



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

August 9, 1983

20/B3

Other Candidates & Methodologies on CIO

MEMORANDUM FOR: [REDACTED]

FROM: Valeria H. Wilson
Management Analysis Branch
Planning and Program Analysis Staff, NRR

SUBJECT: FOIA 83-449 -- REQUEST FROM BILLIE GARDE FOR DOCUMENTS
SUBMITTED BY CONSUMERS POWER CO. FOR CONSIDERATION OF
CANDIDATE COMPANIES OR METHODOLOGIES TO PERFORM THE CON-
STRUCTION IMPLEMENTATION OVERVIEW OF THE CONSTRUCTION COMPLETION
PLAN

The subject FOIA request is enclosed for your action [REDACTED].
Please provide documents which you might have that are subject to this
request, along with a list of such documents so there is a record of what you
actually provided as part of your response.

Incoming documents which are handled through the official distribution system
are in the PDR and need not be provided. However, if you can easily identify
specific letters, reports, dates, applicable docket numbers, etc., please do
so. Internally generated documents do not routinely go in the PDR unless PDR
is specified on the official file copy. Therefore, all such memos which have
been generated without the PDR designation should be provided, even if it
means retrieving them from Central Files. Do not indicate PDR on the file
copy of your response to me. Please make a careful review to identify (1)
any material which should be withheld as classified, safeguards, or pro-
prietary information, and (2) all memos received from, or transmitted
to one or more Commissioners, or which contain substantive excerpts from
records received from, or transmitted to, the Commissioners. Also highlight
or identify any documents obtained from foreign sources. Documents to be
withheld should be separated from documents to be released.

Keep track of the actual search time involved, i.e., time actually spent
reviewing files to determine if there are relevant documents. All other time
should be accounted for under the "other activity" column of the enclosed
FOIA Time Record Form. Please return the Time Record Form with your
documents. If you believe the search time will exceed two hours, please
contact me immediately, and let me know approximately how long the search
will take, as well as whether you anticipate that documents will be withheld
from public disclosure. Also let me know if you think other NRR branches
or NRC offices might have documents which are subject to this request.

8408210401 840718
PDR FOIA
RICE84-96 PDR

Valeria H. Wilson
Valeria H. Wilson
Management Analysis Branch
Planning and Program Analysis Staff, NRR

Enclosure:
FOIA Request

RECORD OF FOIA PROCESSING TIME

INSTRUCTIONS: Complete this form to establish the time associated with the processing of this FOIA request. Record the time in man-hours, rounded to the nearest 15 minutes, for all actions taken. Include the number of pages reproduced.

Your clerical overhead factor will be added by the FOIA/PA Branch.

Negative results time will be reported to this office by telephone.

RETURN FORM TO: Director, Division of Rules and Records, Room 11NBB-4210.

Form Date _____

Name of Requester Billie Yarde

FOIA Request Number 83-449

ORGANIZATION	DIRECT TIME FOR SEARCH		ALL OTHER ACTIVITY ^{2/}
	Clerical ^{1/}	Professional	
LB#4		3 hrs	

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Report actual machine time and applicable cost rate for machine used.

^{1/} Includes only the time actually spent in searching for or locating documents.

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GOVERNMENT ACCOUNTABILITY PROJECT

Institute for Policy Studies
1901 Que Street, N.W., Washington, D.C. 20009

(202) 234-9382

August 5, 1983

FREEDOM OF INFORMATION
ACT REQUEST

FOIA-83-449

Rec'd 8-9-83

Director
Office of Administration
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

To Whom It May Concern:

Pursuant to the Freedom of Information Act (FOIA), 5 U.S.C. §552, the Government Accountability Project (GAP) of the Institute for Policy Studies requests copies of any and all agency records and information, including but not limited to notes, letters, memoranda, drafts, minutes, diaries, logs, calendars, tapes, transcripts, summaries, interview reports, procedures, instructions, engineering analyses, drawings, files, graphs, charts, maps, photographs, agreements, handwritten notes, studies, data sheets, notebooks, books, telephone messages, computations, voice recordings, and other data compilations, interim and/or final reports, status reports, and any and all documents or submittals by Consumer Power Company to the NRC for NRC consideration of candidate companies or methodologies to perform the Construction Implementation Overview (CIO) of the Construction Completion Plan (CCP).

Specifically, we request the materials reviewed by the Office of Nuclear Reactor Regulations that led to an April 22, 1983 letter from Thomas Novack to CPCO rejecting TERA for the CIO. rec'd 2/83

If any records have been destroyed and/or removed, please provide all surrounding records, including but not limited to a list of all records which have been or are destroyed and/or removed, a description of the action(s) taken, relevant date(s), individual, office and/or agency-wide policies and/or justification(s) for the action(s), identification of all personnel involved with the action(s), and any and all records relevant to, generated in connection with, and/or issued in order to implement the action(s).

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Director of Administration
U.S. Nuclear Regulatory Commission

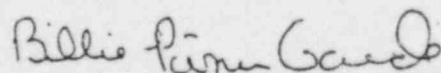
August 5, 1983

GAP requests that fees be waived, because "finding the information can be considered as primarily benefitting the general public." 5 U.S.C. §552(a) (4) (A). The Government Accountability Project is a non-profit, non-partisan public interest organization concerned with honest and open government. Through legal representation, advice, national conferences, films, publications and public outreach, the Project promotes whistleblowers as agents of government accountability. GAP requests the above information as part of an ongoing monitoring project on the adequacy of the NRC's efforts to protect public safety and health at nuclear power plants.

For any documents or portions that you deny due to a specific FOIA exemption, please provide an index itemizing and describing the documents or portions of documents withheld. The index should provide a detailed justification of your grounds for claiming each exemption, explaining why each exemption is relevant to the document or portion of the document withheld. This index is required under Vaughn v. Rosen (I), 484 F.2d 820 (D.C.Cir. 1983), cert. denied, 415 U.S. 977 (1974).

We look forward to your response to this request within ten days.

Yours truly,



BILLIE PIRNER CARDE
Director, Citizens Clinic for
Accountable Government

BPG/ww

20/B3 #5

U.S. NUCLEAR REGULATORY COMMISSION
REGION III

OUTGOING TRANSMISSION SERVICE REQUEST

DATE 3/31/83

Number of pages COVER + 5

To (Name): Dave Hood

From: Bob Warnick

Description Response to CPC's CCP

Air Rights Bldg _____

E/W Towers _____

H Street _____

MNBB _____

Phillips Bldg X _____

Silver Spring
(Willste Bldg) _____

Woodmont Bldg _____

Region I _____

Region II _____

Region IV _____

Region V _____

NSAC _____

INPO _____

Resident at _____

Corporate Office _____
(Identify recipient & fax number)

Other _____
(Designate - include fax number)

FOR WP & D/C USE

System 6 (WP) _____

Rapifax _____

3'M EXT #727 _____

3'M EXT #728 _____

FTS _____

Commercial _____

Time Started _____

Time Completed _____

Trans. Time _____

(Actual Min.)

Operator _____



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
799 ROOSEVELT ROAD
GLEN ELLYN, ILLINOIS 60137

MAR 28 1983

Docket No. 50-329
Docket No. 50-330

Consumers Power Company
ATTN: Mr. James W. Cook
Vice President
Midland Project
1945 West Parnall Road
Jackson, MI 49201

Gentlemen:

By letter dated January 10, 1983, Consumers Power Company described its proposed Construction Completion Program (CCP) for the Midland nuclear facility. This submittal was followed by a public meeting in Midland on February 8, 1983 for the NRC to obtain a better understanding of your proposed program and to obtain public input on the CCP. As a result of our review of the CCP to date, we find we need the following additional information.

- A. Please provide a more detailed description of the scope of the CCP and how it is going to function. Your discussions should address the following subjects or concerns:
1. Because of problems identified by the NRC during the special inspection of the diesel generator building and because similar problems were found in other areas of the plant during subsequent inspections by CPCo, we believe that 100% reinspection of accessible safety related structures, systems, and components is warranted. Should you intend doing less than 100% reinspection, please provide the details of your proposed program and the technical rationale for accepting a sampling approach.
 2. A description of the reinspection program for accessible systems and components important to safety.
 3. A description of the measures you intend to institute to assure that QC reinspection will be sufficiently independent of team controls.

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~~2304/010351~~

MAR 28 1983

4. A description of the training that will be provided to all personnel including craftpersons. Concerning QC inspector recertification training, describe the actions you have recently taken to address the adequacy of the review of PQCI's prior to training being initiated on the PQCI's. In addition, describe the steps you have taken to ensure that all questions raised during PQCI training sessions will be resolved prior to certification to affected PQCI's.
 5. As a result of the diesel generator building inspection, hold points were established by the NRC for the purpose of determining that you adequately performed all of the actions to which you have committed before allowing the work to proceed beyond the hold point. In view of the total CCP effort, the NRC does not wish to remain in the approval chain; therefore, you are requested to develop measures that will ensure that key hold points are honored and that critical parameters of your program are in place before proceeding to the next step.
 6. A description of the controls you will use to ensure all problems have been identified during reinspection of a system or area prior to start of repair work or new work on that system or in that area.
 7. A description of the controls you will use to ensure that no new work will be performed that would cause a known nonconformance to be inaccessible.
 8. A description of your proposed program for in-process QC surveillance (inspection) of rework and new work.
 9. A description of the CPCo management review process for changes to CCP and how CPCo intends to keep the NRC informed of such changes.
- B. Please provide a more detailed description of the third party installation implementation overview mentioned in your January 10, 1983 letter. Your description should address the following subjects or concerns:

MAR 28 1983

1. The installation implementation overview appears to focus solely on future construction and rework. We believe the overview should also encompass all aspects of the CCP, including the reinspection work. Please expand the installation implementation overview to include other aspects of the CCP and provide us with additional details of the overview.
 2. Weekly reports, similar to those issued by Stone and Webster to inform the NRC of the results of the soils overview, are needed. Please provide your commitment to have the third party CCP overviewer prepare weekly reports similar to the soils overview weekly reports.
 3. The CCP overview should continue until CPCo and the NRC have confidence in the adequacy of the CPCo quality assurance program.
- C. Please propose a candidate organization that Consumers Power Company considers acceptable for the installation implementation overview together with your rationale for selecting that organization. The NRC will also need the following:
1. Sworn statements from the candidate corporation and all personnel who will be involved in the third party installation implementation overview, addressing the independence factors described in Chairman Palladino's letter of February 1, 1982 to Congressman Ottinger and Dingell.
 2. The resumes of the key personnel to be involved in the third party overview.
 3. A description of the experience of the candidate corporation that qualifies the corporation to perform an independent third party overview.

The NRC will determine the acceptability of the candidate corporation and will notify CPCo. Our present view is that the installation implementation overviewer would not be acceptable to also perform the independent design and construction verification program.

MAR 28 1983

In order to ensure adequate communications between the NRC, CCo, the independent third party proposed or selected to conduct the independent design/construction verification program, and the public, the protocol in Enclosure 1 should be adhered to. This protocol does not apply to the third party overview of the remedial soils work or the third party overview of the CCP.

Should you have any questions regarding this letter please contact Mr. R. F. Warnick of my staff.

Sincerely,

Original signed by
A. Bart Davis

James G. Keppler
Regional Administrator

Enclosure: As stated

cc w/encl:

DMB/Document Control Desk (RIDS)
Resident Inspector, RIII
The Honorable Charles Bachhoefer, ASLB
The Honorable Jerry Harbour, ASLB
The Honorable Frederick P. Cowan, ASLB
The Honorable Ralph S. Decker, ASLB
William Paton, ELD
Michael Miller
Ronald Callen, Michigan
Public Service Commission
Myron M. Cherry
Barbara Stamiris
Mary Sinclair
Wendell Marshall
Colonel Steve J. Gadler (P.E.)

Docket No. 50-329
Docket No. 50-330

PROTOCOL GOVERNING COMMUNICATIONS BETWEEN CONSUMERS

POWER COMPANY AND THE ORGANIZATION CONDUCTING THE INDEPENDENT DESIGN/
CONSTRUCTION VERIFICATION PROGRAM

1. Recommendations, findings, evaluations and all exchanges of correspondence, including drafts, between the independent reviewer and CPCo will be submitted to the Regional Administrator at the same time as they are submitted to CPCo. For purposes of this protocol, the independent reviewer includes the independent reviewer and any of its subcontractors and Consumers Power Company (CPCo) means CPCo, Babcock and Wilcox, Bechtel, Management Analysis Corporation, S&W, and all of their subcontractors.
2. The independent reviewer has a clear need for prompt access to whatever information is required to fulfill its role. To this end, the independent reviewer may request documentary material, meet with and interview individuals, conduct telephone conversations, or visit the site to obtain information without prior notification to the NRC. All communications and transmittals of information shall, however, be documented and such documentation shall be maintained in a location accessible for NRC examination.
3. If the independent reviewer wishes to discuss with CPCo substantive matters related to information obtained, to provide an interim report to CPCo, or to discuss its findings or conclusions with CPCo in advance of completing its report, or if CPCo desires such communication, such discussions shall be accomplished in meetings open to public observation. In this regard, CPCo shall provide a minimum of five days advance notice to the Regional Administrator of any such meeting. The Regional Administrator shall make reasonable efforts to notify representatives of interested members of the public of the meeting, but the inability of any person to attend shall not be cause of delay or postponement of the meeting. Transcripts or written minutes of all such meetings should be prepared by the organization requesting the meeting and provided to the NRC in a timely manner. Any portion of such meetings which deals with proprietary information may be closed to the public.
4. All meetings between the Staff and CPCo and/or the independent reviewer will be open to public observation, except where the Staff determines that it is appropriate to conduct a meeting(s) in private with CPCo and/or the independent reviewer.
5. All documents submitted to, or transmitted by, the NRC subject to this Protocol, unless exempt from mandatory public disclosure, will be placed in the NRC Public Document Rooms in Midland, Michigan and Washington, D. C., and will be available there for public examination and copying.



UNITED STATES
 NUCLEAR REGULATORY COMMISSION
 REGION III
 799 ROOSEVELT ROAD
 GLEN ELLYN, ILLINOIS 60137

20/B3

Government Accountability Project
 Institute for Policy Studies
 ATTN: Ms. Billie P. Garde
 Director
 Citizens Clinic for
 Accountable Government
 1901 Que Street, NW
 Washington, D. C. 20009

our preliminary thoughts were that

Dear Ms. Garde:

Thank you for your letters dated October 22, 1982 and November 11, 1982 addressed to Mr. Denton and me, conveying the Government Accountability Project's views on quality assurance matters and the third party assessment at the Midland Nuclear Power Station. We are considering your comments and concerns.

There have been two public meetings on the independent review program, one held October 25, 1982, and the second on November 5, 1982.

After the October 25 meeting Mr. Eisenhut and I informed Mr. James Cook of Consumers Power Company by telephone that the following elements were necessary to accomplish an adequate ~~third party review~~ *Overall review of QA matters*

1. The third party design review, ^{which found} of the auxiliary feedwater system (proposed by TERA Corporation), should be broadened by including ^{one or two} ~~an~~ additional safety system; and that the ~~design~~ review should encompass an evaluation of the actual system installation. *(Construction)*
2. The INPO and biennial QA audits are not an acceptable substitute for the third party review. While these activities do have merit, they do not fulfill the ~~review~~ ^{total} needs we have identified.
3. Management Analysis Company was ~~not considered~~ ^{to assume} sufficiently independent ~~and should not have~~ lead responsibility for the independent review. *ES*

kind may not be sufficient

Regarding the ability of the Stone and Webster personnel to perform the third party independent review of the remedial soils work, the final decision ^{will} should be made in the near future.

Questions were raised concerning whether

In addition, independent should be given the best opportunity for confirming construction quality.

The remainder of the independent review effort is still under consideration. We intend to hold a ~~an~~ additional public meeting, probably in Midland, regarding the independent review programs at the Midland site, but the date has not yet been scheduled.

You requested a series of documents in the November 11, 1982 letter. None of these are in the NRC's possession, although they would be available for our review at the plant site or corporate offices. You may wish to request access to the documents from Consumers Power.

I also understand from my staff that you have indicated to them that the Government Accountability Project has additional affidavits concerning construction activities at the Midland site. If you do have any further information, I would hope that you would forward it to us promptly so that we may include it in our investigation of the affidavits you previously submitted.

I can assure that the NRC shares your concern that any third party at Midland be both independent and competent. We also must be careful that we, the NRC, do not intrude into the review process ourselves and thus compromise its independence. We will, however, provide sufficient direction to assure the thoroughness and objectivity of the review.

Sincerely,

James G. Keppler
Regional Administrator



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

20/B3

OCT 7 1982

Docket Nos: 50-329
and 50-330

MEMORANDUM FOR: Richard H. Vollmer, Director
Division of Engineering

FROM: Thomas M. Novak, Assistant Director
for Licensing
Division of Licensing

SUBJECT: INDEPENDENT REVIEW PROGRAM - MIDLAND UNITS 1 AND 2

This memo forwards for your action the Consumers Power Midland Plant Independent Review Program dated October 5, 1982. As discussed in the attached letter, the ACRS recommended a broader and independent assessment of Midland's design adequacy and construction quality. Consumers Power has proposed a three-part program consisting of biennial quality audits, an INPO-type construction evaluation, and an independent design verification of the auxiliary feedwater system.

The applicant has requested a meeting with the staff to discuss the acceptability of the proposed program. This meeting has tentatively been scheduled for the afternoon of October 19, 1982. You are requested to review the attached program and provide Division of Engineering's views and comment prior to the meeting. Please contact Darl Hood (X28474) or Ron Hernan if you require additional information.

Thomas M. Novak, Assistant Director
for Licensing
Division of Licensing

Enclosure:
As stated

cc: D. Eisenhut w/encl.
R. Purple "
R. DeYoung "
S. Chestnut "
J. Knight "
E. Sullivan "
D. Allison "
D. Hood "

[Redacted line]

J. Keppler - RIII
R. Warnick - RIII "
W. Shafer - RIII "
E. Adensam "
W. Ha'ss "

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

20/133

DEC 21 1982

Docket Nos: 50-329
and 50-330

MEMORANDUM FOR: T. M. Novak, Assistant Director
for Licensing
Division of Licensing

THRU: E. G. Adensam, Chief
Licensing Branch No. 4
Division of Licensing

FROM: ~~D. W. Hernan~~, Project Manager
Licensing Branch No. 4
Division of Licensing

SUBJECT: DECEMBER 7, 1982 MEETING ON MIDLAND QA IMPLEMENTATION

The purpose of this memo is to document my understanding of the conclusions reached at the meeting held in Bethesda on December 7, 1982 among Region III, Division of Licensing and Inspection and Enforcement (HQ). The purpose of the meeting was to discuss (a) Midland's QA implementation history, (b) the recent Region III inspection of the Midland Diesel Generator Building, (c) the recent decision by Consumers Power to stop certain safety-related work being performed by Bechtel, and (d) discuss the staff's position and approach regarding the QA implementation programs (including IDVP) which have been proposed by Consumers Power over the past three months.

BACKGROUND

By letter dated September 16, 1982, the staff (Region III W/NRR concurrence) approved two "quality assurance plans" for the Midland Plant. Those plans were MPQP-1, Revision 3 (for the overall Midland work scope) and MPQP-2, Revision 0 (for the soils remedial work only). Since that time, the following submittals have been received from Consumers Power Company:

1. September 17, 1982 - CPCo letter #18845 proposing a QA "implementation plan" for the soils remedial work QA plan. This proposal followed a September 2 meeting in Chicago between CPCo, RIII and NRR and contained the following elements:
 - a) A third-party assessment (by Stone and Webster) of the auxiliary building underpinning implementation.
 - b) Integrating all QA/QC functions into one organization under the control of Consumers Power.
 - c) Creating a "soils project organization" with single-point accountability and dedicated employees.
 - d) Upgrading training of workers and supervisors involved in the soils remedial work.

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- e) Developing a quality improvement program specifically for soils remedial work.
 - f) Increasing senior management involvement in the soils work.
 - g) Developing an administrative system for tracking design commitments.
2. September 17, 1982 - CPCo letter #18850 proposing QA "implementation plan" for the total Midland work scope (vs soils only). This plan documented two significant new commitments by CPCo with details of the second commitment (IDVP) to be supplied at a later date. Those commitments were:
- a) Placing all QA/QC functions under the direct control of Consumers Power (such as was done for the soils remedial work). This entailed requalifying Bechtel QA/QC personnel to Consumers Power procedures.
 - b) Initiating a "total project independent verification program" consisting of a "horizontal" type review using INPO guidelines and a "vertical slice" evaluation of a critical plant system. At the time of this letter, contractors had not been selected to carry out these programs.
3. October 5, 1982 - CPCo letter #18879 which supplied details regarding the independent review program committed to in letter #18850. This letter proposed a 3-part program consisting of:
- a) Biennial QA audit by MAC
 - b) INPO type review by MAC
 - c) Independent Design Review of the AFW system by Tera Corporation.
4. December 3, 1982 - CPCo letter #19750 modifying the program proposed in the October 5 letter as the result of two meetings (10/25 and 11/5) with (and verbal feedback from) the staff. The modifications and additional commitments were:
- a) To not have MAC coordinate the results of Tera's independent review as originally proposed.
 - b) To maintain the MAC and Tera evaluations completely separate in terms of personnel involved.
 - c) A second system will be included in the Tera IDV. The staff was given three candidate systems to choose from on the basis of the PRA. Those systems are the electric power system (diesel generator), the safeguards chilled water system, and the containment isolation system.
 - d) To expand the Tera IDV to include more in-depth review of construction activities.
 - e) To ensure any discussion between Tera and CPCo personnel regarding confirmed findings would take place in open meetings of which the NRC would be notified.
 - f) The INPO evaluation final report would be sent to the NRC at the same time it is sent to INPO.

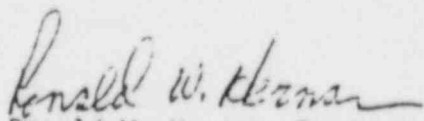
5. December 6, 1982 - CPCo letter #20262 requests staff (Region III) concurrence to proceed with remedial work on piers 12 east and 12 west and provides an update of the status of the seven commitments made in letter #18845 (Item #1 above).

SUMMARY OF MEETING

After detailed discussion of the topics on the meeting agenda, it is my understanding that the following general agreements were made:

1. Region III intends to document the results of the DGB inspection in a formal report to be issued mid-to-late December, 1982.
2. On the basis of the December 6 CPCo letter, Region III would issue a letter in the near future to authorize the start of work on pier 12.
3. Region III would prepare a letter to Consumers Power (w/NRR concurrence) requesting them to consolidate their various proposals on QA implementation plans and independent review/assessments into one single document.
4. After a revised, consolidated proposal is received from CPCo, the staff would schedule two meetings in Midland to present the staff's position to CPCo and to interested members of the public. Tentatively, this meeting was planned for the first week in January 1983. (13th or 14th) ←
5. The letter jointly prepared by Region III and NRR in response to CPCo letter #18845 (QA implementation for the soils remedial work) would not be issued.
6. The Division of Engineering has the technical responsibility for choosing which of the three systems proposed in the December 3 CPCo letter should be added to the scope of the independent design verification to be conducted by Tera Corporation.

We conclude that, as a result of this meeting, the only licensing action for NRR is completion of Item No. 6 above. LB#4 will be coordinating with DE toward timely completion.



Ronald W. Hernan, Project Manager
Licensing Branch No. 4
Division of Licensing

cc: J. Keppler, RIII
D. Eisenhut
R. Warnick, RIII
W. Shafer, RIII
R. Cook, Midland Resident Inspector
R. Vollmer
E. Sullivan
D. Hood
R. DeYoung, IE
E. Adensam

Elinor,
also sent copies to Novak, Eisenhower, Taylor
(I & E), Vallmer and Mattson. 20/1/83

ROUTING AND TRANSMITTAL SLIP		Date
		1/12/83
TO: (Name, office symbol, room number, building, Agency/Post)	Initials	Date
1. <i>E. Adanson</i>		
2.		
3.		
4.		
5.		
Action	File	Note and Return
Approval	For Clearance	Per Conversation
As Requested	For Correction	Prepare Reply
Circulate	<input checked="" type="checkbox"/> For Your Information	See Me
Comment	Investigate	Signature
Coordination	Justify	

REMARKS

Attached is the revised (consolidated) Consumers Power plan for construction completion. The program includes measures to be taken as the result of the work slowdown and the elements of QA implementation and third-party assessments requested by the staff in a series of meetings in Nov and Dec of last year.

A meeting has been scheduled in Midland by Region III for February 8 to present this program for public comment. Please call R. Hernan (29789) or D. Hood (28474) if you have any questions.

DO NOT use this form as a RECORD of approvals, concurrences, disposals, clearances, and similar actions

FROM: (Name, org. symbol, Agency/Post)	Room No. - Bldg.
<i>Ronald W. Hernan</i>	111
Ron Hernan, Project Manager	29789
Division of Licensing	Phone No. 29789

5041-102

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OPTIONAL FORM 41 (Rev. 7-76)
 Prescribed by GSA
 FPMR (41 CFR) 101-11.206



Consumers
Power
Company

D. Hood

James W Cook
Vice President - Projects, Engineering
and Construction

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

January 10, 1983

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

MIDLAND NUCLEAR COGENERATION PLANT
MIDLAND DOCKET NOS 50-329, 50-330
CONSTRUCTION COMPLETION PROGRAM
FILE 0655 SERIAL 20428

REFERENCE LETTER TO J W COOK, DATED DECEMBER 30, 1982, FROM NRC REGION III
REGARDING CONSTRUCTION COMPLETION PROGRAM

On December 2, 1982, Consumers Power Company met with Mr Warnick and other members of your staff to discuss the general concept of our proposed Construction Completion Program. The enclosure to this letter documents in detail the Construction Completion Program, as requested at the meeting and in your follow up letter (Reference).

Since our meeting, the program has undergone considerable development and evolution. Details have been supplied and more specific objectives and implementing methods have been established. Further details are still being developed. While the Company expects the Program, as presently constituted, to be a workable and sufficient framework for future action, revisions may be necessary as future needs and experience dictate.

The Construction Completion Program is a positive step in the overall advancement of Project goals. It represents the best efforts of Project management, support and quality assurance personnel. We believe it will produce an improvement in Project installation and inspection status, systems construction and QA implementation. The quality verification effort should provide increased confidence of the NRC that the plant has been properly built. Other aspects of the Program, including the measure to improve ongoing inspections and scheduling interfaces, should contribute to that result. This Program, together with recent Consumers Power Company commitments regarding quality assurance and remedial soils work, can establish a basis for improved relations between the Company and the NRC Region group assigned to inspect Midland. The Construction Completion Program demonstrates the Company's responsiveness to both NRC concerns and the particular needs of this Project. It is our expectation that the Program, created out of a desire to enhance the

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orderliness and quality of construction, will achieve its intended purpose and lead to the successful "completion of construction" of the Midland Plant in accordance with regulatory requirements.

We hope that this submittal fulfills your request for written information regarding the Construction Completion Program. Consumers Power Company is prepared to support the public meeting proposed for January 26, 1983 in Midland, Michigan.

James W. Cook

JWC/DMB/cl

CC Atomic Safety and Licensing Appeal Board
CBechhoefer
FPCowan, ASLB
JHarbour, ASLB
DSHood, NRC
MMCherry
RWHernan, NRC
RJCook, Midland Resident Inspector
FSKelley
HRDenton, NRC
WHMarshall
WDPaton, NRC
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CONSUMERS POWER COMPANY
Midland Units 1 and 2
Docket No 50-329, 50-330

Letter Serial 20428 Dated January 10, 1983

At the request of the Commission and pursuant to the Atomic Energy Act of 1954, and the Energy Reorganization Act of 1974, as amended and the Commission's Rules and Regulations thereunder, Consumers Power Company submits its Construction Completion Program.

CONSUMERS POWER COMPANY

By JW Cook
J W Cook, Vice President
Projects, Engineering and Construction

Sworn and subscribed before me this 10th day of January, 1983

Patricia A. Lupper
Notary Public
Bay County, Michigan

My Commission Expires 3-4-86

Construction Completion Program
Executive Summary

The Construction Completion Program has been formulated to provide guidance in the planning and management of the design and quality activities necessary for completion of the construction of the Midland Nuclear Cogeneration Plant. Construction completion is defined in this Plan as carrying all systems to the point they are turned over to Consumers Power Company for component checkout and preoperational testing. The Construction Completion Program does not include the Remedial Soils Program which is treated in separate interactions between Consumers Power Company and the Nuclear Regulatory Commission.

Background

The Construction Completion Program was developed in response to a number of management concerns that have been identified during the period preceding the initiation of the Program. The Midland Project had been proceeding at a high level of activity as it approached completion. The final transition from area construction to system completion, using punch lists, has been difficult for most nuclear projects. The Midland Project has not escaped these difficulties which have been compounded due to the congested space and the continuing numerous design changes, both generally attributable to the age of the Project. These factors lead to the need for improved definition of work status, increased emphasis on overall Project objectives as well as continued focus of construction and inspection resources on completion of systems for short-term milestones and increased effort to complete engineering ahead of field installation.

The Midland Project has been criticized by the NRC regional office as not having met their expectations for implementation of the Project's Quality Assurance Program. The result has been that the Project management has too often, during the past few months, been in a reactive rather than proactive posture with regard to quality assurance matters.

In recognition of these conditions, management has concluded that a change in approach was needed to effectively complete the Project while maintaining high quality standards.

Objectives

The development of the Program has considered the Project's current status and recent history and attempts to address the underlying or root causes of the problems currently being experienced. In order to develop the Program the following overall objectives were established under three general headings. The Program must:

Improve Project Information Status By:

- Preparing an accurate list of to-go work against a defined baseline.

- Bringing inspections up-to-date and verifying that past quality issues have been or are being brought to resolution.
- Maintaining a current status of work and quality inspections as the Project proceeds:

Improve Implementation of the QA Program By:

- Expanding and consolidating Consumers Power Company control of the quality function.
- Improving the primary inspection process.
- Providing a uniform understanding of the quality requirements among all parties.

Assure Efficient and Orderly Conduct of the Project By:

- Establishing an organizational structure consistent with the remaining work.
- Providing sufficient numbers of qualified personnel to carry out the program.
- Maintaining flexibility to modify the Plan as experience dictates.

Description

The Construction Completion Program entails a number of major changes in the conduct of the final stages of the construction process and can be described in summary as a two-phase process.

First, after certain necessary preparations, the safety-related systems and areas of the plant will be systematically reviewed. This first phase will be carried out on an area-by-area basis, but will be accomplished mainly by teams organized with systems responsibility and a separate effort to verify the completed work. The product from this phase of the program will be a clear status of remaining installation work and a current inspection status which provides quality verification of the existing work. The teams organized to carry out this first phase will continue to function in the second phase as the responsible organizational units to complete the work.

In order to achieve its complete set of objectives, the Program contains a number of activities and elements that support and are linked to the two major phases described above. The major components of the Plan, which are discussed in more detail in the balance of this report, can be described as follows:

- . A significant reduction in the construction activity in the safety-related portion of the plant, material removal and a general cleanup will be carried out in preparation for installation and inspection status assessment and quality verification activities.

- . A review will be made of equipment status to assure that the proper lay-up precautions have been implemented to protect the equipment until the installation work is completed.
- . The integration of the Bechtel QC function into the Midland Project Quality Assurance Department (MPQAD) under Consumers Power Company management will be completed.
- . The Consumers Power Company is carrying out recertification program of Bechtel QC inspectors, and a review of the inspection procedures to be utilized.
- . The system completion teams will be organized, staffed and trained according to procedures developed to define the team's work process.
- . The systems completion teams will 1) accomplish installation and inspection status assessment, 2) perform systems construction completion and construction quality performance and 3) determine that all requirements have been met prior to functional turnover for test and operation.
- . Quality verification of completed work will be carried out in parallel with installation and inspection status activities of the system completion teams.
- . A series of management reviews will be carried out to carefully monitor the conduct of the Program and to revise the plan as appropriate.
- . Review and resolution will proceed on outstanding issues related either to QA program or QA program implementation as raised by the NRC or third party overviews of the Project.
- . Third party reviews will be undertaken to monitor Project performance and to carry out the NRC's requirements for independent design verification.

Schedule Status

The Program was initiated on December 2, 1982 by limiting certain ongoing safety-related work and starting preparations for the phase-one work of status assessment and quality verification activities. Since the Program also has incorporated a number of commitments made to the NRC during the past few months, activities in support of these commitments such as QC integration into MPQAD and the recertification of QC inspectors, had been initiated prior to December.

Status and schedules for each element of the Plan are enumerated in the text. In general, preparation for the Phase 1 activities are underway and will continue through January. A pilot team to develop the procedures and training requirements will be initiated during January. It is expected that the first

areas to undergo Phase 1 status assessment will be defined and teams mobilized during March.

Quality verification of completed work will start in late January or early February.

The Program provides for the Phase 1 results on a system or partial system to be reviewed and evaluated prior to initiating Phase 2 system completion work on that system or partial system. Management will monitor both process readiness and Phase 1 evaluation results.

The major areas of continuing safety-related work are NSSS construction as performed by B&W Construction Co, HVAC work under the Zack subcontract, the Remedial Soils Program and post-turnover punch list work released to Bechtel construction by Consumers Power Company. The Zack work is currently limited until a recently identified question on welder certification is resolved.

During the implementation of the Program in 1983, the NRC Resident Inspectors can use the Plan to monitor safety-related construction activities at the site. Since a substantial portion of the Plan directly relates to commitments made to NRC management, Consumers Power Company intends to schedule periodic reviews of Program status and progress with the NRC.

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1.0 INTRODUCTION

The Construction Completion Program has been formulated to provide guidance in the planning and quality activities necessary for completion of the construction of the Midland Nuclear Cogeneration Plant. Construction completion is defined in this Plan as carrying all systems to the point they are turned over to Consumers Power Company for component checkout and preoperational testing. The Construction Completion Program does not include the Remedial Soils Program which is treated in separate interactions between Consumers Power Company and the Nuclear Regulatory Commission. The Construction Completion Program will be referred to as the Program in this document which contains the Plan for Program development and implementation.

Background

The Construction Completion Program is being developed in response to a number of management concerns that have been identified during the period preceding the initiation of the Program. The Midland Project had been proceeding at a high level of activity as it approached completion. The final transition from area construction to system completion, using punch lists, has been difficult for most nuclear projects. The Midland Project has not escaped these difficulties which have been compounded due to the congested space and the continuing numerous design changes, both generally attributable to the age of the Project. These factors lead to the need for improved definition of work status, increased emphasis on overall Project objectives as well as continued focus of construction and inspection resources on completion of systems for short-term milestones and increased effort to complete engineering ahead of field installation.

The Midland Project has been criticized by the Nuclear Regulatory Commission regional office as not having met their expectations for implementation of the Project's Quality Assurance Program. The result has been that the Project management has too often, during the past few months, been in a reactive rather than proactive posture with regard to quality assurance matters.

In recognition of these conditions, Consumers Power Company has concluded that a change in approach is needed to effectively complete the Project while maintaining high quality standards.

Objectives

The development of the Program has considered the Project's current status and recent history and attempts to address the underlying or root causes of the problems currently being experienced. In order to develop the Program, the following overall objectives were established under three general headings. The Program must:

Improve Project Information Status By:

- Preparing an accurate list of to-go work against a defined baseline.

- Bringing inspections up-to-date and verifying that past quality issues have been or are being brought to resolution.
- Maintaining a current status of work and quality inspections as the Project proceeds.

Improve Implementation of the QA Program By:

- Expanding and consolidating Consumers Power Company control of the quality function.
- Improving the primary inspection process.
- Providing a uniform understanding of the quality requirements among all parties.

Assure Efficient and Orderly Conduct of the Project By:

- Establishing an organizational structure consistent with the remaining work.
- Providing sufficient numbers of qualified personnel to carry out the Program.
- Maintaining flexibility to modify the Plan as experience dictates.

PLAN CONTENTS

The Program was initiated on December 2, 1982 by limiting on-going work on Q-systems to pre-defined tasks and preparing the major structures housing Q-systems for an installation and inspection status assessment and verification of completed work. The relationship of the major elements of the Plan is shown in Figure 1-1. The sections of the Plan address the following major activity areas:

PREPARATION OF THE PLANT (Section 2.0)

The buildings are being prepared for a status assessment and verification of completed work.

QA/QC ORGANIZATION CHANGES (Section 3.0)

A new QA organization that integrates the QA and QC functions under a Consumers Power Company direct reporting relationship is being established. As a part of this transition, the Bechtel QC inspectors are being recertified to increase confidence in the quality inspection performance.

PROGRAM PLANNING (Section 4.0)

The overall Plan for the program is being developed in two major phases.

The first phase includes:

- A team organization assigned on the basis of systems is being developed to determine present installation and inspection status. The inspection status assessment includes performing inspections on completed work to bring them up to date. A closely coordinated effort involving the construction contractor and Consumers Power Company (QA/QC, testing and construction) will improve quality performance.
- The quality verification of completed work will be based, in part, on a sampling technique using re-certified inspectors as described in Section 3.0.

The second phase includes:

- Following installation and inspection status assessment the team organization will retain responsibility for systems completion work.
- The QC inspection process of new work will be integrated with the systems completion work to ensure adequate quality performance.

PROGRAM IMPLEMENTATION (Section 5.0)

The first phase implementation of the Program will be initiated with a review of the process, procedures and team assignments that will be used. The plan for verification of completed work will be reviewed separately. The teams will conduct the installation and inspection status assessment; verification of completed and inspected work will proceed, as planned, in coordination with the team effort. Following phase 1 completion of the first work segment, a management review of the plan effectiveness will be made.

In second phase Program implementation, the assigned team will plan and schedule the remaining work needed for completion including QC inspections.

QUALITY PROGRAM REVIEW (Section 6.0)

The adequacy and completeness of the quality program will be reviewed on an ongoing basis, taking into consideration questions raised by NRC inspections and findings by third party reviewers. The results of these reviews will be considered as part of the management review that are a part of the Program implementation (Section 5).

THIRD PARTY REVIEWS (Section 7.0)

Independent assessments of the Midland Project will provide management and NRC with evaluations of Project performance.

SYSTEM LAY-UP (Section 8.0)

The on-going work to protect plant equipment and systems will be augmented as necessary to provide adequate protection during implementation of this Plan.

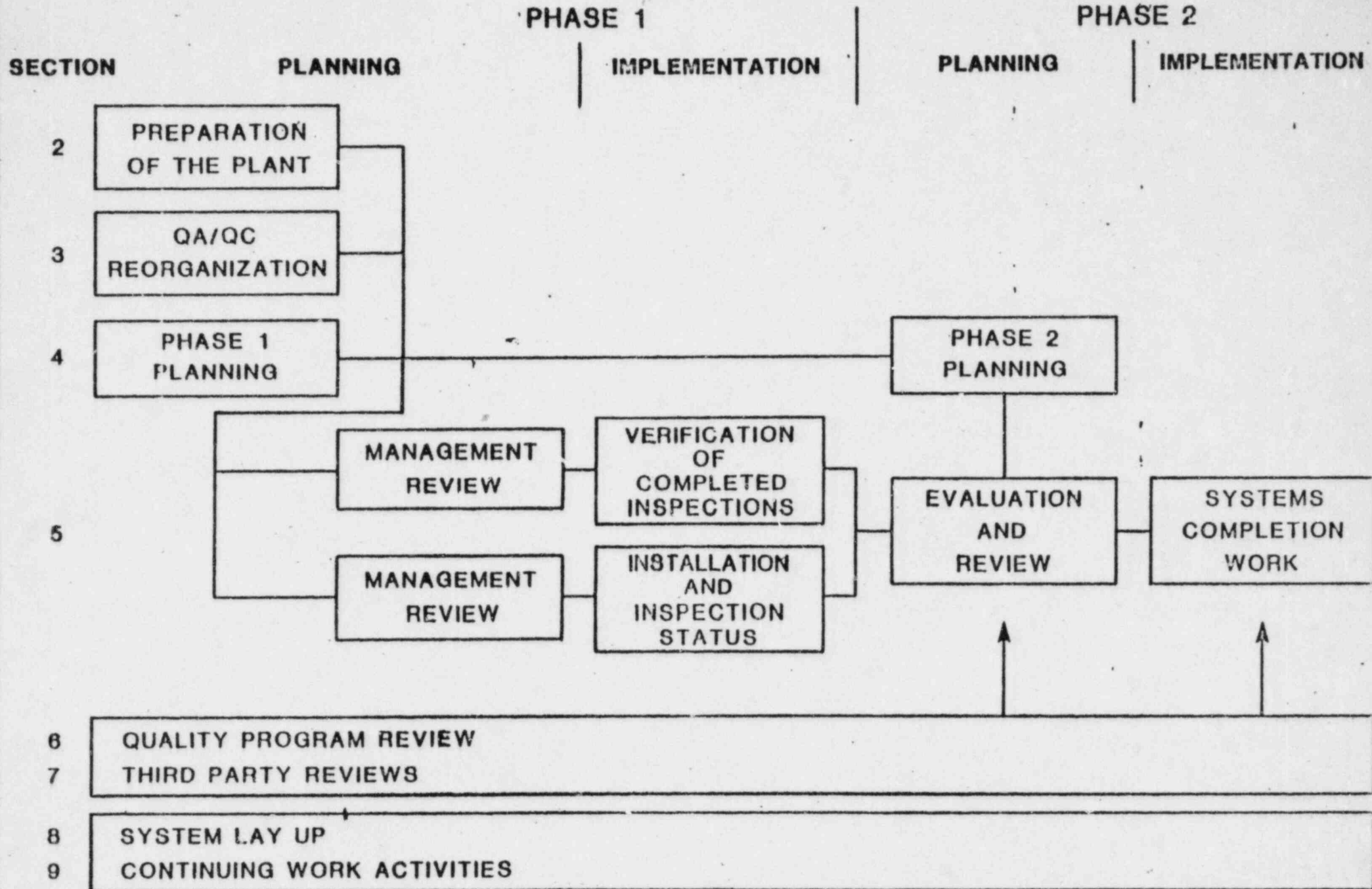
CONTINUING WORK ACTIVITIES (Section 9.0)

Work on Q-Systems has been limited to specific activities. This limitation permits important work to proceed while allowing building preparation for status assessment and verification activities.

SUMMARY

Each section of this Plan presents detailed objectives, a description of the activity involved, and a schedule for achieving major milestones. The Program, however, is still in an evolutionary state and revisions to the Plan may be necessary as Consumers Power Company gains experience in the implementation of Program elements.

FIGURE 1-1
CONSTRUCTION COMPLETION PROGRAM SCHEMATIC



2.0 PREPARATION OF THE PLANT

2.1 Introduction

The preparation of the Plant will clear the auxiliary, diesel generator and containment buildings and the service water pump structure of materials, construction tools and equipment and temporary construction facilities.

2.2 Objective

To allow improved access to systems and areas for the Program activities.

2.3 Description

The preparation activities minimize obstacles and interferences for the Program activities. This is being accomplished through the following steps.

1. Limitation of Q-work to activities and areas defined in Section 9 resulting in substantial work force reduction.
2. Removal and storage of construction tools and equipment, and temporary construction facilities (scaffolding, etc) from the buildings identified in Section 2.1.
3. Removal, control and storage of uninstalled materials from the buildings identified in Section 2.1.
4. Appropriate housekeeping of all areas following material and equipment removal.

The preparation for each area will be complete before initiating further Program activity. The on-going work described in Section 9 will continue as scheduled during the preparation.

2.4 Schedule Status

The preparation of the Plant began on December 2, 1982. It will be complete by January 31, 1983.

3.0 QA/QC ORGANIZATION CHANGES

3.1 Introduction

The Consumer Power Company's Midland Project Quality Assurance Department (MPQAD) is being expanded to assume direct control of Bechtel QC activities. The new organization and the plan for the transition are described below. The transferred QC Inspectors will be recertified as part of this transition.

3.2 Objectives

Establish New QA/QC Organization

Establish an integrated organization which includes the transition of Bechtel QC to MPQAD while accomplishing the following objectives:

1. Establish direct Consumers Power Company control over the QC inspection process.
2. Establish the responsibilities and roles of the QA and QC Departments in the integrated organization.
3. Use qualified personnel from existing QA and QC departments and contractors to staff key positions throughout the integrated organization.

Recertify QC Inspectors

Ensure that those Quality Control inspection personnel transferring to MPQAD from Bechtel will be trained and recertified in accordance with MPQAD Procedure B-3M-1.

3.3 Description

Establish New QA/QC Organization

A new organization will be implemented under Consumers Power Company and will be described in appropriate Topical Reports (CPC-1A and BQ-TOP-1) and quality program manuals (Volume II, BQAM and NQAM). Changes to these documents will be submitted to NRC.

Features of the new organization include:

1. Lead QC Supervisors report directly to a QC Superintendent who reports to the MPQAD Executive Manager. Any required support from Bechtel Corporate QC and QA functions (except ASME N-Stamp activities) is provided at the level of the MPQAD Executive Manager.
2. The MPQAD Executive Manager will review the performance of lead personnel in his department.

3. QA will develop and issue Quality Control inspection plans and be responsible for the technical content and requirements of such plans. QC will be responsible to implement these plans.
4. QA will continue to monitor the Quality Control inspection process to insure that program requirements are satisfactorily implemented.
5. MPQAD will continue to use Bechtel's Quality Control Notices Manual (QCNM) and Quality Assurance Manual (BQAM) as approved for use on the Midland Project.
6. ASME requirements imposed upon a contractor as N-Stamp holder will remain with that contractor. MPQAD QA will monitor the implementation of ASME requirements.

An organization chart (Fig 3-1) showing reporting relationships in the new organization is attached.

Recertify QC Inspectors

The training and recertification process for QC inspectors has been revised to include commitments made during the September 29, 1982 public meeting with the NRC. Those inspectors transferred from Bechtel to MPQAD will be trained and examined in accordance with MPQAD Procedure B-3M-1. Upon satisfactory completion of the training and examination requirements, inspection personnel will be certified for the Project Quality Control Instruction(s) (PQCI(s)) they are to implement. Inspection personnel will be certified on a schedule which supports ongoing work and system completion team activities.

3.4 Schedule Status

Establish New Organization

Advise NRC of the structure of the integrated organization. 12/15/82

Transfer the Bechtel QC Organization to MPQAD. 1/17/83

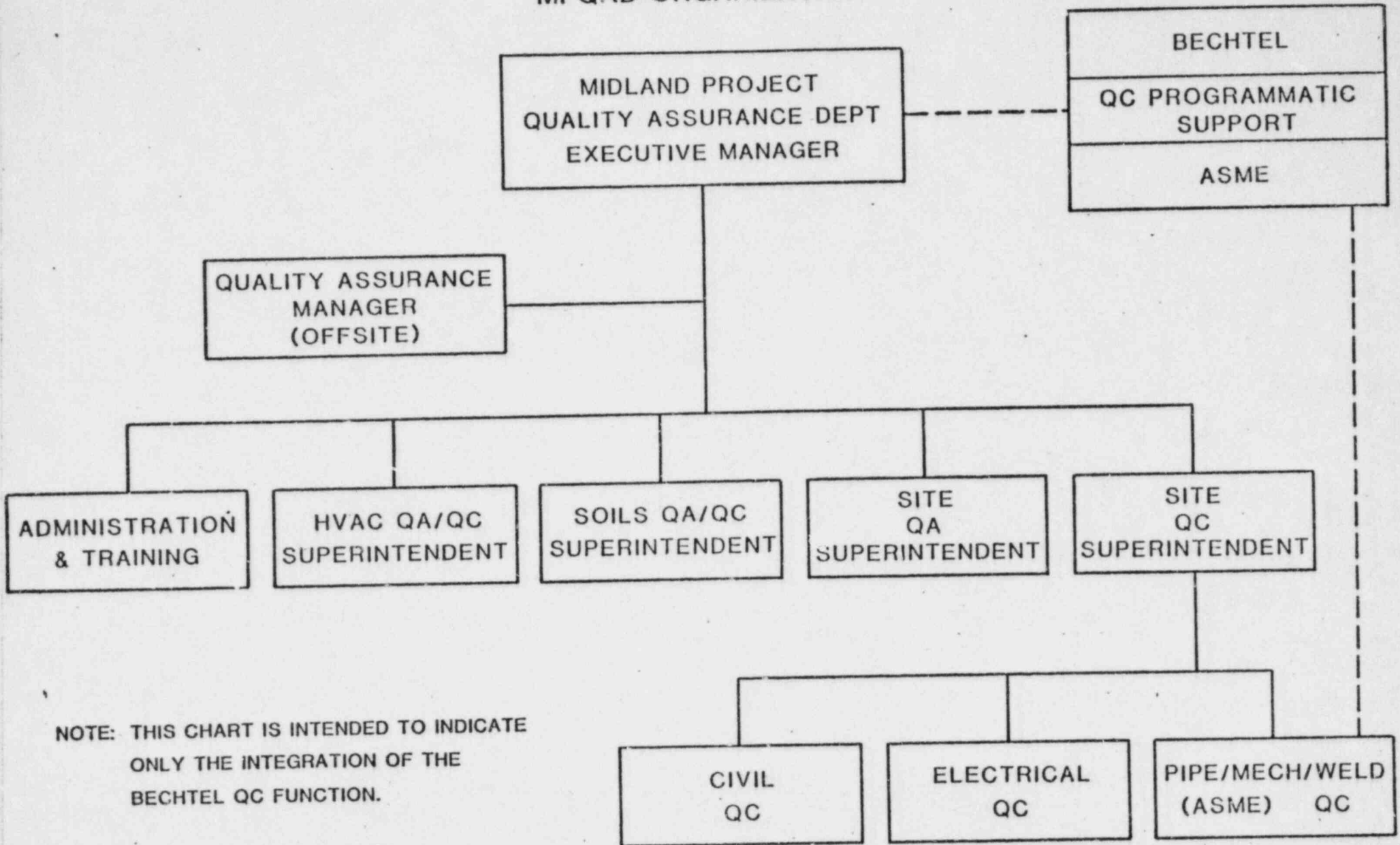
Submit changes to Topical Reports and quality program manuals to NRC. 2/17/83

Recertify QC Inspectors

Specify the revised training and examination requirements for certification (B-3M-1). 10/25/82

Complete recertification 4/01/83

FIGURE 3-1
MPQAD ORGANIZATION



NOTE: THIS CHART IS INTENDED TO INDICATE ONLY THE INTEGRATION OF THE BECHTEL QC FUNCTION.

4.0 PROGRAM PLANNING

4.1 Introduction

The detailed planning for the major portion of the Construction Completion Program is described in this section.

Planning in support of Phase 1 consists of the activities to set up a team organization to assess the installation and inspection status of Q-systems within major structures (Section 4.2) and to verify the adequacy of completed inspection effort (Section 4.3).

The Phase 2 planning effort covers the process and procedures that will be used by the team organization for systems completion work (Section 4.4). The procedures to integrate the quality program requirements with continuing systems completion work will be developed (Section 4.5).

4.2 Team Organization (Phase 1)

4.2.1 Introduction

Organize and train teams and prepare procedures for an installation and inspection status assessment.

4.2.2 Objective

1. Establish and implement a team organization ready to inspect and assess systems for installation and inspection status.
2. Develop the organizational processes and procedures necessary to implement the team approach for status assessment.
3. Provide training to ensure required inspection and installation status assessment activities are satisfactorily performed.

4.2.3 Description

1. The team organization structure will vary depending upon the assigned scope of work. The organization will consist of a team supervisor and personnel as appropriate from field engineering, planning, craft supervision, project engineering, MPQAD and Consumers Power Company Site Management Office. The team may be augmented by procurement personnel, subcontract coordinators and turnover coordinators.

Teams will be assigned a specific scope of work and held accountable for status assessment and overall completion within this scope. The scope includes the requirements

to develop a viable working schedule and insure early identification and resolution of problem areas. Project processes and procedures will be reviewed and modified to incorporate the team organization. The team MPQAD representative is responsible for providing the QA/QC support for the team. He receives scheduling direction from the Team Supervisor and technical direction from MPQAD. For his team's work, he analyzes the quality requirements and plans the QC activities to integrate them with the team effort. He assures the necessary PQCI's and certified inspection personnel are available for performing the inspections. He maintains cognizance of the quality status of the verification activities.

The Washington Nuclear Plant #2 (WNP-2) team organization will be used as a starting point for a Midland specific approach.

A pilot team or teams will be utilized to develop and test processes and procedures during the development stage to assure that Program objectives can be met. This will also provide practical field input to assure that efficient and workable methods are used.

Team members will be physically located together to the extent practicable to improve communication, status assessment, problem identification and problem resolution.

2. Training for inspection and installation status assessment will be provided to team members. It will include responsibilities, reporting functions, indoctrination of project processes and procedures and familiarization with the project quality program to ensure effective implementation.
3. A separate organization of design engineers (presently existing) will coordinate spatial interaction, review and examination with the activities of these teams.

4.2.4 Schedule Status

. Designate pilot team.	1/21/83
. Complete grouping of systems for assignment to teams.	2/28/83
. Complete assignment of team supervisors and members to designated systems.	3/31/83

4.3 Quality Verification (Phase 1)

4.3.1 Introduction

The verification program is the activity undertaken to determine, using a variety of methods, that the inspections performed on completed work were done correctly.

4.3.2 Objectives

The objectives of the verification program are to:

- Review existing PQCI's and revise as necessary to assure that:
 - a. Attributes important to the safety and reliability of specific components, systems, and structures are identified for verification.
 - b. Accept/reject criteria are clearly identified.
 - c. Appropriate controls, methods, inspection and/or testing equipment are specified.
 - d. Requisite skill levels are required per ANSI N45.2.6 or SNT-TC-1A.
- Develop and implement verification inspection plan for completed work which considers:
 - a. Re-inspection of accessible items.
 - b. Review of documentation for attributes determined to be inaccessible for re-inspection.
 - c. Sampling techniques using national standards.

4.3.3 Description

PQCI's will be revised as necessary to meet the objectives in Section 4.3.2. Verification of the quality of accessible completed construction, which has been previously inspected will be performed by use of sampling plans based on MIL-S-105D (1963) or other acceptable methods. Attributes determined to be inaccessible for direct re-inspection due to embedment or the status of completed construction or installation (eg, weld preparation of completed welds, reinforcement in placed concrete, installed anchor bolts, etc) will be verified as appropriate, by examination of records.

4.3.4 Schedule Status

- . Complete review and revision of PQCI's. (Date to be determined.)
- . Establish verification inspection plan for completed work. (Date to be determined.)

4.4 System Completion Planning (Phase 2)

4.4.1 Introduction

Establish the processes for system completion, prepare procedures and expand training to cover systems completion work.

4.4.2 Objective

The objectives of the systems completion planning are as follows:

- . Establish processes and interfaces for system completion.
- . Prepare procedures defining tasks of each system completion team.
- . Train team members by expanding upon training received previously for inspection and status assessment.
- . Establish scheduling methods to be used during system completion activities.

4.4.3 Description

The team organization (developed in Section 4.2) and the processes and procedures will be extended to accomplish the systems completion work.

- . Training will be conducted to assure that supervisors understand the team objectives and their role. Emphasis will be placed on completion of all work in accordance with the design requirements, the change control process used when the design must be modified, and changes to the established team processes and procedures.

4.4.4 Schedule Status

- . Complete team preparation for systems completion work. (Date to be determined.)

4.5 QA/QC Systems Completion Planning (Phase 2)

4.5.1 Introduction

The QA/QC systems completion activity covers the planning to support of system completion work.

4.5.2 Objectives

Establish in-process inspection program and complete review and modification of PQCI's.

4.5.3 Description

The QC in-process inspection program will be directly coordinated with future installation schedules to insure that inspection points, identified by MPQAD QA in the PQCI's, are integrated with the installation schedule. The identification of applicable PQCI's and required inspection points will be used by system completion teams to insure that QC inspections are adequately scheduled into the process. The system completion team quality representative will be responsible for providing the link between the system completion team and MPQAD to insure that quality requirements are satisfied.

PQCI's will be reviewed, and modified as necessary, to insure that proper attributes are being inspected, that inspection plans are clear and concise, that inspection points are specifically scheduled with installation activities and that inspection results are properly documented. MPQAD QA will be responsible for the PQCI review activity and will obtain assistance, as required, from other project functions, such as Project Engineering and Quality Control. Revised PQCI's will be used to conduct inspection of future installation activities.

4.5.4 Schedule Status

Issue procedure for integrating inspection points into the construction schedule.

2/22/83

5.0 PROGRAM IMPLEMENTATION

5.1 Introduction

The implementation of the Phase 1 Construction Completion Program activities will be initiated after a management review of the overall process insures that Project performance and quality objectives have been addressed. The Phase 1 work will then be carried out by the various teams in accordance with the procedures described in the preceding sections. The installation and inspection status assessment of a system or partial system will be followed by a review of results by MPQAD and a second management review before initiating the Phase 2 systems completion work. The Phase 2 work will then be initiated on that system or partial system.

5.2 Objectives

The objectives to be met are:

- . Establish the present installation completion and quality status.
- . Integrate the construction and quality activities for all remaining work.
- . Improve performance in demonstrated conformance to quality goals in all system completion work.

5.3 Description

Management Reviews

Project management will conduct formal review of the plans for implementation activities prior to initiation of team activities for the Phase 1 work. These reviews will ensure that identified project management and quality issues have been adequately addressed by specific actions and that Program objectives are met. The reviews will cover the process for both 1) the verification of completed inspection activity and 2) the installation and inspection status activity.

The installation and inspection status assessment will be performed on a system and/or area basis. Phase 2 is initiated after a formal Project management review of the first status assessment results to evaluate implementation effectiveness. After completion of this review, a work segment will be released for systems completion. Subsequent status assessment results will be reviewed by site management prior to initiation of additional systems completion segments. Reports will be made to Project management at regularly scheduled meetings.

Phase 1 Implementation

The existing installation and inspection status will be established in accordance with the plan presented in Section 4.

Evaluate Phase 1 Results

MPQAD will review the status assessment results to determine if any programmatic or implementation changes must be made. Verification scope will be adjusted, as necessary, based on evaluation results. Also, the evaluation will check for reportability to the NRC (as required by 10 CFR 50.55(e)) and Part 21.

Phase 2 Implementation

This activity starts systems completion for turnover. Work will be scheduled as installation and inspection status assessments are completed and reviewed. Correction of identified problems will be given priority over initiation of new work, as appropriate, and the system completion teams will schedule their work based on these priorities.

5.4 Schedule Status

- . Complete Management review and initiate implementation of plan for verification of completed inspections. (Date to be determined.)
- . Complete Management review and initiate implementation of plan for status assessment. (Date to be determined.)
- . Complete Management review of initial installation and inspection status results and initiate systems completion work. (Date to be determined.)

6.0 QUALITY PROGRAM REVIEW

6.1 Introduction

The adequacy and completeness of the quality program is reviewed as part of the ongoing Project management attention to quality. These reviews consider any questions raised by NRC inspections or findings raised by third party evaluations.

6.2 Objective

Address issues raised by internal audits, NRC inspections and third party assessments. Program changes, if needed, will be evaluated and, as findings are processed, will be factored into the Project work.

6.3 Description

Consumers Power Company believes Midland QA program is sound. From time to time, questions arise on detailed aspects of the program or program implementation. The normal process of addressing these issues ensures that all necessary information is provided to NRC and that internal confidence in the program is maintained.

The recent inspection of the diesel generator building has raised several issues of programmatic concern. These are in the areas of material traceability, design control process, Q-system related requirements, document control and receipt inspection. Project management has directed that MPQAD provide an expeditious evaluation of these issues to be considered as part of the management review prior to initiation of Phase 2. Once the NRC inspection report is received and specified items are identified, these items will be addressed and resolved through the normal process of closing the inspection findings. Any corrective action or program changes will be implemented as appropriate in Project work on a schedule provided in the inspection report response.

The Project will also receive, from time to time, findings from third party assessments (Section 7). These findings or recommendations may also result in program modification or adjustments. Corrective action taken by the Project will be implemented on a schedule stated in the response to these findings.

7.0 THIRD PARTY REVIEWS

7.1 Introduction

This section describes third party evaluations and reviews that have been performed and are planned to assess the effectiveness of design and construction activity implementation. Third party reviews being conducted as part of the Remedial Soils Program are not included in this activity.

7.2 Objectives

To assist in improving Project implementation and assessment of Midland design and construction adequacy, consultants will be utilized in order to:

- Achieve a broad snapshot of current Project practices and performance in relation to a national program.
- Provide continuous monitoring and feedback to Management of Project performance.
- Identify any activities or organizational elements needing improvement.
- Improve confidence (including the NRC's and the public's) in overall Project adequacy.

7.3 Description

The use of consultants to overview Project design and construction activities with particular emphasis on construction is part of the effort to improve the Project's implementation of the quality program. Specifically, the plan overview employs the use of consultants for three separate functions: (1) To carry out a self-initiated evaluation (SIE) of the entire Project under the INPO Phase I program, (2) to utilize a third party overview of ongoing site construction activities to provide monitoring of the degree of implementation success achieved under the new program and (3) to conduct a third party Independent Design Verification (IDV) Program.

1. The INPO self-initiated evaluation was planned as part of an industry commitment to the NRC in response to concerns over nuclear plant construction quality assurance. For the Midland SIE, the evaluation was contracted to be carried out entirely by third party, experienced personnel from the Management Analysis Company.

The evaluation was performed by a team of 17 consultants familiar with the INPO criteria and evaluation methodology. Over a period of a month they interviewed Project personnel at various locations and observed work in progress. The initial results of their evaluation have been presented to the Company

and a Project response to each finding will be prepared and included as part of the evaluation report to be submitted first to INPO and then to the NRC Region III Administrator, together with the INPO overview.

2. A third-party installation implementation overview is being undertaken using, as a model, the program developed specifically for the underpinning portion of the soils remedial work. The overview will be initiated by retaining an independent firm, having considerable experience and depth of personnel in the nuclear construction field. The consultant's overview team will be located at the Midland Plant site and will observe the work activities being conducted in accordance with this Plan on safety-related systems. The overview will continue for a period of six months, after which the Project's cumulative performance will be evaluated. Based on the overview team's findings, a determination will be made by the Company's top management on what modification, if any, should be made to the consultant's scope of work. Findings identified by the installation overview team will be made available to the NRC in accordance with the procedures established for the conduct of independent verification programs.
3. An Independent Design Verification (IDV) is being conducted by Tera Corporation.

The IDV is directed at verifying the quality of design and construction for the Midland Plant. The approach selected is a review and evaluation of a detailed "vertical slice" of the Project design and construction. The design and as-built configuration of two selected safety systems will be reviewed to assure their adequacy to function in accordance with their safety design bases and to assure applicable licensing commitments have been properly implemented. The field work done in support of this activity will not take place until after Phase I implementation (Section 5) has been completed on the systems being reviewed.

The Unit 2 Auxiliary Feedwater System (AFW) plus another system to be selected with NRC concurrence, will be reviewed to fulfill the requirements of the IDV.

7.4 Status/Schedule

1. INPO Construction Project Evaluation

Select consultant and conduct evaluation	Complete
Submit report to INPO	Jan 20, 1983

2. Independent Construction Overview

Define scope	Dec 30, 1982
Select consultant	Jan 31, 1983
Mobilize assessment team	(Date to be determined)
Receive assessment team report	(Date to be determined)

3. IDV

Select 2 Systems	
.AFW System	Complete
.Obtain NRC concurrence for second system.	(Date to be determined)
Complete Evaluation	(Date to be determined)

8.0 SYSTEM LAYUP

8.1 Introduction

Perform system lay-up activities to protect plant equipment.

8.2 Objectives

Expand the protection of completed and partially completed plant systems and components until plant start-up, to take into account any special considerations during the status assessment.

8.3 Description

Procedures and instructions are provided in the Testing Program Manual to protect equipment during the on-going installation and test work. These will be extended to cover special considerations associated with the Program implementation. Both the pre- and post-turnover periods are covered. System and component integrity is ensured through existing programs and implementation of control and verification procedures.

In summary, these procedures and instructions require: Test Engineers to complete walkdowns of Q-Systems (in the auxiliary, diesel generator and containment buildings and the service water pump structure), paying particular attention to systems/components that are open to the atmosphere (eg open ended pipes, open tanks, missing spools, disconnected instrument lines, etc). Systems that have been hydrottested but are not currently in controlled layup require action to place the system in layup. Layup will vary from system to system but in general will consist of air blowing to remove moisture and closing the system from the atmosphere.

8.4 Schedule/Status

- | | |
|---|---------|
| . Start extended layup activities | 1/15/83 |
| . Issue walk down schedules | 1/15/83 |
| . Complete the layup preparation walkdown | 2/28/83 |

9.0 CONTINUING WORK ACTIVITIES

9.1 Introduction

This section describes the activities that are proceeding in accordance with previously established commitments during the implementation of the Program.

9.2 Objectives

- . Maintain installation and support effort on work that will alleviate work interference in congested portions of the plant and facilitate completion and protection of equipment on systems turned over to Consumers Power Company.
- . Meet previous NRC commitments on activities which do not impede the execution of the Program.
- . Provide design support for orderly system completion work and resolution of identified issues
- . Establish a management control to initiate additional specified work that can proceed outside of the systems completion activities

9.3 Description

Those activities that have demonstrated effectiveness in the Quality Program implementation will continue during implementation of the Construction Program.

These are:

1. NSSS Installation of systems and components being carried out by B&W Construction Company.
2. HVAC Installation work being performed by Zack Company. Welding activities currently on hold will be resumed as the identified problems are resolved.
3. Post system turnover work, which is under the direct control of Consumers Power Company, will be released as appropriate using established work authorization procedures.
4. Hanger and cable re-inspections which will proceed according to separately established commitments to NRC.
5. Remedial Soils work which is proceeding as authorized by NRC.

6. Design engineering which will continue for the Midland Plant as will engineering support of other project activities.

Additional activities related to the systems completion effort, may be initiated, as appropriate, to support orderly completion of the overall Project. Any activities in this category that are initiated prior to release of an area for systems completion work will be reviewed with the NRC Resident Inspector before initiation.

9.4 Status Schedule

These activities are proceeding with schedules that are independent of this Plan.

20/B3

GOVERNMENT ACCOUNTABILITY PROJECT

Institute for Policy Studies
1901 Que Street, N.W., Washington, D.C. 20009

(202) 234-9382

March 7, 1983

Mr. Darrell Eisenhut, Director
Division of Licensing
U. S. Nuclear Regulatory Commission
Washington, D. C.

Dear Mr. Eisenhut:

On February 8, 1983, the Government Accountability Project (GAP) attended two public meetings in Midland, Michigan on behalf of the LONE TREE COUNCIL, concerned citizens, and several former and current employees working on the Midland Nuclear Power Plant, Units 1 and 2. As you know, the large public turnout for both the daytime meeting between Consumers Power and various Regional and Washington-based offices of the Nuclear Regulatory Commission (NRC) and the evening session between the NRC and the general public included spirited debate and lengthy presentations. These meetings, although highly beneficial to the education of the Michigan public about the nuclear facility being constructed in Midland, did not allow for the type of technical questions and detail about the Construction Completion Plan (CCP) in which GAP is particularly interested.

Therefore, I appreciate this opportunity to address a number of concerns that we have regarding issues presented at the public meeting and contained in the detailed CCP submissions. In order to complete our own continuing analysis of the Midland project, I would hope that you can provide answers to and/or comments on the enclosed questions.

Pending further public meetings and detailed review of basic elements of the Construction Completion Plan, I assume that your verbal requests to Consumers Power (Consumers) management to "hold off" on making any commitments will be translated into a firm NRC directive. As you know, Consumers has had a history of misinterpretations and miscommunications in relation to many of the aspects surrounding the Midland plant. The public understood quite clearly what your instructions were; if those have changed I suggest that you continue to express those changes to the public through the appropriate local media representatives.

I. REQUESTS FOR FURTHER INFORMATION

A. The relationship between the Washington NRC offices (NRR, DOL, etc.) and the Regional management and on-site Midland Special Team and Inspector.

It is unclear where the authority lines for approval of various elements of the Midland construction project are drawn. GAP investigators, staff and attorneys are continually getting unclear signals from the various regulation divisions as to who is making what decisions and when. Since it has been noted by the NRC staff itself that "[Consumers] seems to possess the unique ability to search all factions of the NRC until they

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March 7, 1983

have found one that is sympathetic to their point of view - irregardless of the impact on plant integrity,"^{1/} it seems critical to establish once and for all the authority lines within the NRC that Consumers must respond to.

We are particularly concerned about the apparent transferring of responsibility for the on-site inspectors and the Midland Special Section Team to the Regional Administration and Washington-based NRC officials. Although I am sure that you have read the testimony of Mr. Keppler, submitted to the Atomic Safety and Licensing Board (ASLB) on October 29, 1983, and attached memorandum from the staff members that are more directly responsible for the Midland project, I have included them with this letter for your renewed attention following the results of the Diesel Generator Building inspection. (Attachment #1.)

There have been a number of incidents within the last several months where Regional personnel (RIII team or on-site) have indicated one answer pertaining to construction work, and then other action was taken after approval from NRR. Several examples of this that are fairly recent are:

1. A February 8, 1983 conference call between Consumers, Bechtel and the NRC regarding the discussion of loading sequence for pier load test and background settlement readings did not include any Region III personnel, most particularly Ross Landsman. Although I do not know the details of his exclusion, I am concerned that he was not a participant in the call, or in the decisionmaking process.
2. At the recent ASLB hearings NRR and RIII personnel were asked about the projected timeline for Consumers to approach the Feedwater Isolation Valve Pit jacking work. RIII personnel seemed confident that work would not begin on this until at least late March or early April, yet work actually was begun on the same day as the conversation, February 17, 1983.
3. The NRC has taken a position that "no major discrepancies" have been found in the soils remedial work to date. Yet: (a) two cracks, including one 10 millimeters by 7 inches long, have been discovered in the valve pit.^{2/} (b) A February 15, 1983 memorandum from R. B. Landsman to R. F. Warnick identifies three specific concerns since the beginning of the underpinning work that -- to GAP -- indicate serious flaws in the perception of Consumers about the seriousness of the work they are engaged in. These include craftworkers not receiving the required amount of training, arguments with Consumers about techniques that show a priority to deadlines instead of quality, and a major flaw in the Stone & Webster independent assessment. (Attachment #2.)

Given our experiences with the NRC inspection efforts, I am particularly anxious to have the on-site/special section team members have as much direct input into the review/licensing process as possible. Although I do not always agree with their decisions or their actions, I am more comfortable with their version of the facts on the Midland site.

^{1/}Memorandum from R. J. Cook to R. F. Warnick, July 23, 1982.

^{2/}According to the Midland Daily News, February 24, 1983, Construction Technology had performed an "independent" analysis of the cracks before the Midland team even had the opportunity to complete its own investigation or review.

B. The guidelines and timetable by which the independent third-party auditor will be chosen.

It is not at all clear what guidelines, if any, your office intends to employ in the review or monitoring of the selection process for the third-party auditor of the Midland facility. We are extremely distressed at the way that both Stone & Webster (S&W) and the TERA Corporation were approved by your office. We feel that the approval was more by default than by aggressive review of the proposals, contracts and criteria as presented to the NRR office. Further, it is very clear to us that the Regional personnel involved in the initial contact with the Stone & Webster organization gave the impression that S&W's on-site activities were authorized. Even if that impression was only technically incorrect, it is a serious breach of public trust by the Regional staff.

We recommend that your office adopt the prudent position that Consumers follow the nominating process used for Diablo Canyon's independent assessment. Although Midland's problems have not yet reached the stage of major public controversy such as Diablo or Zimmer, it is clearly evident that the sensationalism of the problems with the soils settlement and the cost of the Midland facility will move it more into the public eye as it reaches completion.

If there was any doubt as to the active interest of the Midland community in regards to the Midland facility, the February 8, 1983 public meeting should have dispelled that misconception. The community surrounding the plant is extremely attentive to the issues and concerns raised by the nuclear facility -- the debate will continue. To choose another, more congenial approach to identifying the firm that will be responsible for the completion of the plant would be a grave mistake in our opinion.

C. The plans that the NRC staff has made to determine the actual "as built" condition of the rest of the buildings and systems on the Midland site in the wake of the findings in the Diesel Generator Building inspection.

The aggressive efforts of the DGB inspection were a solid step forward in determining the extent of the problems at the Midland facility. However, it is unfortunate that the inspection did not expand to other buildings. The public must have confidence that all the problems have been identified, as well as basic factors about how the problems were caused and how they are going to be fixed if there is ever any hope for restoring faith in the safety of the plant.

D. The methodologies that are to be employed in the technical review of generic problems on the site, such as determining the accuracy of quality control/quality assurance documentation made suspect by the flawed process, and the training and recertification of all the welders who were trained by Photon Testing, Inc.

The two items mentioned above, as well as problems that have resulted from the ZACK corporation, unidentifiable electrical cables, untrained quality control inspectors, material traceability inaccuracies, etc., must be addressed in any workplan to identify the problems on the site. It is not clear whether the NRC staff, the NRR staff or the independent auditor is to

be responsible for identification of all of the problems prior to the start up of construction activities on the site.

E. The resolution of what is and what is not "Q" work in regards to the soils remedial work should be handled in a public forum.

The "Q" debate between NRC staff members - including Regional management and the on-site inspectors - as well as between the NRR and NRC staff has been a topic of considerable concern to us. The resolution of these issues has critical implications for the rest of the soils work project. Because it has been a major item of discussion in the hearings currently underway in Midland, as well as among the staff, we believe that it would be beneficial for you to receive the position that concerned citizens have taken. I have suggested that those residents who have been following this issue very closely prepare a position statement for your office on the "Q" soils issue.

II. COMMENTS CONCERNING THE THIRD-PARTY REVIEWS

It is our understanding that there are currently three separate independent audits being conducted (or considered) at the Midland facility. These are:

(1) The Stone and Webster Corporation's third party independent assessment of the soils remedial work activities. A February 24, 1983 letter from Mr. Keppler to Consumers outlines the scope of the S&W assessment. It significantly broadens the original scope of S&W's review. As a result of the expansion of S&W's responsibilities, and apparently a close monitoring of their work by the RIII team, Mr. Keppler approved the release of additional underpinning work for construction. We request the following documents in reference to the S&W approval:

- a. The criteria that NRC officials used to judge the adequacy of the initial S&W work.
- b. The methodologies which the S&W personnel are utilizing to provide their QA overview and assessment of the design packages, inspector requalification and certification program, and training programs.
- c. The details of the expanded work contract which will assess the actual underpinning work on safety-related structures.

(2) The Independent Design Verification and vertical slice review being performed by the TERA Corporation. We have recently received the detailed Engineering Program Plan from TERA on the Midland Project. Although extremely impressed with some of TERA's procedures, organization and structure there are a number of areas which raise serious questions.

- a. What specific reporting procedures does TERA have to follow in regards to findings, corrective action reports, controversies among their own staff over issues of noncompliance or questionable accuracy, and internal reporting. Figure 1-1 clearly indicates that

March 7, 1983

TERA intends to notify the NRC at the same time as Consumers, but at the February 8 meeting there was a very clear example of that not actually happening because of miscommunication between TERA and the NRC.

b. What is the difference between a Corrective Action Report as referenced in the QA Audit Procedures and a Non-Conformance Report as required by 10 CFR Part 21. (A similiar "informal" nonconformance reporting procedure at the William H. Zimmer plant caused innumerable problems for both the NRC and the licensee.) We would ask that the C.A.R.'s be forwarded to the NRC, or preferably be written up as NCR's immediately upon identification of an item of non-compliance. Any discretion between informal and formal procedures should be limited to the judgement of the NRC.

c. What is the intent and scope of the "EXCEPTIONS" referred to in Part 1.1 of the plan?

d. Who controls the Administrative decision making process between Consumers and TERA over specific points of technical controversy?

e. What documents will be forwarded to the NRC in support of the various findings - whether favorable or unfavorable - during the course of the two vertical slice reviews?

(Further comments and questions about the TERA plan will be forthcoming under separate cover when we are able to finish our review.)

(3) The overall independent third-party assessment. Instead of providing your office with our detailed (and lengthy) analysis of the flaws and shortcomings of the CCP as introduced by Consumers in the January 10, 1983 letter and the public meeting we have decided to wait for further detail to be provided by Consumers on their plan. We are somewhat anxious about this, as we understand that there have been detailed discussions going on between the NRC and Consumers. As you know, similar events at the Zimmer plant led to increased public skepticism and an even greater loss of confidence in the NRC process.

We strongly encourage your office and the Regional Administrator to consider the process of choosing a third-party auditor as important and delicate as was the process at Zimmer. If there is to be a "closed door" approach to Midland we request that you articulate that at this time. If you do not we will assume that the NRC intends to follow a fully public process of nomination and selection.

Thank you for your time, we look forward to answers to our questions in the near future.

Sincerely,

BILLIE PIRNER GARDE
Director, Citizens Clinic

WEDNESDAY

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INTERROGATORY IV

RE INDEPENDENT DESIGN AUDIT: CONTENTION 8

Questions

1. How much time, money, and effort is involved in the Bechtel Audit of Bechtel construction and design announced at the 5/20/82 ACRS meeting? What is the purpose and justification for this self-audit? Who will pay for it?
2. What plans have been made toward an independent design and construction audit at Midland?
3. What contacts have been established thus far with various firms concerning the design and construction audit?
4. Provide names and addresses of all firms considered for performing the independent design and construction audit.
5. What criteria are being used to select the firm for the independent design and construction audit--what are the job requirements?
6. Explain in detail the job description, scope of the audit, and other descriptions of what exactly is to be done during this audit.
7. Provide all documents and correspondence exchanged thus far between CPC and prospective companies or individuals regarding the design and construction audit.
8. Explain to what extent the audit scope, depth, or methodology will be controlled by CPC.
9. Explain CPC's proposed plan of action for responding to audit findings.
10. When does CPC expect the selection of this audit firm to be decided?
11. When does CPC expect the audit to begin? To be concluded?
12. How is it possible for an outside auditor to independently assess the structural adequacy of the containment structures and other structures (due to the missing reinforcing bars) without relying upon CPC's statements and analysis of internal wall conditions?

Reponses

1. This question refers to a "Bechtel audit of Bechtel construction and design announced at the 5/20/82 ACRS meeting." During the 5/20/82 meeting there was discussion of an "independent design verification" conducted by Bechtel and CP Co. We assume that is what the question addresses.

The Midland Independent Design Review Program conducted by Bechtel & CP Co personnel (who were independent of the Bechtel Ann Arbor office and CP Co Midland Project) involved 3183 manhours of the personnel on the review team, at a cost of \$204,100.

The purpose of the Program was to review Bechtel project engineering activities to determine if design criteria are being correctly implemented and if the design assumptions, design methods and the design processes are satisfactory. As discussed at the 5/20/82 ACRS meeting, CP Co decided that based on occurrences at Diablo Canyon and other plants, a design audit was prudent, even without a specific NRC request. CP Co decided that such an audit could be optimized by using people who were knowledgeable about the system but were not working on Midland design such as Bechtel personnel located in offices other than Ann Arbor or CP Co personnel that have not been involved in Midland. The Company also did not at that time, nor do we as yet, know what NRC staff requirements would apply to independent audits for plants that are in the construction and licensing stage similar to Midland. The Company believes that the Bechtel-CP Co audit will be extremely useful either in confirming the adequacy of design and construction, or, if problems are

found, in providing timely identification so that corrective action may be taken consistent with overall project schedules.

2. To date the following plans have been made for an independent design and construction verification program on Midland.

CP Co Management decided that the Independent Design and Construction Verification Program should consist of two parts, and that both parts should be integrated into one report under the jurisdiction of one subcontractor.

The first part is to be an INPO-type evaluation. This type of evaluation has been under development since March of 1982 with INPO developing criteria to be used by the Utility Industry in performing their self evaluation. INPO evaluation teams made up of utility personnel and consultants have conducted evaluations of several pilot plants in 1982 and, in September 1982, issued the latest draft of the "Performance Objectives and Criteria for Construction Project Evaluations." In September 1982, workshops were held by INPO for utility and consultant personnel on how to implement the evaluation. INPO has discussed the program with the NRC Staff and NRC Staff has taken part in training sessions and INPO pilot plant programs. Although the INPO Evaluation Program was designed as a self evaluation program by the utility using its own employees in conjunction with assistance from other utilities or consultants, CP Co has decided to have the INPO evaluation performed by non-CP Co employees to obtain an extra degree of independence in the INPO-type evaluation.

The second part of the Independent Design and Construction Verification Program will be similar to what has been conducted on several plants which were or are to be licensed in 1982. This would be an in-depth review of a system which is important to safety and whose initial design required interfaces within the principal design organization and with another organization, such as the NSSS supplier. This type of program has been accepted by the NRC Staff on other plants. The contractor who will perform the independent, in-depth design and construction verification will be required to meet the independency criteria provided in Chairman Palladino's 2/1/82 letter to Representative John Dingell.

On September 2, 1982 a meeting was held with Region 3 and the staff to discuss the above plans.

3. Three firms have been contacted as potential suppliers of the services described in Item 2 above. All three firms have presented proposals and met with the Company.

4. The three firms considered were:

(a) Management Analysis Co
11095 Torreyana Rd
San Diego, CA 92121

A subcontractor for the second part of the independent design verification proposed by them was:

CYGNA Energy Services
141 Battery Street
Suite 400
San Francisco, CA 94111

(b) TERA Corporation
3131 Turtle Creek Boulevard
Dallas, TX 75219

(c) Torrey Pines Technology
PO Box 81608
San Diego, CA 92138

5. The basic criteria that are being used to select the firm for the Independent Design and Construction Verification Program include:

- a. QA Knowledge and Experience
- b. Technical Capability Including Experience of Personnel
- c. Independency
- d. Program Planning
- e. Cost

The job requirements are explained in the answer to Question 6.

6. As discussed in the answer to Question 2, the independent design and construction verification program will consist of two parts.

Part 1 - INPO

The description of the work is found in the September 1982 INPO Performance Objectives and Criteria for Construction Project Evaluations. The contractor performing Part 1 will assemble a team of personnel who will use these criteria in implementing the evaluations. The preplanning phase will consist of selecting review areas based on complexity, status, interfaces, safety significance, and history of problems (Plant and Industry); and defining review material required (procedures, SAR,

Spec's, drawings, develop tentative assignments and schedule). There will then be more detailed planning of the above, with a plant tour and identification of interfaces. The actual evaluation will consist of interviews, reviews of material provided, observation of activities, discussion of findings within the team, and drafting of performance evaluations.

Part 2

The INPO evaluation team will include one or more members who are employed by the Contractor doing the Part 2, in-depth review. They will assist in the INPO design review aspects, and use the information from the INPO activities to assist in determining the system to be verified in-depth.

The in-depth Part 2 design verification will confirm the design adequacy of an important safety system and will consist of the following activities:

- a. Reviewing design inputs for conformance to system design criteria and commitments;
- b. Confirming that the design process conforms with design control requirements and that interface requirements were factored into design;
- c. Reviewing drawings and specifications for conformance with design criteria, commitments, and incorporation of results of analysis and calculations;

d. For analyses and calculations, reviewing input assumptions, methodology, validation and usage of computer programs and checks of certain calculations outputs;

e. Performing confirmatory analyses and calculations of certain original design analyses and calculations;

f. Verifying as-built conditions by inspections and walkdowns of selected systems and components for conformance with design, inspection and test documentation.

The above would include all engineering disciplines involved in the system (electrical, mechanical, nuclear, civil, instrumentation and control, materials selection, and equipment qualification).

8. Consumers Power Company will not be controlling the Independent Design and Construction Verification Program. CP Co personnel will be answering questions during Parts 1 and 2, and will be providing information on the appropriate organization within CP Co or other Companies to obtain the answers to questions of reviewers. The methodology has been defined in the answer to Question 6. The scope and depth of the audit is pre-defined in accord with the audit methodology as described in the Response to Question 6. Once a contractor is retained, the Company will not interfere with the auditor's ability to carry out its function in accordance with the methodology. The auditors will be free to pursue areas to a depth which they believe necessary to support their conclusions.

9. Findings from the program will be evaluated to determine what corrective action, if any, should be taken. Depending on the nature of the finding, action could include re-analysis, rework, or replacement of hardware items or modifications of programs.

10. The selection of the firms to be involved in Parts 1 and 2 was made on September 16, 1982.

11. Consumers Power Company expects the Independent Design and Construction Verification Program to begin shortly after we make an additional presentation to the NRC. This presentation has not been scheduled. We hope that the Program can begin in October 1982. Some preliminary activities such as training of review team personnel is expected to start the last week in September 1982 and may commence before the additional presentation to the NRC. We expect that the Program would be concluded approximately four months after it commences.

12. For either of the structures mentioned, the independent design and construction verification reviewer would not have to rely upon CP Co statements and analysis of internal wall conditions other than to utilize the as-built drawings for the rebar. He could then use his own method of analysis to assess the adequacy. This is covered in the answer to Question 6, Part 2, Item (e). (Whether or not an independent audit would pursue the rebar matter on these structures depends on whether the audit encompasses them, and, if it does, whether the auditor judges Consumers Power Company's analysis to be adequate.)

21/03

AUG 09

Docket Nos. 50-329/330 DL, DL

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

Dear Mr. Cook:

Subject: Construction Completion Schedule for Midland

On April 19-21, 1983, the NRC staff visited the Midland Plant to evaluate construction completion schedules. The meeting discussed the basis for Consumer's revised estimates of October 1984 (Unit 2) and February 1985 (Unit 1). On April 20, 1983, the staff conducted an tour of both units to observe construction progress.

The staff believes that your estimate of 14 months to complete preoperational and acceptance testing for both units is unduly optimistic. Recent experience for a single unit has indicated that this activity will require at least 24 months to complete. Moreover, the staff believes that your forecast does not realistically account for large uncertainties in the work that must precede start of critical path testing, and that this can be expected to add some months to your schedule. These factors alone would infer that your October 1984 projected completion date is optimistic by at least a year.

Since the staff's visit, you have requested an opportunity to meet with the staff to review the material previously provided as well as to provide any additional information for its further consideration in this matter. We also understand that you plan to reconsider your scheduling priorities between units 1 and 2 in light of recent actions by Dow Chemical Company. At your request, we will be scheduling this meeting in September. A final staff position for Midland's construction completion date will be developed following this further meeting.

Sincerely,

TS/

Thomas H. Novak, Assistant Director
for Licensing
Division of Licensing
Office of Nuclear Reactor Regulation

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cc: See next page

Docket Nos. 50-329/330 OL, OL

Mr. J. W. Cook
Vice President
Consumer Power Company
1946 West Parnall Road
Jackson, Michigan 49201

Dear Mr. Cook:

Subject: Construction Completion Schedule for Midland ACRS (16)

DISTRIBUTION
Docket File 50-329/330 OM, OL
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L PDR
PRC System
NSIC
LB#4 rf
EAdensam
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R-III
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JStone, IE

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Sincerely,

Thomas M. Novak, Assistant Director
for Licensing
Division of Licensing
Office of Nuclear Reactor Regulation

cc: See next page

DSE with added sentence to para 2

J. HICKSON concerned 8/15/83

SEE ATTACHED

OFFICE	DL:LB#4	DL:LB#4	RM	OELD	R-III	AR:DP	DIR
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22/83

July 29, 1983

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

MEMORANDUM FOR: The Atomic Safety and Licensing Board
for the Midland Plant, Units 1 and 2

FROM: Thomas M. Novak, Assistant Director
for Licensing, Division of Licensing

SUBJECT: BOARD NOTIFICATION - NEW INFORMATION RELATING
TO SOILS REMEDIAL WORK, WELDING AND THE DOW
CONTRACT (BN 83-106)

This information is provided in accordance with the present NRC procedures regarding Board Notification.

The following information deals with new developments in various aspects of the Midland project. Portions of the notification may be relevant to the Midland OM/OL proceedings in areas of soils remedial work, HVAC systems, Quality Assurance and the Dow Chemical legal proceedings.

Any additional information relevant to these issues will be provided in a future Board Notification.

Thomas M. Novak, Assistant Director
for Licensing
Division of Licensing

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DATE	7/27/83	7/.../83	7/.../83	7/29/83		



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

22/B3

July 29, 1983

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

MEMORANDUM FOR: The Atomic Safety and Licensing Board
for the Midland Plant, Units 1 and 2

FROM: Thomas M. Novak, Assistant Director
for Licensing, Division of Licensing

SUBJECT: BOARD NOTIFICATION - NEW INFORMATION RELATING
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Any additional information relevant to these issues will be provided in a future Board Notification.

A handwritten signature in cursive script, appearing to read "Tom Novak".

Thomas M. Novak, Assistant Director
for Licensing
Division of Licensing

MIDLAND (For BNs)

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

cc: Stewart H. Freeman
Assistant Attorney General
State of Michigan Environmental
Protection Division
720 Law Building
Lansing, Michigan 48913

Mr. Paul Rau
Midland Daily News
124 McDonald Street
Midland, Michigan 48640

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
799 ROOSEVELT ROAD
GLEN ELLYN, ILLINOIS 60137

JUL 21 1983

MEMORANDUM FOR: D. G. Eisenhut, Director, Division of Licensing, NRR
FROM: R. F. Warnick, Director, Office of Special Cases
SUBJECT: RECOMMENDATION FOR NOTIFICATION OF LICENSING BOARD

In accordance with present NRC procedures regarding Board Notifications, the following information is being provided as constituting new information, some of which is relevant and material to the Midland OM/OL proceedings.

- A. This information deals with the licensee's July 11, 1983, decision to stop all Service Water Pump Structure (SWPS) related dewatering well drilling. The pertinent facts that relate to the stop work are as follows:
1. On July 9, 1983, Bechtel Construction stopped drilling on well #521 when an obstruction was encountered at approximate elevation 619.5 feet. The licensee thought that the obstruction was most likely bedding material for a non-Q prestressed concrete pipe connecting the service water system to the cooling tower.
 2. On July 9, 1983, Bechtel Construction stopped drilling on piezometer #LS-7 when an obstruction was encountered at approximate elevation 614.5 feet. The licensee thought that the obstruction was most likely the mud mat from an electrical duct-bank.
 3. On July 11, 1983, the NRC was informed of these two incidents by a conference call from the licensee. Midland Project Quality Assurance Department (MPQAD) decided to issue a formal stop work on all SWPS drilling after these discussions.

At the current time all drilling around the SWPS remains stopped pending the licensee's completion of their corrective action to preclude recurrence. The events and the licensee's corrective actions are described in the attached letter from Mooney to Harrison, dated July 15, 1983.

Dupe ~~224844451~~

JUL 21 1983

- B. There appears to be a continuing lack of attention to detail in the implementation of the remedial soil/underpinning programs. This is illustrated by the latest Stone and Webster weekly report No. 41, which is attached. The report indicates problems such as untimely resolution of outstanding NCR's, not meeting the intent of design drawings by extending the slope layback under the electrical penetration area (EPA), and not keeping the number of attached changes to a design drawing within workable limits.

On July 13, 1983, the Region III staff performed an inspection of the matters described in paragraphs A. and B. above and questioned why soils work should continue. The licensee's response, dated July 15, 1983, to these questions is attached.

On July 20, 1983, subsequent to the licensee response, the NRC was informed that well #521 had indeed been drilled through the concrete pipe and not into the bedding material as originally thought.

- C. On June 29, 1983, following a review by the Senior Resident Inspector of welding procedures and observation of welding performance demonstrations, the NRC authorized the resumption of safety-related welding work on the Heating, Ventilation, and Air Conditioning systems. The work was initially stopped November 30, 1982, after a licensee audit determined that the quality assurance program for welder qualification and welding procedure qualifications was inadequate. A copy of our authorization letter is attached.
- D. Although this is not a safety concern, the following information is provided to keep the Board informed. The lead welding engineer for remedial soils work allegedly instructed a welding rod room attendant to change the rod return time on a number of weld rod withdrawal slips to conform to site requirements. Bechtel, when learning of the alleged falsification, investigated, and fired the engineer on June 29, 1983.

The inspectors determined there was no safety significance to this incident. The welding rods, even though outside the heating ovens for an extended period, were kept by workmen in small portable warming ovens. In addition, the rods were used in the welding of structures considered temporary.

- E. Consumers Power Company informed Region III that Dow Chemical Company is attempting to terminate its contract with Consumers Power Company to supply process steam to Dow's Midland facility from the Midland Nuclear Power Station. On July 14, 1983, Dow announced it was filing suit seeking a court judgment that all Dow's obligations under the contract be cancelled "because of CPCo's misrepresentations and

D. G. Eisenhower

- 3 -

non-disclosures . . . and CPCo's inability to complete the Midland Nuclear Plant within any reasonable time and at a reasonable cost." CPCo notified the region that they planned to formally notify the Board in the near future.

If you have any questions or desire further information regarding this matter please call me.

R F Warnick

R. F. Warnick, Director
Office of Special Cases

Attachments: As stated

cc w/o attachments:

A. B. Davis
J. J. Harrison
R. N. Gardner
R. B. Landsman
R. J. Cook
B. L. Burgess



~~Office~~
② file

J A Mooney
Executive Manager
Midland Project Office

General Offices: 1945 West Parnall Road, Jackson, MI 49201 • (517) 788-0774

July 15, 1983

Mr J J Harrison
U S Nuclear Regulatory Commission
Region III
799 Roosevelt Road
Glen Ellyn, IL 60137

PRINCIPAL STAFF	
RA	ENF
D/RA	SCS
A/RA	PAO
DPRP	SLO
OR/RA	RC
DRMSP	
DE	
ML	
OL	FILE

orig + 3

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MIDLAND ENERGY CENTER GWO 7020
RESPONSE TO NRC REGION III QUESTIONS
OF JULY 14, 1983 MEETING
File: 0485.16 UFI: 42*05*22*04 Serial: CSC-6792
12*32

On July 14, 1983, the Region III Staff raised certain questions relating to drilling of the soil in the area of the Service Water Pump Structure, technical problems encountered in the drilling of Wells #502 and #503, the procedure for drilling in "Q" concrete, and certain comments in the Stone and Webster "Independent Assessment Report No. 4". The Staff requested that the Company respond in writing to these questions. The Staff also asked that the Company provide justification for continuing soils work in light of the above questions.

Although the Company recognizes the significance of the Staff's concern, we believe that the clarifications and proposed corrective actions provided in this response will satisfactorily resolve these concerns. The following explains the nature of the problems, answers the Staff's questions as we understand them, and provides a more detailed justification for continuing soils work.

ITEMS RELATING TO SERVICE WATER PUMP STRUCTURE

NRC Region III Staff requested information relating to the drilling of Well #521 and Piezometer #LS-7 in the vicinity of the Service Water Pump Structure.

Dupe 8307210208

JUL 18 1983

Well #521 is a dewatering well near the Service Water Pump Structure. An excavation permit was properly obtained and executed in accordance with all applicable procedures before well drilling began. The location of the well was surveyed, verified and marked, as were underground utilities in the vicinity of Well #521. The drill rig was set up on a stake marking an underground utility rather than the stake designating Well #521. Spencer, White and Prentis and Bechtel Field Engineers verified this as the proper location. Quality Control verified that the drilling rig was positioned within allowable tolerances relative to this stake. When drilling proceeded, an obstruction was encountered at approximately elevation 619.5 feet. Drilling was stopped and gravel was found in the drill bit. It has been determined that the obstruction is most likely bedding material for a non-Q prestressed concrete pipe connecting the service water system to the cooling tower. It is not known whether the pipe itself was hit. An investigation is planned to inspect the pipe for damage.

In the case of piezometer #LS-7, drilling also occurred at a wrong location, as a result of misinterpreting a Field Change Request (FCR). Again, the excavation permit system procedures were followed. Prior to drilling, the field organization submitted an FCR to Project Engineering, asking for a change in the location of this piezometer, along with other wells, to avoid interferences with underground utilities and soldier piles. Project Engineering approved certain relocations, revised some proposed relocations, and added additional relocation. When the FCR came back from Project Engineering approved, the Field Engineers and QC inspector failed to notice the revised location for piezometer #LS-7 made by Project Engineering. As a result, the piezometer was drilled in an incorrect location.

As previously indicated, the excavation permit procedures were followed in the above two incidents. We believe that the incidents resulted from work processes which, although basically adequate, were not specific enough to avoid error. Corrective actions are as follows:

- A. We are establishing a new procedure for identifying location markers. Markers for utilities or obstructions will be a different color from those marking drilling location. All responsible personnel will be trained in this procedure before further drilling is implemented.
- B. We are requiring Bechtel Field Engineers to verify and sign for drill rig locations before drilling commences. These individuals will be responsible, on a single point basis, for making sure drilling occurs at the correct location.
- C. Bechtel Field Engineers will be required to be present during field operations.
- D. Spencer, White and Prentis (SW&P) has been directed to provide additional personnel to assure full coverage of field operations.
- E. The PQCI's will be expanded adding clarity to the related inspection activities. This will require the QCE to compare coordinates on the location marker to design documents.

F. Bechtel and SW&P Field Engineers and QCE's will be trained to the new requirements established above.

The Staff also questioned why an MPQAD stop work order was not issued on Saturday, July 9, 1983 when drilling at an incorrect location for Well #521 was first discovered.

The incident relating to hole #521 resulted from a mistake by the Field Engineers in identifying the field markings for the drilling location. The excavation permit system and other applicable procedures were followed. Past work has been successfully carried out using the same procedures which were in place for this Well. After the incident was discovered, Bechtel Construction took immediate corrective action by stopping drilling and resurveying the location markers in the vicinity. Although we recognized the seriousness of this incident, particularly in light of the past drilling problems at Midland, MPQAD did not feel that the incident alone warranted a stop work order.

The second incident, relating to Piezometer #LS-7 was discovered on Monday, July 11, 1983. The actual drilling began on Saturday, July 9, 1983. Shortly after discovering that the drilling was at the wrong location, a verbal directive stopping all SWPS related drilling was issued. A written direction followed that afternoon.

The two different location errors, although caused by different circumstances, indicate that issues existed which must be resolved prior to continuing drilling by Spencer, White and Prentis. The stop work order would have been issued by MPQAD on this basis alone, regardless of whether the NRC discussions had occurred on July 11, 1983. The corrective action described above will be in place before affected drilling work resumes.

TECHNICAL PROBLEMS ENCOUNTERED IN THE DRILLING OF WELLS #502 and #503

During the process of drilling dewatering Well #502, problems were encountered with materials caving into the hole. Because of our inability to keep the hole open, we decided to abandon this well.

Dewatering Well #503 was started approximately the same time that problems with Well #502 were experienced. Dewatering Well #503 has not experienced problems similar to those noted for Well #502. Nevertheless, because the two wells are only five feet apart, we suspended drilling on Well #503, and conducted a technical evaluation of alternatives for completing wells in that area. An acceptable approach towards completing Well #503 in accordance with existing procedures has been determined.

To avoid caving of holes in this area, future holes will be drilled using one of the following methods: (1) Use of a "Becker" hammer drill, which allows the hole to be cased and drilled at the same time, or (2) Use of smaller diameter wells similar to those used in the interior of the SWPS. We believe either of these methods will solve the problem relative to the dewatering wells on the east side of the SWPS.

PROCEDURES FOR DRILLING IN Q-CONCRETE

The NRC was presented with information during the July 14, 1983 meeting pertaining to a stop work order concerning drilling in Q-concrete. PQCI C-1.60, Rev. 6, Concrete Drilling and Cutting of Reinforcing Steel, was considered inadequate to cover inspection of concrete drilling for work performed by FSO Direct Hire Work Forces. A recent FCR (C-5880 to Specification C-231) allows holes to be drilled in "Q" concrete and does not require QC inspection when a ground fault detector and carbide bit are used. The present PQCI revision does not require QC verification of these attributes; it only requires sampling inspection to be performed for drilling in "Q" listed concrete and block walls.

A stop work order for concrete drilling by FSO Direct Hire Work Forces was required until the PQCI could be revised and implemented. The PQCI's applicable to Mergentime and SW&P work requires 100 percent QC inspection and are not affected by this FCR.

The PQCI is being revised to require verification of the drilling method utilized in "Q" concrete and block walls. This PQCI will be revised prior to resuming work.

Further, a QAR is being issued by MPQAD to evaluate the impact of the PQCI's use for drilled holes in the balance of the plant and whether corrective action is required for previous work performed. Concrete drilling inspection plans for HVAC and B&W will also be evaluated for adequacy as a close-out to this QAR.

STAFF CONCERNS WITH STONE AND WEBSTER COMMENTS IN REPORT NO. 41

The Region III Staff expressed concerns over a number of items noted by Stone and Webster in the "Independent Assessment of Underpinning Report No. 41." The company's response to those concerns is as follows:

A. Page 3 - Quality Control, Documentation and Records

Concern: Timely resolution of outstanding NCR's continues to be a nagging problem.

Response: A discussion was held with the Region III Staff relative to the number of NCR's issued and time required for resolution (Attachment 1). A program is in place to identify adverse trends and take corrective action. Significant improvements have been realized as evidenced by the attached charts and considerable emphasis is being placed in these areas by all Soils Remedial Organizations to improve the results. Personnel have been assigned the responsibility in each action organization to coordinate responses and make sure that follow-up commitments are made within their respective organizations. Action is also taken during the Weekly Project Soils Management Meetings, as required, to assure continuing improvement in addressing quality items and closure of NCR's.

B. Item 3 - Notes of 6/27/83 Meeting

Concern: Use of dry-pack grout for pier leveling plates in lieu of pressure grout.

Response: Dry-pack grout is used for temporary pier leveling plates. As previously discussed with the staff, pressure grouting will be used for all permanent pier leveling plates.

C. Item 4 - Notes of 6/27/83 Meeting

Concern: Use of superplasticizer concrete.

Response: As previously agreed, CPCo will submit the concrete mix design using superplasticizer and receive NRC concurrence prior to using this mix.

D. Item 7 - Notes of 6/27/83 Meeting

Concern: Grouting of void between existing fill and West Auxiliary Building Foundation.

Response: The attached report (Attachment 2) addresses the grouting of the gap encountered between the soil and the Auxiliary Building Foundation.

E. Item 8 - Notes of 6/27/83 Meeting

Concern: Slope layback extending under the Unit 1 EPA.

Response: The limits of the drift north of Piers E/W 8 were at the discretion of the Resident Geotechnical Engineer (RGE) and the design drawings recognized the RGE's responsibility to authorize changes as necessitated by field conditions. Since the work was completed in accordance with quality requirements, a Non-Conformance Report was not issued.

F. Item 6 - Notes of 6/28/83 Meeting

Concern: Specification requirement for furnishing grout.

Response: Project Engineering dispositioned NCR FSO-286 relative to furnishing grout by clarifying the requirements and Mergentime Procedure MCP-35.000 will be revised accordingly.

G. Item 2 - Notes of 6/29/83 Meeting

Concern: Electrical IPIN's.

Response: A QA reinspection of IR's with associated IPIN's in the Auxiliary Building monitoring system is being conducted. The status of this reinspection was discussed with R. Landsman and R. Gardner on July 14, 1983.

H. Item 3 - Notes of 6/29/83 Meeting

Concern: Number of attached changes to drawings.

Response: MPQAD Soils had raised a question regarding the number of unincorporated changes to drawings in QAR #F-326 dated 6/20/83. This QAR is open. As part of the closure to this QAR, consideration will be given to the fact that CPCo Volume II Quality Assurance Program Manual Procedure #6-1 sets a limit of four attachments to a drawing for design documents prepared by CPCo. The final closure to the open QAR will satisfactorily address the quality concern related to the number of unincorporated attachments to drawings.

Concern: Use of FCR's and NCR's.

Response: The project adopted a position in June, 1983 to clearly establish the requirement that NCR's are required for "after the fact" FCR's; ie. FCR's written to obtain approval of "as built" conditions which do not conform to design requirements. This position clearly indicates that the Field Engineer is responsible for causing an NCR to be initiated whenever it is desired to use an FCR to get approval of an "as-built" condition which is not in accordance with design requirements. This requirement has been incorporated in Bechtel Field Procedures FPD-2.000 as Revision 9. (This revision is in the final distribution as of this date.) In addition, MPQAD Procedure F-2M, Control of Nonconforming Items, has been revised (Revision 6-Effectivity of 8/29/83) and requires an NCR to be written for any item that is nonconforming and "is at a point in the construction process where it should be in compliance with the applicable design or program requirements and it is not." These actions will programmatically require that NCR's are written for "after the fact" FCR situations.

Stone and Webster indicated that the term "field as-built condition" in this item referred to the original constructed conditions which are encountered during the underpinning work activities and not as a result of current work activities.

I. Item 3 - Notes of 6/30/83 Meeting

Concern: Acceptability of the pumped grout test program for pier leveling plates.

Response: The pumped grout test program has been completed and the results of this program are included as Attachment 3.

J. Item 4 - Notes of 6/30/83 Meeting

Concern: Over excavation under the Unit 1 EPA.

Response: Refer to Item E.

K. Item 2 - Notes of 7/1/83 Meeting

Concern: Number of outstanding drawing changes.

Response: Refer to Item H.

L. Item 3 - Notes of 7/1/83 Meeting

Concern: Pumped grout test program.

Response: Refer to Item I.

M. Item 4 - Notes of MPQAD 6/28/83 Meeting

Concern: Instruction memorandum on issuing QC hold tags.

Response: The memorandum in question did not provide programmatic directions for issuing QC hold tags, but addressed action by FSO and MPQAD to avoid confusion that may occur when hold tags are placed.

DISCUSSION OF JUSTIFICATION FOR CONTINUING SOILS WORK

Because of the concerns previously discussed in this letter, the Region III Staff has asked whether the soils work at Midland should be allowed to continue. We recognize and acknowledge the Region's concerns, which we share, with aspects of the performance of soils remedial work thus far. We are mindful of the need for continuing close attention, and extensive management involvement, to correct deficiencies and avoid errors. As previously described, steps are being taken to correct the deficiencies of concern to the Staff, as expressed in meetings this week.

On the question of whether these concerns warrant an overall stoppage of soils remedial work at Midland, we believe the answer is no. In our opinion, the concerns, while valid, do not run deep enough or are not widespread enough to call into question the overall integrity of the work, or the soundness of as-built hardware.

In our opinion the most serious of the various items cited by the NRC are the drilling incidents. We acknowledge that there have been drilling problems at the Midland Site in the past; however, the two drilling incidents discussed above occurred after a period of successful implementation of involved procedures. The drilling rig mislocations that occurred appear to be caused primarily by too narrow a view of the inspection requirements and lack of specific verification of proper drill rig locations by both field engineers and QC personnel. The entire corrective actions listed previously will, we believe, prevent recurrence of this and possible related problems. In addition, the drilling has been stopped until the corrective actions noted herein are implemented.

Another item referenced by the NRC is an MPQAD stop work order related to drilling in "Q" concrete. Corrective actions, including the issuance of a revised PQCI, are being taken. This represents a case where our Quality Organization identified a problem and stopped work until corrective action has been taken.

Additionally, the NRC had concerns about comments in Stone and Webster's Report No. 41. None of these items resulted in a Stone and Webster nonconformance. By contrast, when deemed appropriate, Stone and Webster has issued nonconformances in carrying out their responsibilities as an independent assessor. We take seriously the need to consider all Stone and Webster comments, and where appropriate, initiate corrective action in our work activities. Without understating the significance of Stone and Webster's comments, we do not believe any of them question the basic adequacy of the work in the soils area.

In summary, while we have not achieved perfection, the quality of our final product is meeting design requirements and commitments. Our Quality Organization and Field Engineers are finding and correcting problems. The substantial upgrading of our quality effort in 1982 has achieved noticeable and acceptable results. The Stone and Webster 90-day assessment of the underpinning work has not identified any major problems. Indeed, Stone and Webster determined that the initial underpinning work, which constitutes the significant activities presently being accomplished, was being performed with a high degree of quality and since this report was issued, Stone and Webster has not advised us of any situation which would change this assessment. Based on all of these factors and in consideration of the overall quality of the work, we believe the soils work at Midland should continue. Continuing basic attention to detail by the Soils Organization with overview and involvement by Stone and Webster and NRC Region III will insure immediate identification and resolution of concerns and provide adequate assurance that the soils activities are successfully completed.

J. Mooney

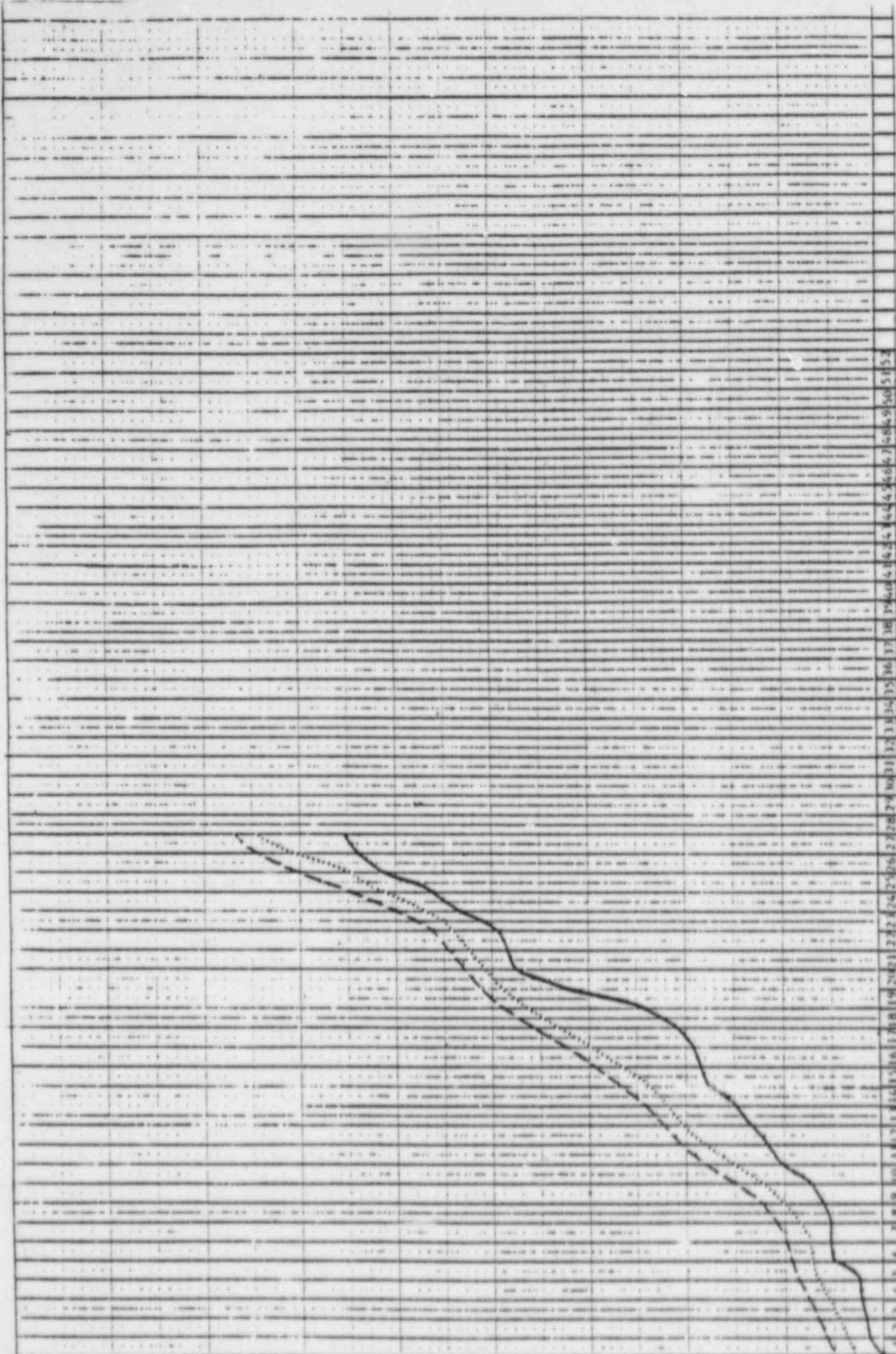
EXPLANATION OF GRAPHS 1 AND 2

The weekly periods begin with Week 1, January 1 through January 15, 1983, and end with Week 27, July 10 through July 16, 1983.

Graph 1: The cumulative number of NCR's is plotted for each week. The broken/slashed line represents all FSO NCR's written. The dotted line represents FSO NCR's written and corrected for those NCR's inherited from the Balance of Plant. These "inherited" NCR's predate the FSO organization and represent long term Non-"Q" soil replacement. The solid line represents the number of NCR's closed.

Graph 2: The average time to close an NCR for a given week is plotted for each week. The number shown beside each point is the number of NCR's used that week to determine the average.

CUMULATIVE NO. NCR'S



JAN FEB MAR APR MAY JUN JULY AUG SEPT OCT NOV DEC

TITLE	GRAPH 1	SOURCE	RECITEL FSO
JOB NO.	7220	NO WRITTEN (CORRECT)	
REV		NO WRITTEN (CORRECT)	
BY		NO WRITTEN (CORRECT)	
CD		NO WRITTEN (CORRECT)	
APPL		NO WRITTEN (CORRECT)	
DATE		NO WRITTEN (CORRECT)	
LEGEND		NO WRITTEN (CORRECT)	
		NO WRITTEN (CORRECT)	
		NO WRITTEN (CORRECT)	
		NO WRITTEN (CORRECT)	

AVERAGE NO. DAYS TO CLOSE

150

100

50

WEEKS

JAN FEB MAR APR MAY JUN JULY AUG SEPT OCT NOV DEC

TITLE

GRAPH 2

JOB NO

7220

REV BY

CKD

APVL

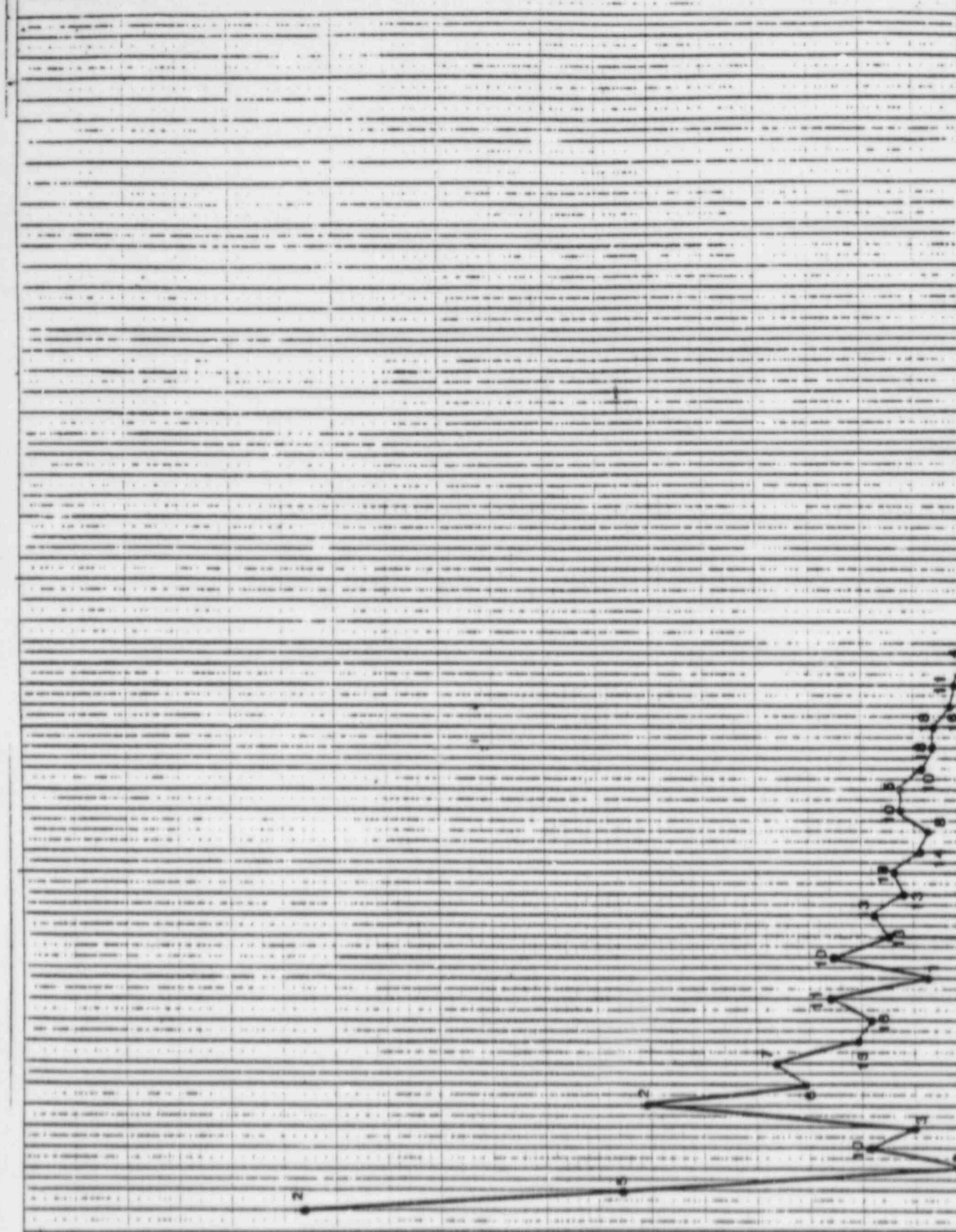
DATE

LEGEND:

SOURCE:

BECHTEL FSO

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52
---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----



MELAND UNITS 1 AND 2 - JOB # 100
RESIDENT GEOTECHNICAL ENGINEER REPORT

DATE 6-22-83
BY DAY
AE

Page 1 of 2

CONCLUSION

- Piers W9 W11 W12 ALSO EQ FILL E12
W17E CONTINUED AND DIAL GAUGE SET IN EDGES OF
TOPP TIP OF THE PIERS TESTING OF WEDGES CONTINUED
PIER PIT W-8 (ACCESS DRIET)
THE PIER PIT HAS BEEN CEMENTED WITH TEMPORARY PLUMBWOOD
MERGENTIME EXTENDED EXCAVATION NORTH OF PIER
PIT THE TOE WAS EXTENDED TO WITHIN THE DISTANCE
OF 3' FROM NORTH EDGE OF THE BRACE TO 2'-0" ±
BERM WAS PROVIDED WITH A NEARLY VERT. CLAY FACE
ABOVE THE DRIET FLOOR AND 1:1 ± SLOPE IN CLAYEY
FILL WAS EXCAVATED ONE NORTH IT WAS NOTED THAT
18" ± THICK LAYER OF SAND WAS LOCATED UNDER THE
MUD MAT & FILL CONCRETE PART OF THE MUD MAT
WAS ALSO REMOVED
EXCAVATION FOR TRA (N-3) BULKHEAD (WEST SIDE)
4) STATED CHIPPING GRAIN AT THE (N-E) SECTION OF
THE EXCAVATION, EAST OF THE EASTERN DRIET, SET
LAGGING (THIS GRAIN WAS POURED IN THE SLOPE
LOWBACK AT THE EAST END OF THE DRIET)
PIER PIT W-8 ACCESS DRIET (CONTINUED)
5) NOTE: EXPOSED DSB-2W AT THE (N-E) SECTION
SOME SATURATED CLAYEY MATERIAL WAS
NOTED AT THE DSB (2W) CASING, THERE WAS
NO INDICATION THAT CHIPPING OF THE ADJACENT
CONCRETE DAMAGED THIS DSB
6) RSE ADVISED THAT AN EXCESSIVE MVMT. (SETTLE)
OF THE STRUCTURE HAS BEEN RECORDED AT
DSB-2W, AND THAT ROUTINE REJACKING ON
PIER W-9, DUE TO THE MVMT OF THE STRUCTURE,
WOULD BE REQUIRED
PIER W-9
7) COMPLETED ROUTINE REJACKING TO THE MVMT. OF STRUCTURE
ON NTR SHEET TODAY. APPLIED 110% OF SPEC. LOAD
AND HELD IT FOR 30 MIN. ALL WEDGES WERE FOUND
TIGHT / COULD NOT BE MADE LOOSE WITH A CLAW HAMMER.
TOTAL SETTLE. OF TOP OF PIER W-9 STRUCTURE TO DATE
WAS 0.480". IT WAS DECIDED TO DRIVE WEDGES

NOTE REG ITEM #3
RSE NOTED THAT A SAND
VOID 1/2" TO 1" 2' TO 4'
WIDE WAS LOCATED
DISCREETLY UNDER MUD
MAT AND ABOVE 18" ±
THICK LAYER OF SAND
THE EXTENT OF THESE
VOIDS HAS NOT BEEN
DETERMINED YET, BUT
IT IS EXPECTED THAT
THIS INSPECTION SHOULD
BE COMPLETED ON 6/23/83

FOR INFORMATION ONLY
FS-030303
7270

Signature: Richard P. Casley
Checked by: J. L. Connel
DATE 6-22-83
DATE 6-30-83

NOTED
DATE

WELAND UNIT AND NO. 2 JOB
RESIDENT GEOTECHNICAL ENGINEER REPORT

2 2

DATE 6-22-83
BY DAY
A

DATE

DESCRIPTION

RETRACTORIZE THE JACKS AFTER 0.003"
IN A PERIOD OF 60 MINS. MINUM WAS RECORDED
ADVISED RGE TO TERMINATE THE DETACKING
PROCURE PROP QUANT. DRIVING OF THE WEDGES WAS
15 PSI. FINAL PRESSURE OF 25 PSI WAS REACHED
IN 18:45 HRS

57-W-10
TO ACTIVITY NOTED AT THE PIER TODAY

PIER KC-2
DURING OF PIER CONCRETE CONTINUED
UPPER TELL-TALE P HAS BEEN DRYPACKED

PIER E-8
THE UPPER PIT SECTION WAS COVERED WITH PLYWOOD
PER E-8 (ACCESS DRIFT). AREA NORTH OF PIER E-8
NOTE: RGE ADVISED TO REVISE THE PROPOSED
NORTH SLOPE FROM 1:1 TO 1 1/2:1 3 FEET
AND THIS LIMIT THE EXCAVATION MINIM

UNDER AUX BLDG. THE TWISTED DISCUSSED
THIS REVISION WITH MESSRS J. WILLIAMS &
KILGORE THIS MORNING.
EXCAVATION FOR (N-S) BULKHEAD (EAST-SIDE)

STARTED BREAKING OUT A SECTION OF "KIM BACE
(ABOUT" AT THE (N-W) SECTION.
LAD OUT LOCATION OF HILT) BOLTS AT P'S (WEST
(SIDE)

PIER E-10
COMPLETED LOAD TRANSFER, 110% OF SPEC LOAD
AT 3:00 PM TODAY AFTER "0.003" SETTLE
CRITERIA IN 24 HRS" WERE REACHED AND SATISFIED
TOTAL WEIGHT OF 102 W TIER W/T STRUCTURE WAS .172"
RGE ADVISED THAT THE JACKS WOULD BE ACTIVE
FOR A LONGER PERIOD OF TIME (WEDGES WILL NOT
BE DRIVEN) AND W/T WOULD READ GAUGES
EVERY 5 HRS. RGE WILL NOT PARTICIPATE IN THE
READING OF THE GAUGES.

PIER KC-11
UPPER TELL-TALE DRYPACKING HAS BEEN REPLACED

FOR INFORMATION ONLY
7200

RES-003-13

DATE 6-23-83
6-30-83
Richard F. Cook
McLennan

WELAND UNIT AND NO. 2 JOB
RESIDENT GEOTECHNICAL ENGINEER REPORT

MELAND UNITS : ANC 2 : JOB 720
RESIDENT GEOTECHNICAL ENGINEER REPORT

DATE 6-23-83
BY DAV
RE

PAGE 1 OF 2

DESCRIPTION

PIERS W9, W11, W12 ALSO SO ENL E12
WTF CONTINUED AND DIAL GAUGE SET UP PINS
AT TOP TIP OF THE PIERS.
NOTE: RSE ADVISED RGE THAT "ROUTINE RETACKING"
DUE TO THE AMOUNT OF THE STRUCTURE "WEIGHT"
BE ACTIVATED TO 110% OF SPEC LOADS ON
PIERS W9, W11 & W12. RETACKING OF W9, W11
& W12 STARTED AT 11:07 AM, 2:35 PM & 5:11 PM
RESPECTIVELY.

THE FOLLOWING RESULTS WERE NOTED ON DAY & NITE SHIFTS

PIER NO	TOTAL SETT. TO DATE (DAY SHIFT)	TOTAL SETT. TO DATE (NITE SHIFT)	NUMBER OF NO. OF SICKLES	
			110%	125%*
W9	.488"/110%	.513/125%*	0	(2)
W11	.647"/110%	.708/125%	0	0
W12	.344"/110%	.366/125%	0	(2)

4) $\Delta 4$: -0.002" (DAY SHIFT) (*) RSE DECIDED TO INCREASE THE LOAD FROM 110% TO 125% OF SPEC. LOAD AT APPROX 8 PM
-0.005" (NITE SHIFT)

NOTE: 4 HR READINGS WERE TAKEN ON ALL THREE PIERS BUT END OF THE NITE SHIFT. DUE TO EXCESSIVE MOVEMENT OF STRUCTURE THE "ROUTINE RETACKING" STATUS WAS CHANGED TO "NON-ROUTINE".

FOR INFORMATION ONLY

PIER PIT 10-B

5) CONTINUED WORK ON SHEET REBARS AND CLEAN UP OF THE PIT. PLACING OF THE CONCRETE HAS AGAIN BEEN DELAYED DUE TO PROBLEMS WITH INSTALLATION OF REMAINING RE-BARS.

PIER W-10

6) NO ACTIVITY NOTED AT THE PIER TODAY
PIER KC-2

7) NO ACTIVITY NOTED AT THE PIER TODAY
ACCESS DRIFT TO PIER PIT W-B

8) NO ACTIVITY AT NORTH OR SOUTH SIDES OF THE PIT EXCAVATION FOR (N-S) BULKHEAD (N-E SECTION OF ACCESS DRIFT PIT W-B)

NOTE: REG. NORTH SIDE OF ACCESS DRIFT (PIER PIT W) RSLIFE CHECKED EXTENT OF THE 1/4 TO 1/2" GAPS UNDER THE MUD MAT ALONG N/E LIMIT OF LAWBACK EXCAVATION WITH 1/4" x 1" LATH PROBE. 4'-6" MAX DEPTH OF THE GAPS WAS NOTED. STEEL TAPE PENETRATED UP TO 12' IN THE GAPS IN PROX OF EX (N-S) C OF THE PIT W-B.

Signature: Richard P. Casby
W. Wang

DATE 6-24-83

DATE 6-30-83

PAGE - 1 OF 2
JOB - 720

MELBO UNITS 1 AND 2 - JOB 720
RESIDENT GEOTECHNICAL ENGINEER REPORT

DATE 6-23-83
BY DAY
AE

2 = 2

- 9) MORGENTHAU HAS BEEN DRILLING HOLDS FOR HULT BOLTS AT 1st 2nd POST #2 (N-E CORNER OF THE DRIFT)
- 10) NO ADDITIONAL EXCAVATION FOR THE (N-S) BULKHEAD IN PROGRESS TODAY

PIER E-8

- 11) HAMMERHEAD SECTION OF PIT - HAS BEEN COVERED WITH PLYWOOD

ACCESS DRIFT TO PIER E-B & EXCAVATION FOR (N-S) - BULKHEAD

- 12) NOTE: KGE DISCUSSED THE STATUS OF BULKHEAD EXCAVATION WITH RIGGERS. MORGENTHAU IT WAS AGREED TO PERMIT AN ADDITIONAL EXCAV AT (N-W) SECTION OF THE ACCESS DRIFT INCL BREAKING OUT OF 18" ± THICK FILL CONCRETE & MUD MAT IN (E-W) DIRECTION. THIS SPACE WAS REQUIRED TO INSTALL BULKHEAD #1 & POSTS (ROOM TO TORQUE THE BOLTS):

FOR INFORMATION ONLY
1220

PIER E-10

- 13) STRUCTURE SUPPORTED ON "ACTIVE JACKS" AT 110% OF SPEC LOAD. READINGS HAVE BEEN TAKEN AT 1 HOUR TIME INTERVALS

PIER KC-11

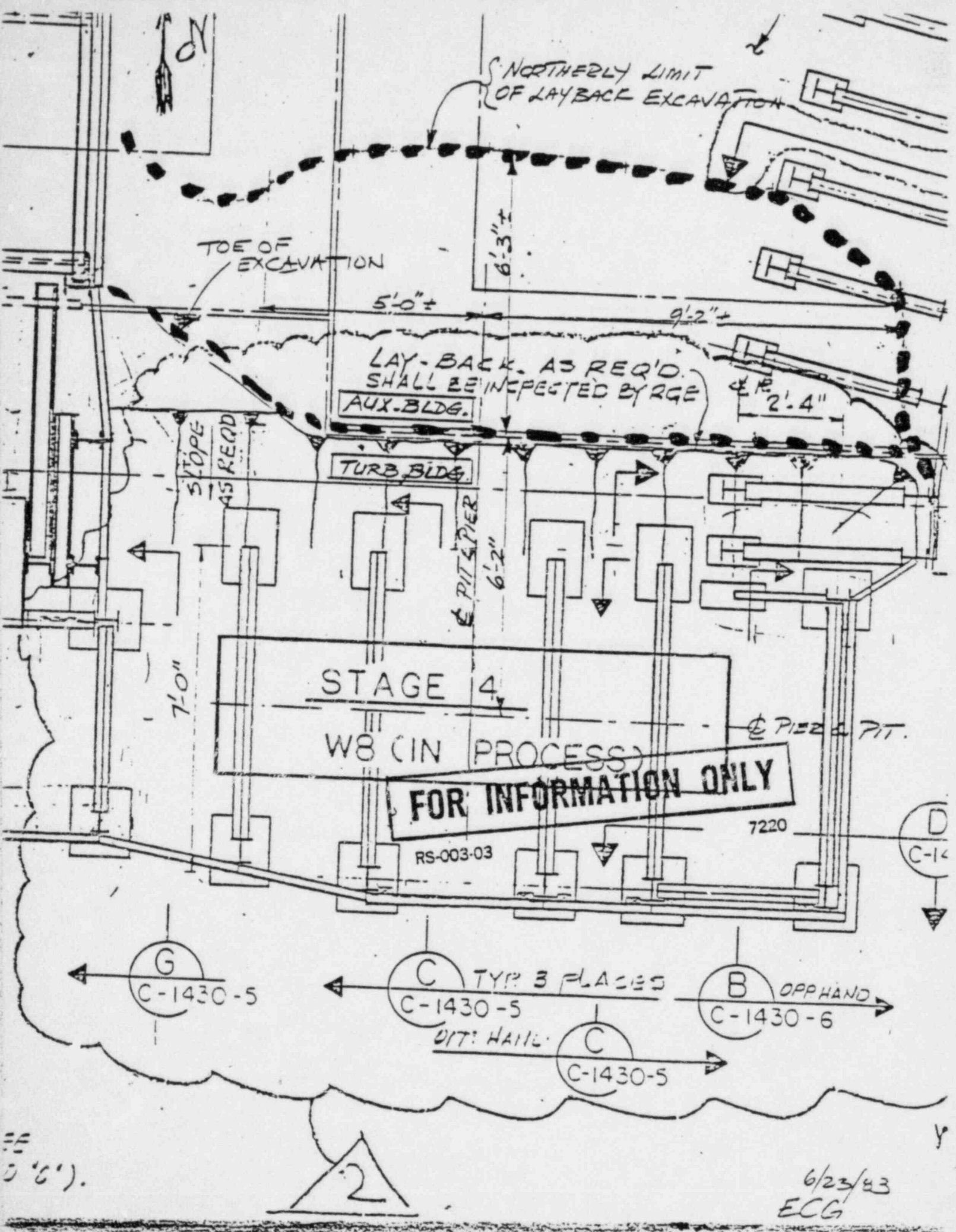
- 14) CURING OF THE UPPER TELL - TALE # DRY SPACE CONTINUED

- 15) RAE (R COSBY & E (GRAY) COMPLETED PREPARATION OF "AS BUILT" EXTENT OF EXCAVATIONS UNDER ANY BLDG ALONG THE NORTH SIDE OF ACCESS DRIFTS TO PIERS E-B & W-9 TODAY. SKETCHES WERE PREPARED.

(3) SHEETS OF SKETCHES ATTACHED TO THIS REPORT

BY Richard P. Cosby DATE 6-24-83
 BY W. W. Wanneel DATE 6-30-83

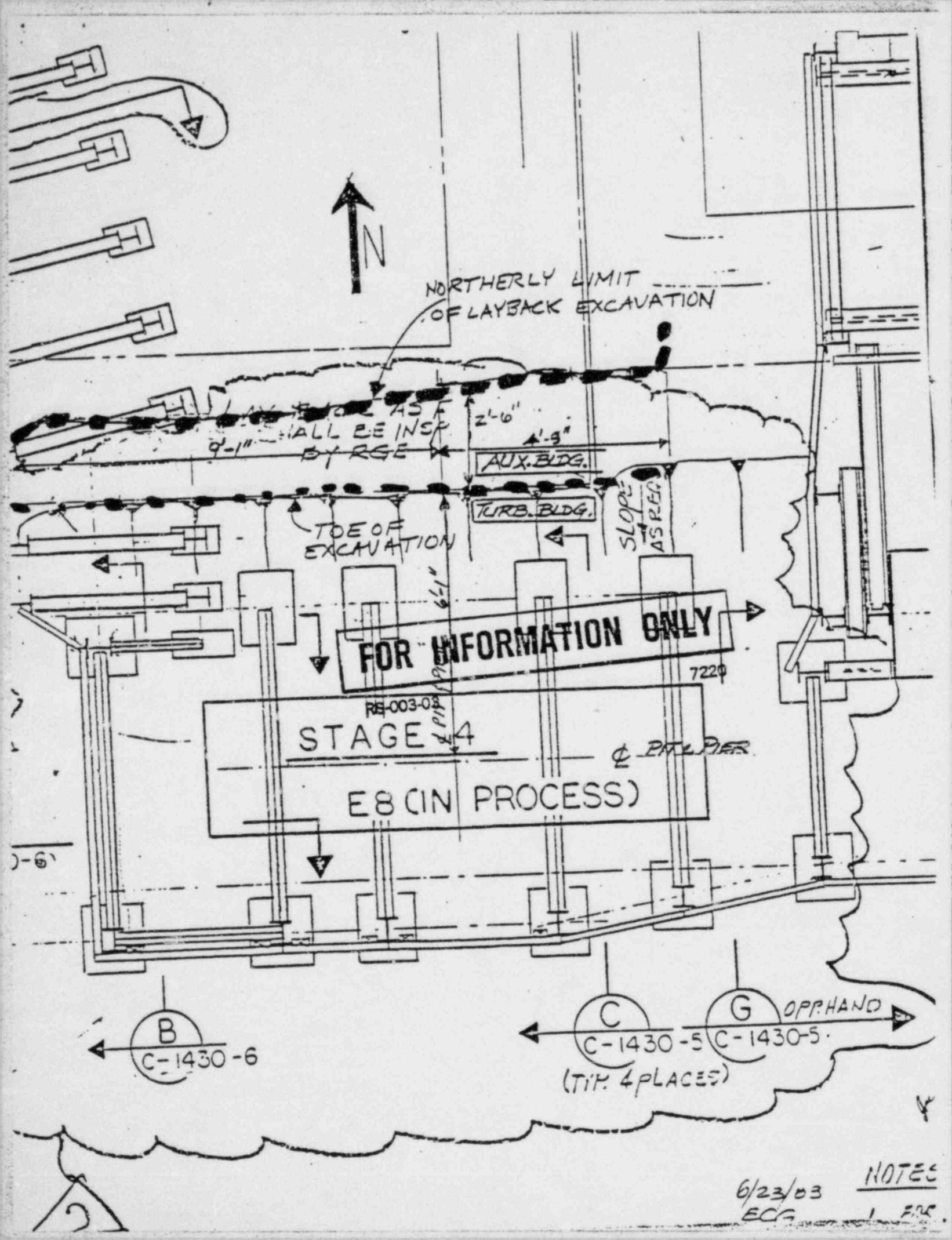
RESIDENT GEOTECHNICAL ENGINEER



0'0").

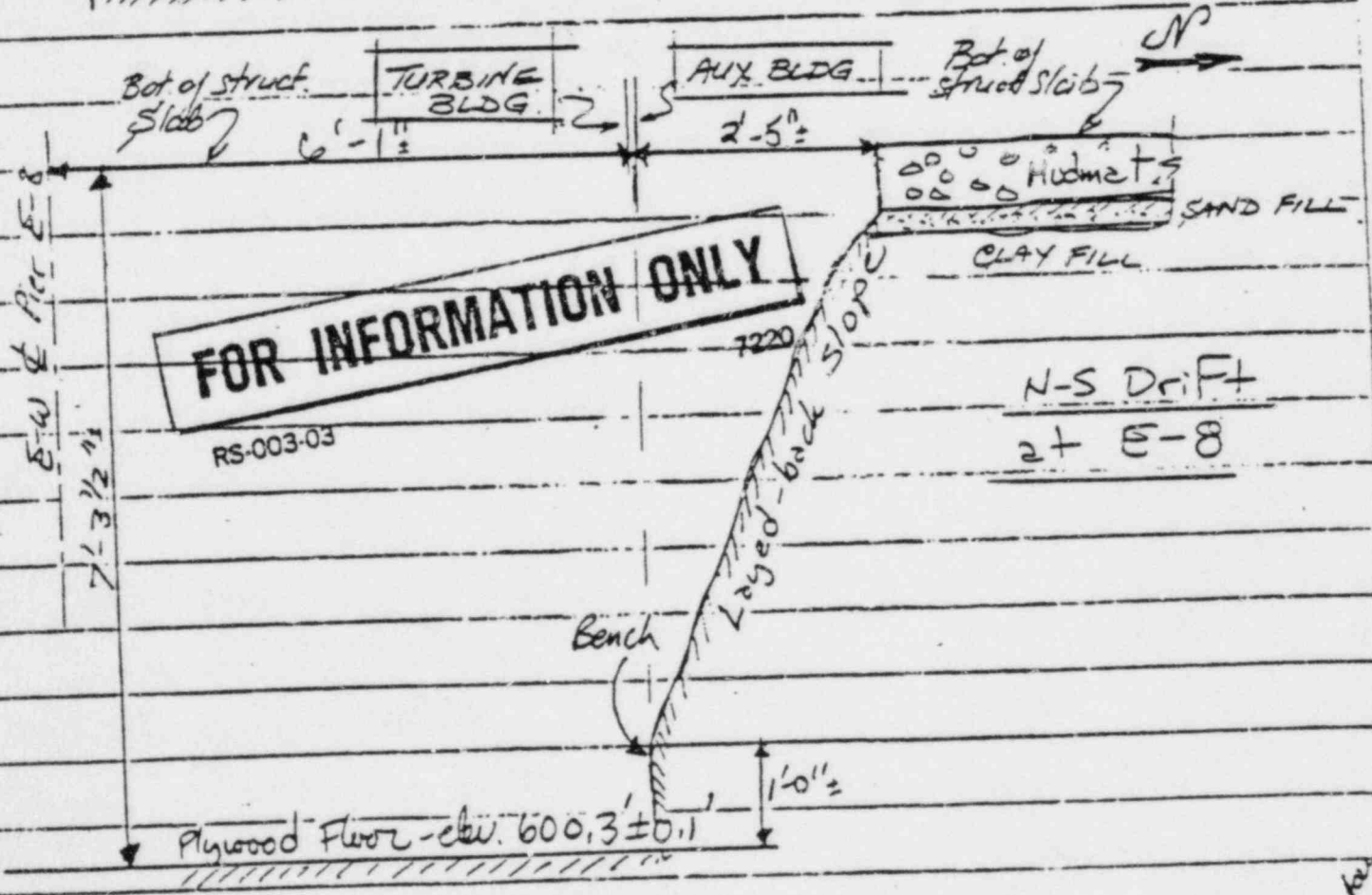
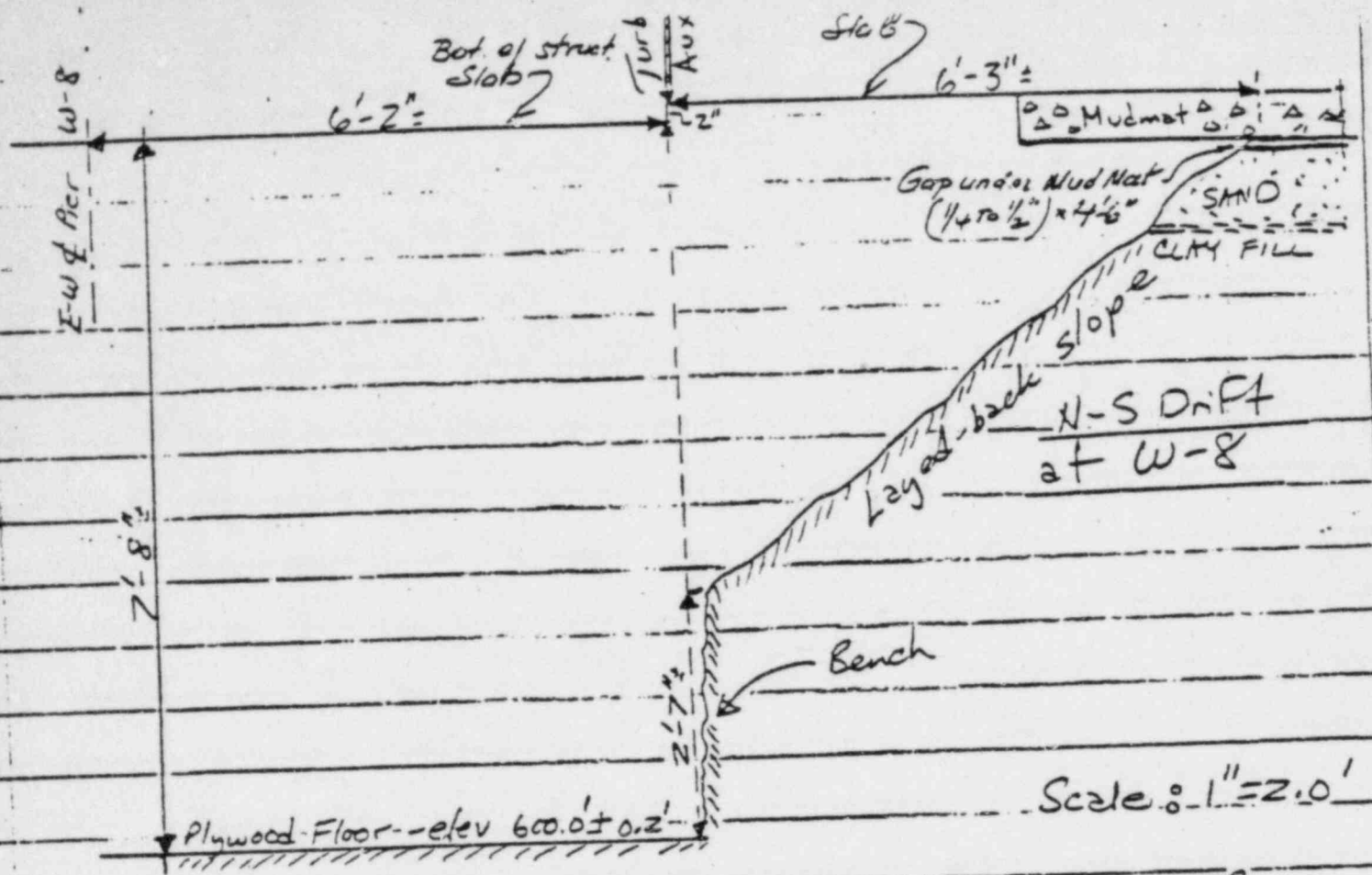


6/23/83
 ECG



6/23/03
ECG

NOTES
1. PRC



6/24/83

MIDLAND UNITS 1 AND 2 - JCS 7220
RESIDENT GEOTECHNICAL ENGINEER REPORT

Date 6/26/83
Shift NIGHT - E
AB

Page 1 of 1

Construction

Remarks

West Shaft

FOR
INFORMATION ONLY

Pier KC-2
No activity

Pier W8
No activity

Pier W9

- "Non-routine" reworking at 125% S.L. Continued. As of 12:56 a.m. Pier top movement was 13 mil in last 48 hours. 4 hour readings continued.

Pier W10 started placing jacks.

N-S Bulkhead North of Ws

- Filled void north of lauback area. 180 gals of neat cement grout ($\frac{3}{4}$ water : 1) were used. grout pressures ranged from approx. 20 to 80 psi. Signed QC IR and stated that RGE concurred with F.E. grouting operation was acceptable. QC hold on bearing P2 on knee brace* of 2nd set. *P2 improperly shimmed on QC tag. See sketch attached.

East Shaft

Pier KC-11

- Started placing jacks on top of pier.

Pier E8

- No activity

Pier E10

- 110% S.L. maintained. 8 hour readings continued! As of 12:35 a.m. movement was 3 mils in last 24 hours.

N-S Bulkhead North of E8

- QC hold on bearing P2 on 2nd post due to gap between P2 & str. Conc. wider than $\frac{1}{16}$ ".

Signed

Alvin Tang

Date

6/27/83

Date

REVISION

PAGE - E. OF
PAGE - J. AND

ATTACHMENT C
TO MCP 15.000

FOR
INFORMATION ONLY.

GROUT PLACEMENT PLAN

Prepared By: W. Roeder (MFE)
Approved By: Thomas J. Eiler (RSG FE)
W. Roeder (MFE)

Location: 11' NORTH OF WEST 2

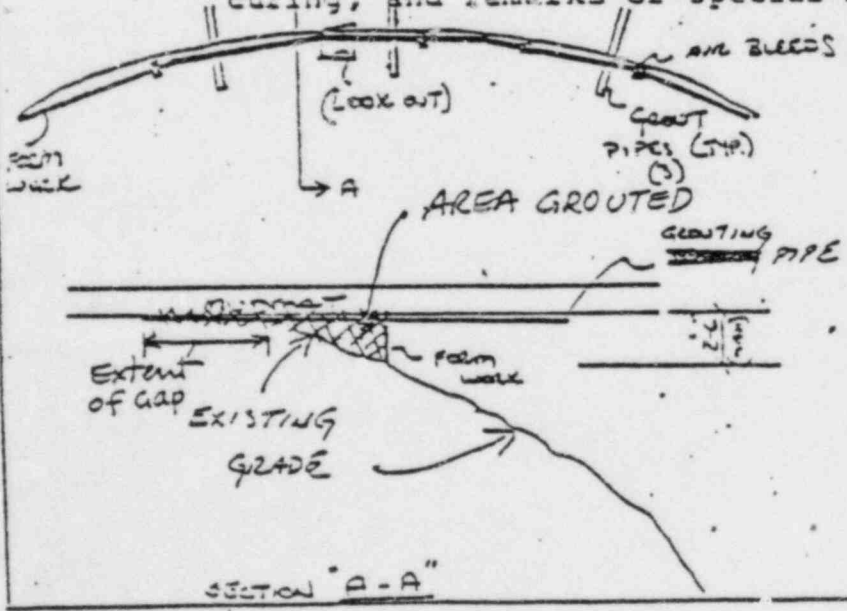
Plate Orientation: N/A

Type of Grout: CEMENT

Method of Grout Placement: Gravity
 Pressure - Hand Pump
 Pressure - Mechanically Driven Pump

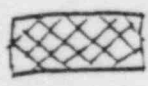
Maximum Grout Pressure: 150 (For pressure grout placement with a mechanically driven pump only.)

Sketch: (Indicate plate orientation, location of forms, location of vent holes and/or vent pipes, grouting sequence to avoid air entrapment, location of grout pipes, edge treatment for curing, and remarks or special notes.)



FORM CURE

- NOTE:
- ① PIPE LOCATION MAY VARY DUE TO RESISTANCE WHILE BEING PLACED.
 - ② AIR BLEEDS AS NECESSARY
 - ③ OBSERVATION PART AS REQUIRED.
 - ④ FORMWORK MAY VARY DEPENDING ON SOIL CONDITIONS (ACTUAL).
 - ⑤ MAX. SPACING OF GROUT TIE 10'.

 AREA GROUTED

F7220-C195-28-7 (2)

ATTACHMENT FOR DAILY REPORT 6/26/83
NIGHT SHIFT (E...)

REPORT
of the
OVERHEAD FLUID GROUTING
TEST PROGRAM

Located at
Consumers Power Company
Midland Nuclear Power Plant
Midland Units 1 & 2

July 15, 1983

Dupe ~~0307210210~~

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OVERHEAD FLUID GROUTING TEST PROGRAM
REMEDIAL UNDERPINNING
MIDLAND UNITS 1 & 2

I. EXECUTIVE SUMMARY OF TEST PROGRAM

A. Purpose of Test

To insure proper pressure grout placement on the permanent underpinning piers, a series of tests simulating leveling plate installations has been performed using different concrete surface preparations, different methods for venting air, and different grouting techniques for the placement of grout.

B. Summary of Test Results

All pressure grouted test plates provided a fully satisfactory grout pad. None of the special surface preparations appeared to have had any affect on reducing the amount of entrapped air. Multiple injection points seemed to induce more entrapped air than the single injection point. An expanded metal/leadwool forming system had more disadvantages than advantages. The performance of the Masterflow #713 grout and the equipment used all proved to be more than adequate for these tests.

C. Summary of Conclusions

The pressure grouting with Masterflow #713 provided a quality product equal to or better than drypacking with Masterflow #713. The overhead pressure grouting of steel plates can successfully be performed using conventional materials, equipment, and methodology already available and in use on the project. Successful pressure grouting can be accomplished using a single centrally located grout injection point thru the steel plates and by bulkheading around the periphery of the plate with wooden forms.

II. SCOPE OF TEST PROGRAM

A. Objectives

1. To determine the quality of a grout pad that can be achieved by overhead pressure grouting. Of particular concern was the minimizing of voids created by air being entrapped in the grout at the interface between the existing concrete surface and grout surface
2. To determine the optimum methods of surface preparation, formwork and grout placement.

II SCOPE OF TEST PROGRAM

B. Location

Testing was performed in a portion of the northeast corner of the Midland Jobsite Poseyville Laydown Area.

C. Test Facilities

The simulation of actual conditions which exist under a structure being underpinned was accomplished by utilizing concrete blocks (crane counter weights) cribbed by other concrete blocks to create two test bays. (See Exhibit D - Photographs #1 and #5).

D. Personnel

The Mergentime personnel during grouting consisted of four (4) craftsmen, a foreman, and a superintendent. The drypack crew consisted of five (5) craftsmen, a foreman, and a superintendent. In addition to the Mergentime personnel, observers were present from Bechtel's FSO Field engineering and MPOAD for all of the grout placements. Part time observers included Mergentime Field Engineering, Stone & Webster Independent Assessment Team, U.S. Testing (for testing) and Consumers Power Company.

III TEST PROCEDURES

A. Layout of Test Plates

Eight (8) test plates were laid out four (4) in each of the two simulation bays. The north simulation bay test plates were installed to test a multiple injection point system of grout placement under varying bulkheading and concrete preparation conditions. The South simulation bay test plates were installed to test the single grout injection point system with various concrete surface preparations. One plate was formed on three sides and drypacked with Masterflow #713 as a comparison to the pressure grouting techniques. (See Exhibit #A for Grouting Plan Arrangement).

B. Description of Test Plates, Formwork, and Surface Preparation Area*

All test plates were made of $\frac{1}{2}$ " x 3'5" x 5'8" steel plates and were held in position by eight (8) $\frac{3}{4}$ " diameter Hilti kwik bolt expansion anchors. The plates were positioned $\frac{1}{2}$ " beneath the concrete slab by means of short pieces of pipe sleeves placed over the anchor bolts. The sleeves also facilitated easier test plate removal. The steel test plates were sized to represent the maximum size anticipated for actual conditions. In addition, four plates were notched to represent the worst geometric conditions anticipated. The concrete underslab surface was lightly greased

*Also see Exhibit A and Photographs #9 thru #12 of Exhibit D

II. TEST PROCEDURES (Cont'd)

with Union 76 - Multipurpose grease. This was used as a bond breaker. The grease was brushed on with a 2½" wide paint brush with 1½" bristles. The underslab concrete surfaces above each plate had a combination of surface preparations consisting of grooves cut in the concrete, forming either a figure X, H, or 3 parallel lines or no surface preparation at all. The cut grooves were installed as air venting systems with the grooves extending well beyond the forming at the edges of the steel plates.

Test plates #1 thru #4 had four grout injection points down the center of each plate. Plates #1 and #4 were formed on four sides (bulkheaded) with 2 x 4 lumber and were sealed to the underslab concrete using a silicone caulking. Plates #2 and #3 were bulkheaded using expanded metal backed with leadwool packing. This system of bulkheading also required 2 x 4 framing to retain the expanded metal. In addition to these cut grooves, the 2 x 4 bulkheading had ½" square vents cut into its top surface. These vents were later plugged with wood plugs or leadwool. The backup framing for Plate #2 and #3 had long slots approximately ¾" deep cut along its top edge to aid in the passage of air thru the leadwool packing.

Test plates #6 thru #8 had one grout injection point each. All were conventionally bulkheaded with 2 x 4 lumber and silicone caulking. Test plate #6 had an injection point at its center and the underslab concrete was prepared by roughening it with a chisel bit tool to simulate an irregular surface. Test plate #7 had an injection point at its center with a pipe extension which protruded up into a 1½" diameter hole cored into the underslab concrete. This was done to provide a positive means of limiting grout loss to the area of the cored hole in the event leakage resulted from failure of the injection shut-off valve. In addition, an "X" groove pattern was cut across the hole extending to each corner. Test plate #8 had one injection point located 3' in from the northwest corner. The underslab concrete was left in its original condition.

Test plate #5 was drypacked utilizing Masterflow #713 grout. This test plate was bulkheaded on the north, south, and east sides with all drypacking being done from the west side. In addition to test plate #5, two additional drypack test plates were prepared from this same location and they were numbered 5A and 5B. Test plate #5A was made with Masterflow #713 grout mix while test plate #5B was made using a 1:1 ratio sand/cement drypack mix.

C. Description of Grouting

The flowable grout used was Masterflow #713 mixed in accordance with Mergentime Grouting Procedure MCP 15.000 (See Exhibit D - Photograph #2 and Exhibit E). Where multiple injection points were used, grouting progressed south to north.

III TEST PROCEDURES (Cont'd)

The grouting was accomplished using an Airplaco model #HG-5, hand operated grout pump, in a five gallon plastic pail. The grout pump was connected to the plate injection point by a flexible hose using Chicago type couplings. Attached to the steel test plate injection nipple was a shut-off valve and a Chicago type coupling. (See Exhibit D - Photographs #4 and #7). Air vents were plugged only after a good flow of grout passed through them. After all vents were plugged the pump was used to apply and maintain a static pressure of 9 to 15 lbs. until the injection point valve was closed.

U.S. Testing was present at the start of grouting and drypacking each day and to take flow cone tests and to make strength cubes (see Exhibit D - Photograph #3) for verification of material characteristics (see Exhibit C). It should be noted that no curing was performed on the grout test pads and that they were all stripped within approximately 20 hours of being placed.

D. Post Test Observations

All test plates were removed the day after placement. The grease bond breaker worked well, however, most test plate grout pads were cracked or otherwise broken during the process of removal.

The results of all test plates grouted with Masterflow #713 were satisfactory. The utilization of various patterns of specially cut grooves in the underslab concrete appeared to have had no influence on relieving entrapped air. In certain instances air bubbles were entrapped continuously across a cut groove. The larger (over $\frac{1}{2}$ " diameter and $\frac{1}{8}$ ") air bubbles appeared almost exclusively on the plates with four (4) injection points. (See Exhibit D - Photograph #27). Since the first injection point generally filled the bulk of each test area it appears that these bubbles may be portions of a larger bubble that was formed when grout was placed from a previous injection point. There is no definite pattern on entrapped air bubbles other than they appear to be radially oriented about one or more of the three subsequent injection points.

Both the wood form and expanded metal/leadwool bulkhead methods effectively contained the grout and provided adequate avenues for escaping air. The wood forms left a neat uniform grouted edge while the Expanded metal/leadwool created a void area approximately $\frac{3}{4}$ " back from the test plate edge. (See Exhibit D - Photograph #28).

The wood plug system used to plug the bulkhead air vents worked well at all locations where it was used. Although the leadwool plugs were satisfactory, in some locations they were pushed as much as $\frac{3}{4}$ " to 1" into the grout pad itself and thus leaving a void. Also leadwool was used at the only two vent areas that showed evidence of grout leakage after grout shut-off.

III TEST PROCEDURES (Cont'd)

Minor dripping of a clear amber fluid was noted from all pressure grouted test plates, starting at approximately half way thru the grouting time period and extending well beyond completion of grouting. This was apparently bleed water and a visual inspection of the pads could find no damage or voids as a result of the fluid.

E. Test Results

Plate No.	Grouting Time	Grouting Pressure	Plate Deflection	% of Voids Over $\frac{1}{2}$ " \emptyset	Remarks
1	35 min.	13 psi	3/16 to 1/4	0.9	Many small surface bubbles noted
2	27 min.	12 psi	3/16 to 1/4	0.5	Contained large and deep trapped air pockets
3	39 min.	15 psi	1/4 to 3/8	0.7	Contained air bubbles apparently formed from subsequent injection points
4	40 min.	9 psi	0 to 1/8	1.2	Contained large shallow air pockets
5 (DP)	1 to 1½ hr	n/a	None	14.0	Poor consolidation at east edge of pad
5A (DP)	Not Avail	n/a	3/16 to 1/4	7.0	Poor consolidation at east edge of pad
5B (DP)	2 to 2½ Hr	n/a	3/16 to 1/4	0.1	Actual Void Area is 2.5% When Lost Contact Area is Included
6	25 min.	12 psi	1/16 to 1/8	0.8	Experienced No Problem Filling Irregularities Chipped Into Concrete Surfaces
7	20 min.	12 psi	1/8 to 3/16	0.5	Appears to have had plate movement during grouting
8	30 min.	10 psi	1/8 to 1/4	0.9	Poor consolidation appears to have resulted from excessive grout flow distance

*See Exhibits B and D for additional photographs and test results evaluations.

III TEST PROCEDURES (Cont'd)

Dates of Testing:

- o Plates 1 thru 5 were grouted on 6-28-83 and removed on 6-29-83
- o Plates 5 thru 8 were grouted on 6-29-83 and removed on 6-30-83
- o Plate 5A was drypacked on 6-30-83 and removed on 7-1-83
- o Plate 5B was drypacked on 7-6-83 and removed on 7-7-83

IV. CONCLUSIONS

All pressure grouted test plates provided a fully satisfactory grout pad for transfer of loading into or from an overhead concrete structure. Based upon the comparison of the seven (7) pressure grouted test plates, it appears that the single centrally located injection point type of test gives the best product.

Test plate #7 had a special condition of a pipe extension of the injection nipple up into a 1½" drilled hole in the underslab concrete. No advantages to this system were noted in the resultant underslab/grout contact surface to merit further consideration.

Two drypack test plates were made using Masterflow #713 for comparison purposes. Neither of these two test plates proved to be better than the pressure grouted test plates. Proper consolidation of the drypack on the far side of the test plate and behind anchor bolts appears to be the weak areas for these plates. A third drypack test plate was made using a 1 to 1 sand/cement ratio which proved to be the best test plate except for a loss of contact area in the northwest corner, apparently a result of the plate moving during final stages of drypacking.

One problem noted from the pressure grouting and from two of the three drypack test plates, was the elastic bowing of the ½" steel test plates resulting from the induced pressures. The least affected pressure grout test plate was #4, on which grouting was stopped with a static pressure, indicated at the grout pump, of approximately 8 to 10 psi. All other plates were stopped at static pressures of 12 psi±. It should be noted that only eight (8) expansion bolts were used to support the test plates and that no attempts were made to restrain or limit plate deflections (bowing). It should also be noted that the static shut-off pressure was measured on a 0 to 60 psi pressure dial attached to the grout pump discharge. (See Exhibit #D - Photograph #4). This static pressure includes approximately six (6) feet of head between the gage and the overhead test plate. Consequently ten (10) pounds per square inch pressure at the gage should mean four (4) psi actual pressure within the grout bed itself. Thus it appears that minimal pressure (sufficient to force grout to flow out the bulkhead air vents) is all that is necessary to achieve grout placements.

IV CONCLUSIONS (Cont'd)

An observation noted was that the pressure gage attached to the grout pump indicated high pressure peaks during the initial stages of pumping. This pressure could not have built up under the plates, since all the vents were open during this stage of pumping. This "peaking" was due to a combination of rapid pumping and line losses during the initial filling. As the vents were closed and pumping slowed, the pressures stabilized in the line, reflecting pressures actually transferred to the grouted plates. (This "peaking" phenomena will be a consideration in gage range selection in permanent pier grouting.)

No advantages were noted by use of the expanded metal/leadwool system over the more conventional wooden bulkhead system. A major disadvantage was, however, noted in that there was a definite loss in available grout pad size in the leadwool system. Consequently production plates utilizing this bulkhead system would require larger sized plates to makeup for the lost grout pad area.

The Union 76 multipurpose grease was used as a bondbreaker on the underslab concrete surface and performed its function. The use of this grease as opposed to normal pre-soaking or the use of the weld crete could be expected to result in a larger amount of air entrapped in the grout concrete contact surface due to the grease being impervious and thus not allowing any air to be absorbed by the concrete.

On the whole the amount of small air pockets noted were about equivalent to what might be expected on a vertically formed surface poured with air entrained concrete. A quantitative value for percentage of lost contact surface, due to air or just no contact, was determined by physical measurements of the void areas larger than $\frac{1}{4}$ " equivalent diameter. The results of these measurements for plates #1 thru #4 and #6 thru #8 show a range of from 0.5 percent to 1.2 percent loss. Inclusion of all void areas less than $\frac{1}{4}$ " ϕ should not amount to any more than double the values calculated or in other words a maximum of 2.4 percent loss in total.

The hand pumping of the grout was a satisfactory method for placement of the grout. It was an easy method to control the placing of grout as well as being mobile and requiring little in the way of support facilities or maintenance during placement.

The Masterflow #713 grout proved to be an acceptable mix in terms of its net physical characteristics as well as the finished product. It should be noted that although the Mergentime Procedures for grouting (MCP 15.000) and drypacking (MCP14.000) were utilized as guidelines, absolute adherence was not expected, nor was it guaranteed by quality control inspections. In particular, no bonding to existing concrete was desired, no grout placement plan was utilized, and no attempts were made to properly cure the test plate grout pads.

IV CONCLUSIONS (Cont'd)

It should be noted also that the expansion anchor bolts were installed at varying depths and in several instances spacer washers had to be utilized in order to tighten the nut without bottoming out on the the threads.

The bowing or elastic bending of virtually all of the test plates was to be expected, but should not be a source of concern. Bowing of the test plates showed up on both the pressure grouted plates as well as the dry-packed plates. To date, no problems have been noted in the Auxiliary Building Underpinning work with drypacked leveling plates. Bowing of pressure grout plates will not be a problem either since the bowing can easily be eliminated by the installation of plate bracing before grout placement.

V. RECOMMENDATIONS

Utilization of leadwool as a form of bulkheading for pressure grouting should be kept as an option for areas where the more conventional wood bulkheading can not be utilized. There may be instances during grouting where the use of leadwool will provide the best and most reasonable means of stopping grout movement. Care will still have to be exercised to ensure that use of leadwool does not reduce the required effective bearing area of the grout pad.

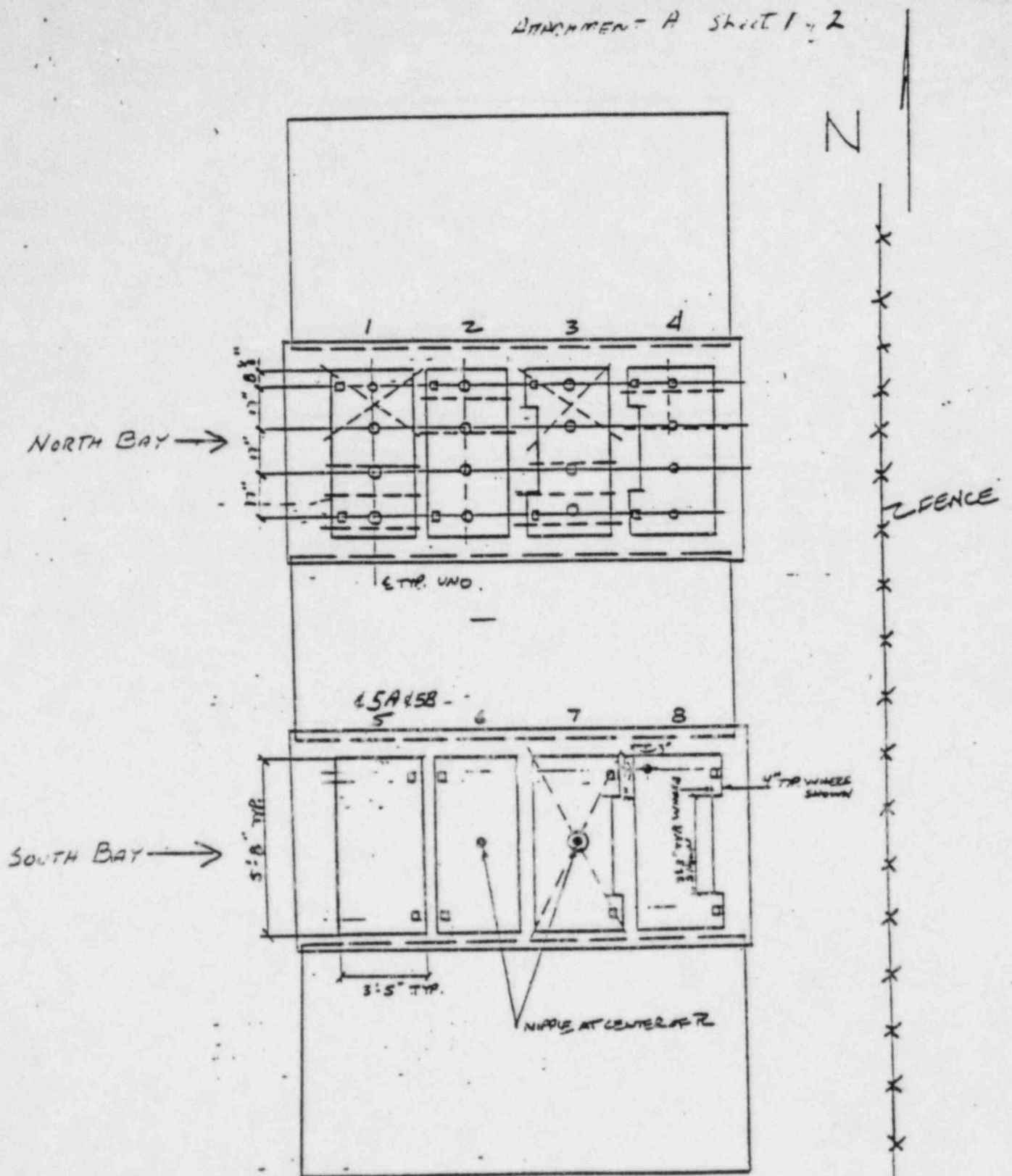
An option, although not tested, that should prove equally as good as the single injection point system would be a dual injection point system (At 1/3 points down the center of plate). This system would use two grout pumps both of which are pumped either simultaneously in a manner so as not to form air pockets/bubbles as noted in Section III D of this report.

Grouting pressure should be kept near the minimal required to obtain grout flow through the air vents. To avoid possible plate bowing or excessive bracing of plates, slow stroking of the handpump to eliminate impulse loading should be utilized.

OVERHEAD FLUID GROUTING TEST PROGRAM

EXHIBIT A

GROUTING PLAN ARRANGEMENT



- -- 5/8" ϕ NIPPLE WELDED TO PLATE
- -- 3/4" ϕ NIPPLE WELDED TO PLATE
- ⊙ -- 1 1/2" ϕ CORE HOLE 3" DEEP
- -- 4" \square HOLE IN PLATE

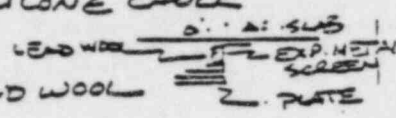
--- GROOVE CUT IN SLAB FOR AIR PASSAGEWAY (DEPTH VARIES FROM 1 1/2" @ CENTER OF RATE TO 3/4" OUTSIDE THE RATE AREA)

1 - TEST RATE LOCATION NUMBER

FORMWORK

PLATE NO.

FORMWORK

1	WOOD FORMS CAULKED W/ SILICONE CAULK
2	EXPANDED METAL SCREEN W/ LEAD WOOL 
3	EXPANDED METAL SCREEN W/ LEAD WOOL
4	WOOD FORMS CAULKED W/ SILICONE CAULK
5	WOOD FORMS (DRYPACK PLATE)
6	WOOD FORMS CAULKED W/ SILICONE CAULK
7	WOOD FORMS CAULKED W/ SILICONE CAULK
8	WOOD FORMS CAULKED W/ SILICONE CAULK

NOTES

1. ALL PLATES WITH THE EXCEPTION OF NO. 5 WILL HAVE 12 VENT HOLES BETWEEN THE SLAB AND THE TOP OF THE FORM EVENLY SPACED AROUND THE PERIMETER OF THE PLATE. THESE HOLES WILL BE PLUGGED WITH WOOD WHEN A STEADY STREAM OF GROUT FLOWS FROM THEM.
2. ALL PLATES WILL BE PRESSURE GROUTED BY HAND PUMP WITH THE EXCEPTION OF PLATE NO. 5 WHICH WILL BE DRYPACKED.
3. SLAB AREA TO BE GROUTED OR DRYPACKED AGAINST WILL BE GREASED FOR EASY REMOVAL OF PLATE AND GROUT/DRYPACK.
4. GROUT/DRYPACK WILL BE MASTERFLOW 713.
5. HILTI EXPANSION ANCHORS WILL HAVE A SMOOTH PIPE SLEEVE ON THEM BETWEEN THE LEVELING PLATE AND THE SLAB TO PERMIT EASY REMOVAL OF THE PLATE AND GROUT/DRYPACK.
6. ALL SLAB SURFACES TO BE GROUTED/DRYPACKED WILL BE PREPARED BY REMOVING SURFACE LAYERS WITH A WIRE BRUSH WITH THE EXCEPTION OF THE SLAB @ PLATE NO. 6 WHICH WILL BE ROUGHENED WITH A HILTI DRILL W/ CHISEL TIP.
7. PLATE NO. 7 WILL HAVE AN ADDITIONAL PIECE OF PIPE ATTACHED AT THE NIPPLE PROJECTING UP INTO A DRILLED CAVITY.

OVERHEAD FLUID GROUTING TEST PROGRAM

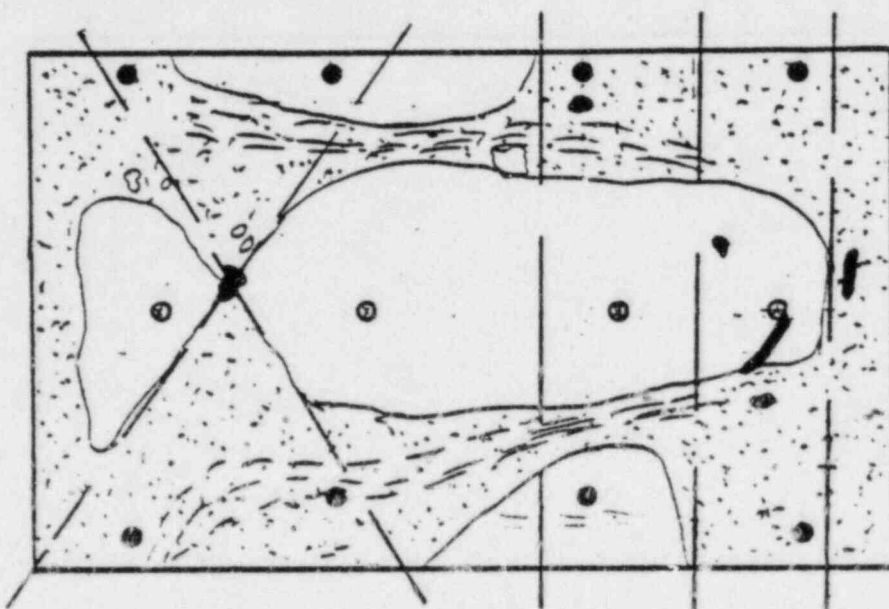
EXHIBIT B

FIELD EVALUATION OF VOID AREAS

1. Peripheral bubbles about nipples?

	No (Peripheral bubbles from #2 over hole) #3	No
#2	Yes - Towards #1 #4 (North)	No
2. Air noted in underslab notch grout projections? Yes
3. Grout leakdown at air vent holes? No, but lead wool hole plugs extending into grout slab 3/4" past plate edge.
4. Noticeable general air bubble pattern? Yes

Visual interpretation sketch (no scale):



- LEGEND
- Full contact surface areas (all plates)
 - Areas of less than full contact containing small air voids. The densities of the small air voids are not indicated. (Pressure grout plates c)
 - Porous and/or less than full contact areas.
 - Injection point nipples
 - Cut grove patterns
 - Anchor bolt holes (8 each per plate)
 - Noticeable air bubble ch
 - Void areas deeper than 1
 - Void areas 1/8" or less

5. Calculated void area in excess of 1/4" Ø nominal sizing = 0.9% percent of surface area.

6. General quality evaluation of grout/concrete contact area.

North 1/2: Poor, satisfactory, good, excellent
 South 1/2: Poor, satisfactory, good, excellent

7. General evaluation of test plate: For some reason, this plate has a lot of little air bubbles and they form chains of flow lines. This is by far the worst of the plates (#2, #3, & #4) placed on same day as far as general appearance and numbers of small bubbles are concerned. The cut grooves appear to have had little, if any effect on the pattern of these bubbles. This was the last plate done on this day.

1. Peripheral bubbles about nipples?

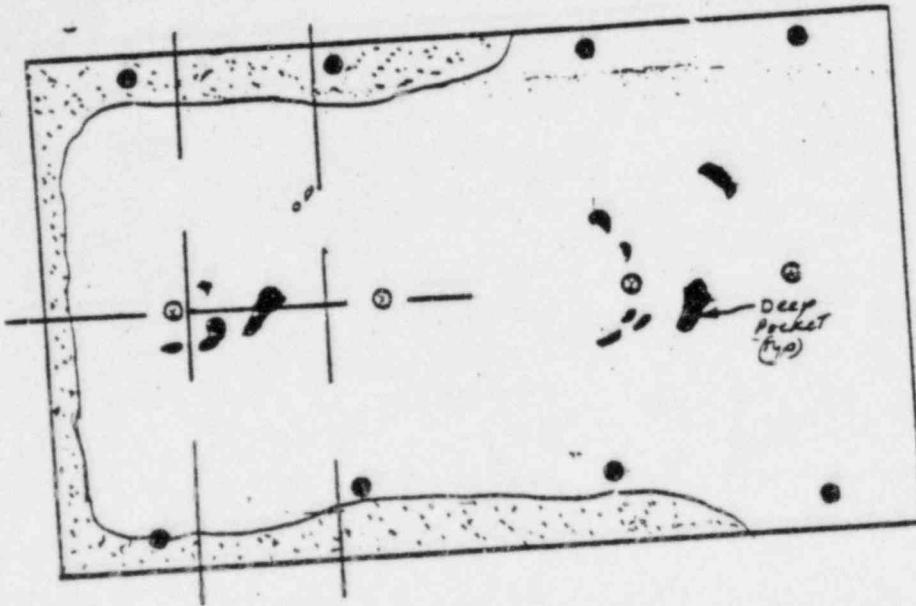
#1 (South)	No	#3	No
#2	Yes, Several (one 2 1/2" x 1 1/2")	#4 (North)	Yes, (two 1" x 1/2" & 3 1/2" x 1/2")

2. Air noted in underslab notch grout projections? Yes, Minor

3. Grout leakdown at air vent holes? n/a
Leadwool/exp. metal bulkhead

4. Noticeable general air bubble pattern? Yes, minor

Visual interpretation sketch (no scale):



- LEGEND
- Full contact surface areas (all plates)
 - Areas of less than full contact containing small air voids. The densities of the small air voids are not indicated. (Pressure grout plates only)
 - Porous and/or less than full contact areas.
 - Injection point nipples
 - Cut groove patterns
 - Anchor bolt holes (8 each per plate)
 - Noticeable air bubble chain
 - Void areas deeper than 1/8
 - Void areas 1/8" or less de



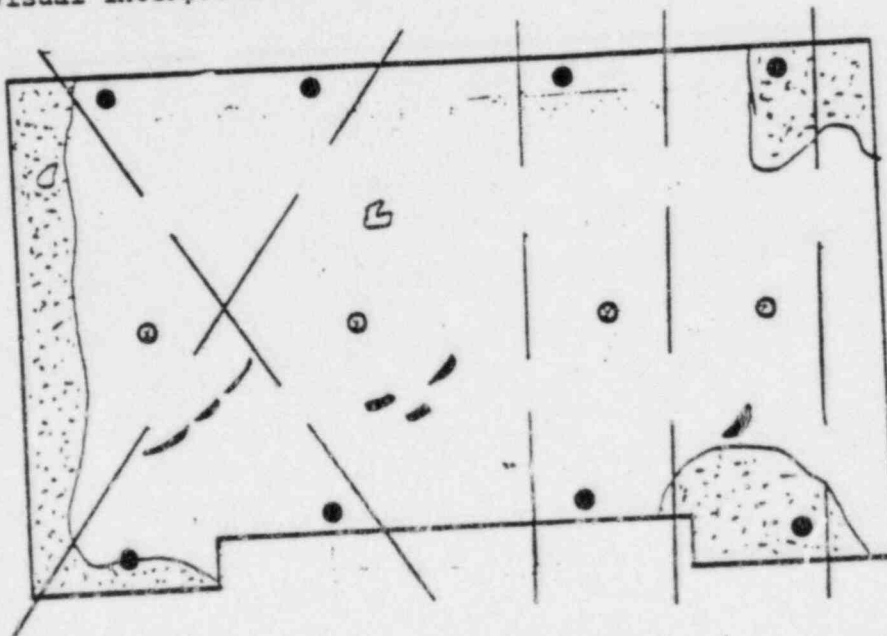
5. Calculated void area in excess of 1/4" Ø nominal sizing = .05% percent of surface area.










6. General quality evaluation of grout/concrete contact area.
 North 1/2: Poor, satisfactory, good, excellent
 South 1/2: Poor, satisfactory, good, excellent

7. General evaluation of test plate: The grooved end seemed to have more small air bubbles than the non-grooved end. Both ends had several large trapped air pockets. In general, the non-grooved end looked better. Steel plate size should be increased to account for approximately 3/4" to 1"± grout pad loss, due to lead-wool packing.

1. Peripheral bubbles about nipples?
 - #1 (South) No #3 Yes, 4 deep approx. 1 1/2" long
 - #2 Yes, one (2 1/2" x 1 1/2") #4 (North) Yes, shallow & minor
2. Air noted in underslab notch grout projections? Yes, minor
3. Grout leakdown at air vent holes? n/a
Lead wool/Exp. metal bulkhead
4. Noticeable general air bubble pattern? Yes, minor

Visual interpretation sketch (no scale):



- LEGEND**
-  Full contact surface areas (all plates)
 -  Areas of less than full contact containing small air voids. The densities of the small air voids are not indicated. (Pressure grout plates only)
 -  Porous and/or less than full contact areas.
 -  Injection point nipples
 -  Cut groove patterns
 -  Anchor bolt holes (8 each per plate)
 -  Noticeable air bubble chair
 -  Void areas deeper than 1/3
 -  Void areas 1/3" or less det

5. Calculated void area in excess of 1/4" Ø nominal sizing = 0.7%
 percent of surface area.

6. General quality evaluation of grout/concrete contact area.
 North 1/2: Poor, satisfactory, good excellent
 South 1/2: Poor, satisfactory, good excellent

7. General evaluation of test plate: Overall grout/cement contact surface is good; however, the leadwool packing bulkhead undercuts the grout pad so plate size would have to be increased. No noticeable difference between the cut groove patterns.

1. Peripheral bubbles about nipples?

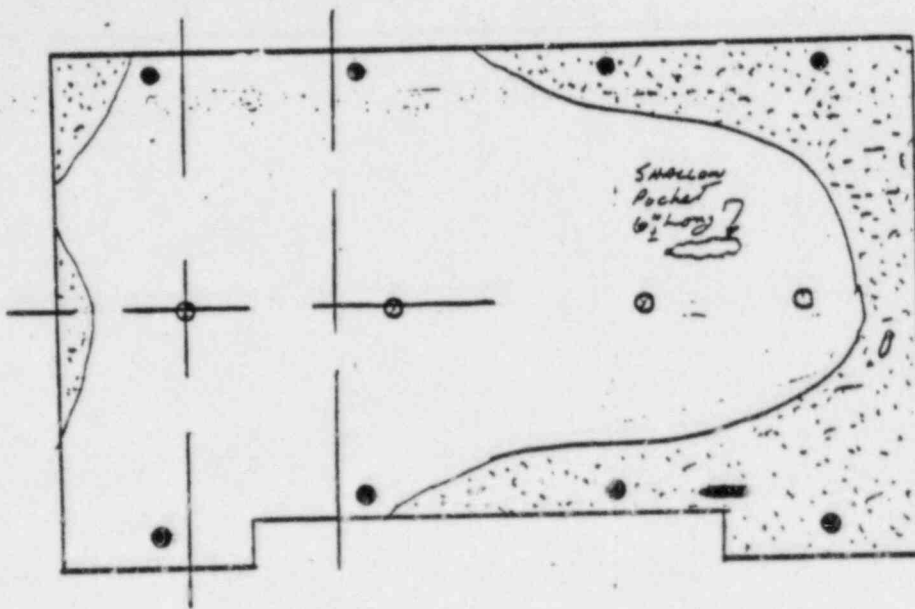
#1 (South) No #3 No
#2 No #4 (North) Yes, one










2. Air noted in underslab notch grout projections? Yes

3. Grout leakdown at air vent holes? No, one wood plug too deeply inserted, though.

4. Noticeable general air bubble pattern? Yes

Visual interpretation sketch (no scale):



- LEGEND
-  Full contact surface areas (all plates)
 -  Areas of less than full contact containing small air voids. The densities of the small air voids are not indicated. (Pressure grout plates or)
 -  Porous and/or less than full contact areas.
 -  Injection point nipples
 -  Cut groove patterns
 -  Anchor bolt holes (8 each per plate)
 -  Noticeable air bubble chn
 -  Void areas deeper than 1
 -  Void areas 1/8" or less :



5. Calculated void area in excess of 1/4" Ø nominal sizing = 1.2% percent of surface area.

6. General quality evaluation of grout/concrete contact area.
North 1/2: Poor, satisfactory, good excellent
South 1/2: Poor, satisfactory, good excellent

7. General evaluation of test plate: The wooden bulkhead with wooden grout hole plugs seem to have worked quite well. No major advantages noted for grooved half.

PLATE NO. 5 - Masterflow #713 Drypack

1. Peripheral bubbles about nipples?

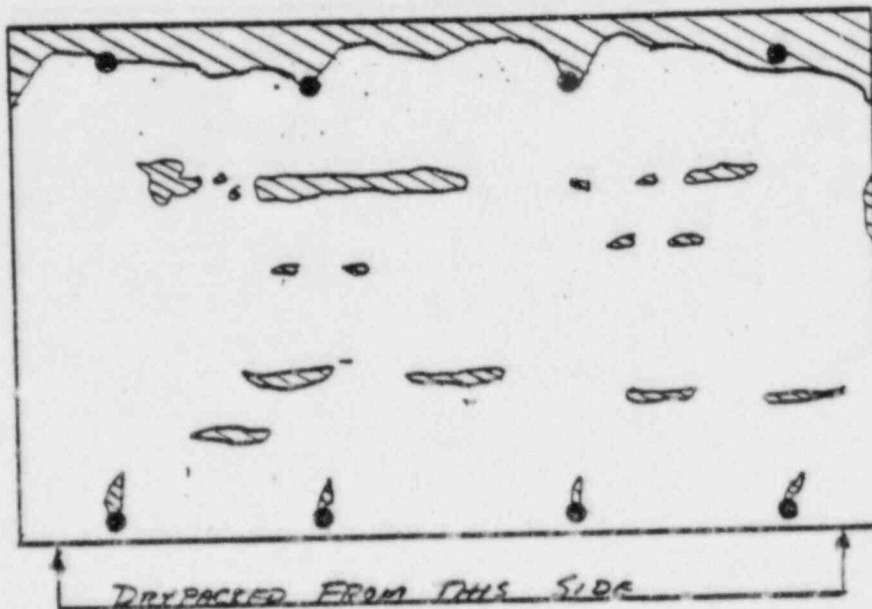
#1 (South) n/a #3 n/a
 #2 n/a #4 (North) n/a










2. Air noted in underslab notch grout projections? n/a

3. Grout leakdown at air vent holes? n/a

4. Noticeable general void pattern? Yes

Visual interpretation sketch (no scale):



- LEGEND
-  Full contact surface areas (all plates)
 -  Areas of less than full contact containing small air voids. The density of the small air voids are not indicated. (Pressure grout plates c)
 -  Porous and/or less than full contact areas.
 -  Injection point nipples
 -  Cut groove patterns
 -  Anchor bolt holes (8 each per plate)
 -  Noticeable air bubble on
 -  Void areas deeper than 1"
 -  Void areas 1/8" or less

5. Calculated void area in excess of 1/4" Ø nominal sizing = 14.0% percent of surface area.

6. General quality evaluation of grout/concrete contact area.

North 1/2: Poor satisfactory, good, excellent
 South 1/2: Poor, satisfactory good, excellent

7. General evaluation of test plate: General appearance of concrete/
grout contact surface is lesser than the worst fluid pumped
grout test plate.

1. Peripheral bubbles about nipples?

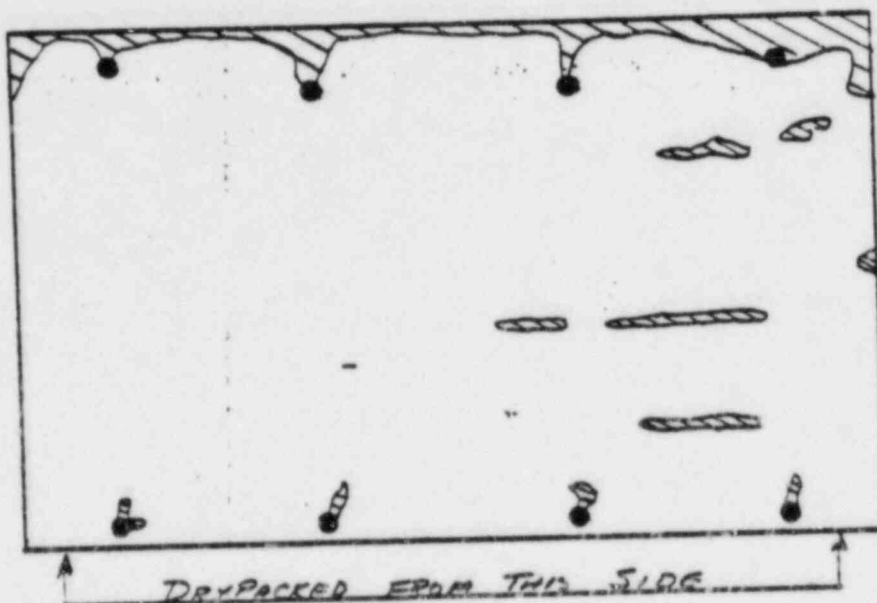
#1 (South) n/a #3 n/a
 #2 n/a #4 (North) n/a










2. Air noted in underslab notch grout projections? n/a

3. Grout leakdown at air vent holes? n/a

4. Noticeable general void pattern? Yes

Visual interpretation sketch (no scale):



- LEGEND
-  Full contact surface areas (all plates)
 -  Areas of less than full contact containing small air voids. The densities of the small air voids are not indicated. (Pressure grout plates only)
 -  Porous and/or less than full contact areas.
 -  Injection point nipples
 -  Cut groove patterns
 -  Anchor bolt holes (8 each per plate)
 -  Noticeable air bubble chain
 -  Void areas deeper than 1/8"
 -  Void areas 1/8" or less deep

5. Calculated void area in excess of 1/4" Ø nominal sizing = 7.0% percent of surface area.

6. General quality evaluation of grout/concrete contact area.

North 1/2: Poor, satisfactory, good, excellent
 South 1/2: Poor, satisfactory, good, excellent

7. General evaluation of test plate: General appearance of contact surface is not as good as best pumped grout test plate, but as good as the worst.

1. Peripheral bubbles about nipples?

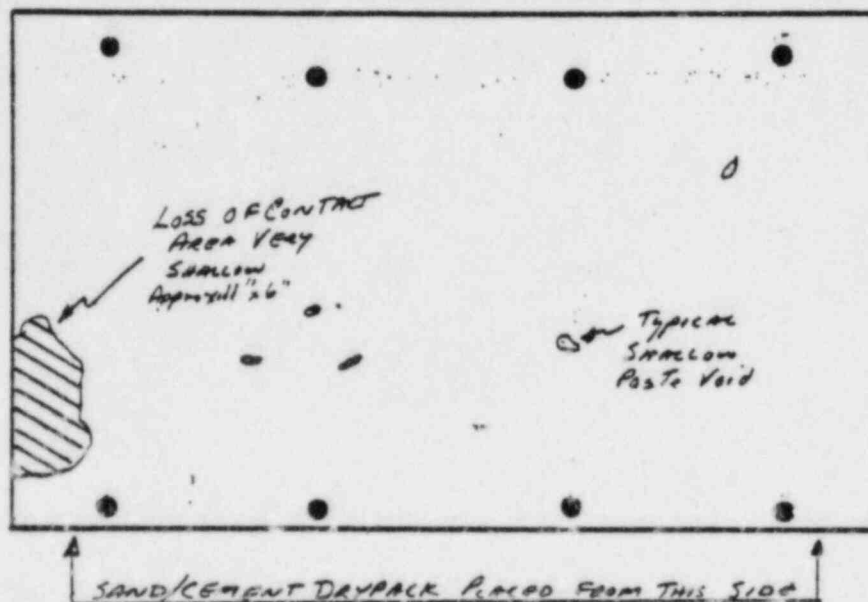
#1 (South) n/a #3 n/a
 #2 n/a #4 (North) n/a

2. Air noted in underslab notch grout projections? n/a

3. Grout leakdown at air vent holes? n/a

4. Noticeable general void pattern? No

Visual interpretation sketch (no scale):



- LEGEND
- Full contact surface areas (all plates)
 - Areas of less than full contact containing small air voids. The densities of the small air voids are not indicated. (Pressure grout plates or)
 - Porous and/or less than full contact areas.
 - Injection point nipples
 - Cut groove patterns
 - Anchor bolt holes (8 each per plate)
 - Noticeable air bubble char
 - Void areas deeper than 1"
 - Void areas 1/8" or less

5. Calculated void area in excess of 1/4" ϕ nominal sizing = 2.49%
 percent of surface area. Neglecting lost contact area = 0.1%

6. General quality evaluation of grout/concrete contact area.

North $\frac{1}{2}$: Poor, satisfactory, good, excellent
 South $\frac{1}{2}$: Poor, satisfactory, good, excellent

7. General evaluation of test plate: Good sound plate, most voids were in surface paste only. Test plate was solid, however, it appears that some, if not all of the West side anchor bolts have slipped some in the final stages of packing. Basic grout pad thickness is 1 1/2", but West face is 1 3/4" at N&S ends and 2" at midpoint. This is probably when large lost contact area was developed.

1. Peripheral bubbles about nipples?

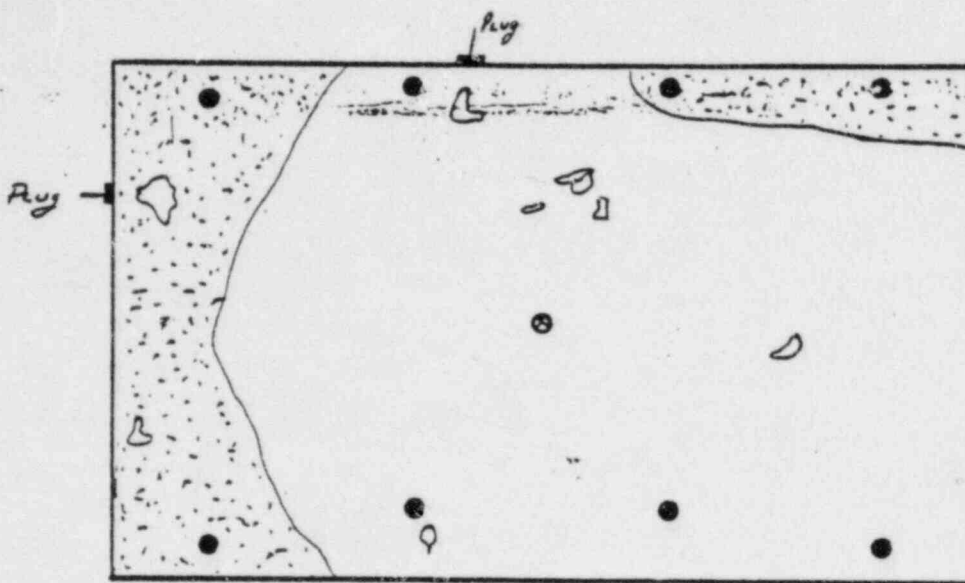
#1 (South) n/a #3 n/a
 #2 n/a #4 (North) n/a










2. Air noted in underslab notch grout projections? n/a

3. Grout leakdown at air vent holes? Yes, at 2 locations, both are lead wool plugs (3" x 2") at North end east plug & 1 1/2" x 1/2" at East side north middle plug, both are shallow depressions.

4. Noticeable general air bubble pattern? Yes, minor

Visual interpretation sketch (no scale):



- LEGEND
-  Full contact surface areas (all plates)
 -  Areas of less than full contact containing small air voids. The densities of the small air voids are not indicated. (Pressure grout plates on)
 -  Porous and/or less than full contact areas.
 -  Injection point nipples
 -  Cut groove patterns
 -  Anchor bolt holes (8 each per plate)
 -  Noticeable air bubble char
 -  Void areas deeper than 1/4"
 -  Void areas 1/8" or less

5. Calculated void area in excess of 1/4" Ø nominal sizing = 0.8% percent of surface area.

6. General quality evaluation of grout/concrete contact area.

North 1/2: Poor, satisfactory, good excellent
 South 1/2: Poor, satisfactory, good excellent

7. General evaluation of test plate: The scarrified contact surface is so irregular that it is hard to evaluate with grooved and non-grooved test plates. Again, the lead wool grout plugs penetrate into grout slab at approximately 3/4". Overall evaluation is that this appears to be one of the better looking less flawed test plates.

1. Peripheral bubbles about nipples?

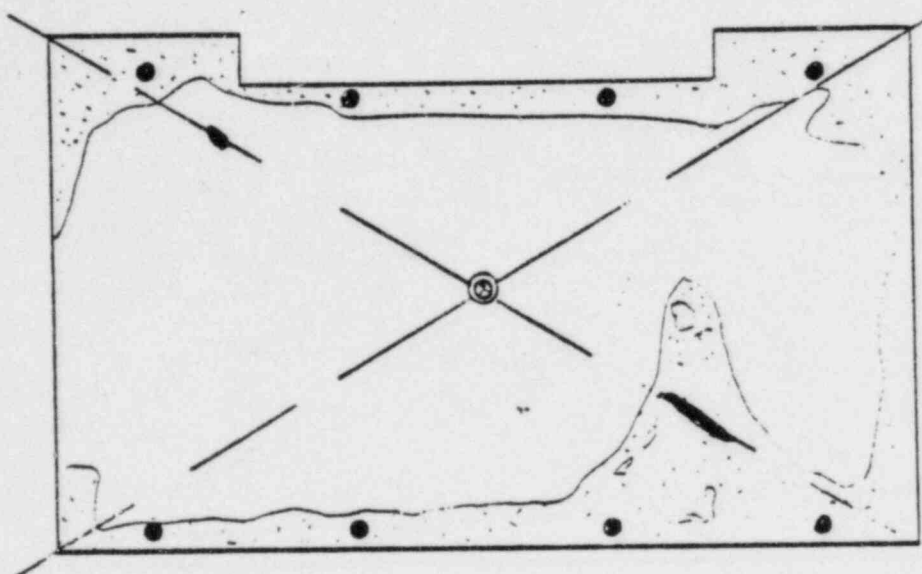
#1 (South) n/a #3 n/a
 #2 No #4 (North) n/a










2. Air noted in underslab notch grout projections? Yes

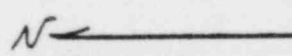
3. Grout leakdown at air vent holes? No

4. Noticeable general air bubble pattern? Yes, minor

Visual interpretation sketch (no scale):



- LEGEND
-  Full contact surface areas (all plates)
 -  Areas of less than full contact containing small air voids. The densities of the small air voids are not indicated. (Pressure grout plates on)
 -  Porous and/or less than full contact areas.
 -  Injection point nipples
 -  Cut groove patterns
 -  Anchor bolt holes (8 each per plate)
 -  Noticeable air bubble cha
 -  Void areas deeper than 1.
 -  Void areas 1/8" or less



5. Calculated void area in excess of 1/4" Ø nominal sizing = 0.5% percent of surface area.

6. General quality evaluation of grout/concrete contact area.

North 1/2: Poor, satisfactory, good excellent
 South 1/2: Poor, satisfactory, good excellent

7. General evaluation of test plate: The expansion bolts on the East side appear to have pulled or never were snug at 1 1/2". Grout pad thickness increased up to 2 1/2" nominally. Overall evaluation is as good as plate #6. No advantage noted due to fountain or cut grooves.

1. Peripheral bubbles about nipples?

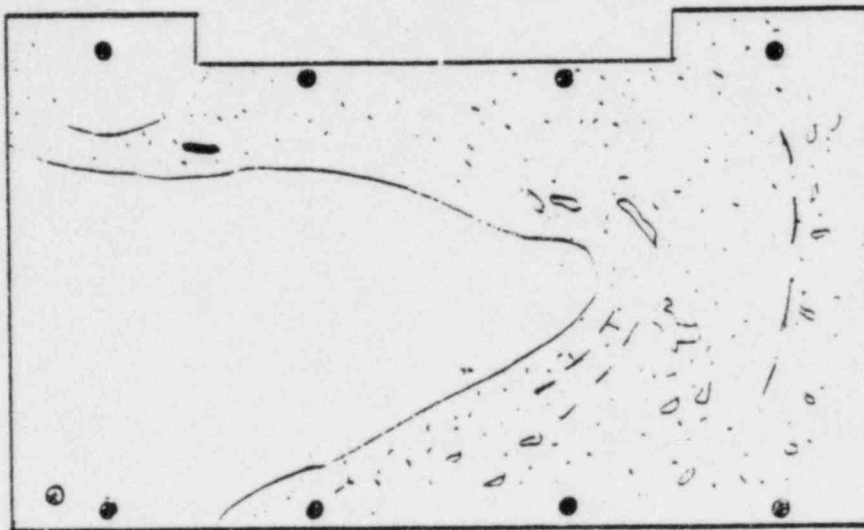
#1 (South) n/a #3 n/a
 #2 n/a #4 (North) No, (in West corner)










2. Air noted in underslab notch grout projections? n/a

3. Grout leakdown at air vent holes? No

4. Noticeable general air bubble pattern? Yes

Visual interpretation sketch (no scale):



- LEGEND
-  Full contact surface areas (all plates)
 -  Areas of less than full contact containing small air voids. The densities of the small air voids are not indicated. (Pressure grout plates or)
 -  Porous and/or less than full contact areas.
 -  Injection point nipples
 -  Cut groove patterns
 -  Anchor bolt holes (8 each per plate)
 -  Noticeable air bubble on
 -  Void areas deeper than 1
 -  Void areas 1/8" or less

5. Calculated void area in excess of 1/4" Ø nominal sizing = 0.9%
 percent of surface area.

6. General quality evaluation of grout/concrete contact area.

North $\frac{1}{2}$: Poor, satisfactory, good, excellent
 South $\frac{1}{2}$: Poor, satisfactory, good, excellent

7. General evaluation of test plate: General condition evaluation is that this plate is no worse than plate #1. One injection nipple in the corner gives a lesser quality product than one in the middle of the plate.

OVERHEAD FLUID GROUTING TEST PROGRAM

EXHIBIT C

LABORATORY TEST DATA



BECHTEL POWER CORPORATION
 MIDLAND NUCLEAR POWER PLANT JOB 7220
 REPORT OF NON-SHRINK GROUT TESTS

INFORMATION
 TEST ONLY

1. Placement Identification NON-Q (TRAINING)		* Lot No: <u>B2662Q3</u> Exp. Date: <u>9-84</u>		2. Date Placed <u>6-28-83</u>	
3. Placement Location <u>POSEYVILLE LAY DOWN AREA</u>					
3A. PLANT DATA		Source <u>MELROTTING HANDMIXER</u>		Grout Brand & Type <u>MASTERCOR IDEALS MASTER FLOW 713 FLOW GROUT</u>	
4. Mix <u>713 FLOW GROUT</u>		5. Class <u>II</u>	6. "Q" List <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		7. Required Strength <u>4000</u> PSI At <u>28</u> Days
8. Test Data At: <u>Handmixer in Poseyville Lay Down Area</u>			9. Stopwatch <u>695</u>		Calibration Date <u>11-3-83</u>
10. Flow Data CTD 811-80 Time of Efflux (Sec) No. 1 <u>19.1</u> No. 2 <u>27.1</u> No. 3 <u>31.1</u> Average <u>25.8</u> Sec				11. Flowcone <u>498</u>	
12. Thermometer <u>211</u>		Calibration Date <u>9-5-83</u>		13. Temp.: Grout <u>61</u> °F	14. Temp.: Air <u>67</u> °F
15. Initials <u>LH SF 6-28-83</u>		16. Initial Curing Thermometer <u>790</u>		Calib. Date <u>10-26-83</u>	
17. Time of Testing <u>1331</u> Hrs at <u>1</u> Bags		18. Time of Molding <u>1343</u> Hrs		19. Initial Curing ASTM C-31-80 SF 6-28-83 <u>71</u> °F To <u>77</u> °F	
20. Stripped ASTM-C109-75 <u>6-29-83</u>		At <u>1135</u> Hrs		21. Initials <u>SF 6-29-83</u>	

COMPRESSIVE STRENGTH DATA ASTM-C-109-75

22. Specimen Identification	23. Date Molded	24. Date Tested	25. Age	26. Total Load In Pounds	27. Actual Cube Dim	28. Actual Cube Area	29. Type of Break	30. Cure		31. Strength PSI
								Field	Lab	
G-164-2491	6-28-83	7-1-83	3	16,750	2x2	4.0	A	1	2	4,188
2492			3	16,450	2x2	4.0	A	1	2	4,112
2493			3	16,450	2x2	4.0	A	1	2	4,112
Average		7-1-83	3							4,170 SF 4,112 7-1-83
2494		7-5-83	7	25,200	2x2	4.0	A	1	6	6,300
2495			7	26,150	2x2	4.0	A	1	6	6,538
2496			7	26,300	2x2	4.0	A	1	6	6,575
G164 Average	6-28-83	7-5-83	7							6,470

32. Specimen Size <input checked="" type="checkbox"/> 2" x 2" Cube <input type="checkbox"/> Other				37. Remarks <u>* NON-ACCEPTED GROUT</u>	
33. Age (Days)	34. Tested By	35. Checked By	36. Reviewed by Q.C.		
3	RZ	RS 7-4-83 SF 7-2-83			
7	RBK	RS 7-1-83 SF 7-6-83			
38. Laboratory Supervisor Signature					39. Date

Type of Breaks: A-Cone, Mortar Failure

C-Shear, Mortar Failure
 QCF-74 Rev. 1

E-Other

G. 0213-1



UNITED STATES TESTING COMPANY, INC.
TRAINING-INFO ONLY

TEST LOCATION: POSEYVILLE LAYDOWN AREA DATE 6-28-83
 MASTER BUILDERS
 CEMENT IDENTIFICATION: NON "O" TRAINING GROUT TYPE: 713 FLOW GROUT
 MASTER FLOW
 FLOW DATA CRD-C-611-RC/QCP-18

Test Number #	1	2	3	4
Set Number #	1312 ^{L.H. 1343} _{W.H.}	G-164		
Time of Sample	1312	1331		
Ambient Temperature (°F)	71	67		
Grout Bag Temperature (°F)	75	75		
Water Temperature (°F)	66	44		
Mix Temperature (°F)	73	61		

Flow Data

First (sec.)	22.8	19.1		
Second (sec.)	42.4	27.1		
Third (sec.)	*	31.1		
Fourth (sec.)		25.8		

Tested By: SF, L.H. ⁶⁻²⁸⁻⁸³ - SF, L.H. ⁶⁻²⁸⁻⁸³

Equipment Data	Model & ID Number	Calibration Due Date
Flow Cone	498	7-22-83
Thermometer	211	9-5-83
Stopwatch	695	11-3-83

Lot Number: B266203 Expiration Date: 9-84 IR No. N/A
 Struck off @ 1435 Hrs. on 6-28-83, after initial set.
 Workability ended @ N/A Hrs. on N/A

Remarks:
 "NON-ACCEPTED" GROUT
 * BROKE EARLY
 mold @ 1343

**INFORMATION
 TEST ONLY**

Checked by: SF
 Date: 6-29-83

TEST ONLY

**BECHTEL POWER CORPORATION
MIDLAND NUCLEAR POWER PLANT JOB 7220
REPORT OF NON-SHRINK GROUT TESTS**

1. Test Identification: Q -- TRAINING
 2. Date Placed: 6-29-83
 3. Lot No: B266293 Exp. Date: 9-84
 4. Test Location: SEYVILLE LAYDOWN AREA
 5. Source: MERGENTIME HAND MIXER
 6. Grout Brand & Type: MASTER BUILDERS MASTERFLOW 713 FLOW GROUT
 7. Required Strength: 4000 PSI At 28 Days
 8. Class: II
 9. Stopwatch: 695
 10. Calibration Date: 11-3-83
 11. Flowcone: 498
 12. Calibration Date: 7-22-83
 13. Time of Efflux (Sec): 29.3 Average 24.2 Sec
 14. Temp.: Air 78 °F
 15. Initials: SF, LH 6-29-83
 16. Thermometer: 211 Calibration Date: 9-5-83
 17. Time of Testing: 1307 Hrs at 1 Bags
 18. Time of Molding: 1320 Hrs
 19. Initial Curing Thermometer: 783 Calib. Date: 12-16-83
 20. Stripped ASTM-C-109-75: 6-30-83 At 1025 Hrs
 21. Initials: SA 6-30-83
 22. Initial Curing ASTM-C-31-89 LH 6-29-83: 74 °F To 78 °F

COMPRESSIVE STRENGTH DATA ASTM-C-109-75

Specimen Identification	23. Date Moulded	24. Date Tested	25. Age	26. Total Load In Pounds	27. Actual Cube Area	28. Actual Cube Area	29. Type of Break	30. Cure		31. Strength PSI
								Field	Lab	
-166	2515 6-29-83	7-2-83	3	11,475	2x2	4.0	A	1	2	3,619
2516	1	1	3	14,650	2x2	4.0	A	1	2	3,668
2517	1	1	3	14,475	2x2	4.0	A	1	2	3,619
G-166 Average	6-29-83	7-2-83	3							3,630
2518	1	7-6-83	7	25,000	2x2	4.0	A	1	6	6,250
2519	1	1	7	23,000	2x2	4.0	A	1	6	5,750
2520	1	1	7	23,500	2x2	4.0	A	1	6	5,875
G-166 Average	6-29-83	7-6-83	7							5,960

37. Remarks: *NON-ACCEPTED GROUT*

32. Specimen Size: 2" x 2" Cube Other
 33. Age (Days): 3
 34. Tested By: PD
 35. Checked By: PD 7-6-83
 36. Reviewed by Q.C.: SF 7-2-83
 38. Laboratory Supervisor Signature: _____
 39. Date: _____

Type of Breaks: A-Cons. Mortar Failure
 C-Shear. Mortar Failure
 QCF-74 Rev. 1
 E-Other

G/M-0213-1



BECHTEL POWER CORPORATION
MIDLAND NUCLEAR POWER PLANT JOB 7220
REPORT OF NON-SHRINK GROUT TESTS

TEST ONLY

1. Placement Identification: **CON "Q" - TRAINING**
 2. Date Placed: **6-29-83**
 Lot No.: **B266202** Exp. Date: **9-84**
 3. Placement Location: **POSEYVILLE LAYDOWN AREA**
 4. Source: **MERGENTIME HAND MIXED** Grout Brand & Type: **MASTER BUILDERS MASTERFLOW 713 DRYPACK**
 5. Class: **II** 6. "Q" List: Yes No 7. Required Strength: **4000** PSI At **28** Days
 8. Mix: **713 DRYPACK** 9. Stopwatch: **N/A** Calibration Date: **N/A**
 10. Test Data At: **MERGENTIME & HAND MIXED POSEYVILLE LAYDOWN AREA** 11. Flowcone: **N/A** Calibration Date: **N/A**
 12. Flow Data CRD 811-80 Time of Efflux (Sec):
 No. 1: **N/A** No. 2: **N/A** No. 3: **N/A** Average: **N/A** Sec
 13. Temp.: Grout: **87** °F 14. Temp.: Air: **82** °F
 15. Initials: **SF, LH**
 16. Initial Curing Thermometer: **211** Calib. Date: **9-5-83** 17. Time of Testing: **1442** Hrs at **1** Bags
 18. Time of Molding: **1444** Hrs
 19. Initial Curing ASTM-C-31-69: **758** Calib. Date: **9-22-83** 20. Stripped ASTM-C109-75: **N/A** At **N/A** Hrs
 21. Initials: **SF, LH**

COMPRESSIVE STRENGTH DATA ASTM-C-109-75 **TAMPER: 741/8-3-83**

22. Specimen Identification	23. Date Molded	24. Date Tested	25. Age	26. Total Load In Pounds	27. Actual Cube Dim	28. Actual Cube Area	29. Type of Break	30. Cure		31. Strength PSI
								Field	Lab	
G-168F 1 2539	6-29-83	7-2-83	3	35,150	2Y2	4.0	A	3	0	8788
2540	1	1	3	35,100	2Y2	4.0	A	3	0	8775
2541	1	1	3	35,150	2Y2	4.0	A	3	0	8788
G-168F Average	6-29-83	7-2-83	3							8780
2542	1	7-6-83	7	39,000	2Y2	4.0	C	7	0	9750
2543	1	1	7	39,500	2X2	4.0	C	7	0	9875
2544	1	1	7	37,000	2Y2	4.0	C	7	0	9850
G-168F Average	6-29-83	7-6-83	7							9680

32. Specimen Size: 2" x 2" Cube Other

37. Remarks: *** "NON-ACCEPTED GROUT"**

33. Age (Days)	34. Tested By	35. Checked By	36. Reviewed by Q.C.	38. Laboratory Supervisor Signature	39. Date
3	LH	SF	7-5-83		
7	BW	SF	7-7-83		

38. Laboratory Supervisor Signature: **DURING 6-30-83 SPECIMENS PICK UP OF 28 & HOLD CUBES**
MOIDS WERE COVERING MOIDS REFINED SINCE THEY WERE
REMOVED BY SENSITIVE APRES HOLDING



BECHTEL POWER CORPORATION
 MIDLAND NUCLEAR POWER PLANT JOB 7220
 REPORT OF NON-SHRINK GROUT TESTS

TEST ONLY

1. Placement Identification: NON-Q-TRAINING Lot No.: * B2474 P3 Exp. Date: 8-84 2. Date Placed: 7-1-83

3. Placement Location: POSEYVILLE LAYDOWN AREA

3A. PLANT DATA Source: HAND MIXED BY MERGENTIME Grout Brand & Type: MASTER BUILDERS MASTERFLOW 713 DRYPACK

4. Mix: 713 DRYPACK 5. Class: II 6. 'Q' List: Yes No 7. Required Strength: 4100 PSI At 28 Days

8. Test Date At: HAND MIXED BY MERGENTIME 9. Stopwatch: N/A Calibration Date: N/A

10. Flow Data CRO 611-80 Time of Efflux (Sec) No. 1: N/A No. 2: N/A No. 3: N/A Average: N/A Sec 11. Flowcone: N/A Calibration Date: N/A

12. Thermometer: 211 Calibration Date: 9-5-83 13. Temp.: Grout: 77 °F 14. Temp.: Air: 78 °F 15. Initials: SF, LH

16. Initial Curing Thermometer: 779 Calib. Date: 10-26-83 17. Time of Testing: 1020 Hrs at 1 Bags 18. Time of Molding: 1022 Hrs

19. Initial Curing ASTM-C-31-69: 67 °F To 81 °F 20. Stripped ASTM-C109-75: 7-2-83 At 1442 Hrs 21. Initials: SF 7-2-83

COMPRESSIVE STRENGTH DATA ASTM-C-109-75 TAMPER: 741 / 8383

22. Specimen Identification	23. Date Molded	24. Date Tested	25. Age	26. Total Load In Pounds	27. Actual Cube C'm	28. Actual Cube Area	29. Type of Break	30. Cure		31. Strength PSI
								Field	Lab	
G-171F 2563	7-1-83	7-4-83	3	33,000	2x2	4.0	A	3	0	6,350
2564	1	1	3	31,250	2x2	4.0	A	3	0	7,312
2565	1	1	3	30,350	2x2	4.0	A	3	0	7,562
G-171F Average	7-1-83	7-4-83	3							7870
2566	1	7-8-83	7	33,500	2x2	4.0	A	7	0	8,375
2567	1	1	7	33,500	2x2	4.0	A	7	0	8,375
2568	1	1	7	33,500	2x2	4.0	A	7	0	8,375
G-171F Average	7-1-83	7-8-83	7							8,380

32. Specimen Size: 2" x 2" Cube Other 37. Remarks: *NON-ACCEPTED GROUT

33. Age (Days): 3 34. Tested By: PB 35. Checked By: SF 7-6-83 36. Reviewed by Q.C.: SF 7-5-83

33. Age (Days): 7 34. Tested By: ATB 35. Checked By: SF 7-12-83 36. Reviewed by Q.C.: SF 7-4-83

38. Laboratory Supervisor Signature: _____ 39. Date: _____

TEST ONLY

HTEL POWER CORPORATION
 LAND NUCLEAR POWER PLANT JOB 7220
 PORT OF NON-SHRINK GROUT TESTS

1. Identification: Training 2. Date Placed: 7-6-83
 3. Location: Ulle Laydown Area Grout Brand & Type: AETNA Type I Cement and Sand
 4. Source: Mergentime Hand Mix 7. Required Strength: 4000 PSI At 28 Days
 5. Class: II 6. 'Q' List: Yes No Calibration Date: NA
 8. Stopwatch: NA Calibration Date: NA
 11. Flowcone: NA Calibration Date: NA
 12. Time of Efflux (Sec): No. 2 NA No. 3 NA Average: NA Sec
 13. Temp.: Grout 70 °F 14. Temp.: Air 75 °F Placement 78 °F 15. Initials: KH BW 7-6-83
 16. Calibration Date: 9-5-83 17. Time of Testing: 1835 Hrs at 1 Bag 18. Time of Molding: 1835 Hrs
 19. Curing Thermometer: 756 Calib. Date: 9-22-83 20. Stripped ASTM-C109-75: 7-7-83 At 11:00 Hrs 21. Initials: KH BW 7-7-83
 22. Curing: ASTM C-31-68 ASTM-C-31-64 92 °F Temper: 941 8-3-83 29. Cure: 9-18-83

COMPRESSIVE STRENGTH DATA ASTM-C-109-75 #4 Sieve

Specimen Location	23. Date Molded	24. Date Tested	25. Age	26. Total Load In Pounds	27. Actual Cube Dim	28. Actual Cube Area	29. Type of Break	30. Cure		31. Strength PSI
								Field	Lab	
2692	7-6-83	7-9-83	3	35,500	24.2	4.0	A	3	0	8.875
2693				36,500	24.2	4.0	A	3	0	9.125
2694				35,500 35,500	24.2	4.0	A	3	0	8.750
Average		7-9-83	3							
2695		7-13-83	7							
2696										
2697										
Average	7-6-83	7-13-83	7							

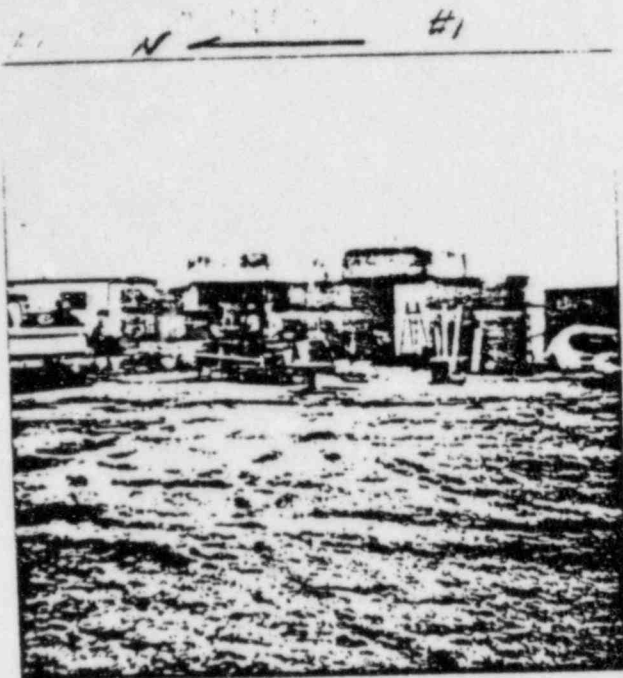
37. Remarks: _____
 Specimen Size: 2" x 2" Cube Other
 34. Tested By: KH 35. Checked By: WJ 7-12-83 36. Reviewed by Q.C.: RF 7-11-83
 38. Laboratory Supervisor Signature: _____ 39. Date: _____

Type of Breaks: A-Cone, Mortar Failure C-Shear, Mortar Failure E-Other
 QCF-74 Rev. 1

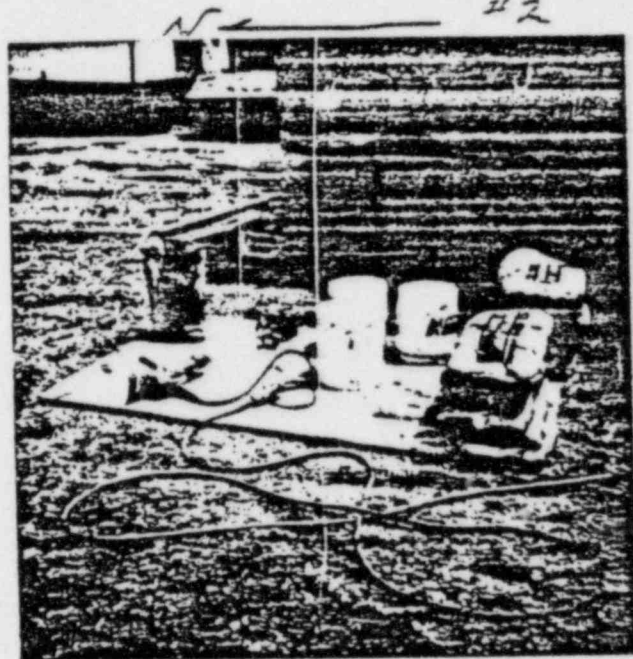
OVERHEAD FLUID GROUTING TEST PROGRAM

EXHIBIT D

PHOTOGRAPHICS



6/28/83 GROUTING TEST SITE
@ POSEYVILLE YARD.



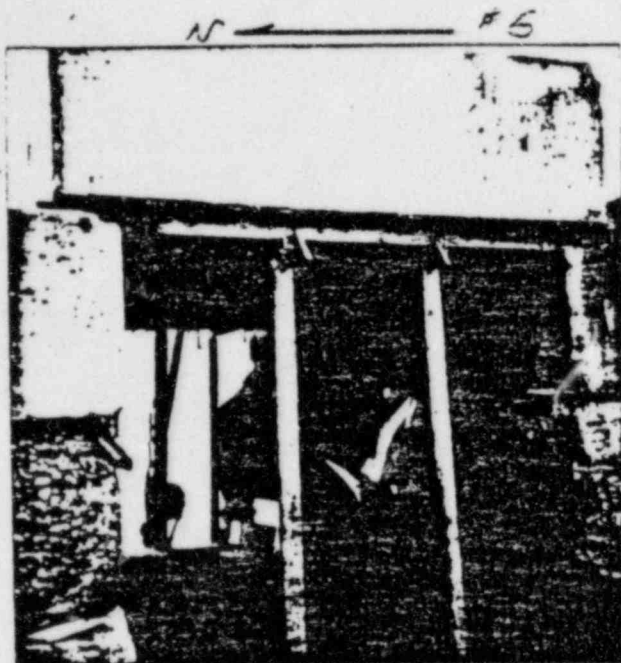
6/28/83 GROUT MIX STATION FOR
TEST RATES #1 THRU #4 POSEYVILLE
YARD



6/28/83 U.S. TESTING - FLOW CONE
SETUP FOR TEST RATES #1 THRU #4
ONE SUCCESSFUL TEST TAKEN FOR
ALL RATES PER MCP 15.000 SECT. 11.2



6/28/83 GROUT PUMP SET UP
PUMP = AIRPLACO MODEL #HG-5,
S.N. - 821121, Pressure Gauge 0-60F
2 1/2" Ø DIAL
ALL APPEAR TO BE IN GOOD CONDITION.



6/26/83 GIRDING TEST SITE
NORTH BAY (RATES #1-#4)
LOOKING EAST SHOWING WIND BREAK
ON FAR END AND BULKHEAD WITH
BRACING



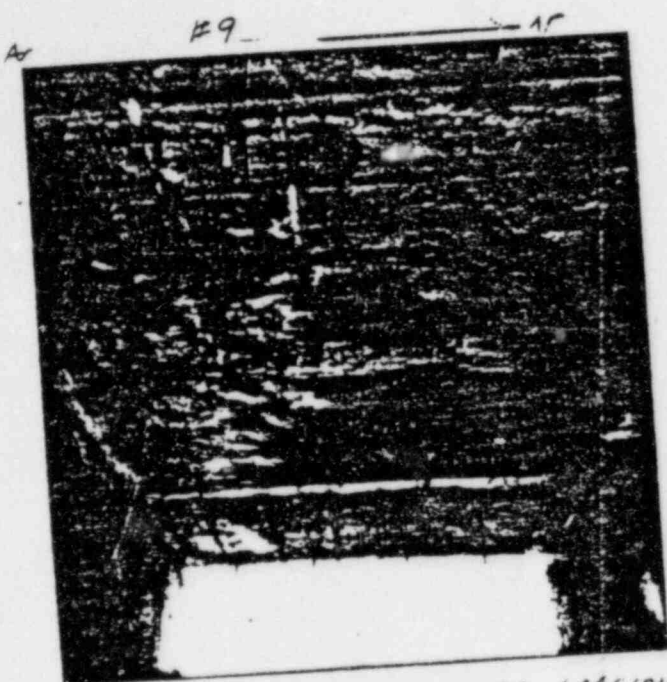
6/28/83 WOODEN BULKHEAD AT RATE
#2 & #3. BOTH WITH LEAD WOOL/EXP.
METAL BEHIND



6/28/83 TYPICAL GIRTS NIPPLE
SET-UP WITH C.P. COUPLING, PIPE
NIPPLE, VALVE AND WELDED NIPPLE.
(SAWING @ RATE No. 4)



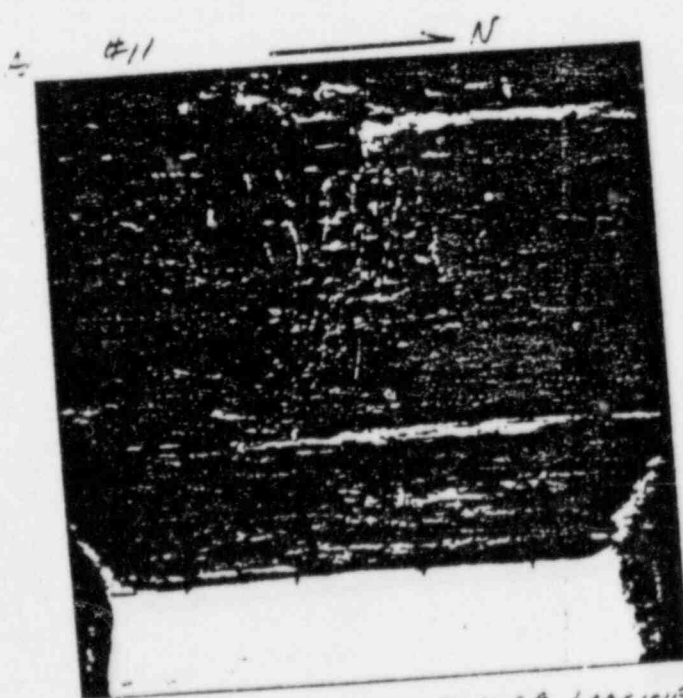
6/28/83 WOOD BULKHEAD WITH AIR
VENTS PLUGGED @ EAST SIDE OF
RATE No. 4. RATES SUPPORTED BY
ANCHOR BOLTS ONLY



7/2/83 NORTH BAY UNDERSLAB LOCKING WEST. CUT GROOVE PATTERNS VISIBLE.



7/2/83 NORTH BAY UNDERSLAB LOCKING EAST. CUT GROOVE PATTERNS VISIBLE



7/2/83 SOUTH BAY UNDERSLAB LOCKING WEST. SCARIFIED PAD #6 AND OYYPARK PAD #5 (ASN) AT FAR END



7/2/83 SOUTH BAY UNDERSLAB LOCKING EAST. SCARIFIED AND CUT GROOVES VISIBLE.



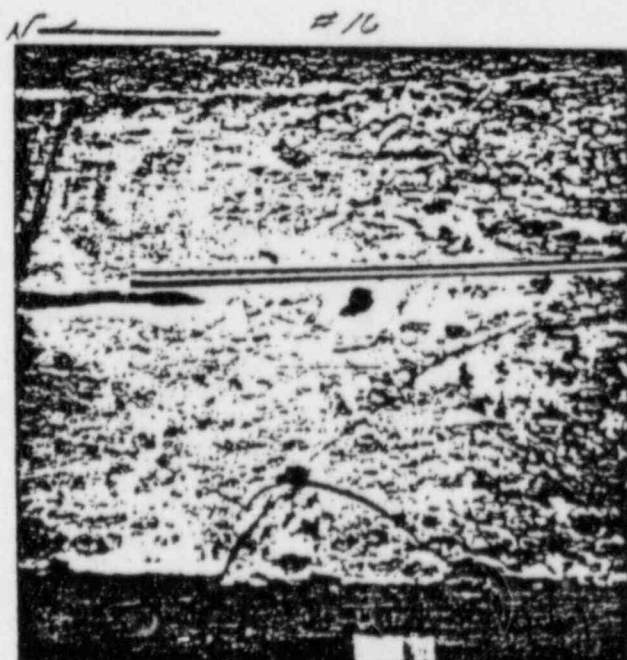
6/29/83 RATE No. 1 (NORTH END)
 CONCRETE CUT "X" PATTERN, 4 NIPPLES
 FINE RATE, WOOD BULKHEAD



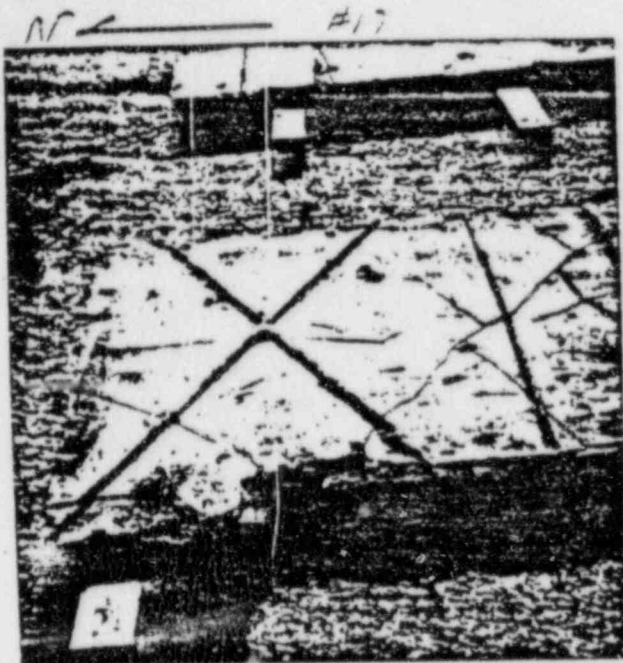
6/29/83 RATE No. 1 (SOUTH END)
 CONCRETE CUT PARALLEL LINES,
 4 NIPPLES FOR RATE, WOOD BULKHEAD



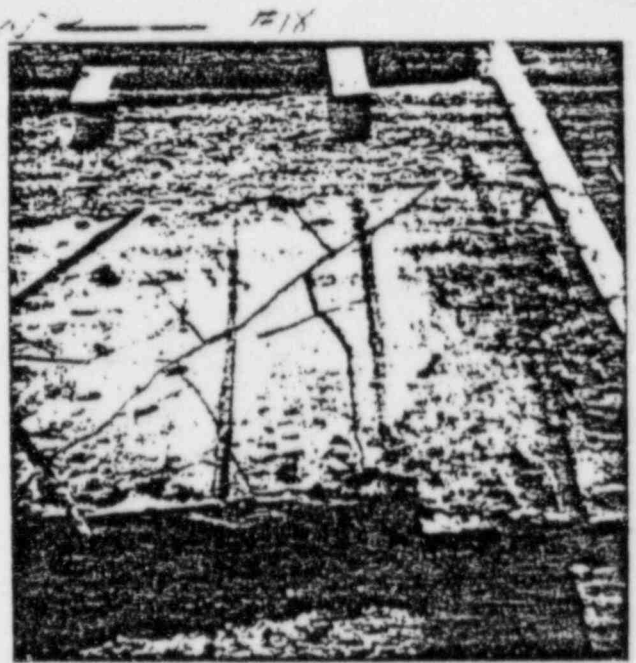
6/29/83 RATE No. 2 (NORTH END)
 CONCRETE CUT "H" PATTERN
 LEAD WOOL/EXP. METAL BULKHEAD
 4 GROSS NIPPLES FOR WOOD RATE



6/29/83 RATE No. 2 (SOUTH END)
 NO CONCRETE CUT, 4 NIPPLES,
 LEAD WOOL/EXP. METAL BULKHEAD



6/29/83 PLATE No. 3 (NORTH END)
 CONCRETE CUT "X" PATTERN, 4 NIPPLES
 FOR RATE, LEAD WOOL/EXP. METAL



6/29/83 PLATE No. 3 (SOUTH END)
 CONCRETE PARALLEL LINES, 4 NIPPLES
 FOR RATE, LEAD WOOL/EXP. METAL
 BULKHEAD



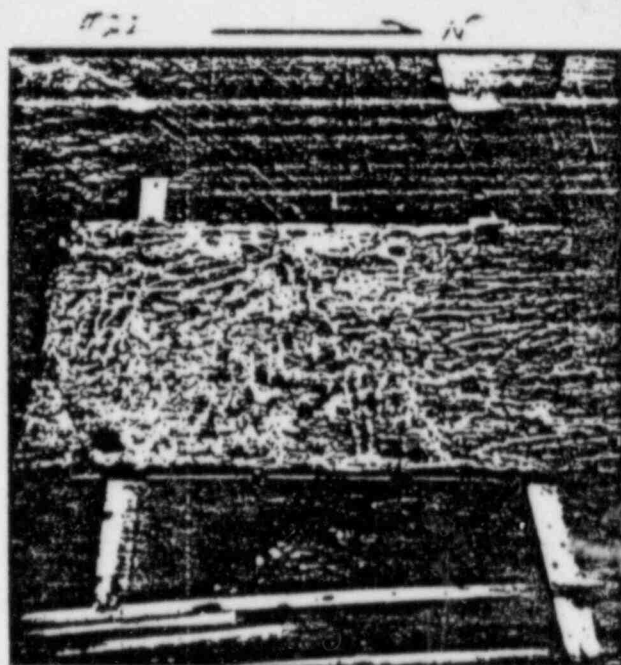
6/29/83 PLATE No. 4 (SOUTH END)
 NO CONCRETE CUT, 4 NIPPLES FOR RATE,
 WOOD BULKHEAD



6/29/83 PLATE No. 4 (NORTH END)
 CONCRETE CUT "H" PATTERN, 4 NIPPLES FOR
 RATE, WOOD BULKHEAD



4/30/83 RATE No. 5
TEST RATE WITH 713 MASTERFLOW
DRY PACK (BEFORE STEEL PLATE REMOVAL)



4/30/83 RATE No. 6
TEST RATE WITH CHISEL PREP. ON
CONCRETE SURFACE



7/12/83 RATE No. 5A (SOUTH END)
SECOND DRYPACK TEST RATE AT
SAME LOCATION ALSO USING
MASTERFLOW #713



7/12/83 RATE #5A (NORTH END)
SECOND DRYPACK TEST RATE AT
SAME LOCATION AS RATE #5



6/30/83 RATE No. 7
 TEST RATE WITH CORE HOLE IN
 SLAB @ CENTER.



7/1/83 RATE No. 8
 TEST RATE WITH GROUTING NIPPLE
 IN NORTH WEST CORNER



7/1/83 RATE No. 2
 NOTING PERIPHERALLY ORIENTED
 AIR HOLES AROUND INJECTION HOLE
 #2 (f. in SOUTH E.W.)



7/1/83 TEST RATE No. 2
 SHOWING LEAD WOOL PACKING TYPE
 BULKHEAD



7/7/83 RATE No. 5B (SOUTH END)
3RD DRYPACK TEST RATE BUT MADE
WITH SAND/CEMENT MIX #713



7/11/83 RATE No 5B (NORTH END)
3RD DRYPACK TEST RATE BUT MADE WITH
SAND/CEMENT MIX #713



7/11/83 RATE No. 5B (NORTH WEST CORNER)
APPEARANT LOSS ON CONTACT AREA
211" x 6". THE M.B. APPEAR TO HAVE SLIPPED
ON THE WEST SIDE (1 1/2" TO 2" GROUND IN)

s will be mortar tight and well
sufficient air relief holes of adequate size
l be provided to avoid entrapment of air
determined by the RSG FE and concurred with
the RSG FE.

required, forms will be caulked to prevent
leakage of grout and loss of head.

grout in a form, the form will be extended
to facilitate rapid, continuous and
filling of the space to be grouted.

estimate amount of water/bag to be used for
it will be as listed in Attachment B.

graduated buckets or containers will be used
for determining quantity of water.

contractor will determine the amount of water to
the grout mix at the beginning of each day
for each type of grout used, excluding Set
on the flow cone tests performed by the
contractor's approved testing agency. Acceptance
for flow cone tests will be as shown in
Attachment B. The amount of water added to Set 45 will
as listed in Attachment B. | 8

the amount of water to be used in the grout
is to be adjusted, the adjusted amount of water
based on the results of a flow cone test
performed by the contractor's approved testing agency.
contractor will notify the RSG FE when
additional flow cone tests are required. | 8

any grout batched for flow cone tests that does
not meet the test requirements given in Attachment B.

compressive strength test cubes will be cast by the
contractor's approved testing agency at the beginning
of each day's production for each type of grout used.
contractor will notify the RSG FE when grout
test cubes are required.

mixer, vertical shaft vane mixer, or Jiffley-
mixer revolving at less than 300 rpm will be used
for mixing grout. In no case will the grout be mixed
by hand.

F7220-C/95-28-7(A)

- 10.1.1 Forms will be mortar tight and well braced.
- 10.1.2 Sufficient air relief holes of adequate size will be provided to avoid entrapment of air as determined by the MFE and concurred with by the RSG FE.
- 10.1.3 If required, forms will be caulked to prevent leakage of grout and loss of head.
- 10.2 When pouring grout in a form, the form will be extended high enough to facilitate rapid, continuous and complete filling of the space to be grouted.

11.0 MIXING

- 11.1 The approximate amount of water/bag to be used for mixing grout will be as listed in Attachment B.
- 11.1.1 Graduated buckets or containers will be used for determining quantity of water.
- 11.2 The subcontractor will determine the amount of water to be used in the grout mix at the beginning of each days production, for each type of grout used, excluding Set 45, based on the flow cone tests performed by the contractor's approved testing agency. Acceptance criteria for flow cone tests will be as shown in Attachment B. The amount of water added to Set 45 will always be as listed in Attachment B. | 2
- 11.3 Any time the amount of water to be used in the grout mix needs to be adjusted, the adjusted amount of water will be based on the results of a flow cone test performed by the contractor's approved testing agency. The subcontractor will notify the RSG FE when additional flow cone tests are required. | 2
- 11.4 Discard any grout batched for flow cone tests that does not pass the test requirements given in Attachment B.
- 11.5 Compressive strength test cubes will be cast by the contractor's approved testing agency at the beginning of each days production for each type of grout used. The subcontractor will notify the RSG FE when grout test cubes are required.
- 11.6 A paddle mixer, vertical shaft vane mixer, or Jiffler-type mixer revolving at less than 300 rpm will be used for mixing grout. In no case will the grout be mixed by hand.

F7220-C195-28-7 (A)

- QAP | 11.7 Water to be used for mixing will be potable water (i.e., drinking water) having a temperature range indicated in Attachment B.
- 11.8 Grout as mixed will be between temperature ranges specified in Attachment B. The use of ice water in hot weather and warm water in cold weather is recommended.
- 11.9 Place at least 90% of the water in the mixer first, then with the mixer operating, steadily add grout and water and mix for the time period shown in Attachment B. If lumps exist, mixing may be continued one additional minute beyond the times listed in Attachment B. If lumps still exist, the grout will be filtered through a 1/8" mesh sieve or discarded.
- 11.10 Do not mix a grout quantity greater than what can be placed in approximately 15 minutes.
- QAP | 11.11 Grout will not be re-tempered. Discard any material that becomes unworkable.

12.0 PLACING

- QAP | 12.1 The grouting sequence for structural plates will be in accordance with approved grout placement plan (Attachment C). Grout placement operations will be observed by the RSG FE for compliance with the approved plan.
- 12.2 Grout will be placed quickly and continuously to avoid segregation, bleeding, and change in the initial set.
- QAP | 12.3 During the grout operation, the surfaces which are to come in contact with grout will have a temperature range as indicated in Attachment B.
- 12.4 Sufficient head will be maintained so that all the spaces become full with grout.
- QAP | 12.5 Subcontractor may drill additional holes in the form to determine whether grout has filled all the spaces. These holes shall be plugged by wood, ethafoam or cork once the grout starts oozing out of these holes.
- 12.6 When grout is being placed by means of tube, the tube will be withdrawn slowly in such a manner that the end of the tube is always in grout. Sufficient holes in the form will be provided to facilitate in making this determination. These holes shall be plugged by wood, ethafoam, or cork once the grout starts oozing out of these holes.

F7220-C195-28-7(G)

12.9.4 For grouting spin lock rock bolts, a steel plate with two keyholes for inserting grout tube and de-air tube will be used. The grout tube will be inserted to the top of the thrust ring. Grout will then be pumped with a hand pump until grout starts oozing out of the de-air tube. The grout tube will be gradually removed once grout starts oozing from the de-air tube. Discharge of grout in a steady stream from the de-air tube is positive proof that the entire hole is filled and entire area of the bolt, including seams, is well grouted. Plug the de-air tube and continue pumping briefly. Then plug the grout hole.

12.9.5 For grouting hollow core spin lock rock bolts, a steel plate with one keyhole for inserting grout tube (for bolting to surface above) or de-air tube (for bolting to surface below) will be used. The hollow tube in the rock bolt is the de-air tube (for bolting to surface above) or the grout tube (for bolting to surface below). Grout will be pumped with a hand pump until grout starts oozing from the de-air tube. Discharge of grout in a steady stream from the de-air tube is positive proof that the entire hole is filled and entire area of the bolt is well grouted. Plug the de-air tube and continue pumping briefly. Then plug the grout hole.

13.0 PRESSURE GROUTING

13.1 The grouting sequence for structural plates will be in accordance with approved grout placement plan (Attachment C). Grout placement operations will be observed by the RSG FE for compliance with the approved plan.

13.2 Pressure grouting will be used where necessary and at the Subcontractor's option. Pressure grouting will be necessary where indicated on the approved grout placement plan (Attachment C) and at other locations determined by the MFE and concurred with by the RSG FE.

13.3 The pump must be a positive displacement type, such as the piston, or a progressive cavity type.

13.4 The pump, the hose, and the nozzle will first be rinsed with water.

F7220-C195-28-7C

QAP 13.5 The grout to be used will be made into a slurry and pumped through the line prior to pumping grout to ensure that neither water nor cement are removed from the grout during pumping, and that the pump and hose will not clog. Slurry will be discarded.

13.6 If a nozzle is not used on a mechanically driven grout pump, first pump water through the line, followed by a pig, and immediately followed by a pump grade grout.

13.7 Grout pressure will be monitored when using mechanically driven pumps to place grout. Maximum grout pumping pressure will be 40 psi or as noted on the approved grout placement plan (Attachment C).

13.7.1 Pressure gauges for monitoring grout pressures will be supplied and calibrated by the Contractor. The range of the gauge will be between 0 and 100 psi (maximum).

13.8 On mechanically driven grout pumps, a pressure gauge will be installed on the pump discharge line, for indicating to the operator incipient line blockage or a plugged insert pipe.

13.9 When grout is pumped into place, grouting is started at the far end of the space to be grouted or as shown on the approved grout placement plan (Attachment C).

13.10 As the grout is pumped in, the nozzle will be backed out slowly so that it always remains within the grout, preventing air entrapment.

14.0 CURING

QAP 14.1 After placement, the grout will be cured in accordance with the methods and temperatures listed in Attachment B until the grout has attained its specified compressive strength.

F7220-C195-28-7'

	Embeco 636	Masterflow 713	Masterflow 814	Set 45
Quantity of Water Per Bag	1.26 gals.*	1.32 gals.*	2.55 gals.*	0.5 gals
Water Temperature	32°F to 80°F	32°F to 80°F	32°F to 80°F	32°F to
GROUT Temperature	45°F to 70°F	45°F to 70°F	45°F to 75°F	50°F to
Surface Temperature	45°F to 85°F	55°F to 85°F	55°F to 85°F	50°F to
Curing Temperature	45°F to 75°F	45°F to 85°F	45°F to 85°F	50°F to
Curing Method	Cover exposed grout with clean wet rags (not burlap) a minimum of 3 days then apply appropriate Contractor approved and supplied curing compound.	Cover exposed grout with clean wet rags (not burlap) a minimum of 3 days then apply appropriate Contractor approved and supplied curing compound.	Cover exposed grout with clean wet rags (not burlap) a minimum of 3 days then apply appropriate Contractor approved and supplied curing compound.	Air dry. Do not use curing compound not wet
Flow Cone Values	25 ±5 Sec.	25 ±5 Sec.	25 ±5 Sec.	N/A
Mixing Time	2-3 Min.	2-3 Min.	Until Uniform 3 Min. Max.	1-1 1/2

*These are recommended quantities of water to be added and may be adjusted as specified in Section 11.2 and 11.3 of this procedure.

F7220-C195-28-4(a)



STONE & WEBSTER MICHIGAN, INC.

P.O. Box 2325, BOSTON, MASSACHUSETTS 02107

United States Nuclear Regulatory Commission
Midland Site Resident Inspection Office
Route 7
Midland, MI. 48640

July 7, 1983

J. O. No. 14358
Ref. MPF 41

Attention Mr. R. Cook

RE: DOCKET NO. 50- 329/330
MIDLAND PLANT-UNITS 1 & 2
INDEPENDENT ASSESSMENT OF UNDERPINNING
REPORT NO. 41

A copy of the Independent Assessment of Underpinning, Weekly Report No. 41 for the period of June 26, 1983 through July 2, 1983 is enclosed with this letter. Included as attachments, are the minutes of the daily meetings held during the week between members of the Assessment Team and Site Engineering, Construction, and Quality Assurance personnel.

If you have any questions with respect to this report, please contact me at 617-589-2067.

Very truly yours,

W E Killen for AS Lucks

A. Stanley Lucks
Project Manager

Enclosures

ASL/pd

~~830804/0455~~

J. O. No. 14358
Midland Plant
Units 1 & 2
Independent Assessment of Underpinning

Weekly Report No 41

June 26, 1983 through July 2, 1983

Personnel on Site

Stone & Webster Michigan, Inc.

W. Kilker 6/27 - 6/29
P. Barry 6/26 - 6/30
L. Rouen 6/27 - 7/ 1
P. Majeski 6/27 - 7/ 2
A. Lucks 6/30

Parsons, Brinckerhoff Michigan, Inc.

W. Parish 6/28 - 7/ 1

Meetings Attended

<u>Date</u>	<u>Represented</u>	<u>Purpose</u>
6/27 - 7/1	Stone & Webster Bechtel Consumers Power Parsons (6/29 - 7/1)	Daily Meeting
6/27	Bechtel Consumers Power Mergentime Stone & Webster	Road Map Meeting for Mass Excavation
6/30	Bechtel Consumers Power Stone & Webster	Weekly Engineering and Construction Coordination Meeting

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Activities:

Construction :

Pier KC11: The load transfer was initiated and the proof load criteria met.

Pier E8: The installation of rebar in the hammerhead was completed and concrete was placed.

Pier E10: The acceptance criteria for load transfer was met. However, the pier remains on active jacks to obtain engineering data for evaluation of secondary settlement.

Pier E8 N-S Bulkhead: Excavation of the drift and installation of lateral bracing continued to approximately 15 % completion.

Pier KC2: Bearing plates and jacks were installed and load transfer commenced.

Pier W8: Installation of rebar in the hammerhead was completed and the concrete was placed.

Pier W10: Load transfer was initiated and the acceptance criteria met. As with pier E10, active jacking will continue to obtain data for evaluation of secondary settlement.

W8 N-S Bulkhead: Excavation of the drift and installation of bracing continued to approximately 25 % completion.

SWPS: Phase II shallow probing was completed and deep probing and sheeted pits for probing continued. Interior well installation began while work on benchmarks and extensometer continued.

BWST: The drilling of anchor holes and fabrication of reinforcing steel continued. Sandblasting existing concrete surfaces and mapping of cracks was continued.

Quality Control, Documentation and Records:

1. The implementation of non-conformance trending analysis as applicable to underpinning activities was reviewed.
2. Reviewed CPCo Audit reports of Dudgeon and of U. S. Testing .
3. Lead Auditor qualifications were reviewed for the U. S. Testing and the Dudgeon audits.
4. Completed inspection reports were examined for the following activities: installation of anchor bolts, grouting, welding of jack stands, concrete drilling and rebar splicing.
5. QC field inspections were witnessed.

Observations

Construction - Load transfer at pier W10 caused slight movement of adjacent piers, particularly W9 which remained on active jacks until late in the week as a result of the building movement noted previously. A review of the data being prepared and evaluated by resident engineering does not indicate any unusual pier or structure movement in this area.

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Resident Engineering continues to evaluate all pier load-settlement and structural movement data to assure that no unexpected problems are developing.

The Assessment Team observed the results of the installation of several flowable grout test panels and two dry-pack test panels. A visual evaluation of the panels indicated no significant defects. Two small void areas were observed in one of the dry-pack panels. Based on these results the Assessment Team believes the Sub-contractor is capable of satisfactorily installing either the dry-pack or flowable grout materials.

Quality Control, Documentation and Records:

1. The trending analysis system implementation has been somewhat modified from its normal usage for application to the remedial soils work. To insure that maximum benefits are obtained the evaluation of data must be accomplished in a more timely manner.
2. All audit findings resulting from the Dudgeon and U S Testing Audits were answered in an acceptable manner. Implementation of a few items has yet to be verified by the audit team.
3. Qualifications and certifications of the lead auditors involved in the audits of Dudgeon and U S Testing were in accordance with ANSI N 45.2.23 in all instances.
4. No discrepancies were found in any of the inspection reports which were reviewed.
5. The QC inspections of Hiltibolt installation and torquing were in accordance with the inspection procedures.

The weekly Engineering and Construction Coordination meetings are becoming an effective forum for discussion of problem areas. However, timely resolution of outstanding NCR's continues to be a nagging problem. The organization involved must strive to significantly reduce the time required for resolution.

During the week an NCR was written on weld rod filler material which was inadvertently used up to 12 hours after withdrawal from the supply station. The specification was recently altered to limit the use time to 10 hours maximum. Of particular significance was the fact that MPQAD discovered alterations to the weld rod filler withdrawal records associated with this nonconformance. FSO reacted quickly to the situation by terminating the employment of the responsible welding engineer.

Nonconformance Identification Report

<u>NIR No.</u>	<u>Description</u>	<u>Date</u>
12	NCR Reviewed for Reportability under 10 CFR 50.55 (e) part 21.	(Opened) (Closed) 6/16/83

Wayne E. [Signature]
 Project Engineer

A. S. [Signature]
 Project Manager

Notes of Daily Meeting
Independent Assessment of Underpinning
Midland Plant Units 1 & 2
Consumers Power Company

Held at Midland Site Location
Midland, Michigan
June 27, 1983

Present For:

<u>Consumers Power</u>	<u>Bechtel</u>	<u>MPQAD</u>	<u>Stone & Webster</u>
G. Murray	M. Blendy D. Lavelle N. Swanberg J. Gaydos	R. Sevo	W. Kilker P. Barry

Purpose

This meeting is held each day to discuss items regarding the Independent Soils Assessment at the Midland Plant, Units 1 & 2.

Discussion

Item 1 - SWPS Soldier Pile Installation.

D. Lavelle reported the procedure for drilling and supporting the pre-drilled 2 ft. diameter hole is being revised based on the experience on the first pile installation attempt. J. Gaydos said a change request was processed to use grout as the pile backfill rather than concrete.

Item 2 - E/W8 Reinforcing Steel Welding.

D. Lavelle said that the two qualified welders have nearly completed this type of welding for pier E8 hammerhead.

Item 3 - Pier KC2 Dry-Pack.

J. Gaydos reported that at pier KC2 the upper leveling plate dry-pack had been removed after the initial cube break strength did not quite meet the specification requirements. Rather than waiting or attempting an engineering resolution, the material was removed and new dry-pack installed.

* Item 4 - Concrete Mix Design.

N. Swanberg stated that the SCN approving new concrete mix designs, including superplasticized concrete, is scheduled for release this week. P. Barry said K. Razden (C P Co) had discussed the proposed designs with him and the Team concerns were stated. K. Razden must approve any new mix design prior to release as a project concrete mix.

Item 5 - MPQAD Inspections and Sign-offs.

R. Sevo will verify that MPQAD has "signature-authorized " personnel on-site on weekpeds to assure timely sign-off on NCRs, FCRs, etc.

* Item 6 - Auxiliary Building Benchmark Movement.

W. Kilker reported J. Darby and P. Barry discussed the measures taken last week to reduce the structural settlement shown on Unit 1 Auxiliary building as shown by the benchmark in the vicinity of pier W8. Apparently care taken in working around the benchmark combined with some pier re-jacking has reduced the settlement rate to that in effect over the past few months.

Notes of Daily Meeting
Independent Assessment of Underpinning 2
Midland Plant Units 1 & 2
Consumers Power Company

Held at Midland Site Location
Midland, Michigan
June 27, 1983

Item 7 - Grouting Of Void Between Existing Fill And West Auxiliary Building Foundation

There was a discussion of the grouting of the gap encountered between the soil and auxiliary building foundation during fill excavation. The grout take was nearly 30 cubic feet.

Item 8 - EPA Excavation.

W. Kilker reported that the Assessment Team considered the recent slope lay-back extending under the Unit 1 EPA area to be questionable in terms of the intent of the drawings. N. Swanberg said Project Engineering agreed with this viewpoint but from a structural support viewpoint there was no reason for concern.

Item 9 - Assessment Team Scope of Work.

W. Kilker reported that, as per conversations last week with the NRC and CCo, the Team will in the future assess all soils remedial work done on safety related structures or installations.

Items Requiring Resolution.

Items requiring resolution are indicated by an *.

Notes of Daily Meeting
Independent Assessment of Underpinning
Midland Plant Units 1 & 2
Consumers Power Company

Held at Midland Site Location
Midland, Michigan
June 28, 1983

Present For:

<u>Consumers Power</u>	<u>Bechtel</u>	<u>MPQAD</u>	<u>Stone & Webster</u>
G. Murray	M. Blendy	R. Sevo	P. Barry
J. Schaub	D. Lavelle		W. Kilker
R. Wheeler	N. Swanberg		P. Majeski
	J. Gaydos		L. Rouen
	E. Cviki		

Purpose

This meeting is held each day to discuss items regarding the Independent Soils Assessment at the Midland Plant, Units 1 & 2.

Discussion

Item 1 - Plate Tolerances.

There was a discussion of tolerance on the fluorocloc plate flatness based on an NCR that has been issued on pier W10 plates. N. Swanberg reported that tolerances will be provided to better define for QC the acceptable limits.

Item 2 - Pier E/W8 Status.

M. Blendy reported that rebar welding for E8 is virtually complete and that the similar activity for W8 is now underway.

Item 3 - Pier W10 Status.

M. Blendy presented an outline of the chronology of events that have led to the delays associated with the load transfer at pier W10.

Item 4 - MPQAD Re-inspection of Auxiliary Building Instrumentation Installations.

R. Sevo reported that MPQAD will re-inspect the open IPIN items and also inspect the remainder of the system. NCRs will be issued for all open items and new nonconforming conditions that will then require disposition.

Item 5 - Engineering/Construction Coordination Meeting.

M. Blendy stated that in an attempt to improve the productivity of the meeting an action item list has been developed and that the goal is to resolve at least 70 percent of all FCRs and NCRs under discussion (at a particular meeting) prior to adjournment.

Item 6 - NCR on Furnishing Pressure Grout.

J. Gaydos reported that an NCR was issued on the grout used to fill the gap between the fill and EPA foundation. The basis for issuance was on interpretation of the specification requirement for furnishing the grout. N. Swanberg said Engineering will disposition by clarifying the specification wording or discussing the interpretation with MPQAD.

Items Requiring Resolution.

Items requiring resolution-none.

Notes of Daily Report
Independent Assessment of Underpinning
Midland Plant Units 1 & 2
Consumers Power Company

Held at Midland Site Location
Midland, Michigan
June 29, 1983

Present For:

<u>Consumers Power</u>	<u>Bechtel</u>	<u>MPQAD</u>	<u>Stone & Webster</u>
G. Murray	M. Blendy J. Gaydos E. Cvikl	R. Sevo	P. Barry P. Majeski
			<u>Parsons</u> P. Parish

Purpose

This meeting is held each day to discuss items regarding the Independent Soils Assessment at the Midland Plant, Units 1 & 2.

Discussion

Item 1 - Documentation Concerning Pier Load Transfer.

R. Sevo requested a copy of the load transfer field data sheets from QC prior to Mergentime issuing the final copy."

* Item 2 - QA Reinspection.

R. Sevo and M. Blendy stated that a number of NCR's will be issued concerning reinspection of electrical conduit originally installed as non-Q but now re-inspected as Q. P. Majeski stated that it would be important to review these NCR's to determine if the nonconforming items were an indication of construction quality on nonQ items, the result of as-built conditons or the result of differing inspection criteria. G. Murray stated that none of the NCR's to date concerns the integrity of the system.

* Item 3 - Use of FCR's For Drawing Revisions.

P. Parish stated that often drawings were difficult to review because of the number of attached changes and the physical problem of looking on the back of the drawing. In the past, these documents were kept in a binder but CPCo requested that they be attached to the drawings. E. Cvikl will look up the current requirements for reissuing drawings based upon the number of outstanding changes. It was also mentioned that an FCR, etc. is usually written to approve a field as-built condition prior to QC inspection to prevent an NCR from being written. M. Blendy stated that from three to six FCR's are usually issued a day.

Item 4 - Building Settlement.

E. Cvikl stated that the differential settlement from DSB 2W had leveled off in the last few days but still was being monitored.

Items Requiring Resolution.

Items requiring resolution are indicated by an *.

Notes of Daily Meeting
Independent Assessment of Underpinning
Midland Plant Units 1 & 2
Consumers Power Company

Held at Midland Site Location
Midland, Michigan
June 30, 1983

Present For:

<u>Consumers Power</u>	<u>Bechtel</u>	<u>MPQAD</u>	<u>Stone & Webster</u>
G. Murray	M. Blendy	R. Sevo	P. Barry
K. Razden	J. Gaydos *		P. Majeski
	E. Cvikl		
	D. Lavelle *		<u>Parsons</u>
	J. Kelleher		P. Parish
	D. Himmelberger *		

Part time. *

Purpose

This meeting is held each day to discuss items regarding the Independent Soils Assessment at the Midland Plant, Units 1 & 2.

Discussion

Item 1 - Rebar Welding For E8.

An NCR was written against the welding of rebar because a portion of the welding was done with weld rod which was in use for more than the specified 10 hour period. This situation inadvertently occurred because of two factors. The first being that the weekend shifts on which much of the work was performed were 12 hours, rather than 10 hours. The second factor is that there has been a recent specification change cutting the allowable time from 12 hours to 10 hours. D. Lavelle advised the Assessment Team that the FSO Lead Field Welding Engineer was terminated for altering the weld rod withdrawal records associated with the E8 welding nonconformance described above.

* Item 2 - Carlson Meters.

P. Barry questioned if the WJE procedure on Carlson Meters may need changing as a result of an upcoming specification change.

* Item 3 - Pumped Grout Test Program.

The results of the testing of grouting procedures of the first four test plates showed satisfactory results. Three additional plates were grouted and one dry packed on June 29. During this test series, plate bulge as high as 3/8 inch was noted. R. Sevo indicated that the MPQAD inspector noted pressures of up to 125 psi during grout placement. There was some discussion as FSO had noted maximum pressures of 12-14 psi. R. Sevo is to confirm his understanding of MPQAD's observation.

Notes of Daily Meeting
Independent Assessment of Underpinning
Midland Plant Units 1 & 2
Consumers Power Company

Held at Midland Site Location
Midland, Michigan
June 30, 1983

Item 4 - EPA Excavation.

No NCR is to be written for overexcavation under the Unit 1 EPA as the drawings give the RGE authority to layback the slope as required. No specific dimensions are provided on drawings and engineering has no additional concerns.

* Item 5 - Load Transfer Acceptance Determination.

Paul Barry asked how rebound would be taken into consideration in determining acceptance of a pier after load transfer. E. Cvikel is to determine method of acceptance.

Item 6 - Carlson Meter Readings at Pier W11.

P. Barry asked if Carlson meter information would be used to determine a need to rejack W11 or any other pier. K. Razden indicated that the intent is to maintain constant elevation of the structures.

Items Requiring Resolution.

Items requiring resolution are indicated by an *.

Notes of Daily Meeting
Independent Assessment of Underpinning
Midland Plant Units 1 & 2
Consumers Power Company

Held at Midland Site Location
Midland, Michigan
July 1, 1983

Present For:

<u>Consumers Power</u>	<u>Bechtel</u>	<u>MPQAD</u>	<u>Stone & Webster</u>
G. Murray	M. Blendy	R. Sevo	F. Majeski
	E. Cvikl		<u>Parsons</u>
	D. Himmelberger*		P. Parish

Part time. *

Purpose

This meeting is held each day to discuss items regarding the Independent Soils Assessment at the Midland Plant, Units 1 & 2.

Discussion

Item 1 - Carlson Meters.

E. Cvikl indicated that the WJE procedure will require changes as a result of the upcoming specification change. Forecast dates for completion are being developed.

Item 2 - Use of FCR's For Drawing Revisions.

E. Cvikl provided copies of the pertinent pages defining the criteria to be used for reissuing a drawing based upon the number of outstanding changes. In summary these are: 45 days since approval of first FCR/FCN against the drawing; 10 days have elapsed since the 10th FCN; and, 30 days since the 15th FCR, FCN and DCN, taken in total.

Item 3 - Pumped Grout Test Program.

R. Sevo indicated that the high pressures noted by MPQAD inspector during the pumping operation were only instantaneous "spikes" during the hand pumping operation. M. Blendy indicated that the test panel for the dry pack did not go as well as for the pumped grout. It was his understanding that the crew was not as experienced as the crews actually performing the work at the piers. An additional test panel is to be constructed using dry pack. P. Parish said that it was his understanding that the dry pack used for the test was not as moist as that used at the piers. He further stated that all of the panels including the dry packed panel appeared acceptable to him.

Items Requiring Resolution.

Items Requiring Resolution-None.

Notes of MPQAD Meeting
Independent Assessment of Underpinning
Midland Plant Units 1 & 2

Held at Midland Site Location
Midland, Michigan
June 28, 1983

Present For:

Stone & Webster

P. Barry
P. Majeski
L. Rouen
W. Kilker

MPQAD

R. Oliver
D. Horn
M. DeWitt
J. Meisenheimer

Purpose

This meeting is held each week to obtain information from MPQAD regarding the soils underpinning work at the Midland Plant Units 1 & 2.

Discussion

Item 1 - Status of NIR # 12.

J. Meisenheimer reported that the QAR has been dispositioned and a revised NCR form will be forthcoming to include the "reportability" consideration.

Item 2 - Instrumentation IPINs.

J. Meisenheimer explained that MPQAD will re-inspect the open IPIN items and issue NCRs as required. In addition, MPQAD will re-inspect the remainder of the instrumentation system installation. The majority of these open items are electrically related.

Item 3 - MPQAD Signature Authority.

M. DeWitt and J. Meisenheimer explained that signature authority has been designated for all work shifts. However, in the case of sensitive issues or disputes over interpretation, department supervisory signature shall be obtained.

Item 4 - Revised Instruction on Issuing QC Hold-Tags.

J. Meisenheimer reported the instruction on issuing QC Hold Tags is being revised. Once implemented, there should be less delay in actually placing the tag and thereby a reduction in confusion with the field personnel as to the "limits" of the hold area.

Item 5 - MPQAD Activities Status.

R. Oliver reported that presently his group is concentrating on reviewing drawings for Control Tower piers. Few Work Activity Package submittals are coming through from the FSO Constructability group.

Notes of MPQAD Meeting
Independent Assessment of Underpinning
Midland Plant Units 1 & 2

Held at Midland Site Location
Midland, Michigan
June 28, 1983

Item 6 - MPQAD Receipt Inspections.

W. Kilker inquired if there are any significant problems in receiving materials from Q vendors or in MPQAD-Soils inspectors encountering problems with materials originally Q-Received. J. Meisenheimer said the receiving inspection process is very thorough and in general has identified any problem materials and resulted in the proper corrective action.

Item 7 - Future Meeting.

W. Kilker requested that the next Assessment Team/MPQAD meeting to be on 7-6-83 at 7:30 a. m.

Items Requiring Resolution

None