress relief" wedge was excavated in the clay fill just below the roof level. Clay fill soil was also encountered in the lower right corner of the face of the drift. This material was cut back on a flat slope commencing at the bottom of the face. No groundwater entered the drift excavation, although minor perched water continued to enter the sump in the adjacent access pit.

Quality Control, Documentation and Records -

1. Reviewed the qualification of the QC welding inspector performing the inspection of the pier W12 channel bracing.

2. Verified the proper implementation of the probing procedure for measuring groundwater at pier W12.

3. Reviewed the qualification records of the concrete batchplant inspector.

4. Witnessed the performance evaluation of a QC inspector by a Quality Assurance Engineer on the W12 drift excavation inspection plan.

5. Reviewed the completed QC Inspection Reports for the W12 pier excavation to date.

6. Reviewed two QC Inspection Reports on the fabrication of steel lagging.

7. Reviewed the QA "over-inspection" reports for the W12 drift and pier excavation for the last week of December and first 10 days of January.

8. Verified the development of strength vs time curves for the concrete mix designated for the W12 access pit and drift mud-mat.

9. Observed and inspected the mock-ups in the Poseyville storage area that will be used to aid in the performance evaluation of QC inspectors. The mock-up installations include an in-ground lagged pier excavation with reinforcing bars in-place, an above-ground pier bell with bracing and bottom reinforcing steel, and concrete anchor and anchor drill hole installations.

10. Witnessed the performance evaluation at the mock-up area of a QC inspector by a QA engineer on the pier lagging procedure.

Observations

Construction - The Team determined that the construction practices employed to advance the W12 pier excavation and the E12 access drift excavation were in compliance with the project documents.

On the W12 pier excavation, care was taken to accurately trim the soil, to maintain the overall verticality of the shaft, to control and remove perched water seepage and to minimize the movement of fines and fine sand into the excavation by the use of excelsior packing where required. The Team did observe that backpacking was difficult due to the narrow 1 inch spacing between lagging sets. The inspection of the effectiveness of the backpacking is also difficult. However, due to the care being exercised in trimming the excavation prior to installation of the lagging, this does not represent a problem.

On the E12 access drift, the contractor did a thorough investigation to determine the junction of the turbine mat structural concrete with mud-mat concrete.

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Quality Control, Documentation and Records - The Team surveillance indicated the MPQAD organization has adequately performed and documented the inspections, training, qualifications and overview assessments.

In the opinion of the Assessment Team, the concept of partial training of the QC personnel at the mock-up area, is worthwhile. It not only results in a more efficient training schedule, but permits the QA examiner to test the ability of the QC inspector to detect "built-in" errors

The Team advised MPQAD that although the Inspection Reports produced to date by the field personnel are in good order, the final sign-off of these documents by supervisory personnel should be accomplished more efficiently.

Non-Conformance Identification Reports

Status of previous issues: (NIR numbers no longer listed have been closed-out during previous weeks.)

NIR No.	Description	Date (Opened)	Date (Closed)
3	Coupler Testing Temperature	12/2/82	*
4	Welding Qualification Procedure	12/29/82	

* A reply has been received and is being reviewed.

W E Fuller
Project Engineer

L. S. [signature]
Project Manager

INDEPENDENT ASSESSMENT TEAM MEETING WITH BECHTEL

Date: January 10, 1983

Attendees:	Bechtel	Stone/Webster	MPQAD	CPCo
	J. Fisher	W. Kilker	L. Kettren	G. Murray
	E. Cvikl	A. Scott		
		A. Lucks		
		Parsons		
		J. Ratner		

1. L. Kettren reported that a list of shop drawings requiring Engineering approval has been compiled. Copies of the list were distributed.

2. W. Kilker said that J. Ratner discussed the backpacking of the west wall of the access drift lagging with M. Lewis (FSO) on January 8, 1983.

INDEPENDENT ASSESSMENT TEAM MEETING WITH BECHTEL

Date: January 11, 1983

Attendees:	Bechtel	Stone/Webster	MPQAD	CPCo
	J. Fisher	A. Scott	D. Oliver	G. Murray
	E. Cvikl	J. Ratner		
	D. Lavelle	L. Rouen		

1. R. Oliver reported that MPQAD comments on completed access pit and drift installations are included on their documentation reports. D. Lavelle said construction will conduct a review for any possible improvements.

2. J. Fisher stated that MIOSHA had some observation based on their recent inspection of the construction improve barriers around access pits, modify hoist cable and protect floodlights.

3. The second shift for the West Pier will commence once bell level is reached - tentatively January 17, 1983.

4. E. Cvikl said Engineering is preparing to answer the Assessment Team NIR #3 on the testing temperature of couplers.

INDEPENDENT ASSESSMENT TEAM MEETING WITH BECHTEL

Date: January 12, 1983

Attendees:	Bechtel	Stone/Webster	MPQAD	CPCo
	J. Fisher	L. Rouen	R. Sevo	R. Wieland
	E. Cviki	A. Scott		
	D. Lavelle	W. Kilker		
		Parsons		
		J. Ratner		

1. E. Cvikl and J. Fisher described the conversation engineering had with NRC with respect to backpacking. Backpacking as stipulated in the procedures will continue to be adhered to.

2. R. Sevo reported that QA has established mock-ups of a lagged excavatation, a pier bell and concrete bolt installation in order to conduct QC performance evaluation on certain of the Quality Control Plans.

3. D. Lavelle said engineering is conducting a review of drawings, specifications and procedures for piers E-W 9 and 11 to assure agreement between documents.

4. R. Wieland will verify requirements on resuscitators for inspection after work hours.

INDEPENDENT ASSESSMENT TEAM MEETING WITH BECHTEL

Date: January 13, 1983

Attendees:	Bechtel	Stone/Webster	MPQAD	CPCo
	J. Fisher E. Cvikl	L. Rouen A. Scott W. Kilker	L. Kettren	G. Murray

Parsons

J. Ratner

1. W. Kilker and J. Ratner described the observation of January 12, 1983 concerning the difficulty of backpacking and inspecting the degree of backpacking with the present spacer size on the pier lagging. There was no concern over the quality of the lagging/backpacking work.

2. E. Cvikl reported that engineering is preparing the response to the team NIR #3.

3. L. Rouen questioned if the mud-mat placement in pier W12 would impact the NCR written on welding of the bracing channel. J. Fisher replied there would be no interference since the mat wouldn't come up to the level of the channel.

INDEPENDENT ASSESSMENT TEAM MEETING WITH BECHTEL

Date: January 14, 1983

Attendees:	Bechtel	Stone/Webster	MPQAD	CPCo
	J. Fisher	L. Rouen	------	G. Murray
	E. Cvikl	A. Scott		
		W. Kilker		
		Parsons		
		J. Ratner		

1. Mud-mat in W12 access drift will be placed at 5:00 PM today.

2. J. Fisher advised that pier excavation will begin to advance 42 inches in the clay prior to lagging installation.

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Weekly Report No. 18

January 17, 1983 through January 22, 1983

Personnel on Site

Stone & Webster Engineering Corporation (SWEC)

W. Kilker	1/17 - 1/20
L. Rouen	1/19 - 1/22
P. Barry	1/17 - 1/22

Parsons, Brinckerhoff, Quade and Douglas (PBQD)

V. Madill	1/17 - 1/21

Meetings Attended

Date	Represented	Purpose
1/17 through 1/21	Stone & Webster Bechtel Consumers Power Parsons	Daily Meetings
1/21	Stone & Webster Bechtel Consumers Power	Weekly Soils Revie

Activites

Construction - Pier W12 was excavated to the approximate final elevation of 564.6. At this elevation support channels were grouted and the mud-mat concrete placed. The excavation for the bell was not started. Wood lagging was used to temporarily support the side of the pit in the zone to be later excavated for the bell.

The material encountered during this weeks excavation in W12 was predominately natural (undisturbed) gray clay containing some small silt lenses. As excavation approached the final elevation, very few silt lenses were encounted and only small traces of silt were evident in the clay. The flow rate of perched groundwater into the excavation had reduced to approximately 10-15 gallons per day.

After entering the natural clay, the pier pit was alternately excavated approximately 42 inches and lagged. However, after breakback occurred the unlagged portion of the excavation was not allowed to exceed 18 inches. The void left by the breakback was formed and filled with grout. Probing for groundwater was performed as the pit was advanced. No groundwater was encountered (apart from the perched groundwater at El 586) and the probe hole was grouted as required by the construction procedures.

Excavation and lagging of pier E12 was begun this week and progressed to El 588. In addition fill concrete, the excavated material was a combination of sand and clay backfill, no perched groundwater was observed. The pier pit was alternately excavated approximately 18 inches and lagged. Backpacking of the lagging was done after installation of each spreader set (every 4th set). The backpacking material was an imported medium grained sand.

Quality Control, Documentation and Records-

1. Reviewed records of the performance demonstration that the Assessment Team witnessed the previous week.

2. Observed the RGE's verification of satisfactory conditions of pier W12 founding grade.

3. Observed the verification of the W12 founding grade elevation.

4. Reviewed qualification and certification records for the new excavation inspectors.

5. Observed QC inspection of bolting of spreader sets.

6. Observed batching of concrete for W12 mud-mat.

7. Observed testing of concrete for W12 mud-mat.

Observations

Construction - The Assessment Team determined that the construction practices employed to advance both the E12 and W12 pier excavations were in compliance with the project documents. In particular, the Assessment Team observed instances where work had progressed to an inspection point and was stopped until MPQAD was notified and an inspector was made available. The Assessment Team inspected the founding grade for pier W12 and did not note any unstable conditions. These observations agreed with the RGE's verification of satisfactory foundation conditions. It is the opinion of the Assessment Team, that the parties involved have exhibited great care in following procedures and performing the work in the best manner possible.

Quality Control, Documentation and Records - Training of MPQAD personnel continues in order to build-up sufficient numbers of knowledgeable inspectors. However, the need for inspectors has not resulted in "rubber stamping" certifications. This point is demonstrated by the fact that certification was denied one inspector who did not adequately document inspection documents to be used in his performance evaluation. This and other performance demonstrations were witnessed by the Assessment Team. The performance demonstrations were observed to be rigorous as to inspection details. The attention of supervisors to inspection hold points was clearly demonstrated on several occassions. Certification documentation reviewed was adequate and in accordance with procedures.

Non-Conformance Identification Reports

NIR #3 - Closed as a result of a CPCo safety Analysis Report change prepared for submission to the NRC. The change describes the commitments to control the production testing of the couplers.

Status of previous issues: (NIR numbers no longer listed have been closed-out during previous weeks.)

NIR No.	Description	Date (Opened)	Date (Closed)
3	Coupler Testing Temperature	12/2/82	1/21/83
4	Welding Qualification Procedure	12/29/82	

L. T. Rowley
Project Engineer

A. S. Lucks /TR
Project Manager

INDEPENDENT ASSESSMENT TEAM MEETING WITH BECHTEL

Date: January 17, 1983

Attendees:	Bechtel	Stone/Webster	MPQAD	CPCo
	E. Cvikl R. Bradford	W. Kilker	R. Sevo	G. Murray

1. W. Kilker advised that Project Engineering had responded to NIR #3. W. Kilker requested G. Murray or E. Cvikl obtain for him a copy of the proposed SAR change notice on interpretation of the ASME III code with respect to the coupler testing.

2. R. Bradford reminded R. Sevo that QA must issue a new letter on the qualifications of the jack calibration agency. (MPQAD is in the process of auditing and certifying the manufacturer/calibrator.)

3. E. Cvikl advised that the Bechtel concrete specialist requested to be advised of the first pier concrete placement so as to be on-site.

INDEPENDENT ASSESSMENT TEAM MEETING WITH BECHTEL

Date: January 18, 1983

Attendees:	Bechtel	Stone/Webster	MPQAD	CPCo
	E. Cvikl J. Fisher	W. Kilker	-----	G. Murray

Parsons

V. Madill

1. E. Cvikl reported he had received a copy of the FSAR change notice on the code requirements for testing of the Fox-Howlett couplers. However, he needed a clarification prior to passing it on.

2. J. Fisher said that starting today, the subcontractor will not attempt to fill the space between lagging levels unless in the view of the Geotechnical Engineer a large enough void exists behind the lagging to initiate a backpacking operation.

INDEPENDENT ASSESSMENT TEAM MEETING WITH BECHTEL

Date: January 19, 1983

Attendees:	Bechtel	Stone/Webster	MPQAD	CPCo
	J. Fisher	W. Kilker	-----	-----
	E. Cvikl	Paul Barry		
	D. Lavelle			

Parsons

V. Madill

1. W. Kilker advised that NIR #3 on Testing Temperature of Couplers is being closed-out based on the SAR change notice. (The notice describes the intent to design the underpinning structure in accordance with ACI 349 not to ASME III - 2.)

2. J. Fisher advised that the audit of the jack calibration agency is complete and QC is witnessing the calibration.

3. J. Fisher issued the notes of a step-by-step procedure prepared by by Mergentime on excavating the pier bell.

4. The importance of maintaining a proper perspective with respect to backpacking was discussed. Attempting to backpack very narrow or spaces of limited spacial extent was not the intent of the procedure, nor is it considered necessary from the standpoint of a high quality installation. Backpacking will be used to prevent loss of ground and when in the opinion of the Geotechnical Engineer the trimming of the soil results in large void spaces.

INDEPENDENT ASSESSMENT TEAM MEETING WITH BECHTEL

Date: January 20, 1983

Attendees:	Bechtel	Stone/Webster	MPQAD	CPCo
	J. Fisher	W. Kilker	-----	G. Murray
	E. Cvikl	L. Rouen		
	J. Kelleher	P. Barry		
		Parsons		
		V. Madill		

1. J. Fisher reported that a zone of clay along the north side of pier W12 at approximately E1573 had spalled into the excavation last night. The zone was approximately 6 ft. long 2 ft. high and up to 1½ ft. deep. The subcontractor was authorized to grout the void to maintain stability and was performing that procedure this morning.

2. The option of placing concrete only in the bell of pier W12, maybe selected if in excavating and preparing the bell the clay material appears somewhat unstable. J. Fisher will insure that QC can support that option, if selected.

3. Discussion of the need for the sign-out of a work permit for the load transfer work on pier W12 with held.

INDEPENDENT ASSESSMENT TEAM MEETING WITH BECHTEL

Date: January 21, 1983

Attendees:	Bechtel	Stone/Webster	MPQAD	CPCo
	J. Fisher	P. Barry	------	G. Murray
	H. Bradford	L. Rouse		
		Parsons		
		V. Madill		

1. J. Fisher stated that the work schedule would remain 2-10 hr. shifts 6 days aweek during the excavation of the bell. Work over and above this scheduled will be performed as needed to stabilize the excavation if required.

2. R. Bradford stated that all material necessary to place concrete in the bell, if that option is used, is available now. Concrete can be ordered normally during the day, and arrangements have been made to have concrete delivered at night and on weekends if necessary with minimum of advanced notice.

3. The fabricators of the Fox-Howlett couplers in the fab shop are qualified splices. This will allow half of the coupler to be torqued at the fab shop.

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Weekly Report No. 19

January 23, 1983 through January 29, 1983

Personnel on Site

Stone & Webster Engineering Corporation (SWEC)

L. Rouen	1/24 - 1/28
P. Barry	1/24 - 1/27
A. Scott	1/25 - 1/29
B. Holsinger	1/27 - 1/29

Parsons, Brinckerhoff, Quade and Douglas (PBQD)

J. Ratner	1/24 - 1/29

Meetings Attended

Date	Represented	Purpose
1/24 through 1/28	Stone & Webster Bechtel Consumers Power Parsons (1/25 - 1/28)	Daily Meetings
1/21	Stone & Webster Bechtel Consumers Power	Weekly Soils Review

Activities

Construction - Pier W12 bell excavation was initiated and completed. The excavation was sequenced and supported in order to minimize the possibility of soil collapse. Initially, the short sides of the bell were excavated and supported by steel plates prior to commencing work on the long sides. Excavation of the two long faces was accomplished in 4 stages - one-half of the bell length on each side was shaped and supported before starting excavation on the remaining half. Since some raveling of the soil had occurred near the top of the bell excavation, the contractor elected to support nearly the entire bell area surface with steel plating and channel sections. Minor groundwater seepage continued to enter the pier excavation as during the previous weeks. The contractor installed a second trough type seepage collector in the shaft portion of the pier at El 575.

Pier E12 excavation was advanced as a straight shaft to El 570. The excavated material consisted of natural stiff gray clay. The excavation was carefully shaped in order to minimize backpacking requirements. In areas of over-excavation backpacking with sand was done as the lagging proceeded. Steel lagging was installed to the level of the top of the bell followed by the placement of temporary wood lagging to El 570. No groundwater entered the pier excavation. In addition, a probe hole was advanced to El 565 with no evidence of groundwater.

Quality Control, Documentation and Records -

1. Reviewed Quality Control Instructions for placing reinforcing steel, miscellaneous embedments, and concrete.

2. Verified that Mergentime training requirements were satisfied for those present in an access pit.

3. Verified resolution of a MPQAD identified need for providing identification and traceability of high strength steel.

4. Verified that Inspection Reports were being reviewed. (See Weekly Report No. 17.)

Observations

Construction - Both pier excavations were advanced and supported in accordance with the project procedures. Based on ground conditions, the decision was made to steel support the belled area of pier W12. The work progress during the week was delayed to the point where some collapsing of the soil would likely have occurred without the added support. For future belling work the Contractor should either be prepared to organize, schedule, and perform the work in such a way as to avoid the lengthy delays encountered during the pier W12 belling operation or, enter into the belling operation with the objective of steel supporting the bell area.

Quality Control, Documentation and Records - The Assessment Team found the MPQAD quality controls employed were in compliance with project procedures and recognized standards. Of particular significance, the Assessment Team observed the MPQAD organization identify and resolve the need for the Contractor to provide identification of high strength steel. Resolution was provided by adding requirements to the Subcontractor's procedures for maintaining identification to the ASTM designation. In addition, Weekly Report No. 17 identified a need for the MPQAD supervisor to review the Inspection Reports in a more timely manner. The Assessment Team observed the MPQAD implementation of corrective action in this area.

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Non-Conformance Identification Reports

Status of previous issues: (NIR numbers on longer listed have been closed-out during previous week.)

NIR No.	Description	Date (Opened)	Date (Closed)
4	Welding Qualification Procedure	12/29/82	

Project Engineer

A. S. [signature]
Project Manager

INDEPENDENT ASSESSMENT TEAM MEETING WITH BECHTEL

Date: January 24, 1983

Attendees:	Bechtel	Stone/Webster	MPQAD	CPCo
	J. Fisher	L. Rouen	J. Shan	G. Murray
	E. Cvikl	P. Barry		

1. G. Murray stated that CPCo is providing design packages to the NRC for review in order to gain to release for work on subsequent pier installations.

2. J. Fisher stated that access to the pits is available at anytime for persons with a definite purpose for entry.

3. It was agreed by all present, that at this time meetings on Saturday are not necessary, but will be held if and when the need arises.

INDEPENDENT ASSESSMENT TEAM MEETING WITH BECHTEL

Date: January 25, 1983

Attendees:	Bechtel	Stone/Webster	MPQAD	CPCo
	J. Fisher	L. Rouen	------	------
	E. Cvikl	P. Barry		
	D. Lavelle			

Parsons

J. Ratner

1. J. Ratner asked if P. Parish questions were answered concerning unused grout stabilization materials. J. Fisher said no answer was yet available.

2. D. Lavelle asked that Stone & Webster personnel on night shift advise the night shift superintendent, Al Meier. J. Fisher also asked for notification of the personnel on night shift and to be informed of the group leader in W. Kilker's absence.

3. P. Barry questioned if there was a requirement on strength of concrete for torquing against embedded reinforcement when installing couplers. E. Cvikl will respond.

4. D. Lavelle stated that the NRC site visit of the previous week did not result in findings concerning the work performed on the E-W12 piers to date.

INDEPENDENT ASSESSMENT TEAM MEETING WITH BECHTEL

Date: January 26, 1983

Attendees:	Bechtel	Stone/Webster	MPQAD	CPCo
	E. Cvikl	L. Rouen	J. Shah	G. Murray
	J. Kelleher	P. Barry		
		A. Scott		
		Parsons		
		J. Ratner		

1. Discussed the W12 pit angle welding non-conformances and the effect of response time on the work.

2. E. Cvikl stated that Project Engineering is considering action on a minimum strength requirement prior to torquing couplers.

INDEPENDENT ASSESSMENT TEAM MEETING WITH BECHTEL

Date: January 27, 1983

Attendees:	Bechtel	Stone/Webster	MPQAD	CPCo
	E. Cvikl	L. Rouen	D. Oliver	G. Murray
	J. Kelleher	P. Barry		
		A. Scott		
		Parsons		
		J. Ratner		

1. J. Ratner and J. Kelleher will meet to discuss resolution of P. Parish's concerns regarding storage of stabilizing grout.

2. E. Cvikl stated that the NCR on the pier W12 breast plate weld had been resolved. An FCN had resolved the question of welds on the angle supports within the bell of pier W12.

3. J. Ratner asked if the ring set for E12 would be ready when needed. J. Kelleher would check.

4. A. Scott asked how the week lag between E/W piers would be handled. G. Murray said he believed E12 would not progress into the bell, unless W12 was ahead by one week.

5. J. Ratner stated that he reviewed the backpacking of pier E12 with Mr. Lewis and reached concurrence on a acceptable degree of back-packing.

INDEPENDENT ASSESSMENT TEAM MEETING WITH BECHTEL

Date: January 28, 1983

Attendees:	Bechtel	Stone/Webster	MPQAD	CPCo
	E. Cvikl	L. Rouen	R. Oliver	-----
	R. Bradford	A. Scott	J. Shah	
	J. Kelleher			

Parsons

J. Ratner

1. NCR on pier W12 steel set channel weld is still unresolved.

2. The ring beam for E12 pier is ready.

3. A second shift on the E12 pier will begin Monday. Bob Wheeler is checking on the NRC commitment to maintain one week lag time between piers.

4. Pier concrete is tenatively scheduled for Wednesday or Thursday.

5. L. Rouen requested pier concrete mix design information. J. Kellener action item.

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Weekly Report No. 20

January 30, 1983 through February 5, 1983

Personnel on Site

Stone & Webster Engineering Corporation (SWEC)

W. Kilker	1/31 - 2/5
A. Scott	1/31 - 2/5
B. Holsinger	1/31 - 2/4
A.S. Lucks	2/1 - 2/2
G.M. Schierberg	2/1
N.B. Cleveland	2/1
J.P. Allen	2/1
J.R. Hall	2/1
E.A. Long	2/1

Parsons, Brinckerhoff, Quade and Douglas (PBQD)

J. Ratner	1/31 - 2/3
L. Silano	2/1

Meetings Attended

Date	Represented	Purpose
1/31 through 2/4	Stone & Webster Bechtel Consumers Power Parsons (1/31 - 2/3)	Daily Meetings
2/4	Stone & Webster Bechtel Consumers Power	Weekly Soils Review
2/1	Stone & Webster Consumers Power Parsons	Senior Level Management Team Site Visit

Activities

Construction - Within pier W12 the bell bottom reinforcing mat, shaft stirrups and vertical reinforcing steel was installed up to about El. 604. The Fox-Howlett couplers used to join sections of reinforcing rod were installed and torqued. Forming was begun for the portion of the pier above the access drift floor at El. 600. In addition, three embedment plates with headed stud anchors were installed as shown on the design drawings.

Grouting behind the steel plating in the bell was done where necessary to fill voids. Since nearly all of the bell area has been sheeted and braced there are only small areas of soil left exposed. Throughout the week there has been minor raveling of the exposed soil near the bottom of the bell. Minor seepage of groundwater into the pier continued to accumulate on the mud-mat and was easily handled by periodic bailing.

Excavation of pier E12 as a straight shaft was completed to El. 565, approved by the Engineers, and a concrete mud-mat was installed at the bottom. Work on the bell commenced once the mat had set sufficiently to allow work to proceed. Initially, the short sides of the bell were formed and trimmed to the correct dimensions. Then the long sides were excavated in two stages on each side followed by cutting the slopes into the corners. The installed bell support consists of 2 braced channel sections extending the entire height of the bell on each of the long sides of the bell.

The excavated soil consisted of a natural, very stiff gray clay with occasional randomly oriented thin brown silt lenses. No groundwater entered the excavation.

Quality Control, Documentation and Records -

1. Reviewed the batch plant calibration and certification.

2. Reviewed the certification and tests for concrete materials.

3. Witnessed the QC inspection and subsequent documentation of pier W12 bell.

4. Reviewed QC Inspection Reports for concrete mud-mat placement in piers W12 and E12.

5. Witnessed the QC inspection of torquing of Fox-Howlett couplers between approximate El. 580 and El. 590 on pier W12.

6. Reviewed truck mixer uniformity test results.

7. Verified the taking and testing of the specified number of Fox-Howlett "sister splices" of the No. 11 reinforcing bars installed in pier W12. Verified the strength adequacy of the referenced splice tests.

8. Reviewed Geotechnical Engineers Daily Reports on pier W12.

9. Verified the evaluation and acceptance of the pier W12 subgrade.

10. Verified sign-off of Geotechnical Engineer on QC Inspection Report on excavation of piers.

Observations

Construction - The pier W12 bell support installation was judged to be thoroughly done in accordance with good industry practice. The steel plates are well supported and care was taken to grout behind the plates as required.

The reinforcing steel was clean and installed properly. The tapered threaded ends of the reinforcement were protected and in good condition prior to installation. The Fox-Howlett coupler connections were being properly installed. The pier E12 bell installation was accomplished quite efficiently. The combination of the stiff clay till and absence of groundwater seepage resulted in normal bell support without the additional support required on pier W12.

Quality Control, Documentation and Records - The review of the documentation on the batch plant, concrete materials, truck mixer uniformity and coupler splice testing indicated these items are in conformance with the project requirements. In addition, the Team's review of the QC Inspection Reports for the mud-mats and bell inspections, and the Geotechnical Engineers Daily Reports demonstrated that adequate records and documentation of these activities have been kept. The Team identified a minor problem with one facet of the concrete Inspection Report, in that the method of consolidating the concrete was not identified. The Team also observed that completion of Inspection Reports should be done in a more timely manner. The adequacy of the QC Inspector's performance on the bell inspection and coupler torquing was demonstrated in the presence of a member of the Assessment Team during the actual inspections.

Non-Conformance Idetification Reports

Status of previous issues: (NIR numbers on longer listed have been closed-out during previous week.)

NIR No.	Description	(Opened) Date	(Closed)
4	Welding Qualification Procedure	12/29/82	

L. T. Rosen
Project Engineer

Project Manager

INDEPENDENT ASSESSMENT TEAM MEETING WITH BECHTEL

Date: January 31, 1983

Attendees	Bechtel	Stone/Webster	MPQAD	CPCo
	J. Fisher	A. Scott	J. Shah	G. Murray
	E. Cvikl	B. Holsinger		R. Weiland
		Parsons		
		J. Ratner		

1. Discussed the need for a definition of when couplers can be torqued against reinforcing bars embedded in freshly placed concrete. This situation will arise when bell concrete is placed prior to installation of the shaft reinforcement. E. Cvikl will resolve.

2. A. Scott questioned why the resolution of the channel welding non-conformance on the pier W12 access drift has not yet been dispositioned.

3. J. Fisher stated that as a result of recent discussion with the NRC, an FCN is being prepared to require vibration of all the concrete placed in pier W12. A Mergentime procedural change will be to generated

4. The Team requested the schedule on U.S. Testing calibration of jacks and the mock-up of jacking set-ups. J. Kelleher will notify.

5. A. Scott requested copies of truck mixer uniformity tests and pump calibrations for water reducing agents.

INDEPENDENT ASSESSMENT TEAM MEETING WITH BECHTEL

Date: February 1, 1983

Attendees:	Bechtel	Stone/Webster	MPQAD	CPCo	Mergentime
	E. Cvikl R. Bradford J. Kelleher	A. Scott W. Kilker	R. Sevo	-----	T. Goedjen

Parsons

J. Ratner

1. Discussion of previous items not resolved (coupler torquing, mixer uniformity, grout storage.)

2. J. Ratner asked for status of pier W12 jacks. T. Goedjen replied the jacks are on-site with calibrated gauges.

INDEPENDENT ASSESSMENT TEAM MEETING WITH BECHTEL

Date: February 2, 1983

Attendees:	Bechtel	Stone/Webster	MPQAD	CPCo
	E. Cvikl	A. Lucks W. Kilker A. Scott	G. Carpenter	G. Murray

1. G. Murray requested that Bechtel take steps to respond more efficiently to a number of open item questions or requests of the Team.

2. Team concern of storage of grout materials is being addressed by a change in Mergentime procedure.

3. A. Scott reported he had received the mixer uniformity test results on the non-plasticized concrete mix. If plasticizer is to be used he requested simuler results be made available for that mix.

INDEPENDENT ASSESSMENT TEAM MEETING WITH BECHTEL

Date: February 3, 1983

Attendees:	Bechtel	Stone/Webster	MPQAD	CPCo
	E. Cvikl	A. Scott	R. Sevo	G. Murray
	J. Gaydos	W. Kilker		
	J. Fisher			

Parsons

J. Ratner

1. J. Fisher reported that daily meeting times may vary in order to allow J. Fisher or D. Lavelle to attend the meeting.

2. J. Gaydos will be responsible for tracking Team requests. J. Fisher presented a close-out schedule for responding to Team requests on Carlson meters, grout storage, NCR disposition on pier W12 channel welding, plasticizer metering equipment, and grout strength determination.

3. J. Ratner submitted a list of questions as a result of observations of the excavation and support of piers W12 and E12:

   A. Has the use of beam sections, rather than channel sections for bell support, been considered as an option to allow for easier insertion of plating when required?

   B. Would shotcrete be an acceptable alternate bell support method?

   C. Has the use of bentonite powder applied to the exposed soil surfaces been considered a means to stabilize any reveling material?

   D. Why are the short sides of the lagging spreader sets being spread and not the long sides?

   J. Fisher and J. Gaydos will respond.

4. J. Fisher explained that in future piers the bell excavation maybe initiated once the bottom of the shaft section is reached without first excavating the shaft section to final grade.

5. A. Scott questioned why the steel lagging is considered under AISC structural steel code with respect to a recent non-conformance written on the use of washers for the lagging bolts. J. Fisher will respond.

6. W. Kilker asked if due to the break in the construction activities not that the excavating of piers W12 and E12 is nearing completion, the "trained" labor force could be lost by lay-offs. This action could deter from the goal to learn from the initial pier installations. J. Fisher said every reasonable effort would be made to retain the the labor crews until the next excavating activity proceeds.

INDEPENDENT ASSESSMENT TEAM MEETING WITH BECHTEL

Date: February 4, 1983

Attendees:	Bechtel	Stone/Webster	MPQAD	CPCo
	E. Cvikl	A. Scott	R. Sevo	G. Murray
	J. Fisher	W. Kilker		J. Mooney
	J. Gaydos	B. Holsinger		J. Schaub

1. W. Kilker stated the Team received a copy of MCP 28.000. The Team will review the procedure to evaluate how previous questions have been addressed.

2. J. Fisher reported that if a concrete mix design with plasticizer is approved and tested this material will be used for pier W12. Reportedly the strength of the plasticized concrete is gained faster than "non-plasticized" concrete.

3. W. Kilker requested an explanation of the field engineering response to an NCR written on steel lagging washers. J. Fisher explained the steps taken by the "field" to expedite the disposition.

4. J. Fisher stated the tell-tale centralizers are being fabricated. A. Scott said he intends to witness the procedure.

5. Since J. Fisher also keeps notes of the daily Team meetings with Bechtel, W. Kilker will insure that the Bechtel copy includes at least the topics included in the Team copy. This consistency is important since Bechtel takes action based on those items on their copy.

6. W. Kilker reminded J. Fisher that one of J. Ratner's questions of February 3, 1983 had not been included on Bechtel's meeting notes.

J.O. NO. 14358
Midland Plant
Units 1 and 2
Independent Assessment
Auxiliary Building Underpinning

Weekly Report No. 21

February 6, 1983 through February 12, 1983

Personnel on Site

Stone & Webster Engineering Corporation (SWEC)

S. Lucks	2/8 - 2/9
S. Rossier	2/8
W. Kilker	2/7 - 2/8
L. Rouen	2/7 - 2/12
P. Barry	2/7 - 2/12

Parsons Brinckerhoff, Quade and Douglas (PBQD)

P. Parish	2/7 - 2/12

Meetings Attended

Date	Represented	Purpose
2/7 through 2/11	Stone & Webster Bechtel Consumers Power Parsons (2/7 - 2/11)	Daily Meetings
2/8	Stone & Webster Bechtel Consumers Power Mergentime	FIVP proofload jacking coordination
2/11	Stone & Webster Bechtel Consumers Power Mergentime	Weekly Soils Rev:

Activities

Construction - The telltales were installed in pier W12. Forming was completed and concrete was placed from the bottom of the bell to the top of the pier. Concrete Mix C-1c was used. This mix was previously tested and approved for use on the main plant construction. Concrete was pumped to the pier and a trunk was utilized within the pier to place the concrete. The vertical free fall of the concrete was controlled as the placement progressed and the concrete was continuously vibrated to insure consolidation.

Installation of reinforcing steel was started in pier E12.

The proofload jacking of the Unit 1 FIVP was performed.

Quality Control, Documentation and Records -

1. Reviewed the over-inspection report for pier W12 rebar installation and splicing.
2. Reviewed splicer qualification test results.
3. Reviewed production "sister splice" test results.
4. Observed the installation and inspection of reinforcing in pier E12.
5. Reviewed trial mix data for the concrete mix to be used in pier E12.
6. Observed batching of concrete for pier W12.
7. Observed placement of pier W12 concrete.
8. Observed testing of pier W12 concrete.
9. Observed Unit 1 FIVP proofload jacking.

Observations

Construction - The concrete placement for pier W12 was in accordance with the specifications and procedures. Concrete was properly placed and vibrated.

Reinforcing steel for pier E12 was clean and installed properly. The tapered threaded ends of the reinforcing were protected and in good condition prior to installation.

The proofload jacking of the Unit 1 FIVP was well planned and organized. It was accomplished in accordance with the drawings. A transcription error on the Combined Calibration Record for one of the jack points resulted in a load that was slightly lower than that specified for the 90, 95 and 98% load increments. The resolution of this problem was immediately coordinated between the Resident Structural Engineer, the Project Engineering Representative, the Field Engineers and the Quality Assurance and Quality Control Representatives. The situation was corrected prior to attaining the 100% load increment and the intent of the proofload jacking was accomplished.

Quality Control, Documentation and Records - A review of the splicer qualification records showed that one splicer was not fully qualified. MPQAD had already issued a non-conformance report on this item. The review of production splice test results and the over-inspection reports for reinforcing steel installation indicated these items to be in compliance with the project requirements.

A review of the data for Concrete Mix C-5c showed that the mix did not meet the qualification requirements of ACI-301. This was identified by the Assessment Team as NIR No. 5.

The contractor elected to use a previously approved concrete mix for pier W12 instead of Concrete Mix C-5c.

Non-Conformance Identification Reports

Status of previous issues: (NIR numbers on longer listed have been closed-out during previous week.)

NIR No.	Description	Date (Opened)	(Closed)
4	Welding Qualification Procedure	12/29/82	2/8/83
5	Concrete Mix Qualification	2/10/83	

W E Kelley
Project Engineer

A. S. Boos for CK
Project Manager

INDEPENDENT ASSESSMENT TEAM MEETING WITH BECHTEL

Date: February 7, 1983

Attendees:	Bechtel	Stone/Webster	MPQAD	CPCo
	E. Cvikl	W. Kilker	R. Sevo	------
	J. Fisher		W. Lytle	
	J. Gaydos			

1. J. Fisher said all NCR on materials in pier W12 including access drift will be dispositioned before concrete is placed in the pier.

2. Plasticized concrete will be used for pier W12 if all of the trial mix design criteria can be met in time.

3. E. Cvikl explained the need for washers on the bolts for the steel lagging.

4. J. Fisher stated that a specification change has been issued to require vibrating of all concrete.

5. J. Gaydos said truck mixer uniformity tests are scheduled to be made with the plasticizer additive.

6. J. Fisher said the requirments for minimum strength on mud-mat mixes is being re-evaluted.

7. In response to a Team question, E. Cvikl said spreading of steel sets in done in the direction of the adjacent piers (i.e., east/west) to produce an arching effect. On some future piers spreading will be on the long sides.

8. J. Fisher and W. Kilker discussed a clarification of defining use of and need for backpacking as stated in daily meeting note of January 18. Backpacking will be performed to avoid loss of ground and all voids will be backpacked unless the RGE agrees it is not necessary.

INDEPENDENT ASSESSMENT TEAM MEETING WITH BECHTEL

Date: February 8, 1983

Attendees:	Bechtel	Stone/Webster	MPQAD	CPCo
	E. Cvikl	W. Kilker	R. Oliver	R. Weiland
	J. Gaydos	A. Lucks	J. Shah	
	D. Lavelle	L. Rouen		
		Parsons		
		P. Parish		

1. Dave Lavelle described the on-going process of qualifying the plasticized concrete mix for use in the underpinning.

2. R. Oliver said further discussions with engineering are required on closing-out the NCR on channel welding.

3. J. Gaydos stated truck mixer uniformity tests were completed yesterday. Results will be available today.

4. In response to previous discussions on Carlson meter installation J. Gaydos will prepare short description.

5. Dave Lavelle said there had been two "round-map" meetings on concrete placement. W. Kilker said the Team should be informed of these meetings ahead of time.

INDEPENDENT ASSESSMENT TEAM MEETING WITH BECHTEL

Date: February 9, 1983

Attendees:	Bechtel	Stone/Webster	MPQAD	CPCo
	J. Fisher	L. Rouen	R. Sevo	-----
	E. Cvikl	S. Lucks		
	J. Kelleher	P. Barry		
		Parsons		
		P. Parish		

1. The disposition to the NCR for the reshore channel in the west access drift is due February 9, 1983.

2. Calibration data was submitted for equipment to be used in the addition of plasticizer to concrete.

3. J. Kelleher said truck mixer uniformities were performed today.

4. The Team raised questions about the preliminary road map for concrete placement. R. Sevo said that the questions are answered in the Revision No. 12 of the Mergentime procedure.

5. The Assessment Team questioned Spec C-195 statement that jackloading of FIVP - on hold. E. Cvikl is to provide answer.

6. The Team questioned what requirements are used for the development of concrete mixes. J. Kelleher is to provide answer.

7. The Team also questioned the adequacy of the Mergentime rebar splicing procedure, to define what functions are to be performed by the qualified splicer. J. Fisher will investigate.

INDEPENDENT ASSESSMENT TEAM MEETING WITH BECHTEL

Date: February 10, 1983

Attendees:	Bechtel	Stone/Webster	MPQAD	CPCo
	J. Fisher	L. Rouen	G. Carpenter	-----
	E. Cvikl	P. Barry		
	D. Lavelle			
	J. Gaydos			
	D. Hemmelberger			
	V. Patankar			

Parsons

P. Parish

1. Additional mixer uniformity tests will be performed on the truck mixers using a mix with the working slump range.

2. Received requested mix design information.

3. FIVP proof load jacking is not on hold. The details are on drawing No. C-1494.

INDEPENDENT ASSESSMENT TEAM MEETING WITH BECHTEL

Date: February 11, 1983

Attendees:	Bechtel	Stone/Webster	MPQAD	CPCo
	J. Fisher	L. Rouen		G. Murray
	E. Cvikl	P. Barry		
		Parsons		
		P. Parish		

1. NIR #5 was written on the approval of mix C-5c since trial mix data did not meet ACI-301. Bechtel will use another concrete mix for placement of pier W12 today.

2. Stone/Webster considered the mixes with and without HRWR separate mixes requiring separate qualifications. The requirement for the qualifications of mix with HRWR is based on ACI-301 Section 3.8.2 and ACI-212 Section 1.5.2.

3. Stone/Webster questioned if two sets of cylinder tests would be taken, if concrete used for a pier placement included trucks with and without HRWR. Bechtel will advise.

5. Stone/Webster asked if mix E-4c approved by an SCN on December 1, 1982 is still approved for use in underpinning. Bechtel will advise. If the mix is still approved, Stone/Webster would like to review the test data on this mix.

6. Stone/Webster asked if the mix to be used for pier W12 placement was approved mix. Bechtel stated it was approved mix that had been used during plant construction. Stone/Webster asked for the test data for mix approval on this mix.

J.O. NO. 14358
Midland Plant
Units 1 and 2
Independent Assessment
Auxiliary Building Underpinning

Weekly Report No. 22

February 13, 1983 through February 19, 1983

Personnel on Site

Stone & Webster Engineering Corporation (SWEC)

B. Holsinger	2/17 - 2/19
W. Kilker	2/17 - 2/19
L. Rouen	2/14 - 2/16
P. Barry	2/14 - 2/16
A. Scott	2/14 - 2/19

Parsons, Brinckerhoff, Quade and Douglas (PBQD)

J. Ratner	2/14 - 2/17

Meetings Attended

Date	Represented	Purpose
2/14 through 2/18	Stone & Webster Bechtel Consumers Power Parsons (2/15 - 1/17)	Daily Meetings

Activities

Construction - At the W12 pier location, the upper and lower leveling plates were bolted to the turbine building mat and the top of the pier, respectively. The nominal 2 inch spaces between the leveling plates and the structural concrete surfaces were than filled with dry-pack grout.

The telltale instrumentation was installed in pier E12, the formwork between El 600 and 605 was completed and the concrete was placed in a continuous pour from the bottom of the bell, El 565, to top of the pier, El 605. The upper leveling plate was installed. The proofload jacking of Unit 2 FIVP was performed.

Quality Control, Documentation and Records

1. Reviewed the Quality Control Instruction on proof-jacking the FIVPs.
2. Reviewed the QC Inspection Report completed for the Unit 2 FIVP proof-jacking.
3. Observed the Unit 2 FIVP proofload jacking and the in-progress QC inspection of the jacking.
4. Reviewed performance history of concrete mix utilized for piers W12 and E12.

Quality Control, Documentation and Records - (continued)

5. Witnessed QC inspection of dry-pack placement for upper plate at pier W12.

6. Observed the placement of the concrete at pier E12.

7. Witnessed the QC inspection and testing of concrete during the pier E12 concrete placement.

Observations

Construction - The placement of the dry-pack grout between the leveling plates and the structural concrete at pier W12 was properly done. However, the initial handling of the grout material was found wanting in that the bags of grout were openned and spread-out well before required for placement. As the activity proceeded the Contractor modified the handling so that the grout bags remained sealed until just prior to mixing and placement.

Observations of the bell area of pier E12 prior to concrete placement revealed minor unraveling of the exposed soil. This occurrence was due to air exposure for a period of at least 11 days. Although no significant problems occurred on this bell, the Assessment Team feels that based on normal good industry practice, for future piers the time between bell excavation and concreting should be appreciably reduced.

The concrete-mix and placement procedure for pier E12 were in accordance with the project documents. The Contractor selected the same concrete mix design used for pier W12 since the mix design using plasticizer had not yet been approved.

The proofload jacking of Unit No. 2 FIVP was well planned and executed. The entire organization responded efficiently in resolving a jack recalibration non-conformance.

Quality Control, Documentation and Records - The Quality Control procedures and reports reviewed by the Assessment Team were properly prepared and executed. The QC inspectors performing the inspections had a good understanding of the activity being inspected as well as their own role. With respect to the FIVP proofload jacking in particular, the Quality Assurance organization produced a good quality inspection plan from the field procedure outlined on a project drawing. In addition, the QA organization recognized ahead of time the need for training the construction personnel on the jacking procedure and established training as a prerequisite for the jacking.

With respect to a minor problem noted in Weekly Report No. 20, the Team verified that a change has been made. The PQCI and corresponding Inspection Report now provide a means for documenting the results of concrete consolidation.

J.O. NO. 14358
Midland Plant
Units 1 and 2
Independent Assessment
Auxiliary Building Underpinning 3

Non-Conformance Identification Reports

Status of previous issues: (NIR numbers on longer listed have been closed-out.)

NIR NO.	Description	Date (Opened)	(Closed)
5	Concrete Mix Qualification	2/10/83)	

Project Engineer

Project Manager

INDEPENDENT ASSESSMENT TEAM MEETING WITH BECHTEL

Date: February 14, 1983

Attendees:	Bechtel	Stone/Webster	MPQAD	CPCo
	J. Fisher	L. Rouen	R. Sevo	—
	E. Cvikl	P. Barry		
	J. Gaydos			

1. J. Fisher said trial mixes of all new concrete mixes will be run. Notification will be given to all interested parties when begun.

2. Concrete placement for E12 is scheduled for Wednesday. Unit 2 FIVP jacking is scheduled for Tuesday.

3. R. Sevo asked about load trasfer mock-up. J. Fisher will check on this.

INDEPENDENT ASSESSMENT TEAM MEETING WITH BECHTEL

Date: February 15, 1983

Attendees:	Bechtel	Stone/Webster	MPQAD	CPCo
	J. Fisher E. Cvikl J. Gaydos	L. Rouen	R. Savo	G. Murray

Parsons

J. Ratner

1. In response to an earlier Team question, J. Fisher said bentonite was not used to prevent slaking because Mergentime felt it would not adhere to the clay surface.

2. J. Fisher advised that if a pier was poured using both a mix with plasticizer and without, cylinders would be made for each mix.

3. J. Ratner expressed concern about the bell in pier E12 being exposed to air for such along period of time. J. Fisher said that he and M. Lewis had discussed this before and will if necessary take measures to protect the face of the excavation.

4. E. Cvikl stated that a new crack in the FIVP had been mapped. This crack would be inspected by CTL Company. Bechtel Ann Arbor will evaluate.

INDEPENDENT ASSESSMENT TEAM MEETING WITH BECHTEL

Date: February 16, 1983

Attendees:	Bechtel	Stone/Webster	MPQAD	CPCo
	E. Cvikl	A. Scott	R. Sevo	G. Murray
	J. Fisher	P. Barry		
		L. Rouen		
		Parsons		
		J. Ratner		

1. J. Fisher will advise when trial mixes will be run for the concrete mix C-5c with & without plasticizer.

2. The schedule for FIVP jacking has been delayed, due to the fact that the jack calibration records must be checked for those jacks used to install anchor bolts.

3. L. Rouen asked for clarification on which steps in MCP 16.000 on splicing of Fox-Howlett couplers must be performed by the qualified splicer whose identification mark goes on the bar.

4. J. Fisher advised that there would be a "dress rehearsal" for the load transfer prior to actual pier loading. Will advise the time.

5. L. Rouen stated the FIVP proof jacking and pier W12 concrete placement were performed adequately in the views of the Assessment Team members present.

INDEPENDENT ASSESSMENT TEAM MEETING WITH BECHTEL

Date: February 17, 1983

Attendees:	Bechtel	Stone/Webster	MPQAD	CPCo
	D. Lavelle E. Cvikl J. Gaydos	A. Scott	J. Shah	G. Murray

Parsons

J. Ratner

1. D. Lavelle reviewed the list of requirements needed prior to jacking the FIVP Unit 2 east side. At present the start of jacking will be 7:00 AM on February 18, provided all requirements are met this date.

2. A "dress rehearsal" for pier W12 load transfer will be held in Mergentime's Mechanical Shop at 10:00 AM and 5:30 PM on February 18, and at pier W12 on Monday February 21, with the actual load transfer to be performed on February 22.

3. D. Lavelle presented a new organization chart to show how Bechtel plans to organize their forces to expedite the disposition and closing of NCR's and to effect better planning and scheduling of materials for the construction forces.

4. Mr. Cvikl stated that CTL had been on the job to investigate the new crack that appeared in the west FIVP and that he was awaiting a written report.

5. J. Ratner asked if there were plans to reduce the time for leaving the bell open. J. Fisher stated that scheduled time for the bell to be open was to be 12 to 13 days and thought this was good and not detrimental.

6. A. Scott requested information concerning the resolution of the question originally raised on January 27, concerning "hold tag" on Reshore Channel and which was dropped on February 10 from the meeting notes. "Hold tag" is still in-place. J. Fisher indicated he would raise this concern in the weekly management meeting.

INDEPENDENT ASSESSMENT TEAM MEETING WITH BECHTEL

Date: February 18, 1983

Attendees:	Bechtel	Stone/Webster	MPQAD	CPCo
	E. Cvikl	A. Scott	-----	G. Murray
	J. Gaydos	W. Kilker		
	J. Fisher			

1. J. Fisher advised that jack stand fabrication will begin today at the Poseyville fab. shop.

2. J. Fisher said FIVP, Unit 2 proof-jacking will be either on February 18 or February 19. Will advise.

J.O. NO. 14358
Midland Plant
Units 1 and 2
Independent Assessment
Auxiliary Building Underpinning

Weekly Report No. 23

February 20, 1983 through February 27, 1983

Personnel on Site

Stone & Webster Engineering Corporation (SWEC)

B. Holsinger	2/21 - 2/26
W. Kilker	2/21 - 2/23
P. Barry	2/24 - 2/26
A. Scott	2/21 - 2/25

Parsons, Brinckerhoff, Quade and Douglas (PBQD)

V. Madill	2/21 - 2/25

Meetings Attended

Date	Represented	Purpose
2/21 through 2/25	Stone/Webster Bechtel Consumers Power Parsons (2/22 - 2/25)	Daily Meetings

Activities

Construction - Pier W12: No activity.

Piers W9/11: Construction of the 6 x 6ft. access pit from El. 609 to El.600 was completed. The excavated material consisted of up to a 1 ft. thickness of unreinforced concrete underlain by sand and clay fill. The excavation was braced with wood lagging as the work progressed. Backpacking with sand was done as required and excelsior was placed between lagging boards. No groundwater was encountered. The lagging technique and materials were simular to those employed in constructing the access pits to piers E/W12 (Refer to Assessment Team Weekly Report Nos. 13 and 14).

Pier E12: The Subcontractor installed lower leveling plate on the pier. Dry-pack grout was then placed in the spaces between the lower leveling plate and the pier, and the upper leveling plate and the turbine building mat.

Piers E9/11: The construction of the access pit progressed from El. 609 to El. 603. The excavated material consisted of up to 2 ft. of unreinforced concrete underlain by sand fill. The work was done in a manner simular to that described above for piers W9/11 access pit. No groundwater was encountered.

Quality Control, Documentation and Records

1. Observed load transfer training session at the Subcontractor's shop.

2. Observed storage conditions at the Poseyville storage yard.

3. Witnessed the mixing and installation of dry-pack grout for the upper leveling plate at pier E12.

Observations

Construction - The dry-pack grouting and excavation/lagging installations were performed in accordance with the project documents. The dry-pack grout was kept prot[illegible]and moist well beyond the nominal cure time requirements.

Quality [illegible]entation and Records - The storage conditions at the Subcontract[illegible]rd meet project requirements and are in-conformance with go[illegible]ice. The grout materials were properly handled and mixe[illegible]ation.

Non-[illegible]dentification Reports

Status of previous issues: (NIR numbers on longer listed have been closed-out.)

NIR NO.	Description	Date (Opened)	Date (Closed)
5	Concrete Mix Qualification	2/10/83	

W E Killen
Project Engineer

Project Manager

TRIP REPORT
MIDLAND PLANT - UNITS 1 AND 2
INDEPENDENT ASSESSMENT
AUXILIARY BUILDING UNDERPINNING
CONSUMERS POWER COMPANY

Trip to the Midland Site
Consumers Power Company
By Senior Level Management Review Team
February 2, 1983

On February 2, 1983 the members of the Senior Level Management Review Team for the independent assessment of the Auxiliary Building Underpinning visited the site. The Management Review Team consisted of:

J. P. Allen III
N. B. Cleveland
J. R. Hall, Jr.
E. A. Long
G. M. Schierberg
L. Silano (Parsons Brinckerhoff, Michigan, Inc.)

Activities

In preparation for our visit to the soils remedial area we were given a short course on "Confined Space Training" by Consumers Power Company (CPCo) staff.

The Management Team was given a presentation on the underpinning work by J. Fisher of Bechtel Power Corporation. We were then escorted on a tour of the site with emphasis on all the soils remedial work and a full account of the instrumentation program and crack monitoring being done by Wiss, Jenny, Elstener & Associates.

At exactly 11:00 A.M. members of the team were at access shafts to piers E-12 and W-12 where we had the opportunity to inspect the two piers. Pier W-12 excation was completed. Only the bell remained to be excavated on Pier E-12.

After lunch, some of the members of the team visited the pier and bell mock-up at the Poseville Yard and CPCo used a small scale model to further describe the Auxiliary Building Underpinning. Each stage of the underpinning for the Feedwater Isolation Valve Pit, the Electrical Penetration Area and the Control Tower power portions of the Auxiliary Building were adequately explained by the CPCo engineers and the Stone & Webster - Parsons Brinckerhoff Assessment Team. There was sufficient time for many questions and these were answered satisfactorily for the Management Team.

The Independent Assessment Team described their scope of work and their day-to-day operations. The reporting mechanism was discussed and the four Nonconformance Identification Reports issued to-date were described.

Conclusions

In general, the overall underpinning operation is well organized. Progress, although slow initially, has been gaining momentum and is anticipated to accelerate. The instrumentation program is very satisfactory. Plotting

of results is up-to-date and frequency of reading more than adequate. The Independent Assessment Team activities are being effectively carried out.

E. A. Long
Chairman, Management Review Team

INDEPENDENT ASSESSMENT TEAM MEETING WITH BECHTEL

Date: February 21, 1983

Attendees:	Bechtel	Stone/Webster	MPQAD	CPCo
	J. Fisher	W. Kilker	R. Sevo	G. Murray
	E. Cvikl	A. Scott		
	J. Gaydos			

1. E. Cvikl stated that NIR #5 resolution is being discussed with the Team. In the meantime, as soon as Project Engineering makes available the mix design trial mixes will be prepared.

2. J. Fisher said a mock-up session on load transfer will be held today at the Mergentime's Mechanical Shop. Later a load transfer mock-up with the jack stand in-place will be held at pier W12 prior to actual load transfer.

3. W. Kilker stated the Team witnessed several increments of the Unit No. 2 FIVP proofload jacking on February 19-including the initial loading, full load and load release. The activity was well-planned and sucessfully accomplished.

4. A. Scott requested clarification on the requirements for washers and plates for steel lagging bolting. E. Cvikl is coordinating response with Project Engineering.

5. A. Scott requested clarification on requirements for concrete sampling during placement in terms of back of truck or end of the pump line. E. Cvikl will resolve.

6. J. Fisher stated that dry-packing of the bearing plates on pier E12 should be done today.

INDEPENDENT ASSESSMENT TEAM MEETING WHT BECHTEL

Date: February 22, 1983

Attendees:	Bechtel	Stone/Webster	MPQAD	CPCo
	J. Fisher	W. Kilker	R. Oliver	R. Weiland
	E. Cvikl	A. Scott	W. Lytle	
	J. Gaydos	B. Holsinger		
		Parsons		
		V. Madill		

1. E. Cvikl advised that trial mixes for concrete will begin February 28, 1983. B. Holsinger described the Assessment Team response to the proposed resolution to NIR #5. Specifically, the proposal was to perform 3 point trial mixes for the regular concrete mix and 1 point for the plasticized concrete mix. The Team agreed this was an adequate proposal but cautioned that in the future making "upward" mix adjustments could be difficult.

2. J. Fisher informed the group that jack-stand fabrication was delayed pending the resolution of a non-conformance on the milled surface quality.

3. W. Kilker requested access to the FSO training records and matrix. J. Fisher stated R. Bradford and R. Groshong were responsible for that area. W. Kilker will follow-up.

4. B. Holsinger inquired about the inspection of instrumentation installations. R. Oliver will furnish required documents and information.

5. V. Madill questioned the adequacy of the load transfer acceptance criteria of gauge monitoring "at least once per 8 hours." J. Fisher will respond.

6. V. Madill asked if a "slight drop" in the pressure reading might not be a better way to recognize effectiveness of wedge tightening rather than listening for a "ringing" sound from hammering.

7. E. Cvikl stated that AISC 8th Edition requires the use of washers or plates on all slotted holes. In this regard will pursue with Project Engineering the need for washers/plates on non-spreader sets of lagging.

8. E. Cvikl clarified the requirements for sampling concrete by reference to FSAR Revision 29, Question 421.7.

INDEPENDENT ASSESSMENT TEAM MEETING WITH BECHTEL

Date: February 23, 1983

Attendees:	Bechtel	Stone/Webster	MPQAD	CPCo
	J. Fisher	W. Kilker	J. Moran	------
	E. Cvikl	A. Scott		
	J. Gaydos	B. Holsinger		
		Parsons		
		V. Madill		

1. W. Kilker asked for a description of "seal" required between circulating and service water pumphouse. J. Fisher said a diver would place a form and beutonite pellets to form the seal.

2. J. Fisher said FSO & MPQAD resolved the need for re-milling jack stand plates. Extra work will be done today.

3. E. Cvikl reported that although recording of data during the load transfer hold is only every 8 hours (maximum), Engineering personnel will be continously present throughout the period. (Response to V. Madill question of February 22, 1983).

4. E. Cvikl stated that acoording to Project Engineering washers or plates will be required on all slotted/bolted holes.

5. E. Cvikl said Project Engineering will take under advisement the use of correlation sampling for concrete testing.

INDEPENDENT ASSESSMENT TEAM MEETING WITH BECHTEL

Date: February 24, 1983

Attendees:	Bechtel	Stone/Webster	MPQAD	CPCo
	D. Lavelle	A. Scott	R. Oliver	-----
	E. Cvikl	B. Holsinger		
	J. Gaydos			
		Parsons		
		V. Madill		

1. D. Lavelle informed those present that fabrication of the jack stands had commenced and completion was scheduled for February 28, 1983. A mock-up of the load transfer with the jack stands in place is scheduled to be held at pier W12 on March 1, 1983.

2. A Scott questioned the amount of time that is taken to write a NCR. Example was given to the group of NCR No. FSO-052 written on February 22, 1983.

3. B. Holsinger questioned paragraph 8.1 of the Mergentime Procedure MCP 19.000, Revision 9 as to the reason of referencing ASME in the procedure.

4. B. Holsinger questioned paragraph 9.3.5 of the Mergentime Procedure MCP 19.000, Revision 9 as to the method of identification of primary tensile stress so that welders and inspectors would know when this condition was applicable for weld undercut.

5. D. Lavelle informed the group of the sequence of work forthcoming is based on the ability of MPQAD to cover the work. The work schedule was based on the need of fabrication of drift sets and lagging which require inspection to the 1980 AWS code.

INDEPENDENT ASSESSMENT TEAM MEETING WITH BECHTEL

Date: February 25, 1983

Attendees:	Bechtel	Stone/Webster	MPQAD	CPCo
	J. Fisher	A. Scott	R. Sevo	-------
	E. Cvikl	B. Holsinger		
	J. Gaydos	P. Barry		
		Parsons		
		V. Madill		

1. Reference L. Roune's question on Procedure MCP 16.000, Rebar Splicing Procedure, E. Cvikl stated that procedure will not be tied to the ASME code for inspection since the QAR-F253 states that the splicing of rebar is not ASME.

2. The "dress rehearsal" for the load transfer jacking of pier W12 will be held March 1, 1983. A meeting with heads of Engineering and MPQAD will be held on Monday February 28, 1983, to determine the number of men actually necessary to perform the work due to the area available.

3. A. Scott questioned when the form tie-rod holes would be grouted for piers E/W12. J. Fisher stated that this was under advisement at present.

4. P. Barry & A. Scott requested a breakdown of the new organization chart in accordance to the old organization chart attached to Administrative Guideline, FSO-1.000 Revision 1. In fact FSO-1.000 should be revised to incorporate the new chart.

J.O. NO. 14358
Midland Plant
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Weekly Report No. 24

February 27, 1983 through March 5, 1983

Personnel on Site

Stone & Webster Michigan, Inc.

A. Lucks	3/3 - 3/4
W. Kilker	2/28 - 3/5
P. Barry	2/28 - 3/5
A. Scott	3/2 - 3/5
L. Rouen	3/2 - 3/5

Parsons, Brinckerhoff Michigan, Inc.

J. Ratner	3/2 - 3/5

Meetings Attended

Date	Represented	Purpose
2/28 through 3/4	Stone & Webster Bechtel Consumers Power Parsons (3/3 - 3/4)	Daily Meetings
3/2	Stone & Webster Bechtel Consumers Power Weiss, Janney, Elstner	Discussion of coordination of Carlson meter installation activities
3/3	Stone & Webster NRC	Discussion of Scope of Assessment and Reports
3/4	Consumers Power Bechtel Stone & Webster	Weekly Soils Review

Activities

Construction - Pier W12: The upper and lower level bearing assemblies and bearing plates were installed.

Pier W9: The 20 ft. long, 6 ft. x 8 ft. access drift was excavated and supported. The excavated material consisted of approximately a 1 ft. thickness of unreinforced concrete (encountered below the turbine building mat), 2 ft. of sand fill and 5 ft. of gray clay fill. No groundwater seepage entered the excavation. Six steel drift sets were installed and wood lagging was placed between the sets and across the end of the drift. Upon completion of the drift, the concrete mud-mat was placed in the floor of the drift and access pit.

Pier E12: No activity.

Pier E9: The construction activities on the access drift were similar to those performed in the pier W9 access drift. The excavated material consisted of 9-12 inches of unreinforced concrete underlain by 1 ft. of sand and 6 ft. of grayish brown clay. No groundwater seepage entered the excavation. The drift supports (steel sets and wood lagging) and concrete mud-mat were installed.

Quality Control, Documentation and Records

1. Witnessed the preparation of concrete trial mixes required to qualify a new mix design incorporating a "plasticizer" additive.

2. Verified the preparation of Quality Control Inspection Records and Quality Assurance Inspection Reports on the access pit for piers W9/11.

3. Reviewed a revised procedure on the installation of mechanical splices that clarifies the responsibility in the field for the final splice quality.

4. Witnessed the fabrication and inspection of pier E/W9 steel drift sets and pier W12 jackstands.

Observations

Construction - The excavation of the drifts and installation of the steel sets and wood lagging were done in accordance with the project documents. Soil was used to backpack the lagging as required.

In the east access drift to pier E9 excelsior was inserted into the space between most of the lagging boards. The Team feels that in the absence of groundwater seepage the use of excelsior is unnecessary. The use of excelsior makes the inspection of the backpacking more difficult and under these circumstances is not considered to be good practice. In the northwest corner of the drift the excavated clayey material was used to fill the space between the lagging boards. Clay should not be used to backpack between the boards. However, in this instance it should not create a problem due to the absence of groundwater.

Quality Control, Documentation and Records - The procedures for the preparation of the concrete trial mixes were in accordance with project documents and industry standards. The Quality Assurance and Control records observed were properly completed. The revision of the splicing procedure clarified the responsibility for the splice quality.

The completion of piers E/W12 has been impacted to a large degree by delays associated with welding and the acceptance of the welded materials by the Quality organization. The welding associated delays that have prolonged the length of time between pier excavation and load transfer to the pier is contrary to good underpinning practice. In this regard, the Team is proposing to have welding specialists perform an on-site assessment of the shop and field welding together with the associated inspection activities.

Non-Conformance Identification Reports

Status of previous issues: (NIR numbers on longer listed have been closed-out.)

NIR NO.	Description	(Opened) Date	(Closed)
5	Concrete Mix Qualification	2/10/83	

W E Kelley
Project Engineer

A S. Boos
Project Manager

INDEPENDENT ASSESSMENT TEAM MEETING WITH BECHTEL

Date: February 28, 1983

Attendees:	Bechtel	Stone/Webster	MPQAD	CPCo
	J. Fisher	P. Barry	R. Sevo	G. Murray
	E. Cvikl			
	J. Gaydos			

1. The "dress rehearsal" for the load transfer for pier W12 has been delayed to Wednesday March 1, 1983.

2. P. Barry inquired as to the documentation required by the RGE when authorizing or stopping work on piers adjacent to a pier being loaded. E. Cvikl said the "authorization" is set by drawings or sequencing schedules so no written RGE statement is required. On the other hand, if the RGE stops work it will be documented in his reports.

3. J. Fisher said the jacks will be manned at all times when the jacks are pressurized including during the acceptance periods.

4. J. Fisher stated that the access pit for pier W9 is completed waiting for approval to drift under the FIVP. The access pit for E9 is almost complete and should be completed today. Fabrication of drift sets is proceeding and some sets should be released today. The drift under the FIVP is delayed pending discussion with the NRC regarding the minor cracks opened in the FIVP during proof-jacking.

5. Bechtel will up-date the training procedure to reflect the new organization of personnel. This organization does not affect the Field Engineers who are in direct contact with the Subcontractor. The training record for the Field Engineers are available for review.

INDEPENDENT ASSESSMENT TEAM MEETING WITH BECHTEL

Date: March 1, 1983

Attendees:	Bechtel	Stone/Webster	MPQAD	CPCo
	J. Fisher	P. Barry	-----	G. Murray
	E. Cvikl	W. Kilker		
	J. Gaydos			

1. J. Gaydos gave the Team a copy of the proposed trial mix design. P. Barry will read and comment or question as necessary.

2. MCP 16.000 is being clarified with respect to reinforcement splicing process. MPQAD has commented on the changes.

3. G. Murray said E12 should not be loaded until after acceptance of the soil deformation criteria on W12. J. Fisher agreed.

4. E. Cvikl reported that in response to an earlier question by the Team, references to ASME requirements will be eliminated in MCP 70.000.

5. J. Fisher advised that NRC approval on E/W 9 resulted in work starting last night shift on drifting under the FIVPs.

6. J. Fisher stated that the FSO-1.000, Administrative Guideline, will be revised by March 3, 1983.

7. P. Barry questioned if MPQAD would interface with Bechtel procurement quality control (PQC) on inspection and acceptance of fabrication done off-site. The Team verified with R. Sevo that the PQC would be responsible for those off-site activities.

8. W. Kilker said he would review the past Team daily meeting notes to verify if there are any open items. If so, a list will be prepared and presented at a daily meeting.

INDEPENDENT ASSESSMENT TEAM MEETING WITH BECHTEL

Date: March 2, 1983

Attendees:	Becthel	Stone/Webster	MPQAD	CPCo
	E. Cvikl	P. Barry W. Kilker	R. Sevo	D. Puhalla

1. E. Cvikl advised that "dress rehearsal" for load tranfer at pier W12 is delayed until further notice by J. Fisher.

2. Trial mixes for concrete will be done today.

3. P. Barry asked about need for secondary telltale at piers E/W12. E. Cvikl replied that the secondary telltale was not required to be active until the mass excavation stage.

4. Discussion of what maybe a layer of non-structural concrete above membrane in pier W12 drift. E. Cvikl stated that the FIVP maybe core drilled to determine the extent on any non-structural concrete and if a "cold joint" exists that could cause a failure of any concrete into the drift.

INDEPENDENT ASSESSMENT TEAM MEETING WITH BECHTEL

Date: March 3, 1983

Attendees:	Bechtel	Stone/Webster	MPQAD	CPCo
	E. Cvikl	P. Barry	R. Sevo	G. Murray
	J. Gaydos	W. Kilker		
		L. Rouen		
		A. Scott		
		A. Lucks		
		Parsons		
		J. Ratner		

1. A general discussion was held of the merits of improving early concrete and grout strength to allow quicker access to the loading of the pier.

2. E. Cvikl presented a revised schedule on load transfer to pier W12.

3. E. Cvikl indicated the FIVP slab maybe care drilled to determine if a "cold joint" exists above the membrane level.

4. A discussion was held of the value of insuring the accuracy of placement of Carlson meters compared to the effect on the load read-out. A. Scott said tolerance levels being considered should be carefully evaluated.

INDEPENDENT ASSESSMENT TEAM MEETING WITH BECHTEL

Date: March 4, 1983

Attendees:

Bechtel	Stone/Webster	MPQAD	CPCo
E. Cvikl	W. Kilker	R. Sevo	G. Murray
J. Gaydos	A. Lucks		J. Schaub
J. Fisher	L. Rouen		
	Parsons		
	J. Ratner		

1. J. Fisher advised that trial mixes for revised concrete mix are underway.

2. E. Cvikl said the NCR on pier W12 grout strength was being dispositioned. Strength on grout for this pier is adequate. Clarification will be made on the drawing.

3. L. Rouen stated he had seen the Revision of the procedure on reinforcing splicing and that his question had been resolved.

4. J. Fisher provided a new schedule for pier W12 load transfer. Sunday's work had been authorized to expedite the process.

5. W. Kilker brought-up a previous item discussed in the meetings of December 28/29, 1982. At that time, there was discussion of defining "construction aids" to distinguish certain items as not being part of the design. J. Fisher will up-date on decisions regarding this subject.

6. J. Fisher provided a copy of the revised FSO Training Program procedure.

7. E. Cvikl reported that he discussed with Project Engineering the tight tolerance on Carlson meter installations. Project Engineering said that the instrumentation Subcontractor feels it needs tight tolerance and the Field group feels it can be installed to those tolerances.

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Weekly Report No. 25

March 6, 1983 through March 12, 1983

Personnel on Site

Stone & Webster Michigan Inc.

W. Kilker	3/6 - 3/12
P. Barry	3/6 - 3/9
A. Scott	3/6 - 3/9
L. Rouen	3/6 - 3/8

Parsons, Brinckerhoff Michigan, Inc.

J. Ratner	3/6 - 3/11

Meetings Attended

Date	Represented	Purpose
3/7 through 3/11	Stone & Webster Bechtel Consumers Power Parsons	Daily Meetings
3/10	Stone & Webster Consumers Power	Discussion of Work Package Submitals
3/11	Stone & Webster Bechtel Consumers Power	Weekly Soils Review

Activities

Construction - Pier W12: Th ackstands were completed and installed. The load transfer was initiated a.ound noon on March 11. Within 2½ hours the proof test load of 1375 kips (125 percent of specified load) had been applied through two 565 ton jacks. Some 2 hours later the proof test load settlement criteria was satisfied, less that .01 inch for a continuous 1 hour period, and the load was reduced to 110% of specified load. This time the pier had moved downward approximately 0.19 inches with respect to the turbine mat while the bottom of the pier had moved 0.03 inches with respect to the top of the pier. As of March 13, the 110% load had been maintained for 36 hours. The pier deflection criteria of less than 0.01 inches for 24 hours had not yet been satisfied. Total pier settlement was approximately 0.23 inches. The actual movement of the building, as measured by a benchmark approximately 55 ft. away, was less than .005 inches.

Pier W9: The 9 ft. long N-S drift at right angles to the previously completed 20 ft. long E-W drift was excavated and supported. The excavated material was similar to that in the E-W drift - unreinforced concrete underlain by a thin layer of sand and 6 ft. to 7 ft. of clay. The unreinforced concrete was located both above and below the turbine mat membrane. No groundwater seepage entered the excavation. Three steel drift sets were installed and wood lagging was placed between the sets along the sides of the drift and at the end of the drift.

The pier excavation was completed from El. 600 to El. 582. The excavated material consisted of approximately 15 ft. of a mixture of clay, sand and gravel fill underlain by 3 ft. of natural gray clay. No groundwater seepage entered the excavation. Sixteen levels of steel lagging were installed and backpacked.

Pier W11: Once the load transfer to pier W12 was complete, excavation and support of the N-S 8 ft. x 8 ft. access drift to pier W11 was initiated and completed to a distance of 4 ft. under the turbine building. The excavated material consisted of approximately 2 ft. of unreinforced concrete and 6 ft. of clay fill. One steel set was installed in the drift.

Pier E12: Installation of the upper and lower bearing plates and the tell-tale bearing plate was completed.

Pier E9: The construction activities and progress on this drift and pier were similar to those at pier W9. The excavated materials in the drift were unreinforced concrete (above and below the turbine building mat), thin layers of sand fill and about 7 ft. of clay fill. The soil excavated from the pier to El. 581 consisted of 13 ft. of clay fill underlain by natural gray clay. No groundwater seepage entered the excavation. Seventeen levels of steel lagging were installed and backpacked.

Quality Control, Documentation and Records

1. Verified the completion of the jack record, loading schedule and calibration forms prior to initiating load transfer to pier W12.

2. Verified that the procedural criteria was met for load reduction during load transfer at pier W12.

3. Witnessed the implementation of the QC hold-point on the RGE determination of the natural clay-fill interface at pier W9.

4. Witnessed the probe for groundwater near El.589 in a zone of granular fill at pier W9.

5. Verified the completion of the QC welding inspection report for pier W12 Jackstands.

Observations

Construction - The load transfer to pier W12 was being accomplished according to the project documents. Downward movement of the pier has been small - less than one-quarter inch over a period of 36 hours. Deflection of the turbine building as measured by nearby benchmarks has been less than .005 inch.

The construction of the N-S drifts to piers E/W9 and W11 was in accordance with the project documents and good underpinning practice. The lagging was securely installed behind the drift sets and backpacking was generally adequate.

A few spacer blocks were located so close to the set supports that good backpacking was difficult to achieve in these areas. Future lagging work should avoid this condition. The use of excelsior was avoided since no groundwater seepage was present. Previously installed excelsior in the N-S drift to pier 9E was removed.

Pier excavation and support at piers E/W9 was for the most part well done. However, narrow lagging set spacers of 1 inch or slightly less in the upper 8-10 ft. of the pier excavations makes proper backpacking and inspection extremely difficult. The Team does not agree with the use of the nominal 1 inch spacers to separate lagging sets. This separation does not provide sufficient space to adequately backpack or inspect behind the lagging. A 1½ inch minimum spacing should be maintained (unless ground conditions require closing the gap) to allow proper backpacking and inspection.

Quality Control, Documentation and Records - The quality-related procedures observed or verified by the Team were properly implemented.

Quality Assurance Overview of MPQAD-Soils Requalification and Certification Prog:

The Assessment Team has completed an overview of the classroom training and examination portions of the process required for MPQAD certification.

MPQAD has established a training group specifically charged with developing and presenting the required information as well as overseeing the testing of the comprehension of the classroom information. Basically, the procedure initially requires all personnel to complete courses in (1) Quality Assurance Indoctrination; (2) Midland Plant Quality Procedures (MPQP) 1 and 2; and 3) Field Soils Organization (FSO) procedures on work and excavation permits, coordination forms, and emergency plans. The QA Indoctrination course discusses such topics as the site QA program and its goals, Federal regulations, general QA organizati and procedures, and the role of the NRC. MPQP 1 and 2 cover the specific soils related procedures to be implemented. The FSO training on work permits, excavation permits, and coordination forms explains the need for and proper use of the respective forms. The emergency plan training addresses the identification of an emergency condition and the defines responsibilities in responding to a given emergency. The Team reviewed the above referenced basic material and is satisfied that this training provides the proper framework to initiate specific technical and procedural training of the organization personnel.

The QA personnel subsequently receive programmatic QA and QC training and are required to pass examinations on these subjects. QC personnel are required to receive training in and pass an exam on the QC programmatic portion only. The Team reviewed the content of these courses and exams and has concluded that the necessary programmatic criteria have been met. Personnel having completed these courses should have an adequate understanding of the goals and procedures of Quality Assurance and the purpose and goals of quality control inspections.

The training for a specific technical procedure-Project Quality Control Instruction (PQCI) - is required for all QC personnel and QA personnel below Level III who will perform inspections on work covered by procedure. The format for the training to a specific PQCI consists of the preparation of a lesson plan and corresponding exam bank of questions by the training group. Prior to presentation, this material is reviewed by a Soils Level III QA Engineer (QAE). Once the comments of the QAE are resolved, the classroom training is scheduled and presented. The content of the courses is a combination of procedural and technical information with emphasis depending upon the subject material. Courses can last from minimum of a few hours to several days. Closed book exams, generally involving some 20 questions, are then given to the personnel. Those who receive a score of at least 80 percent proceed to the on-the-job training for that particular PQCI. In all cases, incorrectly answered questions are reviewed with the applicant to assure a proper understanding. For those who fail, retesting is required after review of the material with the course instructor.

The Team specifically reviewed numerous lesson plans and more than a dozen PQCI exam banks. These lesson plans and subsequent exams should result in MPQAD staff with a good understanding of the procedural and technical requirements of a particular PQCI. The lesson plans, exam banks, and the training records were kept well-organized. There is a security system in effect that keeps the exam questions from leaving the training room.

After completion of the on-the-job training, the final step in the certification process is a proficiency demonstration that is a "hand-on" test of the applicant's understanding of the inspection procedure. The portion of the certification process does not involve the speciality training group but is conducted by engineers from the Soils QA group. The Assessment Team did not witness any proficiency demonstrations this past week but have in the past been present at several (refer to Weekly Reports Nos. 13, 14, 17 and 18) and found these sessions to be thorough.

A Level III QA Engineer must give final approval for certification of the applicant.

The Team feels that the above approach to QA/QC training results in personnel who have a good understanding of the subject materials and who have the knowledge to carry out their duties correctly and thoroughly.

Future Assessment Team activities will include surveillance of classroom training, QC proficiency demonstrations, and training records.

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Quality Assurance Overview of Training of FSO Personnel (Excluding MPQAD Personnel)

The Assessment Team reviewed the administrative guideline on Field Soils Organization Training. The guideline dictates that QA Indoctrination and MPQP 1 and 2 be presented to all FSO personnel and that Emergency Plans, Bechtel Field procedures and Subcontractor procedures are required for selected personnel in the organization. An organization chart is included in the guideline. The guideline identifies that a FSO Training Coordinator be named to coordinate activities and maintain training records. The Team feels that the training stipulated in the guideline adequately prepares the FSO personnel to perform in the soils remedial work effort. The Team also reviewed the training matrices for Resident Engineering, and two Subcontractors - Mergentime and Spencer, White and Prentise. It is the opinion of the Team that the training fulfills the procedural requirements of the Midland Plant Quality Plan and that the individuals are adequately trained for their particular level of responsibility. A follow-up Review of the training records indicated that implementation of the procedures is being accomplished.
Future Assessment Team effort in this area will consist of observation of the classroom training sessions and random surveillances of personnel records to insure adequate training is being obtained.

Overview of Design Work Packages

The Assessment Team reviewed the design work package on Rebar Mapping and Core Drilling for Instrumentation Raceways in the SWPS. The Team found the package was generally complete with the following exceptions - (1) Drill permits were not stamped with the rebar mapping stamp required by an administrative guideline, (2) Final Project Engineering approval of a Field Change Request had not been obtained, and (3) The referenced FCR was difficult to understand dimensionally. Understanding could only be gained through indirect reference to an architectural drawing. A meeting was held with the SMO groups of CPCo to discuss this package and how future work package overviews by the Team would be implemented

Non-Conformance Identification Reports

Status of previous issues: (NIR numbers on longer listed have been closed-out.)

NIR NO.	Description	Date (Opened)	Date (Closed)
5	Concrete Mix Qualification	2/10/83	

W E Kilker QFB
Project Engineer

A. S. Fuchs QFB
Project Manager

INDEPENDENT ASSESSMENT TEAM MEETING WITH BECHTEL

Date: March 7, 1983

Attendees:	Bechtel	Stone/Webster	MPQAD	CPCo
	E. Cvikl	A. Lucks	R. Sevo	R. Visser
	J. Fisher	W. Kilker		J. Moran
	J. Gaydos	L. Rouen		
		Parsons		
		J. Ratner		

1. E. Cvikl advised that trial mix preparation of the proposed concrete mix design had been completed. Results will be forwarded to Project Engineering for analysis.

2. J. Fisher reported that Quality Control release of the jackstands for pier W12 had not been obtained. However, dress rehearsal for load transfer is still scheduled for March 8, 1983.

3. J. Gaydos reported that a study of concrete placement records indicated that the FIVP mat was done monolithically eliminating the concern to core for a "cold joint" in the concrete.

4. J. Ratner will discuss the procedure for calibrating the FIVP load check jacks with L. Morris of Bechtel.

5. P. Barry described review of work activity request package on core drilling in the SWPS. Will meet with CPCo on March 8, 1983.

6. J. Ratner asked for a clarification on unique requirements for grout strength on the top and bottom leveling plates for pier W12. J. Fisher will respond.

7. P. Barry discussed the general applicability of a drawing detail on welding re-shore channels to drift sets.

INDEPENDENT ASSESSMENT TEAM MEETING WITH BECHTEL

Date: March 8, 1983

Attendees:	Bechtel	Stone/Webster	MPQAD	CPCo
	J. Fisher	Paul Berry	R. Visser	D. Puhalla
	J. Gaydos	W. Kilker	J. Moran	
		A. Scott		
		Parsons		
		J. Ratner		

1. E. Cvikl will respond to the request for clarification of the strength requirements for grout behind the leveling plates.

2. Dress-rehearsal for the load transfer at pier W12 is March 9,1983.

3. J. Fisher said coring of the FIVP will not be required. However, a "mud-mat" approximately 4 inches thick has been encountered above the membrane and is being removed in the N-S access to piers E/W 9.

4. J. Fisher provided a copy of a Field Instruction on "Construction Aids."

5. J. Fisher discussed the use of excelsior between lagging in areas with no groundwater seepage with resident geotechnical engineering. Generally such usage of excelsior will be avoided in the future.

INDEPENDENT ASSESSMENT TEAM MEETING WITH BECHTEL

Date: March 9, 1983

Attendees:	Bechtel	Stone/Webster	MPQAD	CPCo
	J. Fisher	P. Barry	R. Visser	G. Murray
	J. Gaydos	W. Kilker		
		A. Scott		
		Parsons		
		J. Ratner		

1. J. Fisher informed the meeting that beginning March 14, 1983 Mike Blendy of the Constructability group and L. Weight the area Superintendent will also attend the daily meetings.

2. J. Fisher advised that the telltale linkage between the pier and turbine mat on pier W12 is located in such away that installation of the wedges will be difficult. Resident engineering will resolve.

3. In response to earlier discussions, J. Fisher said the NCR on grout at pier W12 applies to grouted care holes not to dry-pack grouting of the leveling plates.

4. W. Kilker stated that the Team is overviewing the design work packages that CPCo will submit to the NRC. FSO will offer support for this effort as necessary.

INDEPENDENT ASSESSMENT TEAM MEETING WITH BECHTEL

Date: March 10, 1983

Attendees:	Bechtel	Stone/Webster	MPQAD	CPCo
	J. Fisher J. Gaydos	W. Kilker	R. Visser	G. Murray

Parsons

J. Ratner

1. J. Fisher provided the response from E. Cvikl describing the reasons for unique grout strength requirements on different piers. Basically, it relates to the pier design and the loads on the pier.

2. "Dress-rehearsal" for the load transfer was held March 9, 1983. However, the monitoring telltale was not installed last night. Plan is to complete the installation this morning and load transfer starting in the PM.

3. J. Fisher said a material availability matrix is being introduced into their word processor to allow better planning.

4. W. Kilker said an interim report covering the September thru March period will be issued by the Assessment Team by the end of March.

INDEPENDENT ASSESSMENT TEAM MEETING WITH BECTHEL

Date: March 11, 1983

Attendees:	Becthel	Stone/Webster	MPQAD	CPCo
	J. Fisher	W. Kilker	R. Visser	G. Murray
	J. Gaydos			
	E. Cvikl			

Parsons

J. Ratner

1. J. Fisher stated the FCRs on the telltale installations have been dispositioned. Load transfer will be today.

2. J. Fisher reported there is a welding NCR on one of the jackstands for E12 that is impacting the schedule.

3. The decision has been made that NPS will perform long-term fabrication of embeds, beams and jackstands. On-site fabrication will continue for lagging and drift sets.

4. J. Fisher stated that in response to a concern of J. Ratner, spacers on pier lagging will generally by 1½" (inch) thickness to permit backpacking and inspection.

APPENDIX E

NONCONFORMANCE IDENTIFICATION REPORTS

This appendix contains the nonconformance identification reports issued by the Assessment Team during the period September 20, 1982 through March 12, 1983.

STONE AND WEBSTER ENGINEERING CORPORATION

NONCONFORMANCE IDENTIFICATION REPORT

DATE OF NONCONFORMANCE: 10/24/82 NIR Number 1

IDENTIFICATION/LOCATION OF ITEMS: Procedure for Mechanical Splicing of Reinforcement (MCP 16.000; Rev. 3.)

DESCRIPTION OF NONCONFORMANCE: Technical Specification for Underpinning of Auxiliary Building and Feedwater Isolation Valve Pits (para 11.5.3-g) requires subcontractor's procedure for Mechanical Splicing of Reinforcement to provide a method of mechanically locking the position splices.

The Mergentime Procedure does not provide for mechanically locking splices.

INITIATOR:	DATE:	PROJECT MANAGEMENT CONCURRENCE:
L. T. Rosen	10/24/82	A. S. Sacks per WRK

CORRECTIVE ACTION BY: MPQAD - SOILS
(IDENTIFY ORGANIZATION TAKING CORRECTIVE ACTION)

On 11/24/82 a Quality Action Request (QAR) was issued recommending corrective action on NIR No. 1(see attached copy of QAR).

On 12/8/82, MPQAD completed corrective action on the QAR as shown on the attached copy of NIR No. 1

The Assessment Team concurs with the action taken in deleting the specification requirement for preparing procedure on mechanically locking the position splices since position splices will not be used in the underpinning work.

INITIATOR CONCURRENCE:	PROJECT MANAGEMENT CONCURRENCE:	DATE:
LT Rosen per	A. S. Sacks per WRK	12-9-82

WRBird IJha JARutgers
JERrunner MJuister TKSu[illegible]manian
JWCook GSkeeley DATa[illegible]ert
MLCurland BWMarguglio ECVikl
MADietrich REMcCue RAWells
'Fisher JAMooney JKMeisenheimer
Anel RLOliver DBMiller

QUALITY ACTION REQUEST

JCShah
ALAB-2

CLOSED

PRIORITY: 03 SUS: PGMORO TREND: 1-8 AI: S 1850

(1) From:
Jagdish Shah/Don Horn Soils QAE

(2) To:	(3) Control Document ref.:	(4) QAR Identification No.:
NSwanberg/RCHollar	Spec C-195/MCP 16.000	F-234

(5) Action Requested:
Bechtel Specification 7220-C-195(Q), Rev 0, Section 11.5.3 states in part "..... as a minimum, the reinforcement splicing procedure shall include the following: ..... (g). method of mechanically locking the position splices."

Contrary to the above the current Mergentime procedure for Mechanical Splicing of Reinforcement (MCP 16.000, Rev 3) does not provide for mechanically locking splices. (Found by S & W)

RECOMMENDED CORRECTIVE ACTIONS: (Discussed with AGoel AAO)

(1) Project Engineering to evaluate the need to revise Spec C-195 and or Mergentime Procedure MCP 16.000, Rev 3 to include the above requirement or design criteria. Ref: Current design does not utilize mechanical locking the position splices.

(2) Revise other technical specifications/and or procedures as applicable (such as C-194).

(3) Determine reason for omission and any action to prevent recurrance.

Signature:	(6) Date:	(7)	(8) Reply Requested by:
[signature]	CLOSED 11/24/82 5/14/83		(1) 12/15/82 (2) & (3) 12/24/82

(9) Reply: 1. The position splice shall not be used and section 11.5.3g has been deleted in Revision 1 of Specification 7220-C-195(Q). The Mergentime procedure MCP 16.000 is now consistent with Specification.

2. Other related specifications including Specification 7220-C-194(Q) and procedures have been checked or revised to exclude any requirement of position splice.

3. NRC did not approve the use of Fox Howlett position splice. Cognizant engineer's have been advised accordingly not to consider the use of position splice.

(10) Signature:	(11) Date:
RCHollar for LHCurtis Trans. # 220392 RCHollar for LHCurtis Trans. # 227108	12/27/82 1/27/83

(12) Action Verified:	(13) Date:
[signature]	2/14/83

STONE AND WEBSTER ENGINEERING CORPORATION

NONCONFORMANCE IDENTIFICATION REPORT

DATE OF NONCONFORMANCE: 10/21/82 NIR Number 1

IDENTIFICATION/LOCATION OF ITEMS: Procedure for Mechanical Splicing of Reinforcement (MCP 16.000; Rev. 3.)

DESCRIPTION OF NONCONFORMANCE: Technical Specification for Underpinning of Auxiliary Building and Feedwater Isolation Valve Pits (para 11.5.3-g) requires subcontractor's procedure for Mechanical Splicing of Reinforcement to provide a method of mechanically locking the position splices.

The Mergentime Procedure does not provide for mechanically locking splices.

INITIATOR:	DATE:	PROJECT MANAGEMENT CONCURRENCE:
L. T. Bruen	10/21/82	A. S. Lacks for FTK

CORRECTIVE ACTION BY: MPQAD - Soils
(IDENTIFY ORGANIZATION TAKING CORRECTIVE ACTION)

Quality Action Request (QAR) F-234 (Attached) covers the concern identified above. Also, Specification C-195 Revision 1 deleted the requirement in Para 11.5.3g, because the requirement was not applicable.

Donald E. Horn 12/6/82

INITIATOR CONCURRENCE:	PROJECT MANAGEMENT CONCURRENCE:	DATE:

STONE AND WEBSTER ENGINEERING CORPORATION

NONCONFORMANCE IDENTIFICATION REPORT

DATE OF NONCONFORMANCE: October 28, 1982 NIR Number 2

IDENTIFICATION/LOCATION OF ITEMS: Technical Specification for Underpinning of Auxiliary Building and Feedwater Isolation Valve Pits, and associated C1400 Series Drawings, located at MPQAD and QC.

DESCRIPTION OF NONCONFORMANCE: The MPQAD and QC controlled copies of the above Specification and Drawing are missing the following change documents:

QC's - 1) Specification - Specification Change Notice (SCN) No. 12002, 12003, and 12004.

QC and MPQAD 2) Drawing C1424-2 - Drawing Change Notice (DCN) No. 7 Field Change Request (FCR) - No. C4743 and C4485.

INITIATOR:	DATE:	PROJECT MANAGEMENT CONCURRENCE:
Barry L. Holsinger Barry L. Holsinger	October 28, 1982	Wayne Kitlan for A. S. Lucke

CORRECTIVE ACTION BY: MPQAD
(IDENTIFY ORGANIZATION TAKING CORRECTIVE ACTION)

On December 8, 1982 SWEC received the attached response to the observed non-conformance. On December 12, 1982 the corrective action was verified by observing that the referenced documents were at the appropriate stations.

INITIATOR CONCURRENCE:	PROJECT MANAGEMENT CONCURRENCE:	DATE:
B. L. Holsinger by LTR	A. S. Lucke by WEK	12-14-82

STONE AND WEBSTER ENGINEERING CORPORATION

NONCONFORMANCE IDENTIFICATION REPORT

DATE OF NONCONFORMANCE: October 28, 1982 NIR Number 2

IDENTIFICATION/LOCATION OF ITEMS: Technical Specification for Underpinning of Auxiliary Building and Feedwater Isolation Valve Pits, and associated C1400 Series Drawings, located at MPQAD and QC.

DESCRIPTION OF NONCONFORMANCE: The MPQAD and QC controlled copies of the above Specification and Drawing are missing the following change documents:

QC's - 1) Specification - Specification Change Notice (SCN) No. 12002, 12003, and 12004.

QC and MPQAD 2) Drawing C1424-2 - Drawing Change Notice (DCN) No. 7 Field Change Request (FCR) - No. C4743 and C4485.

INITIATOR:	DATE:	PROJECT MANAGEMENT CONCURRENCE:
Barry L. Holsinger Barry L. Holsinger	October 28, 1982	Wayne Kitlan for A. S. Lucas

CORRECTIVE ACTION BY: MPQAD - Soils
(IDENTIFY ORGANIZATION TAKING CORRECTIVE ACTION)

Item 1) Revision 1 to C-195 has been received in Soils QC and incorporates SCNs 12002, 12003 and 12004. The QC file is now current regarding C-195.

Item 2) Revision 3 to C-1424 has been received in Soils QA and QC and incorporates DCN #7 and FCRs C-4743 and C-4485. QA and QC files are now current regarding Drawing C-1424.

In addition, Soils QA and QC are presently performing a check of all controlled copies of design documents and vendor prints distributed to us. This is to verify we have the latest versions of these documents. The check will be completed and orders for new or updated copies placed by 12/13/82.

REF 12/8/82
Donald E. Horn 12/9/82

INITIATOR CONCURRENCE:	PROJECT MANAGEMENT CONCURRENCE:	DATE:

STONE AND WEBSTER ENGINEERING CORPORATION

NONCONFORMANCE IDENTIFICATION REPORT

DATE OF NONCONFORMANCE: 12/8/82 NIR Number 3

IDENTIFICATION/LOCATION OF ITEMS: Specification 7220-C 195(Q) Rev. 1, and U. S. Testing Co. Inc. QCP-11, Rev. 2 - Testing of splices for Qualification of Splicers and Production Splices made by Splicers.

DESCRIPTION OF NONCONFORMANCE: ASME, Section III, Div. 2, Para. CC-4333.5.4 requires splice tensile test for all tapered threaded splices be conducted at 20°F(-7°C). QCP 11 - Rev. 2, Section VI, Para. 2-1 specifies splice tensile test to be conducted at 60°F minimum.

INITIATOR:	DATE:	PROJECT MANAGEMENT CONCURRENCE:
A B Scott	12-8-82	A. S Lucki by LTR

CORRECTIVE ACTION BY: CPCo.
(IDENTIFY ORGANIZATION TAKING CORRECTIVE ACTION)

CPCo has prepared an SAR change for submittal to the NRC that delineates the applicable requirements for crew qualifications and tensile testing of the Fox-Howlett couplers. This SAR change takes exception to the ASME Section III Division 2 requirements for low temperature testing. At the same time the SAR change endorses the requirements of ACI 349. Since the ASME III Division 2 Code applies only to concrete containments and ACI 349 does not detail requirements for taper threaded splices, the SAR commitment forms the criterion to be used for installation, inspection and testing of Fox-Howlett couplers.

INITIATOR CONCURRENCE:	PROJECT MANAGEMENT CONCURRENCE:	DATE:
A.B. Scott by LTR	A.S. Lucki by LTR	1/21/83

STONE AND WEBSTER ENGINEERING CORPORATION

NONCONFORMANCE IDENTIFICATION REPORT

DATE OF NONCONFORMANCE: December 28, 1982 NIR Number 4

IDENTIFICATION/LOCATION OF ITEMS: Mergentime procedure on welding (MCP 19.000 Rev 6) - qualification restrictions on stainless steel to carbon steel welding. (Refer to Attachment E - MCP 19.)

DESCRIPTION OF NONCONFORMANCE: The project procedure permits electrode weld wire sizes that exceed the size used in the qualification process - in this case 1/8 inch and 5/32 inch diamenter. The AWS D1.1 (1972-74) ~~standard~~ restricts the use of electrode sizes only to those sizes qualified by demonstratio (Refers to pgs 25 and 26-29 of MCP 19). In addition, the procedure allowables on amperage and voltage exceed the qualification level by more than the 15% variance stipulated in AWS D1.1 (Refer to pgs 25 and 26-29 of MCP 19).

INITIATOR:	DATE:	PROJECT MANAGEMENT CONCURRENCE:
Barry L. Holsinger by RT Rowen	12-21-82	A. S. Zurko by WEK

CORRECTIVE ACTION BY: Midland Plant QA Department
(IDENTIFY ORGANIZATION TAKING CORRECTIVE ACTION)

MPQAD Soils responded to the items identified above by coordinating a new revision of MCP-19.000 with Mergentime Corporation the first week of January 1983. Mergentime Corporation had a first draft of revision 7 by 1/6/83 for MPQAD review which included a revision to the qualification process identified above and restricted amperage and voltage for the electrode size to ±15 %. Rev. 7 of MCP-19.000 was approved by MPQAD, 1/13/83.

In addition to the above, no work done to the welding procedure specification (attachment E, MCP-19.000) prior to revision 7 of MCP-19.000.

Approved MPQAD Soils:
JK Meisenheimer 2/4/83

CHANGES HAS BEEN VERIFIED BEH

INITIATOR CONCURRENCE:	PROJECT MANAGEMENT CONCURRENCE:	DATE:
B. L. Holsinger 2-4-83		2-8-83

STONE AND WEBSTER ENGINEERING CORPORATION

NONCONFORMANCE IDENTIFICATION REPORT

DATE OF NONCONFORMANCE: February 10, 1983 NIR Number 5

IDENTIFICATION/LOCATION OF ITEMS: CONCRETE MIX C-5C

DESCRIPTION OF NONCONFORMANCE Documentation for the approval of mix C-5C did not meet the requirements of ACI-301. The mix was approved for use with and without a high range water reducer. The trial mix data for the mix using water reducer consisted of one w/c ratio point, rather than three. None of the data points, for either mix, established strength values 1200 psi above f'c. Three of the slumps used in establishing the data were not within one inch of the maximum allowed.

INITIATOR:	DATE:	PROJECT MANAGEMENT CONCURRENCE:
L. T. Rowen	2/10/83	A. S. Fuchs PFB

CORRECTIVE ACTION BY:
(IDENTIFY ORGANIZATION TAKING CORRECTIVE ACTION)

INITIATOR CONCURRENCE:	PROJECT MANAGEMENT CONCURRENCE:	DATE: