



STONE & WEBSTER MICHIGAN, INC.

P.O. Box 2325, BOSTON, MASSACHUSETTS 02107

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United States Nuclear Regulatory Commission
 Midland Site Resident Office
 Route 7,
 Midland, Michigan

April 11, 1984

J. O. No. 14358
 Ref. MPF 81

Attention: Mr. Cook

DOCKET NO. 50-339/330
 MIDLAND PLANT UNITS 1 & 2
 INDEPENDENT ASSESSMENT OF UNDERPINNING
 REPORT NO. 81

A copy of the Independent Assessment of Underpinning Weekly Report No. 81 for the period of April 1, 1984 through April 7, 1984 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.

A. Stanley Lucks
 Project Manager

Enclosures
 ASL/pd

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

Weekly Report No. 81

April 1, 1984 through April 7, 1984

Personnel on Site

Stone & Webster Michigan, Inc.

P. Majeski	4/1 - 4/3
D. Benvie	4/2 - 4/6
D. Zito	4/2 - 4/6
L. Rouen	4/3 - 4/7
W. Kilker	4/3 - 4/7

Parsons Brinckerhoff Michigan, Inc.

J. Oliveira	4/1 - 4/3
B. Metros	4/3 - 4/7
J. Ratner	4/6

Meetings Attended

<u>Date</u>	<u>Represented</u>	<u>Purpose</u>
4/2 - 4/6	Stone & Webster Bechtel Consumers Power Parsons	Daily Assessment Team Meeting
4/4	Consumers Power Bechtel MPQAD Stone & Webster	Engineering-Construction Co-ordination Meeting
4/6	NRC Consumers Power Bechtel Stone & Webster	Discuss Crack Surveys and Allowable Auxiliary Building Movements

Underpinning and Remedial Soils - Construction

Piers E/W16: Load transfer and routine re-jacking was completed.

Pier W/17: The excavation of the drift to the pier has begun.

Piers CT 1/12: Installation of the transfer frame continued.

Kc3 to Kc4 Drift: Placement of concrete for the drift invert mudmat was completed.

Kc10 to Kc9: Placement of concrete for the drift invert mudmat was completed.

E/W8 Grillages: Jacking to increase the reserve capacity load at each grillage continued. The amount of loading on the east and west grillages is at 150% and 159% of the specified load, respectfully.

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Access Shaft Level C Wales : Alignment and fitup of the Level C wales is in progress for the east and west access shaft.

SWPS: Installation of the upper level wale is in progress.

Assessment Team Observations - Construction

Load transfer and the initial required re-jacking was performed for piers Kc4 and E/W16. Increments and rate of loading for the initial load transfer and re-jacking was accomplished in accordance with project procedures. Jacking loads were maintained at the required values until the acceptance criteria was met. Absolute movement measured for piers Kc4 and E/W16 at the base was on the order of 1/8 inch. The Assessment Team concluded that procedural requirements were properly implemented during initial load transfer and re-jacking for piers Kc4 and E/W16. The initial soil compression of approximately 1/8 inch was consistent with that observed at most of the previous installed pier locations.

The Assessment Team observed preparation for pressure grouting of the horizontal rock bolts at the Control Tower corners. Grout tubes were installed full depth in accordance with the procedures. Vent tubes were properly located to facilitate air escape during the grouting operation. It is the opinion of the Assessment Team that preplacement activities and the proposed method of pressure grouting of the rock bolts conforms with good construction practice.

The Assessment Team observed an underwater inspection at the SWPS. Leakage beneath the bentonite seal at the joint between the SWPS and Circulating Water Intake Structure prompted the Contractor to initiate the underwater inspection. The inspection revealed that water was flowing toward the area being dewatered for the underpinning. The base of the seal does not penetrate through the rip rap layer on the front side of the pump structure. In order to address the seepage problem, the Contractor plans to extend the bentonite seal into the clay beneath the rip rap. The Assessment Team believes this a prudent measure to alleviate the possibility of seepage occurring during future underpinning excavation activities.

Assessment Team Observations - QA/QC

The Assessment Team observed the torquing of the high strength bolts and associated inspection for the top members of the transfer frame at piers CT 1 and CT 1/12. The bolting and inspection activities were judged to be properly performed. The certification of the QC inspectors were verified for this activity.

The pre-concrete placement preparation for the Kc3-4 drift invert slab was checked by the Assessment Team. The reinforcing, embedments, formwork and subgrade dampening were all found acceptable. All of the observed items were properly identified and were free of defects.

The Team observed at US Testing the testing of a series of 7-day cured concrete cylinders representing the concrete placed within the top one-third of piers CT 1/12. The tests were performed in accordance with ASTM and US

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Testing procedures and the compressive strengths at 7 days were approaching the 4000 psi minimum design strength.

Work Activity Packages

No Work Activity Packages were overviewed or active during the past week.

Nonconformance Identification Reports

The following Nonconformance Reports (NIRs) remain open or have been closed during the week.

<u>NIR No.</u>	<u>Description</u>	<u>Status</u>	
		(Opened)	(Closed)
22	Resident Engineering Document Control Stations	2/21/84	
24	Design Drawing Review at UAT Workprint Station	3/30/84	
25	Compressive Strength Testing of Concrete Cylinders	3/30/84	

Open Items

Items discussed during meetings are categorized as follows:

OPEN ITEM - An item for which an action is required. The item will remain open until the required action has been taken. Tracking is required.

CLOSED ITEM - An item, usually brought forward by the Assessment Team that is discussed and adequately responded to. No tracking is required.

INFORMATION ITEM - An item brought forward to provide general background information regarding work, such as work status or an upcoming design change. No tracking is required.

OPINION ITEM - An opinion or suggestion given by the Assessment Team expressing an alternate construction or quality assurance technique. The opinion or suggestion is given as a possible alternate that may facilitate an operation.

CLOSES ITEM -XX-XX - This notation identifies an action that closes a previously identified open item. Tracking of the item stops.

The following listing of all Open items from the Daily Meeting Notes with Bechtel and the text of the Weekly Reports. Carry-over items from past weeks have been Closed this week are listed.

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Midland Plant
Units 1 & 2
Independent Assessment of Underpinning

<u>Item No.</u>	<u>Description</u>	<u>Closure</u>
64-7	QAP Review Program	Open
64-10	Trend Analysis	Open
71-17	Computerized Civil Drawing Register	Open
74-21	US Testing Corrective Action	Open
74-25	Expansion Anchors	Open
77-12	FCR Processing Task Force	Open
79-26	Upper Leveling Plate	Open
79-28	SWPS Backpacking Material	Open
79-34	SWPS Backpacking Placement	Open
80-28	Resident Engineering	81-22
81-6	MPQAD Controlled Document Review	Open
81-8	MPQAD Welding Audit	Open
81-21	BOP Construction Verification of Soils Work	Open
81-25	Trend Analysis Update	Open
81-34	Update on Welding NCRs	Open

W E K. Hill
Project Engineer

Albee
Project Manager

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

Held at Midland Site
Midland, Michigan
April 2, 1984

Present For:

<u>Consumers Power</u>	<u>Bechtel</u>	<u>MPQAD</u>	<u>Stone & Webster</u>
R. Wheeler	D. Lavelle	J. McMaster	P. Majeski
G. Murray	J. Kelleher	J. Moran	D. Benvie
	E. Cvikl		D. Zito
	S. Hartstern		
	J. Fisher		<u>Parsons Brinckerhoff</u>
	G. Givens		J. Oliveira

PURPOSE

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

DISCUSSION

Status Items

Item 81-1 - Auxiliary Building Underpinning Activities.

The transfer frame beams and posts for piers CT1/12 have been moved into place.

Jacking required for each of the three days after initial load transfer is in progress for pier Kc4.

Load transfer for pier E16 has been initiated.

Installation of plates for support of the Level "C" wales continued on the east and west sides.

(INFORMATION ITEM)

Item 81-2 - SWPS Underpinning Activities.

J. Kelleher stated that 3 FCRs and 1 NCR required to install the embedded plates for strut support of the soldier pile wall along the north side of the SWPS have been issued. Plate installation is scheduled to start today.

(INFORMATION ITEM)

Item 81-3 - Expansion Anchors.

J. Kelleher stated that the FCR written to allow the use of a rapid set grout beneath the bearing plate is being revised. This FCR will address both procedural and drawing changes required for the use of this type of grout.

(INFORMATION ITEM)

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

Held at Midland Site
Midland, Michigan
April 2, 1984

New Items

Item 81-4 - NIR 25 - Compressive Strength Testing of Concrete Cylinder.

P. Majeski stated that the Assessment Team observed the compressive strength testing at the US Testing laboratories on 3/30/84. It was noted that the technician performing the test did not use the maximum load indicator on the pressure gauge as prescribed in ASTM procedures. As a result, NIR 25 was issued. (INFORMATION ITEM)

Item 81-5 - FSO Controlled Document Review.

P. Majeski requested a copy of the report summarizing the results of the FSO review of their controlled document station performed last week. He also requested a copy of the plan used by FSO to conduct the review. J. Fisher will respond. (OPEN ITEM)

Item 81-6 - MPQAD Controlled Document Review.

P. Majeski requested a copy of the review plan and the report summarizing the results of the MPQAD March monthly review of their controlled document station. (OPEN ITEM)

Item 81-7 - Quality Engineering Controlled Document Review.

P. Majeski requested a copy of the Quality Engineers near term audit schedule for monitoring the Resident Engineers controlled documents. (OPEN ITEM)

Item 81-8 - MPQAD Welding Audit.

P. Majeski requested a copy of the report summarizing the results of the MPQAD welding audit performed last week. J. McMaster will respond. (OPEN ITEM)

Response Items

No response items were addressed.

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

Held at Midland Site
Midland, Michigan
April 3, 1984

Present For:

<u>Consumers Power</u>	<u>Bechtel</u>	<u>MPQAD</u>	<u>Stone & Webster</u>
G. Murray	J. Kelleher E. Cvikl J. Fisher	J. McMaster R. Sevo	P. Majeski D. Benvie D. Zito
			<u>Parsons Brinckerhoff</u> None

PURPOSE

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

DISCUSSION

Status Items

Item 81-9 - Auxiliary Building Underpinning Activities.

The stabilizer plate rock bolts have been grouted into place for piers CT1/12. Load transfer for pier W16 has begun.

Alignment and fitup of the Level C wales has begun for the west access shaft.

(INFORMATION ITEM)

Item 81-10 - SWFS Underpinning Activities.

J. Fisher stated that installation of the struts and strut plates is in progress on the east side of the SWPS. P. Majeski asked if the bentonite seal between the SWPS and the Circulating Water Intake Structure was part of the permanent dewatering system. J. Fisher responded that the bentonite seal was installed for temporary construction activities and would not be used as part of the permanent dewatering system. (CLOSED ITEM)

Item 81-11 - QAP Review Program.

J. McMaster stated the QAP task force recommendations for improving selected PQCI's, construction procedures and specifications will be presented to C.P.Co. on 4/13/84. (Item 64-7 remains OPEN) (INFORMATION ITEM)

Item 81-12 - NIR 24-Design Drawing Review at UAT Workprint Station..

J. McMaster stated that a QAR has been initiated in response to the controlled document deficiencies noted in NIR 24. (NIR 24 remains OPEN) (INFORMATION ITEM)

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

Held at Midland Site
Midland, Michigan
April 3, 1984

Item 81-13 - NIR 25 Compressive Strength Testing of Concrete Cylinders.

J. McMaster stated that a QAR was initiated on 3/30/84 in response to the nonconformance noted in NIR 25. This nonconformance describes the deficiency associated with use of the maximum load indicator on the concrete compression machine. (NIR 25 remains OPEN) (INFORMATION ITEM)

New Items

Item 81-14 - Vendor Determination of Fabrication Tolerance.

D. Zito requested information on how vendors determine fabrication tolerances for pier leveling and bearing plates. J. Fisher will respond. (OPEN ITEM)

Item 81-15 - Piers E/W17.

D. Benvie asked when drifting activities will begin to piers E/W17. J. Fisher responded that load transfer for piers E/W16 is scheduled for completion in the next few days. Drifting to piers E/W17 will begin thereafter. (CLOSED ITEM)

Item 81-16 - Balance of Plant Construction Verification of Soils Work.

D. Zito asked how BOP is notified when their construction verification is required related to the remedial soils work. J. Fisher will respond. (OPEN ITEM)

Item 81-17 - Future Work Activities.

J. Fisher reviewed planned work activities once load transfer for piers CT1/12 is completed. Work activities expected to be initiated include drifting to piers E/W5, CT3/10 and Kc5/8. (INFORMATION ITEM)

Response Items

No response items were addressed.

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

Held at Midland Site
Midland, Michigan
April 4, 1984

Present For:

<u>Consumers Power</u>	<u>Bechtel</u>	<u>MPQAD</u>	<u>Stone & Webster</u>
G. Murray	J. Fisher J. Kelleher E. Cvikl	J. McMaster R. Sevo	D. Benvie D. Zito W. Kilker L. Rouen
			<u>Parsons Brinckerhoff</u> B. Metros

PURPOSE

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

DISCUSSION

Status Items

Item 81-18 - Auxiliary Building Underpinning Activities.

Jacking for reserve capacity loading will resume today at the E8 grillage. Placement of concrete for the Kc10 to Kc9 drift invert is scheduled for today. Alignment and fitup for the Level C wales has begun for the east access shaft.

(INFORMATION ITEM)

Item 81-19 - SWPS Underpinning Activities.

J. Fisher stated that installation of the embedded plates on the SWPS is scheduled to begin later this week. (INFORMATION ITEM)

New Items

Item 81-20 - Field Engineering Review of Workprint Stations.

J. Fisher stated that field engineering will start performing a daily review of workprint station documents to supplement the efforts of document control personnel. Field engineers will verify that documents and/or attachments issued on the previous shift have been posted properly at their respective work print stations. (INFORMATION ITEM)

Response Items

Item 81-21 - Balance of Plant Construction Verification of Soils Work.

J. Fisher responded to the Assessment Team question concerning BOP notification for construction verification related to remedial soils work. FSO is presently formulating a plan for notifying BOP when the remedial

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

Held at Midland Plant
Midland, Michigan
April 4, 1984

soils work being performed necessitates BOP construction verification.
(CLOSES ITEM 81-16) (OPEN ITEM)

Item 81-22 - Quality Engineering Controlled Documents.

E. Cviki responded to the Assessment Team question concerning the Quality Engineers near-term audit schedule. A review using standard sampling techniques will be performed on randomly selected stations on a monthly basis. A full audit will be performed every 6 months. Twenty five percent of the Resident Engineers controlled documents will be reviewed by Quality Engineering during these 6 month audits. The Assessment Team considers the frequency and scope of the Quality Engineers auditing program to be satisfactory in ensuring proper maintenance of the Resident Engineers controlled documents. (CLOSES ITEM 81-7)

Item 81-23 - Resident Engineering Document Control.

E. Cviki responded to the Assessment Team question concerning inconsistencies between Project Engineering and Administrative procedures for controlled drawings. Although the procedural inconsistencies do exist, the posting and annotating of Resident Engineers' controlled documents is done exclusively by remedial soils Project Administrative Procedures. Project Engineering procedures are not utilized by site Resident Engineering administrative personnel assigned to maintaining files. In one case where the Administrative procedure did not address a particular annotating activity, the site personnel were directed not to utilize the Project Engineering procedure. Based on this discussion, the Assessment Team is satisfied that the implementation of the document posting and annotating activity for remedial soils is such that the procedural inconsistency does not affect the proper completion of the activity. (CLOSES ITEM 80-28)

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

Held at Midland Site
Midland, Michigan
April 5, 1984

Present For:

Consumers Power

G. Murray

Bechtel

J. Fisher
J. Kelleher
E. Cvikl

MPQAD

J. McMaster
R. Sevo

Stone & Webster

W. Kilker
D. Benvie
D. Zito

Parsons Brinckerhoff

B. Metros

PURPOSE

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

DISCUSSION

Status Items

Item 81-24 - Auxiliary Building Underpinning Activities.

Piers Kc4 and W16 were locked off yesterday.

Grouting of the upper leveling plates for piers CT1/12 is scheduled for today.

Fitup and alignment for the east and west access shaft Level C wales is in progress.

(INFORMATION ITEM)

Item 81-25 - Trend Analysis Update.

J. McMaster stated that the effectivity date for implementing the revised trending procedures has been rescheduled from 5/1/84 to 7/1/84. W. Kilker expressed concern that implementation of the revised trending will not aid in improving the NCR process as it relates to the underpinning work if it continues to be delayed. He requested that MPQAD address this concern.
(Item 64-10 remains OPEN) (OPEN ITEM)

Item 81-26 - Upper Leveling Plate Warping.

J. Kelleher discussed methods being evaluated to address the concern with warping of the upper leveling plates. Engineering is presently evaluating the use of a smaller size weld to alleviate warping that has resulted from the present size weld being used. Additionally engineering is considering the possibility of designating a zone of influence on the plate outside of which warping would not affect the plate's capability to carry the load.
(Item 79-26 remains OPEN) (INFORMATION ITEM)

New Items

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

Held at Midland Site
Midland, Michigan
April 5, 1984

Item 81-27 - MPQAD Audit of the Crackmapping Subcontractor.

G. Murray stated that an audit of the crack mapping subcontractor (WJE) will begin today. Additionally, MPQAD will audit training activities for all organizations related to the underpinning activities. (INFORMATION ITEM)

Item 81-28 - Weekly Report # 80.

The text of Weekly Report # 80 was reviewed. It was determined that all open items had been previously identified. (INFORMATION ITEM)

Response Items

Item 81-29 - FSO Controlled Document Review.

J. Fisher provided a copy of the review plan and results of the FSO "self audit" of their controlled document station performed on 3/29/84. Attributes evaluated during the review included drawing revision number, proper posting of attachments and the proper identification stamp on the drawing. Based on a sample size of 321 documents, five deficiencies were noted. The five deficiencies found were due to missing attachments attributed to clerical error. This deficiency rate is considered acceptable for the population size. (CLOSES ITEM 81-5)

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

Held at Midland Site
Midland, Michigan
April 6, 1984

Present For:

<u>Consumers Power</u>	<u>Bechtel</u>	<u>MPQAD</u>	<u>Stone & Webster</u>
G. Murray	J. Fisher J. Kelleher E. Cvikl	J. McMaster R. Sevo	W. Kilker D. Benvie D. Zito L. Rouen
			<u>Parsons Brinckerhoff</u>
			B. Metros J. Ratner

PURPOSE

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

DISCUSSION

Status Items

Item 81-30 - Auxiliary Building Underpinning Activities.

The lower leveling plate for the pier CT1 transfer frame has been grouted into place.

Initial load transfer and the three day rejackng has been completed for pier E16.

Drifting to pier W17 has begun.

Placement of the Kc10 to Kc9 drift invert concrete has been completed.

(INFORMATION ITEM)

Item 81-31 - US Testing Corrective Action.

J. Fisher gave a status report on upgrading being undertaken by US Testing. Cross training of the US Testing Technicians to at least 20 certifications is on schedule and should be completed by 6/22/84. The lab chief has been qualified to at least Level I for 44 certifications. Submittal of Quality Control Procedures (QCPs) with attached work instructions continues. Final issuance of all seven QCPs containing 46 work instructions is scheduled for the first part of May. (Item 74-21 remains OPEN) (INFORMATION ITEM)

Item 81-32 - NIR 22 Resident Engineering Document Control.

E. Cvikl stated that the engineers response to the QAR concerning NIR 22 will be issued today. The response addresses corrective action undertaken to address Resident Engineering document control deficiencies noted in NIR 22. (NIR 22 remains OPEN) (INFORMATION ITEM)

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

Held at Midland Site
Midland, Michigan
April 6, 1984

New Items

Item 81-33 - UAT Lateral Wellpoints.

B. Metros asked if the lateral wellpoints will be reactivated once work on piers CT 3/10 begins. J. Fisher stated that at this time the water level in piezometer BB-2 indicates the groundwater level is low enough such that the lateral wellpoints will not be needed. However, the lateral wellpoints will be placed into service if groundwater conditions necessitate their use when excavation of the piers begins. (CLOSED ITEM)

Item 81-34 - Update on Welding NCRs.

W. Kilker requested that FSO or MPQAD present an update summary on welding related NCRs. In particular, the request was to relate the number and nature of welding NCRs that have been issued during the past 2-3 months with those issued during the similar time period in 1983. J. Fisher will respond. (OPEN ITEM)

Response Item

Item 81-35 - Vendor Determination of Fabrication Tolerances.

J. Kelleher responded to an Assessment Team question on the mechanism utilized by Vendors, such as NPS, to determine the proper fabrication tolerance. A flow chart was supplied that referenced the applicable specifications, AISC and ASTM standards. The chart described how the Vendor uses the specification and standards in determining the appropriate tolerances. The Assessment Team agrees that this methodology allows the Vendors to correctly interpret the intended tolerances. (CLOSES ITEM 81-14)