

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

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

TESTIMONY OF JAMES A. MOONEY
ON REMEDIAL SOILS WORK

I. Introduction and Scope

My name is James A. Mooney. I am Executive Manager - Midland Project Office. I have responsibility for the remedial soils work now being undertaken by the Midland Project. My testimony describes the significant steps the Company is taking in order to successfully complete the remedial soils project. To place these steps in proper perspective, this testimony discusses the events in the soils area leading up to and including the major action announced by the Company in Mr. Cook's September 17, 1982, letter (Serial No. 18845) to Mr. Denton and Mr. Keppler. It further addresses the implementation of the commitments in the September 17, 1982, letter and provides a progress report regarding underpinning work completed thus far.

My experience and background are described in detail in the resume appended to my testimony (Appendix 1). The following is a summary:

I have been Executive Manager - Midland Project Office since August, 1981. Previously I was associated with Alabama Power Company for more than 21 years and held positions of major responsibility associated with providing generating facilities for that system. Prior to my current position, I was Project Manager for the Farley Nuclear Plant Units 1 and 2. In that position, I directed all activities to insure the successful completion of the facility. Previously, I was responsible for directing the overall system construction services activities including: contracts, budgets, quality control, material services, geologic services, and concrete and soils.

I am a Registered Professional Engineer and a member of Phi Kappa Phi, Tau Beta Pi, and Eta Kappa Nu Honorary Societies. I received my BEE from Auburn University in 1963 and MSEE from Auburn University in 1970.

II. Background

The Consumers Power Company September 17, 1982, action plan was the result of concern both on the part of Consumers Power Company and on the part of the NRC Staff with the progress and performance of soils remedial work and quality assurance implementation. A number of events in calendar year 1982 brought these concerns to a focus in September, 1982.

In early March, the Company and NRC Staff had a technical difference relating to the appropriate quality requirements for the proposed underpinning work. On March 30, 1982, the Company accepted the Staff's position. However,

certain Staff members felt they had been misled during an earlier phone call. After a formal investigation, the Region determined that no material false statement had been made, but I believe the incident adversely affected Region III's confidence in the soils work. (Further testimony on this subject appears in the "Testimony of J. A. Mooney and R. M. Wheeler Concerning the Alleged Violation of the April 30 Order and March, 1982, Cable Pulling Incident.")

In April, 1982, the Company met with representatives of NRC Region III to discuss a draft SALP Report critical of soils QA performance for the reported SALP period. The Region stated that soils QA as of the report date was only minimally acceptable.

Additionally, in the Spring of 1982, drilling and excavation problems resulted from inadequate procedures and controls. These specific problems were later resolved by the creation of an excavation permit system, but their occurrence suggested a need for more basic changes. The Board's April 30 Order, which resulted in part from these implementation problems, also indicated this need. In May, the Company, as a result, began a comprehensive review of the soils remedial work. This included an evaluation of the resources committed to the soils project, the QA/QC effort on soils, and needs for improved overall implementation of soils work. The immediate result of this consideration was the July, 1982, decision to consolidate

soils QA and QC under MPQAD, as described more fully below. Other steps were also under review.

In August, 1982, the Company stopped all ongoing soils work as a result of an accusation that it had violated the Board's April 30 Order. Although I do not believe the Order was violated, the incident further pointed out that some basic changes were necessary to bring the job up to both our and the Region's expectations. The Company, at that time, entered into a work authorization system with Region III to resolve the specific concern giving rise to the allegation that the Order had been violated.

In a meeting on September 2, 1982, the Company proposed a number of steps in addition to the consolidation of soils QA and QC, to assure the successful implementation of all aspects of the planned soils remedial construction. These measures amounted to a major change in the Company's methodology for carrying out the job. The specific actions were detailed in Mr. Cook's September 17, 1982, letter (Serial No. 18845) to Mr. Denton and Mr. Keppler (Appendix 2). These revisions and additions to the job implementation plan were the culmination of a number of discussions with the NRC Staff, in-house analysis and consideration of soils remedial work to date.

III. The September 17 Action Items

The proposal by the Company and its Action Plan incorporated seven major items:

- (1) Retaining a third party to independently assess the implementation of the auxiliary building underpinning work,
- (2) Integrating the soils QA and QC functions under the direction of MPQAD,
- (3) Creating a "Soils" project organization with dedicated employees and single-point accountability to accomplish all work covered by the ASLB Order,
- (4) Establishing new and upgraded training activities, including a special quality indoctrination program, specific training in underpinning activities, and the use of a mock-up test pit for underpinning construction training,
- (5) Developing a quality improvement program (QIP), specifically for soils remedial work,
- (6) Increasing Senior Management involvement in the soils remedial project through weekly, onsite management meetings wherein both work progress and quality activities are reviewed, and
- (7) Improving systems for tracking of and accounting for design commitments.

In the following testimony I will discuss the details of the seven items included in the September 17 action plan.

1. Independent Assessment

Mr. Cook's September 17, 1982, letter states: "A third party will be retained to independently appraise the initial

phases of the construction of the auxiliary building underpinning."

A. Selection of Independent Assessment Team

After a review to determine the most acceptable and qualified contractors, the Company decided to retain the firms of Stone & Webster Engineering Corporation (S&W), a highly respected engineering and construction firm, and Parsons, Brinckerhoff, Quade & Douglas (Parsons), an engineering, design, planning and construction management firm with recognized underpinning expertise, to carry out the assessment. Following the meeting with the NRC on September 2, 1982, in which the Company described its plans, the Company executed the necessary contractual documents, prepared and reviewed implementing plans and procedures, and arranged for the presence of S&W/Parsons onsite by September 20, 1982.

The independent third-party assessment includes both a review of the soils design documents and construction plans and observation of the construction itself to assure that (1) the design intent is being implemented, (2) that construction is consistent with industry standards, (3) that the Quality Assurance program is being implemented satisfactorily and (4) that construction is being performed in accordance with construction documents.

On September 28, 1982, the Company and the S&W/Parsons team met with the NRC Region III Staff to discuss communications among S&W/Parsons, the Company, and NRC, as well as the process

S&W/Parsons would use to report assessment results and findings. Subsequently, on November 5, 1982, the NRC convened a public meeting to discuss the scope of the assessment, S&W's and Parsons' credentials, and S&W's and Parsons' independence. At this meeting, the Company presented qualifications of all S&W's and Parsons' personnel assigned to the assessment team. On November 15, 1982, the Company transmitted to the NRC information responding to certain questions raised in the November 5, 1982 meeting regarding S&W's independence (Attachment C to the February 24, 1983, Keppler to Cook letter (Appendix 3)). The NRC made further requests for information on that subject and S&W responded on February 14 and 15, 1983. (Attachments A and B to the February 24, 1983, Keppler to Cook letter (Appendix 3)).

B. The S&W/Parsons Program

a. Qualifications

The S&W/Parsons Team is highly qualified to carry out the independent assessment of the Midland underpinning effort. Stone & Webster is a large, highly experienced and well respected engineering and construction firm with considerable nuclear power plant design and construction experience. S&W has direct experience conducting independent assessments at the Summer and Diable Canyon Nuclear Stations. Parsons brings to the assessment team special experience in the field of soils construction, particularly underpinning. The Parsons firm has extensive experience in foundations, tunnelling, excavation and

support of underground caverns and underpinning much of which has been in conjunction with the San Francisco, Washington, Baltimore and Atlanta mass transit systems. The S&W/Parsons team includes individuals with expertise in quality assurance, design and construction as well as members specifically skilled in underpinning techniques.

The particular individuals assigned to the S&W/Parsons assessment team are all highly qualified personnel with impressive credentials and a number of years of soils experience. The S&W and Parsons Project Managers are experienced in both design and field aspects of soils-related construction, and each has over 20 years experience in soils work and a number of years in management capacities within those fields. At the November 5, 1982, meeting both S&W and Parsons presented credentials of all individuals on the assessment team to the NRC and the public. By letter dated February 24, 1983, the NRC Staff informed Consumers Power that S&W/Parsons satisfied its criteria for competence. (See Appendix 3.)

b. Team Independence

The assessment team meets the independence criteria established by Commissioner Palladino in his letter of February 1, 1982 to Congressmen Ottinger and Dingell and implemented in the Company's Specification CC-100 issued September 20, 1982. S&W and Parsons have attested to their Corporate independence by information and affidavits supplied to the NRC and attached to Mr. Keppler's February 24, 1983, letter

to Mr. Cook (Attachment A to February 24, 1983, Keppler to Cook letter (Appendix 3)). Moreover, at the NRC's request, the members assigned to the assessment team have individually supplied affidavits pertaining to their own independence from Consumers Power company, Bechtel and the Mergentime Corporation. (Attachment B to February 24, 1983, Keppler to Cook letter (Appendix 3)).

Specifically, neither S&W/Parsons, nor its personnel assigned to perform the work at Midland, have had any direct previous involvement with the Midland activities being reviewed by S&W/Parsons. S&W/Parsons and its personnel assigned to perform the independent assessment have not been previously hired by Consumers Power Company to perform the design, construction, or quality work relative to the soils remedial program. The personnel assigned to this independent assessment have not been previously employed by Consumers Power Company within the last three years. Further, the S&W/Parsons personnel assigned to the assessment project do not have household members employed by Consumers Power Company, do not have any relatives employed by Consumers Power in a management capacity, and do not own or control significant amounts of Consumers Power Company stock. In the February 24, 1983, letter (Appendix 3), Mr. Keppler stated that S&W/Parsons met the independence criteria.

c. Scope of Work

The scope of the assessment is defined in Consumers Power Company Specification CC-100 (Rev. 1) as follows:

- 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 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 days after receipt of the scope revision.

In accordance with paragraph j of the foregoing, the scope was expanded in my letter of February 24, 1983 (Appendix 4), to include the following:

- (1) Provide a QA overview and assessment of the design work packages to ensure accuracy and adequacy. This overview is to insure conformance to procedural and programmatic requirements.
- (2) Provide a QA overview and assessment of the QC inspector requalification and certification program.
- (3) Provide a QA overview and assessment of the training conducted for all personnel in the soils remedial work effort.
- (4) 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 Michigan, Inc. is in effect.

S&W/Parsons independent assessment will cover at a minimum the first three months of the Auxiliary Building underpinning work which has been authorized by the Nuclear Regulatory Commission. The independent assessment program is to continue, however, until the independent assessment team concludes; (1) that the design intent of the remedial construction program is being fully implemented and (2) the remedial

construction work is consistent with industry standards. The independent assessment will also continue until the assessment team has assured itself that the Quality Assurance program is being implemented and the work is being done in accordance with the construction documents.

d. Activities to Date

The S&W/Parsons assessment team was on-site and began the assessment of the auxiliary building underpinning work on September 20, 1982. To support the independent assessment, Consumers Power Company has made available such information as design and construction drawings, specifications and procedures, building and pier monitoring data, and construction schedules. Access to facilities needed by Stone & Webster and its approved subcontractors has been provided. By November 5, 1982, Stone & Webster had reviewed the vertical access shaft, the material storage area, the test facility and off-site batch plant, and the Quality Assurance documents. This fact is summarized in the letter from the NRC dated November 22, 1982, which documented the November 5, 1982, meeting between Consumers Power Company, the NRC and the public.

By February 11, 1983, Stone & Webster had observed the excavation, placing of reinforcement, and concreting of Pier W-12, and the excavation and placing of reinforcement for Pier E-12. In addition, the assessment team had reviewed the drawings, procedures and other documents pertaining to the underpinning work and observed performance of the QA and QC

organizations during the progress of such work. During this period, the assessment team was on the site and had daily meetings with construction, quality and engineering personnel to obtain information and discuss the assessment team's observations.

As of the date of this testimony, the S&W/Parsons team has not completed their final report in accordance with paragraph h of the Scope of Work, as amended, set forth above.

C. Reporting and Communication

The S&W/Parsons team assigned to the Independent Assessment reports to the Company and to the NRC Staff in several ways. The team holds daily meetings with Company personnel and Bechtel personnel. The NRC Staff has been invited to these meetings. The daily meetings are summarized in the weekly reports which the team issues on the activities covered during that particular week. Each weekly report summarizes the activities which the team has observed, the meetings which they have attended, the quality documents and records which they have reviewed and the observations which they made concerning the work activities.

In addition, when the team observes an item of deviation, for example, between a specification or drawing and the written work procedures, between a specified code and the work procedures, between construction materials and specifications for materials, or from good construction practice, it

writes a "Nonconformance Identification Report" (NIR). These NIRs are held open until the Company provides an acceptable resolution.

At the conclusion of the first three months of the Auxiliary Building underpinning work, S&W/Parsons is required to provide a report to the NRC with a copy to Consumers Power. Prior to submission, senior S&W/Parsons management are to review the contents of the report with the team members for completeness and accuracy. The report will summarize all of the team's observations on the underpinning work and give an overall assessment of the quality of construction.

All documents issued by the team including weekly reports, letters, the final report and NIRs are sent to the NRC and copies are issued to the Company. The purpose of this procedure is to assure that the Company exerts no editorial influence over the contents of documents or oral reports to the NRC.

In addition to these written reports, the S&W/Parsons team has met privately with the NRC Staff and reviewed the performance of this soils work.

2. Integrating Soils QA/QC Functions

Mr Cook's September 17 letter states:

"The project has reorganized the Soils QA/QC effort, creating an integrated organization with single point quality accountability under the MPQAD. This new organization is expected to improve QC performance, increase CP Co involvement in the management of the quality control function and improve QA/QC interfaces."

A major aspect of the incorporation of the Quality Control function within MPQAD is the recertification of Quality Control inspectors to Consumers Power Company procedures. This certification effort involves training and examination in three areas: (1) programmatic quality procedures, including programmatic quality plans, nonconformance procedures, and general quality procedures; (2) inspection plans, including inspection requirements, inspection methodologies, testing methodologies, hold points, etc; and (3) on the job training, followed by a performance demonstration to assure proficiency, which requires the satisfactory performance of an inspection under the observation of a certified inspector.

The NRC Region III had some concerns with our initial efforts at recertifying QC inspectors, as described in NRC Inspection Report 82-21. After the NRC advised us of its concerns, all Quality Controls inspectors previously certified to evaluate soils work were decertified and have been recertified to MPQAD procedures. Approximately 55 Quality Control inspectors have now been certified in one or more inspection plans. This is adequate to support present construction activities.

3. Soils Project Organization

Mr Cook's September 17, 1982, letter states:

"The project organization formed for the performance of the soils remedial work incorporates single-point accountability, dedicated personnel to the extent practical, minimum interfaces - particularly at the working level, and a quality organization integrating QA and QC. The soils project organization is tailored to the task at hand. The entire organization, including quality assurance and quality control are staffed

with well qualified, experienced personnel, augmented by design consultants and construction subcontractors nationally recognized in the underpinning field."

The term single-point accountability refers to the fact that I am in charge of and responsible for the performance of the soils remedial work, other than MPQAD's work. Subgroups responsible for portions of the work are managed by individuals who report directly to me. This approach towards responsibility provides uniform direction and direct accountability. Prior to this change, the soils project design, construction and various scheduling groups reported to different individuals either within CP Co or within Bechtel. For example, the engineering supervisor in charge of the design elements of the soils project reported through Bechtel's project engineering organization. Similarly, the construction supervisor responsible for soils work reported through Bechtel's construction organization. Under the present approach, both positions now report directly to a Bechtel Assistant Project Manager who in turn reports to me. The scheduling groups have been organized into an integrated group reporting directly to me.

In addition to the above, the organization structure after September 17, 1982 provided for improved and enhanced coordination between engineering, construction and quality aspects of the underpinning work. The Engineering, Construction and Quality groups participate in weekly project meetings wherein short-term schedules, objectives and goals are discussed. This

facilitates better coordination of engineering, construction and inspection activities.

Finally, the new organization brings a higher level management presence directly to the Midland jobsite. Under the new organization, a field soils manager controls all construction activities of the Bechtel Field Soils Organization and the soils subcontractors, the Mergentime Corporation and SW&P. Also onsite is an assistant resident project engineer responsible for design interface with construction activities. The quality group is headed by a Soils Superintendent.

4. Training Activities

The September 17, 1982 letter states:

"Extensive training programs for the soils underpinning work have been developed. This overall training program, which includes the major Construction and Quality organizations involved in soils work, covers both general training in quality and specific training relative to the construction procedures.

The majority of the personnel associated with Remedial Soils work have attended a special Quality Assurance Indoctrination Session. The QA indoctrination has been provided to Bechtel Remedial Soils Group, CP Co Construction, QC, QA, Mergentime and Spencer, White and Prentis (SW&P) personnel down to the craft foreman level. This training consists of one three-hour session covering Federal Nuclear Regulations, the NRC, Quality Programs in general and the Remedial Soils Quality Plan in detail.

With regard to the work procedures, a requirement on both Mergentime and SW&P is that specific training on the procedures be provided prior to initiating any quality related construction activity. The identification of individuals to receive this training is spelled out in each procedure pertaining to a specific construction activity. Completion of the specific training requirements is a QA hold point which must be satisfied before work can proceed.

In further recognition of the importance of training to the underpinning work, the Company is util-

izing a mock-up test pit as part of its training program for underpinning construction. The purpose of this test pit is to provide specific training in the construction of a pier, bell and grillage assembly from initial issuance of design drawings through completion of construction. This allows supervisory and craft personnel to perform work under the conditions, requirements and restraints which will be encountered when the actual underpinning starts. It also allows the various quality organizations to inspect the work and insure that their concerns and requirements are properly reflected in the procedures."

As initially envisioned, the training program did not require formal documentation of the training material or attendance rosters. In reviewing these activities, Region III raised concerns regarding the status of the training program and the lack of records documenting who had received the specific training programs. In response, the project developed a matrix specifying which individuals would receive the various training, by subject, position in the organization and discipline or group. On the basis of the matrix, a procedure was developed by MPQAD implementing the directions and defining record keeping requirements.

The original training program, and the one carried into the matrix, included instructions on the role of QA and QC, the function of the NRC, QA requirements and procedures (including specifically the QA plans, MPQP-1 and 2), emergency procedures, and the excavation and work authorization procedures. The training program required that craft personnel attend training in QA and special processes relating to particular tasks. After a review of the training program, Region III requested that the training of craft personnel be expanded to provide a more general

understanding of underpinning technique and awareness of problems which could be encountered. In compliance with Region III's request, Mergentime was requested to implement these changes and responded on February 16, 1983, that the training program was being upgraded accordingly.

A unique element of the training program at Midland involved the use of a mock-up test pit, which was located in a non-Q area of the site. The test pit provided hands-on experience in excavating, lagging, placement of reinforcing steel, and concrete placement. It also provided an opportunity for QA personnel to inspect and document the execution of underpinning activities in advance of the actual work. During mock-up pit operations, the project discovered deficiencies in the construction procedures, which were corrected, and also improved certain elements of the underpinning design.

5. Quality Improvement Program (QIP)

The September 17, 1982, letter states:

"The Company is establishing a separate Quality Improvement Program (QIP) for the soils project. Although not part of the formal Quality Assurance program, the QIP is a management system that should be helpful in communicating and reinforcing project policies and expectations to all project participants. To launch this effort, an indoctrination program will be presented to all individuals, stressing the absolutes of Quality and the concept of 'Doing it right the first time.' Measurements specific to soils will be developed for those critical areas which are indicative of a 'quality product.' Tracking these activities will provide an indication of the effectiveness of the program. The QIP will provide mechanisms for individual 'feedback' from all individuals involved, including the craft personnel."

The Quality Improvement Program Manual developed specifically for soils was issued September 24, 1982. Under this program, supervisors are trained in the principles of the QIP, and are responsible for training the individuals who work for them. The QIP philosophy emphasizes feedback to improve quality performance. Specific measurements and indications of quality are reported through a mechanism, which is apart from the formal requirements of 10 CFR 50 Appendix B. The QIP approaches quality from the standpoint of individual and group performance. The program also includes provision for recognizing quality performance on the part of individuals who are given awards on the basis of their contributions to improve quality.

6. Senior Management Involvement

The September 17, 1982, letter states: "The soils remedial effort also include a high level of senior management involvement." I conduct weekly in-depth reviews on site of all aspects of the work including quality and implementation of commitments. Mr. Cook meets onsite with this group an average of once a month and I personally brief Mr. Cook on the progress of soils remedial work at least once a week. In addition, the reporting chain, to the senior project personnel have been shortened. The Company's CEO is briefed on a regular basis and schedules bi-monthly briefings on all aspects of the project including soils. During the bi-monthly briefings, the CEO normally tours the Midland site.

7. Design Commitments

To assure that commitments made to the NRC are properly accounted for in design documents, CP Co and Bechtel have reviewed correspondence with the NRC and other documents generated in connection with the NRC's review of the design proposals. From this review, the Project created a computer listing of NRC commitments. This listing is updated on a periodic basis. Copies of it are provided to the NRC.

IV. Status Report on Remedial Soils Work To Date

Preparatory work for underpinning the auxiliary building has been completed. This included the installation of underground utility protection, installation and activation of the freeze wall, installation of necessary construction dewatering, installation of monitoring instrumentation, and installation of east and west access shafts.

On December 9, 1982, the NRC released the work activities for Piers E/W 12, which are located under the turbine building. Work commenced on Pier W 12 on December 13, 1982.

The soil excavation and lagging installation for the Pier W 12 access pit, a six foot by eight foot pit, commenced at el. 609 and extended down to approximately el. 600. A nine-foot long drift (tunnel) under the turbine building was then begun. A few inches into the drift the excavators encountered a vertical face of concrete. This was removed using a hydraulic rock splitter. When the drift was completed, excavation and lagging of the three foot by six foot pier began. In this process, probe

holes were advanced to determine if there was evidence of ground water. By January, 22, 1983, the pit in which the pier would be placed had been excavated to its approximate final depth. The bottom of the hole was then widened to accommodate the footing of the pier. At that point, reinforcing steel was installed up to about elevation 604. Instrumentation was then installed and concrete was placed on February 11, 1983. The upper and lower leveling plates were then bolted to the turbine building mat and the top of the pier, respectively. The level bearing assemblies and jackstands were installed and the load transfer was initiated around noon on March 11, 1983. Within 2-1/2 hours, the proof test load of 1,375 Kips had been applied. Some two hours later, the proof test load settlement criteria was satisfied (less than .01 inch for a continuous one hour period) and the load was reduced. On March 14, the acceptance criteria of .01 inch deflection maximum in 24 hours was attained, the wedges between the pier and bottom of the structure were inserted and the pressure in the jacks released.

Installation of Pier E 12, commenced on December 20, 1982, and was carried out in the same sequence as Pier W 12, but lagging Pier W 12 by one week. The one week lag time was to permit incorporation of "lessons learned". Remaining underpinning piers will be installed using the same methods as those used for Piers 12.

The NRC authorized the excavation and installation of Piers E/W 11 and Piers E/W 9 on February 22 and 24, 1983,

respectively. Piers E/W 11 and Piers E/W 9 are located under the turbine building. The drifts to Piers 9 pass under the FIVPs. The work on Piers 9 has been completed. The work on Piers 11 is presently in progress.

Also during February, the temporary support system for the FIVPs were jacked to insure the total FIVP load was being supported by the system. The temporary support was necessary because the Pier 9 drifts pass beneath the FIVPs. During jacking, a crack in excess of 10 mils developed on the western FIVP at a location where piping was supported. In accordance with procedures agreed upon with the NRC requiring that such cracks be evaluated, an engineering analysis was carried out by one of the Company's consultants, Construction Technology Laboratories. The analysis determined that the structural integrity of the FIVP was not threatened by the crack. A minor crack also developed at a similar location in the eastern FIVP. This crack was also evaluated and determined not to be structurally significant.

All of this work has been closely monitored by the S&W/Parsons independent soils assessment team and Region III, which identified no major problems.

As the Manager with direct responsibility for the remedial soils work, I am pleased with the success of the underpinning work thus far. I recognize that the complexity of this job will require a continuing forceful management presence to ensure its continued success. I am paying special attention to

feedback from the soils section of MPQAD on inspection findings. To this end, I and other top managers within the soils/group review nonconformance reports issued by MPQAD, as well as the reports of the S&W/Parsons assessment team. MPQAD has been reviewing nonconformance reports in an effort to identify and correct potential generic problems. In carrying out this effort, MPQAD recently reported to me that several nonconforming conditions indicated a problem with the welding for metal lagging to be used in underpinning excavations. With this information, the soils group was able to take prompt corrective action.

As a further measure to enhance communications between the soils project management organization and MPQAD, I have appointed an individual on my Staff to monitor quality indicators and maintain an inclusive list of nonconformances. This list is reviewed and the ten most critical items are brought specifically to management attention at weekly meetings. With these measures and the others described above, I am confident that project management is maintaining proper control over quality aspects of the job.

V. Conclusion

The Midland Project has taken a number of steps to improve the implementation of design, construction and quality assurance requirements in the soils area. These steps have substantially enhanced the performance of the job. I am satisfied that, with continued aggressive implementation of these measures and the other programmatic requirements, the soil

remedial work at Midland will be successfully completed and will present no undue risk to the public health and safety.

RESUME

JAMES A. MOONEY

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Jackson, Michigan 49201
Phone: (517) 788-0774

PERSONAL DATA

Date of Birth : March 24, 1940
Place of Birth: Wilsonville, Alabama (Shelby County)

EDUCATION

High School Diploma:

Holtville High School
Deatsville, Alabama
June, 1958

Bachelor of Electrical Engineering:

Auburn University
Auburn, Alabama
June, 1963

Master of Science in Electrical Engineering:

Auburn University
Auburn, Alabama
March, 1971.

REGISTRATIONS

Registered Professional Engineer
State of Alabama No. 7830

HONORS

Member of the following Honorary Societies:

Eta Kappa Nu
Tau Beta Pi
Phi Kappa Phi

DETAILED STATEMENT OF PROFESSIONAL EXPERIENCE

August, 1981 to Present

Executive Manager - Midland Project Office; Consumers Power Company; Jackson, Michigan

Responsible for directly managing all of the soils related activities. Relationship and authority for soils QA is limited to project coordination as specified by QA program requirements. Additionally, responsible for implementation and overview of the Midland Project Quality Improvement Program.

January, 1977 to August, 1981

Project Manager - Farley Nuclear Plant; Alabama Power Company; Dothan, Alabama

Responsible for all construction activities associated with completion and modification of Farley Nuclear Plant Unit 1 which achieved initial criticality in August, 1977. Responsible for all functions necessary to insure the successful completion of Farley Nuclear Plant Unit 2 and reported directly to the Project Review Board on all matters relating to scope, schedule, budget and procedures. These functions included but were not limited to; design, construction, quality assurance, licensing, procurement, expediting, project planning and cost engineering.

August, 1975 to January, 1977

Manager - Construction Services; Alabama Power Company; Birmingham, Alabama

Responsible for all construction service activities necessary to support the total major project construction effort of the Company which included two (2) nuclear units, five (5) fossil units and three (3) hydro units. These services included the following groups: Contracts, Budgets, Quality Control, Material Services, Geologic Services, Concrete and Soils. Major accomplishments included defining, developing and implementing the "Labor Broker" concept of construction at a new four (4) unit fossil site.

March, 1973 to August, 1975

Power Plant Material Superintendent; Alabama Power Company; Birmingham, Alabama

Responsible for coordinating delivery of all materials, equipment and drawings required in the construction of Company generating plant facilities. Major accomplishments included a redefinition of site-general office responsibilities to insure a more effective and responsive site organization.

March, 1971 to March, 1973

Assistant to Senior Vice-President; Alabama Power Company; Birmingham, Alabama

Work as assigned by Sr. Vice-President, Engineering and Construction, with major responsibilities in connection with construction of Company's first nuclear steam electric generating plant including participation in licensing procedures, development of construction and start-up schedules, coordination of engineering, procurement and construction, and involvement in quality assurance activities. Also participated in joint utility effort to develop a computerized construction management system and studied needs of Company relative to that system.

March, 1970 to March, 1971

Engineering Computer Applications Coordinator; Alabama Power Company; Birmingham, Alabama

Responsible for coordinating computer related engineering activities within Company and with the Service Company including identifying needs, developing programs and confirming results. This assignment required participation in industry groups and professional societies.

September, 1968 to March, 1970

Graduate Assistant; Auburn University, Auburn, Alabama

Obtained Masters Degree in Electrical Engineering under program sponsored jointly by Alabama Power Company and Auburn University. This program included teaching responsibilities in basic circuits, power system analysis and electrical machinery. Thesis was in area of digital load flow analysis of power systems.

February, 1967 to September, 1968

Staff Assistant; Transmission and Distribution; Alabama Power Company; Birmingham, Alabama

Conducted special projects as assigned by Vice-President, Transmission and Distribution, including such items as feasibility study for adapting Pert Technique for planning and scheduling engineering and construction projects of the Company, preparation and presentation of plant additions and retirements budget for final Company approval and economical analysis to determine replacement age of fleet cars.

April, 1966 to February, 1967.

Engineer-in-Charge; Livingston Sub-District; Alabama Power Company; Livingston, Alabama

Responsible for all operations in sub-district including engineering and design of extensions and improvements to distribution system, supervision of line construction crews, selection and adaptation of distribution hardware, handling customer inquiries and complaints, operation of transmission lines and substations, etc.

October, 1964 to April, 1966

Senior II Engineer; Clanton District; Alabama Power Company; Clanton, Alabama

Responsible for engineering and designing distribution system extensions and improvements, for operation of system including proper restoration of service following a power outage, and for scheduling and following construction progress of projects to assure that they met required in-service dates.

April, 1964 to October, 1964

Assistant to Division Chief Engineer; Alabama Power Company; Montgomery, Alabama

Made voltage drop calculations for existing distribution systems and recommended engineering solutions when problems were indicated. Made flicker calculations for new motors of larger sizes to be added by customers and specified starting and running requirements. Instructed operating personnel and construction crews in the proper installation and operation of underground distribution systems.

June, 1963 to April, 1964

Junior Engineer; Montgomery District; Alabama Power Company; Montgomery, Alabama

Engineered and designed distribution systems to serve new and added electrical loads and prepared specifications and cost estimates for these extensions. In this capacity, it was necessary to coordinate the engineering and design to meet the requirements of contractors, developers and other utilities.

March, 1960 to June, 1963

Co-op Student; Alabama Power Company; Birmingham, Alabama

Assigned to Rural Services Department. Responsibilities included developing programs and mailing educational presentations to agricultural groups to promote use of electricity on farms in service area.

Ross 312-679-4632

Wayne 219-8329
663-8329 ✓

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

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

TESTIMONY OF JAMES A. MOONEY
ON REMEDIAL SOILS WORK

Bob Warmick
312-653-
5780

Jay
793-1921
631-7807
Ron Cook

I. Introduction and Scope

My name is James A. Mooney. I am Executive Manager - Midland Project Office. I have responsibility for the remedial soils work now being undertaken by the Midland Project. My testimony describes the significant steps the Company is taking in order to successfully complete the remedial soils project. To place these steps in proper perspective, this testimony discusses the events in the soils area leading up to and including the major action announced by the Company in Mr. Cook's September 17, 1982, letter (Serial No. 18845) to Mr. Denton and Mr. Keppler. It further addresses the implementation of the commitments in the September 17, 1982, letter and provides a progress report regarding underpinning work completed thus far.

My experience and background are described in detail in the resume appended to my testimony (Appendix 1). The following is a summary:

I have been Executive Manager - Midland Project Office since August, 1981. Previously I was associated with Alabama Power Company for more than 21 years and held positions of major responsibility associated with providing generating facilities for that system. Prior to my current position, I was Project Manager for the Farley Nuclear Plant Units 1 and 2. In that position, I directed all activities to insure the successful completion of the facility. Previously, I was responsible for directing the overall system construction services activities including: contracts, budgets, quality control, material services, geologic services, and concrete and soils.

I am a Registered Professional Engineer and a member of Phi Kappa Phi, Tau Beta Pi, and Eta Kappa Nu Honorary Societies. I received my BEE from Auburn University in 1963 and MSEE from Auburn University in 1970.

II. Background

The Consumers Power Company September 17, 1982, action plan was the result of concern both on the part of Consumers Power Company and on the part of the NRC Staff with the progress and performance of soils remedial work and quality assurance implementation. A number of events in calendar year 1982 brought these concerns to a focus in September, 1982.

In early March, the Company and NRC Staff had a technical difference relating to the appropriate quality requirements for the proposed underpinning work. On March 30, 1982, the Company accepted the Staff's position. However,

certain Staff members felt they had been misled during an earlier phone call. After a formal investigation, the Region determined that no material false statement had been made, but I believe the incident adversely affected Region III's confidence in the soils work. (Further testimony on this subject appears in the "Testimony of J. A. Mooney and R. M. Wheeler Concerning the Alleged Violation of the April 30 Order and March, 1982, Cable Pulling Incident.")

In April, 1982, the Company met with representatives of NRC Region III to discuss a draft SALP Report critical of soils QA performance for the reported SALP period. The Region stated that soils QA as of the report date was only minimally acceptable.

Additionally, in the Spring of 1982, drilling and excavation problems resulted from inadequate procedures and controls. These specific problems were later resolved by the creation of an excavation permit system, but their occurrence suggested a need for more basic changes. The Board's April 30 Order, which resulted in part from these implementation problems, also indicated this need. In May, the Company, as a result, began a comprehensive review of the soils remedial work. This included an evaluation of the resources committed to the soils project, the QA/QC effort on soils, and needs for improved overall implementation of soils work. The immediate result of this consideration was the July, 1982, decision to consolidate

} why

soils QA and QC under MPQAD, as described more fully below. Other steps were also under review.

In August, 1982, the Company stopped all ongoing soils work as a result of an accusation that it had violated the Board's April 30 Order. Although I do not believe the Order was violated, the incident further pointed out that some basic changes were necessary to bring the job up to both our and the Region's expectations. The Company, at that time, entered into a work authorization system with Region III to resolve the specific concern giving rise to the allegation that the Order had been violated.

Eisenhart, Keppler Cook

In a meeting on September 2, 1982, the Company proposed a number of steps in addition to the consolidation of soils QA and QC, to assure the successful implementation of all aspects of the planned soils remedial construction. These measures amounted to a major change in the Company's methodology for carrying out the job. The specific actions were detailed in Mr. Cook's September 17, 1982, letter (Serial No. 18845) to Mr. Denton and Mr. Keppler (Appendix 2). These revisions and additions to the job implementation plan were the culmination of a number of discussions with the NRC Staff, in-house analysis and consideration of soils remedial work to date.

III. The September 17 Action Items

The proposal by the Company and its Action Plan incorporated seven major items:

- (1) Retaining a third party to independently assess the implementation of the auxiliary building underpinning work,
- (2) Integrating the soils QA and QC functions under the direction of MPQAD,
- (3) Creating a "Soils" project organization with dedicated employees and single-point accountability to accomplish all work covered by the ASLB Order,
- (4) Establishing new and upgraded training activities, including a special quality indoctrination program, specific training in underpinning activities, and the use of a mock-up test pit for underpinning construction training,
- (5) Developing a quality improvement program (QIP), specifically for soils remedial work,
- (6) Increasing Senior Management involvement in the soils remedial project through weekly, onsite management meetings wherein both work progress and quality activities are reviewed, and
- (7) Improving systems for tracking of and accounting for design commitments.

In the following testimony I will discuss the details of the seven items included in the September 17 action plan.

1. Independent Assessment

Mr. Cook's September 17, 1987, letter states: "A third party will be retained to independently appraise the initial

phases of the construction of the auxiliary building underpinning."

A. Selection of Independent Assessment Team

After a review to determine the most acceptable and qualified contractors, the Company decided to retain the firms of Stone & Webster Engineering Corporation (S&W), a highly respected engineering and construction firm, and Parsons, Brinckerhoff, Quade & Douglas (Parsons), an engineering, design, planning and construction management firm with recognized underpinning expertise, to carry out the assessment. Following the meeting with the NRC on September 2, 1982, in which the Company described its plans, the Company executed the necessary contractual documents, prepared and reviewed implementing plans and procedures, and arranged for the presence of S&W/Parsons onsite by September 20, 1982.

The independent third-party assessment includes both a review of the soils design documents and construction plans and observation of the construction itself to assure that (1) the design intent is being implemented, (2) that construction is consistent with industry standards, (3) that the Quality Assurance program is being implemented satisfactorily and (4) that construction is being performed in accordance with construction documents.

On September 28, 1982, the Company and the S&W/Parsons team met with the NRC Region III Staff to discuss communications among S&W/Parsons, the Company, and NRC, as well as the process

S&W/Parsons would use to report assessment results and findings. Subsequently, on November 5, 1982, the NRC convened a public meeting to discuss the scope of the assessment, S&W's and Parsons' credentials, and S&W's and Parsons' independence. At this meeting, the Company presented qualifications of all S&W's and Parsons' personnel assigned to the assessment team. On November 15, 1982, the Company transmitted to the NRC information responding to certain questions raised in the November 5, 1982 meeting regarding S&W's independence (Attachment C to the February 24, 1983, Keppler to Cook letter (Appendix 3)). The NRC made further requests for information on that subject and S&W responded on February 14 and 15, 1983. (Attachments A and B to the February 24, 1983, Keppler to Cook letter (Appendix 3)).

B. The S&W/Parsons Program

a. Qualifications

The S&W/Parsons Team is highly qualified to carry out the independent assessment of the Midland underpinning effort. Stone & Webster is a large, highly experienced and well respected engineering and construction firm with considerable nuclear power plant design and construction experience. S&W has direct experience conducting independent assessments at the Summer and Diable Canyon Nuclear Stations. Parsons brings to the assessment team special experience in the field of soils construction, particularly underpinning. The Parsons firm has extensive experience in foundations, tunnelling, excavation and

support of underground caverns and underpinning much of which has been in conjunction with the San Francisco, Washington, Baltimore and Atlanta mass transit systems. The S&W/Parsons team includes individuals with expertise in quality assurance, design and construction as well as members specifically skilled in underpinning techniques.

The particular individuals assigned to the S&W/Parsons assessment team are all highly qualified personnel with impressive credentials and a number of years of soils experience. The S&W and Parsons Project Managers are experienced in both design and field aspects of soils-related construction, and each has over 20 years experience in soils work and a number of years in management capacities within those fields. At the November 5, 1982, meeting both S&W and Parsons presented credentials of all individuals on the assessment team to the NRC and the public. By letter dated February 24, 1983, the NRC Staff informed Consumers Power that S&W/Parsons satisfied its criteria for competence.

(See Appendix 3.)

b. Team Independence

The assessment team meets the independence criteria established by Commissioner Palladino in his letter of February 1, 1982 to Congressmen Ottinger and Dingell and implemented in the Company's Specification CC-100 issued September 20, 1982. S&W and Parsons have attested to their Corporate independence by information and affidavits supplied to the NRC and attached to Mr. Keppler's February 24, 1983, letter

to Mr. Cook (Attachment A to February 24, 1983, Keppler to Cook letter (Appendix 3)). Moreover, at the NRC's request, the members assigned to the assessment team have individually supplied affidavits pertaining to their own independence from Consumers Power company, Bechtel and the Mergentime Corporation. (Attachment B to February 24, 1983, Keppler to Cook letter (Appendix 3)).

Specifically, neither S&W/Parsons, nor its personnel assigned to perform the work at Midland, have had any direct previous involvement with the Midland activities being reviewed by S&W/Parsons. S&W/Parsons and its personnel assigned to perform the independent assessment have not been previously hired by Consumers Power Company to perform the design, construction, or quality work relative to the soils remedial program. The personnel assigned to this independent assessment have not been previously employed by Consumers Power Company within the last three years. Further, the S&W/Parsons personnel assigned to the assessment project do not have household members employed by Consumers Power Company, do not have any relatives employed by Consumers Power in a management capacity, and do not own or control significant amounts of Consumers Power Company stock. In the February 24, 1983, letter (Appendix 3), Mr. Keppler stated that S&W/Parsons met the independence criteria.

c. Scope of Work

The scope of the assessment is defined in Consumers Power Company Specification CC-100 (Rev. 1) as follows:

- 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 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

Some have highlighted some significant concerns. What did he do?

Consultant may reject any such revision by mailing written notice of such rejection to the Owner within 10 days after receipt of the scope revision.

In accordance with paragraph j of the foregoing, the scope was expanded in my letter of February 24, 1983 (Appendix 4), to include the following:

- (1) Provide a QA overview and assessment of the design work packages to ensure accuracy and adequacy. This overview is to insure conformance to procedural and programmatic requirements.
- (2) Provide a QA overview and assessment of the QC inspector requalification and certification program.
- (3) Provide a QA overview and assessment of the training conducted for all personnel in the soils remedial work effort.
- (4) 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 Michigan, Inc. is in effect.

S&W/Parsons independent assessment will cover at a minimum the first three months of the Auxiliary Building underpinning work which has been authorized by the Nuclear Regulatory Commission. The independent assessment program is to continue, however, until the independent assessment team concludes; (1) that the design intent of the remedial construction program is being fully implemented and (2) the remedial

construction work is consistent with industry standards. The independent assessment will also continue until the assessment team has assured itself that the Quality Assurance program is being implemented and the work is being done in accordance with the construction documents.

Any
used
in
site?

Will they seek NRC concurrence before stopping this oversight?

d. Activities to Date

The S&W/Parsons assessment team was on-site and began the assessment of the auxiliary building underpinning work on September 20, 1982. To support the independent assessment, Consumers Power Company has made available such information as design and construction drawings, specifications and procedures, building and pier monitoring data, and construction schedules. Access to facilities needed by Stone & Webster and its approved subcontractors has been provided. By November 5, 1982, Stone & Webster had reviewed the vertical access shaft, the material storage area, the test facility and off-site batch plant, and the Quality Assurance documents. This fact is summarized in the letter from the NRC dated November 22, 1982, which documented the November 5, 1982, meeting between Consumers Power Company, the NRC and the public.

By February 11, 1983, Stone & Webster had observed the excavation, placing of reinforcement, and concreting of Pier W-12, and the excavation and placing of reinforcement for Pier E-12. In addition, the assessment team had reviewed the drawings, procedures and other documents pertaining to the underpinning work and observed performance of the QA and QC

organizations during the progress of such work. During this period, the assessment team was on the site and had daily meetings with construction, quality and engineering personnel to obtain information and discuss the assessment team's observations.

As of the date of this testimony, the S&W/Parsons team has not completed their final report in accordance with paragraph h of the Scope of Work, as amended, set forth above.

C. Reporting and Communication

The S&W/Parsons team assigned to the Independent Assessment reports to the Company and to the NRC Staff in several ways. The team holds daily meetings with Company personnel and Bechtel personnel. The NRC Staff has been invited to these meetings. The daily meetings are summarized in the weekly reports which the team issues on the activities covered during that particular week. Each weekly report summarizes the activities which the team has observed, the meetings which they have attended, the quality documents and records which they have reviewed and the observations which they made concerning the work activities.

In addition, when the team observes an item of deviation, for example, between a specification or drawing and the written work procedures, between a specified code and the work procedures, between construction materials and specifications for materials, or from good construction practice, it

What does CPC do with these?

writes a "Nonconformance Identification Report" (NIR). These NIRs are held open until the Company provides an acceptable resolution.

At the conclusion of the first ~~three months~~ ^{90 day report} of the Auxiliary Building underpinning work, S&W/Parsons is required to provide a report to the NRC with a copy to Consumers Power. Prior to submission, senior S&W/Parsons management are to review the contents of the report with the team members for completeness and accuracy. The report will summarize all of the team's observations on the underpinning work and give an overall assessment of the quality of construction.

All documents issued by the team including weekly reports, letters, the final report and NIRs are sent to the NRC and copies are issued to the Company. The purpose of this procedure is to assure that the Company exerts no editorial influence over the contents of documents or oral reports to the NRC.

In addition to these written reports, the S&W/Parsons team has met privately with the NRC Staff and reviewed the performance of this soils work.

2. Integrating Soils QA/QC Functions

Mr Cook's September 17 letter states:

"The project has reorganized the Soils QA/QC effort, creating an integrated organization with single point quality accountability under the MPQAD. This new organization is expected to improve QC performance, increase CP Co involvement in the management of the quality control function and improve QA/QC interfaces."

*Why wasn't US Testing Audit shown to Soils QC Org?
Why not considered to be part of soils? Why BOP?*

Bill - I think CPCOs problems lie in middle management. How can you question that?

A major aspect of the incorporation of the Quality Control function within MPQAD is the recertification of Quality Control inspectors to Consumers Power Company procedures. This certification effort involves training and examination in three areas: (1) programmatic quality procedures, including programmatic quality plans, nonconformance procedures, and general quality procedures; (2) inspection plans, including inspection requirements, inspection methodologies, testing methodologies, hold points, etc; and (3) on the job training, followed by a performance demonstration to assure proficiency, which requires the satisfactory performance of an inspection under the observation of a certified inspector.

Why didn't they find the problems?

The NRC Region III had some concerns with our initial efforts at recertifying QC inspectors, as described in NRC Inspection Report 82-21. After the NRC advised us of its concerns, all Quality Controls inspectors previously certified to evaluate soils work were decertified and have been recertified to MPQAD procedures. Approximately 55 Quality Control inspectors have now been certified in one or more inspection plans. This is adequate to support present construction activities.

3. Soils Project Organization

Mr Cook's September 17, 1982, letter states:

"The project organization formed for the performance of the soils remedial work incorporates single-point accountability, dedicated personnel to the extent practical, minimum interfaces - particularly at the working level, and a quality organization integrating QA and QC. The soils project organization is tailored to the task at hand. The entire organization, including quality assurance and quality control are staffed

with well qualified, experienced personnel, augmented by design consultants and construction subcontractors nationally recognized in the underpinning field."

The term single-point accountability refers to the fact that I am in charge of and responsible for the performance of the soils remedial work, other than MPQAD's work. Subgroups responsible for portions of the work are managed by individuals who report directly to me. This approach towards responsibility provides uniform direction and direct accountability. Prior to this change, the soils project design, construction and various scheduling groups reported to different individuals either within CP Co or within Bechtel. For example, the engineering supervisor in charge of the design elements of the soils project reported through Bechtel's project engineering organization. Similarly, the construction supervisor responsible for soils work reported through Bechtel's construction organization. Under the present approach, both positions now report directly to a Bechtel Assistant Project Manager who in turn reports to me. The scheduling groups have been organized into an integrated group reporting directly to me.

In addition to the above, the organization structure after September 17, 1982 provided for improved and enhanced coordination between engineering, construction and quality aspects of the underpinning work. The Engineering, Construction and Quality groups participate in weekly project meetings wherein short-term schedules, objectives and goals are discussed. This

Maybe these guys are more interested in schedule than quality.

facilitates better coordination of engineering, construction and inspection activities.

Finally, the new organization brings a higher level management presence directly to the Midland jobsite. Under the new organization, a field soils manager controls all construction activities of the Bechtel Field Soils Organization and the soils subcontractors, the Mergentime Corporation and SW&P. Also onsite is an assistant resident project engineer responsible for design interface with construction activities. The quality group is headed by a Soils Superintendent.

4. Training Activities

The September 17, 1982 letter states:

"Extensive training programs for the soils underpinning work have been developed. This overall training program, which includes the major Construction and Quality organizations involved in soils work, covers both general training in quality and specific training relative to the construction procedures.

The majority of the personnel associated with Remedial Soils work have attended a special Quality Assurance Indoctrination Session. The QA indoctrination has been provided to Bechtel Remedial Soils Group, CP Co Construction, QC, QA, Mergentime and Spencer, White and Prentis (SW&P) personnel down to the craft foreman level. This training consists of one three-hour session covering Federal Nuclear Regulations, the NRC, Quality Programs in general and the Remedial Soils Quality Plan in detail.

With regard to the work procedures, a requirement on both Mergentime and SW&P is that specific training on the procedures be provided prior to initiating any quality related construction activity. The identification of individuals to receive this training is spelled out in each procedure pertaining to a specific construction activity. Completion of the specific training requirements is a QA hold point which must be satisfied before work can proceed.

In further recognition of the importance of training to the underpinning work, the Company is util-

izing a mock-up test pit as part of its training program for underpinning construction. The purpose of this test pit is to provide specific training in the construction of a pier, bell and grillage assembly from initial issuance of design drawings through completion of construction. This allows supervisory and craft personnel to perform work under the conditions, requirements and restraints which will be encountered when the actual underpinning starts. It also allows the various quality organizations to inspect the work and insure that their concerns and requirements are properly reflected in the procedures."

As initially envisioned, the training program did not require formal documentation of the training material or attendance rosters. In reviewing these activities, Region III raised concerns regarding the status of the training program and the lack of records documenting who had received the specific training programs. In response ^{to the NRC} the project developed a matrix specifying which individuals would receive the various training, by subject, position in the organization and discipline or group. On the basis of the matrix, a procedure was developed by MPQAD implementing the directions and defining record keeping requirements. The original training program, and the one carried into the matrix, included instructions on the role of QA and QC, the function of the NRC, QA requirements and procedures (including specifically the QA plans, MPQP-1 and 2), emergency procedures, and the excavation and work authorization procedures. The training program required that craft personnel attend training in QA and special processes relating to particular tasks. After a review of the training program, Region III requested that the training of craft personnel be expanded to provide a more general

Why?
What
was their
thinking?

Why does
the NRC

have to
find the problems? What's wrong with CPC's supervision & management?

Same
questions!

understanding of underpinning technique and awareness of problems which could be encountered. In compliance with Region III's request, Mergentime was requested to implement these changes and responded on February 16, 1983, that the training program was being upgraded accordingly.

This is great!

A unique element of the training program at Midland involved the use of a mock-up test pit, which was located in a non-Q area of the site. The test pit provided hands-on experience in excavating, lagging, placement of reinforcing steel, and concrete placement. It also provided an opportunity for QA personnel to inspect and document the execution of underpinning activities in advance of the actual work. During mock-up pit operations, the project discovered deficiencies in the construction procedures, which were corrected, and also improved certain elements of the underpinning design.

5. Quality Improvement Program (QIP)

The September 17, 1982, letter states:

"The Company is establishing a separate Quality Improvement Program (QIP) for the soils project. Although not part of the formal Quality Assurance program, the QIP is a management system that should be helpful in communicating and reinforcing project policies and expectations to all project participants. To launch this effort, an indoctrination program will be presented to all individuals, stressing the absolutes of Quality and the concept of 'Doing it right the first time.' Measurements specific to soils will be developed for those critical areas which are indicative of a 'quality product.' Tracking these activities will provide an indication of the effectiveness of the program. The QIP will provide mechanisms for individual 'feedback' from all individuals involved, including the craft personnel."

The Quality Improvement Program Manual developed specifically for soils was issued September 24, 1982. Under this program, supervisors are trained in the principles of the QIP, and are responsible for training the individuals who work for them. The QIP philosophy emphasizes feedback to improve quality performance. Specific measurements and indications of quality are reported through a mechanism, which is apart from the formal requirements of 10 CFR 50 Appendix B. The QIP approaches quality from the standpoint of individual and group performance. The program also includes provision for recognizing quality performance on the part of individuals who are given awards on the basis of their contributions to improve quality.

6. Senior Management Involvement

The September 17, 1982, letter states: "The soils remedial effort also include a high level of senior management involvement." I conduct weekly in-depth reviews on site of all aspects of the work including quality and implementation of commitments. Mr. Cook meets onsite with this group an average of once a month and I personally brief Mr. Cook on the progress of soils remedial work at least once a week. In addition, the reporting chains to the senior project personnel have been shortened. The Company's CEO is briefed on a regular basis and schedules bi-monthly briefings on all aspects of the project including soils. During the bi-monthly briefings, the CEO normally tours the Midland site.

7. Design Commitments

To assure that commitments made to the NRC are properly accounted for in design documents, CP Co and Bechtel have reviewed correspondence with the NRC and other documents generated in connection with the NRC's review of the design proposals. From this review, the Project created a computer listing of NRC commitments. This listing is updated on a periodic basis. Copies of it are provided to the NRC.

Again, this was asked for by the NRC.

IV. Status Report on Remedial Soils Work To Date

Preparatory work for underpinning the auxiliary building has been completed. This included the installation of underground utility protection, installation and activation of the freeze wall, installation of necessary construction dewatering, installation of monitoring instrumentation, and installation of east and west access shafts.

On December 9, 1982, the NRC released the work activities for Piers E/W 12, which are located under the turbine building. Work commenced on Pier W 12 on December 13, 1982.

The soil excavation and lagging installation for the Pier W 12 access pit, a six foot by eight foot pit, commenced at el. 609 and extended down to approximately el. 600. A nine-foot long drift (tunnel) under the turbine building was then begun. A few inches into the drift the excavators encountered a vertical face of concrete. This was removed using a hydraulic rock splitter. When the drift was completed, excavation and lagging of the three foot by six foot pier began. In this process, probe

holes were advanced to determine if there was evidence of ground water. By January, 22, 1983, the pit in which the pier would be placed had been excavated to its approximate final depth. The bottom of the hole was then widened to accommodate the footing of the pier. At that point, reinforcing steel was installed up to about elevation 604. Instrumentation was then installed and concrete was placed on February 11, 1983. The upper and lower leveling plates were then bolted to the turbine building mat and the top of the pier, respectively. The level bearing assemblies and jackstands were installed and the load transfer was initiated around noon on March 11, 1983. Within 2-1/2 hours, the proof test load of 1,375 Kips had been applied. Some two hours later, the proof test load settlement criteria was satisfied (less than .01 inch for a continuous one hour period) and the load was reduced. On March 14, the acceptance criteria of .01 inch deflection maximum in 24 hours was attained, the wedges between the pier and bottom of the structure were inserted and the pressure in the jacks released.

Again -
NRC
request.

Installation of Pier E 12, commenced on December 20, 1982, and was carried out in the same sequence as Pier W 12, but lagging Pier W 12 by one week. The one week lag time was to permit incorporation of "lessons learned". Remaining underpinning piers will be installed using the same methods as those used for Piers 12.

The NRC authorized the excavation and installation of Piers E/W 11 and Piers E/W 9 on February 22 and 24, 1983,

respectively. Piers E/W 11 and Piers E/W 9 are located under the turbine building. The drifts to Piers 9 pass under the FIVPs. The work on Piers 9 has been completed. The work on Piers 11 is presently in progress.

Also during February, the temporary support system for the FIVPs were jacked to insure the total FIVP load was being supported by the system. The temporary support was necessary because the Pier 9 drifts pass beneath the FIVPs. During jacking, a crack in excess of 10 mils developed on the western FIVP at a location where piping was supported. In accordance with procedures agreed upon with the NRC requiring that such cracks be evaluated, an engineering analysis was carried out by one of the Company's consultants, Construction Technology Laboratories. The analysis determined that the structural integrity of the FIVP was not threatened by the crack. A minor crack also developed at a similar location in the eastern FIVP. This crack was also evaluated and determined not to be structurally significant.

All of this work has been closely monitored by the S&W/Parsons independent soils assessment team and Region III, which identified no major problems.

As the Manager with direct responsibility for the remedial soils work, I am pleased with the success of the underpinning work thus far. I recognize that the complexity of this job will require a continuing forceful management presence to ensure its continued success. I am paying special attention to

NRC
requested

give examples that have resulted in CPGO
action.

feedback from the soils section of MPQAD on inspection findings. To this end, I and other top managers within the soils/group review nonconformance reports issued by MPQAD, as well as the reports of the S&W/Parsons assessment team. MPQAD has been reviewing nonconformance reports in an effort to identify and correct potential generic problems. In carrying out this effort, MPQAD recently reported to me that several nonconforming conditions indicated a problem with the welding for metal lagging to be used in underpinning excavations. With this information, the soils group was able to take prompt corrective action.

As a further measure to enhance communications between the soils project management organization and MPQAD, I have appointed an individual on my Staff to monitor quality indicators and maintain an inclusive list of nonconformances. This list is reviewed and the ten most critical items are brought specifically to management attention at weekly meetings. With these measures and the others described above, I am confident that project management is maintaining proper control over quality aspects of the job.

V. Conclusion

The Midland Project has taken a number of steps to improve the implementation of design, construction and quality assurance requirements in the soils area. These steps have substantially enhanced the performance of the job. I am satisfied that, with continued aggressive implementation of these measures and the other programmatic requirements, the soil

remedial work at Midland will be successfully completed and will present no undue risk to the public health and safety.